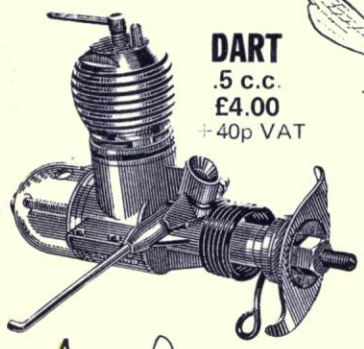
Aero Modeller

June 1973
15p
U.S.A. & Canada 75c.

INCORPORATING
MODEL AIRCRAFT

MAP **HOBBY MAGAZINE**

PRICES DOWN! ALMOST 7% REDUCTION THROUGHOUT
ON ALL RECOMMENDED SELLING PRICES



DART
.5 c.c.
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+40p VAT

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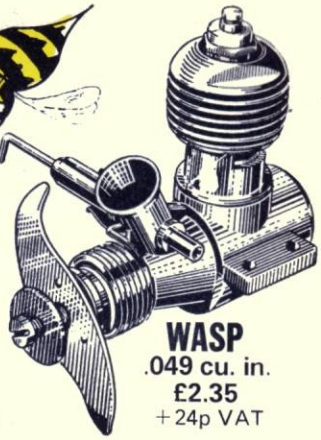

WASP
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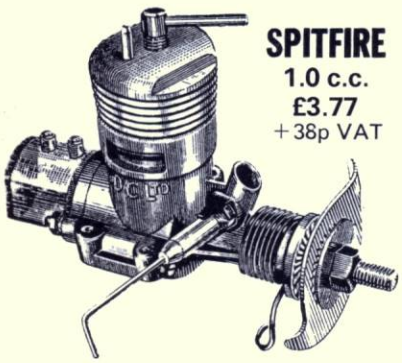
£2.35
+24p VAT

at your model shop !

QUICKSTART

THE GREATEST RANGE OF SPORTS FLYERS' ENGINES



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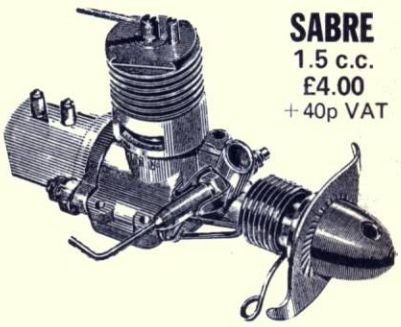

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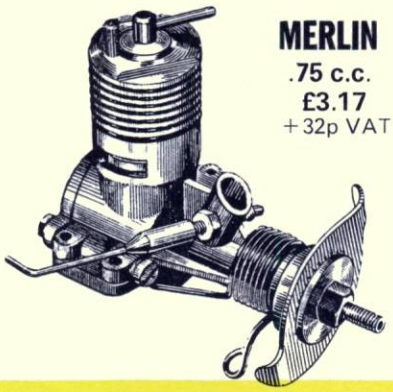

MERLIN
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£3.17
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No spares-backing worries – if you have a Quickstart you can be sure of full and continuous use of your engine

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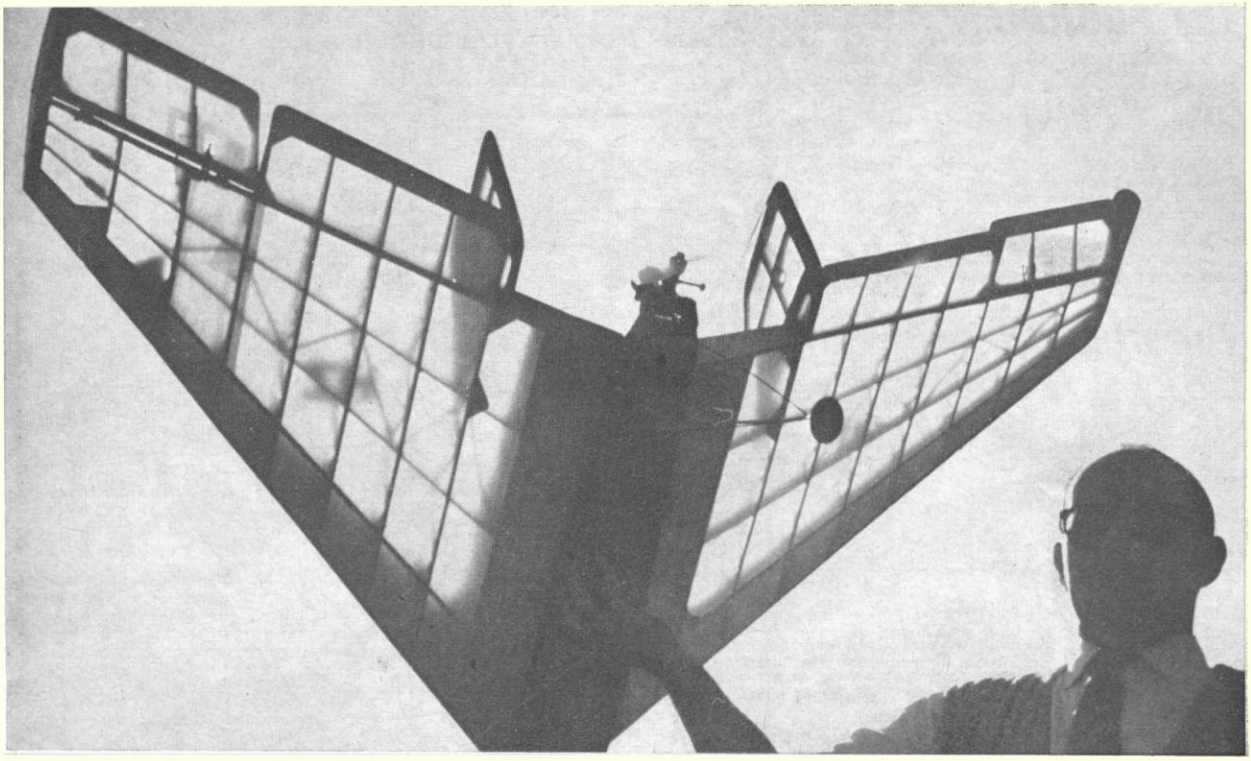
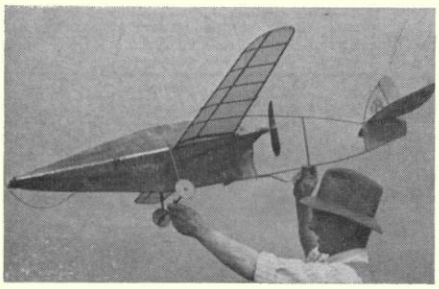
DAVIES-CHARLTON LTD. HILLS MEADOW DOUGLAS, Isle of Man

SOLARBO





Fill in that 'different' outline shape with a more or less orthodox structure and you can prove your ability as a model aircraft designer. And if you add radio, a bit of expert piloting can make up for aerodynamic deficiencies! Puts you back in the 'real' test piloting days, when designs had to be proved in the air.

Models still have to be proved that way, although some do fly 'right off the drawing board'. But aeromodelling has always been a challenge to produce — and prove — better (or different) design shapes. And think how much more difficult it would be without Balsa as a standard airframe material. You could treble the performance of that real old-timer (small picture, left), using Balsa.

Just be sure to use the **right** Balsa for every job. Solarbo Balsa. True aeromodelling quality. . . every piece!

Solarbo BALSA

ALWAYS ASK FOR IT BY NAME

SOLARBO LTD.,
COMMERCE WAY, LANCING, SUSSEX

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Buy and Fly the Best... VERON

The FOURNIER RF5 72" SPAN MOTEUR – PLANEUR

(1829mm)

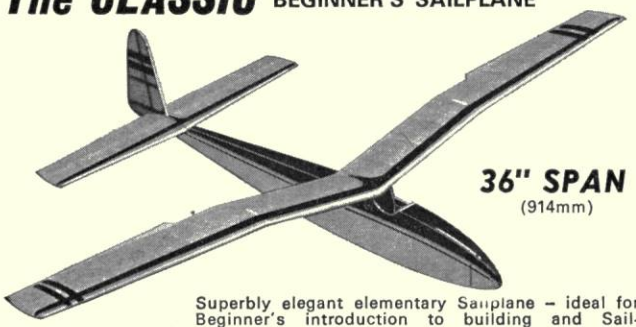
A TWO-IN-ONE SOARER AND RADIO SCALE

FOR ENGINES 1.49 to 2.49 RACING DIESEL OR GLOW (0.09 to 0.15 cu. in.)

Very-near-to-scale Auxiliary Powered Soarer and Sport Plane for Intermediate 2-Channel Proportional Radio on Rudder and Elevator only.

Ideal for Hillside Soarers who like to fly power when the wind drops. Flown best on hillsides in moderate to strong winds! (loading 16 oz.)

The CLASSIC BEGINNER'S SAILPLANE



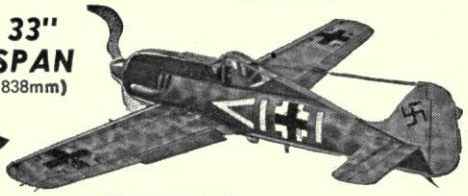
36" SPAN
(914mm)

Superbly elegant elementary Sailplane – ideal for Beginner's introduction to building and Sailplaning! Complete kit of parts – die-cut balsa formers and ribs. Full layout plans.

COLT CONTROL-LINE TRAINER

19" SPAN
(483mm)

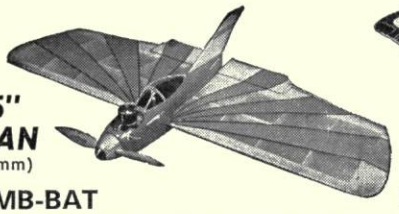
Fully pre-fabbed all-Balsa part. For 1 to 1.4 motors on C/Line!



33" SPAN
(838mm)

F.W. 190 A3

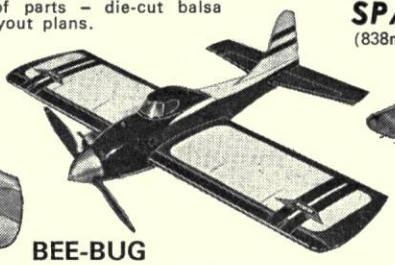
Combined Flap and Elevator Scale Stunter for 3-5 c.c. motors. Ideal for 'Glo-star'.



25" SPAN
(635mm)

BOMB-BAT

Bat-wing Lightweight Stunter for combat or Stunt. Ideal for Webra 'Record' or 'Sport-Glo'.

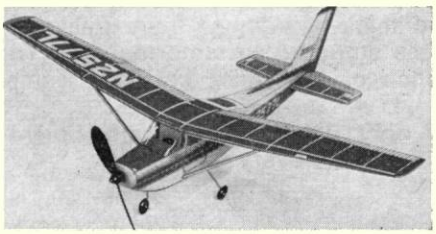


BEE-BUG

Snappy Stunter for 1 c.c. motors.

See these super Veron kits at your dealer and check their latest list prices during tax changeover!

TWO KWIK-FIX PRE-DECORATED FLYING SCALE



CESSNA SKYWAGON

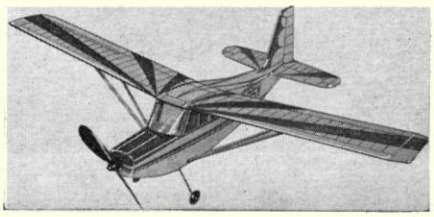
23" SPAN (584mm)

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

CHAMPION CITABRIA

22" SPAN (559mm)

EASY-TO-BUILD, FUN-TO-FLY!



WORLD WIDE AND EUROPEAN DISTRIBUTION

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

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

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

June 1973 Volume XXXVIII No. 449

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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.

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

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

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EDITOR **P. S. RICHARDSON**

COMMENT

In April issue we commented upon the fact that when its insurance became a loss operation on existing terms for the S.M.A.E. membership, the Society was obliged to pass the onus of responsibility to the individuals who now have to provide their own cover. Our concluding remarks were to the effect that the S.M.A.E. would still maintain the Airfield Indemnity policy through which clubs, Areas and rally organisers are able to run the annual model flying programme. Alas, such talk was premature! No sooner had the ink dried than the umbrella of protection collapsed! The Insurers refused to renew the policy as of April 1st and the whole model flying movement was placed in jeopardy. Brokers and insurance experts pronounced gloom and despondency. Even the most optimistic were beginning to consider cancellation of the Nats and other events. However, the diligent efforts of the S.M.A.E. Officers should not have been underestimated. Despite all forecasts, they located a new Company willing to provide the £250,000 cover. The situation was saved. This is what the membership gets for its annual fee. Without such service there could be no use of any M.o.D. property for model flying.

The public nuisance factor, protection of rights to fly, provision of a contest programme; make unified action among modellers more and more essential. When the implications of the Town & Country Planning Act are realised by clubs who opted out of the S.M.A.E. to whom will they turn for support when asked to seek planning permission for use of a flying site?

on the cover

Chosen your summer holidays yet? Remember that the combination of stiff sea breezes and cliffs can produce massive lift, so pack an R/C thermal soarer next to the bucket and spade. This picture by Daphne Brown shows a glider being flown from Rhossilli Downs on the Gower Peninsula, Glamorganshire, and should provide plenty of incentive for some last-minute building activity!

next month

Plans for Tony Cordes' huge open glider – all 96 in. wingspan of it – named **Big Dad**. Jim Mannell explains in greater detail how to fly the **F.A.I. control line aerobatic schedule**, while the second of Ron Coleman's article on **propellers for rubber models** details moulding blades from a wooden former and our **beginners' feature** explains how to make 'running repairs' to a glider. These, and much, much more in the highly instructive, topical July issue, on sale June 15th.

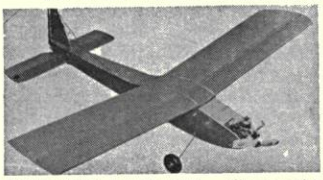
Made and printed in Great Britain by Graphic Art Services (Brighton) Ltd., Burgess Hill, Sussex RH15 9EH, for the proprietors, Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE. Published by Argus Press Ltd., 12-18 Paul Street, London, E.C.2, to whom all trade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

RipMax

RIPMAX-AVIETTE

With veneer-covered Styro-Tru wings, all balsa and ply parts precut, hardware, etc.

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 Tr. 60" £11.80 **Fullhouse Tr.** £12.80
Senator 52" £10.90 **Supabipe** 50" £15.45
Skyqueen 58" £9.95 **Ivinghoe** 72" £9.80

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Fokker D-7 24"	£3.20
Stearman PT17 Crop Duster	£2.65
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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

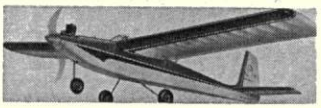
GOLDBERG

Superbly designed — superbly engineered kits by the American maestro himself — Carl Goldberg. All kits are extensively prefabricated, including die-cut balsa and ply sheets, many formed parts, etc. Special attention is given to BALSA GRADE SELECTION throughout — a feature which the discriminating aeromodeller will appreciate.

Models illustrated and listed on the right are designed for RADIO CONTROL, all in DE LUXE kit form. For sports flyers, the SKYLARKS have a special appeal with optional single- or twin-engine installations!

Other models not illustrated include a range of CONTROL LINE KITS for sport and training, combat and full stunt.

Swordsman 18 18" span	£2.10
Li'l Wizard 21" span	£2.35
Li'l Jumpin' Bean 21" span	£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



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 ... £5.94
SKYLANE 62 DE LUXE scale ... £22.30

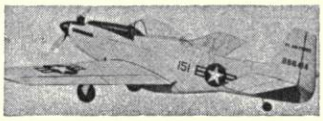
SKYLARK 56 DE LUXE £13.80
JUNIOR SKYLARK DE LUXE 37" £5.35
SHOESTRING P/RACER 54" ... £17.95

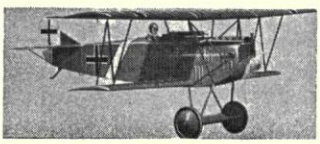
STERLING R/C

Top models specially selected from the STERLING range by RIPMAX — scale and freelance designs, each one in prefabricated 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

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





Wizard bipe 54"	£13.25
Lancer 53½" span	£15.95
Super Lancer SL-62	£20.95
Rimfire 56" span	£14.80
Schweizer I-34 98½"	£15.95
Schweizer I-26D 70"	£11.65
Fledgling 56" span	£14.30
Citabria 54" span	£15.95

CONTROL LINE KITS

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

Also compatible to R/C

NEW STERLING KITS

Curtiss Jenny* 32¾" span	£4.25
Fokker Triplane* 23½"	£4.25
Diamant Saiplane 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

RipMax SPITFIRE

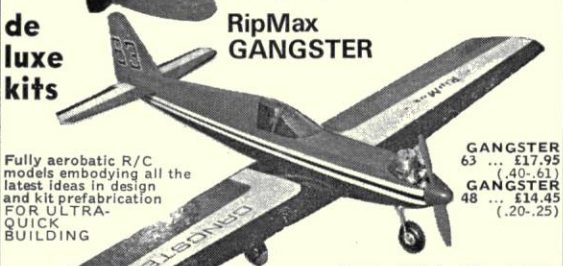
63" span
for .40 to .61
engines (7-10 c.c.)
£20.95

Realistic scale appearance – without the handling problems of many scale models!

Veneered foam wings, pre-cut balsa and ply parts, moulded canopy, engine mount, formed wire u/c nylon horns, nylon wing bolts, hinge material, 7" roundels, etc.

de luxe kits

RipMax GANGSTER



Fully aerobatic R/C models embodying all the latest ideas in design and kit prefabrication FOR ULTRA-QUICK BUILDING

GANGSTER 63 ... £17.95 (.40-.61)
GANGSTER 48 ... £14.45 (.20-.25)

These superb kits contain READY VENEERED FOAM WINGS, all balsa and ply parts preshaped and numbered, R/C clunk tank, moulded canopy, formed U/C, nylon engine mount, aileron and rudder and elevator horns, nylon hinge material, etc.

TOPFLITE KITS

All sheet balsa construction with all parts die-cut. Really satisfying to build.

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" sp.	£26.50
R/C Nobler 51" span	£16.70
Contender 54" span	£19.45
P-51 Mustang 60" sp.	£24.95
P-40 Warhawk 60" sp.	£27.80
P-39 Airacobra 60"	£27.80

CONTROL LINE KITS

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
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P-51D MUSTANG 37" span	£9.95
P-40 TIGER SHARK 42"	£4.95
HAWKER HURRICANE 42"	£4.95

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!

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

This Articulated Lorry

made with used BIC ballpens won a cash prize.

Regd. Trade Mark

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Graupner

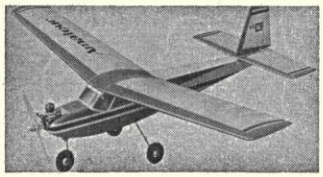
BO 209 MONSUN £3.55

All-sheet 21½" span scale model for rubber power. Complete kit. One of the latest additions to the Graupner range featuring the latest ideas in prefabrication.

ALSO

MINI-PIPER Quickie £6.95

Diecut all-sheet model. 29" span.

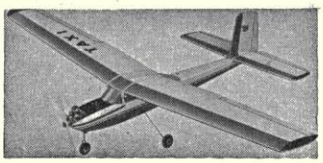


AMATEUR £9.15

43¼" span. Kit includes full-length diecut balsa fuselage sides, diecut sheet and ply, shaped wire parts, wheels, hardware, etc. Takes engines up to 1.5 c.c. for free-flight or radio control. One of the best sports-type power models available today, with semi-scale appearance and a proven flying performance. Ideal as an R/C trainer.

TAXI £14.60

Kit includes die-cut balsa-ply and ply parts, preshaped engine mount, bulkheads and fairings, milled stripwood, shaped wire parts, scale-type wheels, cement, covering material, decals, etc. . . . 'Quick-build' plan and separate R/C INSTALLATION PLAN. Wingspan 59". Engines .15 to .35. Ideal for 2- to 8-channel R/C.

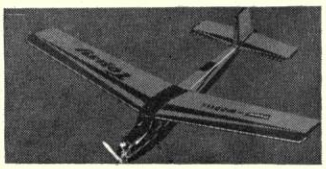


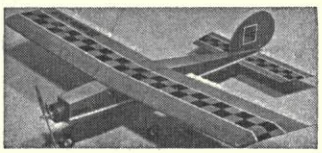
CESSNA 177 CARDINAL £35.25

A truly SUPERB prefabricated kit with injection moulded plastic fuselage, foam wings and tail. Span 61" for 5-6 c.c. motors. This kit is an outstanding example of modern design and use of mixed materials – plastic, foam-plastic and wood – with all parts fully shaped. The most advanced production of its type!

TOPSY 32" span £4.10

Topsy is a long-time favourite in the Graupner range for free-flight sports with engines up to 0.5 c.c., but is equally suitable for rudder-only R/C (engines up to 0.8 c.c.). Kit contains quickbuild plan, printed and die-cut balsa and ply, shaped wire undercarriage, RECORD wheels, tissue, cement, decals and miscellaneous parts.



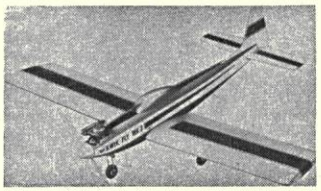


MIDDLESTICK £17.70

Wing span 55". Length 38¾" overall. Wing area 611 sq. in. Tail area 124 sq. in. Weight approx. 3¾ lb. (up to 5 lb. with radio). Suitable for .40 engines. Assembly time is reduced to a minimum with plenty of precut parts, including precurved, preglued fuselage sides.

KWIK FLY Mk. III £23.50

This kit makes an authentic duplicate of Phil Kraft's WORLD CHAMPIONSHIP winner. Kit includes glued and curved fuselage sides, shaped wood parts, diecut balsa and ply sheets, formed undercarriage wheels, canopy, hardware, etc. 59½" wingspan. Wing area 657 sq. in. Engines up to .61. Acclaimed as the Finest Kit yet for R/C 'multi' or proportional.



BELL 212 HELICOPTER

Now available this absolutely superb radio controlled helicopter engineered by **GRAUPNER**

Bell 212 fuselage kit £46.00
Engine with mechanics kit £123.50
Bell 212 Engine only (HB61 Stamo) £48.00
Rotorhead only £42.40
Main Motors (pr.) £2.95 Tail Rotors (pr.) £1.15 Steering Rotors (pr.) £3.00 Main Rotor Shaft £2.65

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FOCKE WULF 190 38¾" ... £9.50
KLEMM KL-107B 28½" ... £6.55

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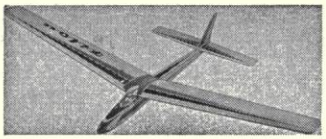
(not illustrated)

HI-FLY (Electric) 90½" ... £16.20
TERRY 41½" span Power £10.65
JUNIOR 53½" span £6.25
PIPER SUPER CUB PA18 21¼" £3.75

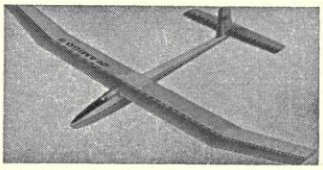


FILOU SAILPLANE £5.80

50" span sports-type sailplane which converts to auxiliary power (pylon mount extra). Kit contains quickbuild plan, printed and die-cut sheets of balsa and ply, canopy, wire parts, tissue covering, decals and miscellaneous items. Model also recommended for R/C flying.

AMIGO 2 £9.95

Here is a real contest-type sailplane, 78¾" span and total area 694 sq. in. Extensively prefabricated, the kit includes die-cut and printed balsa and ply parts, milled and slotted stripwood, ready-formed tow hook, canopy, tissue covering, decals, etc., etc. The Amigo 2 also adapts readily to pylon power and is ideal for R/C (R/C installation plan included).

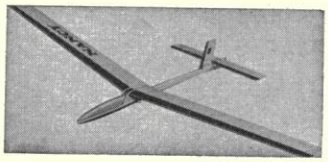


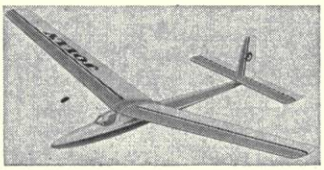
DANDY £8.25

A kit designed for rapid assembly with die-cut sheet, preshaped fuselage parts, milled and slotted stripwood, canopy, cement, tissue covering, decals, etc. Span 63". Total area 540 sq. in. Can be converted into a powered glider with pylon mount and .049 engine.

NANCY £4.90

Another design in the popular A1 class. Span 48¾". Kit includes milled fuselage nose section, die-cut sheets, milled stripwood, preshaped wire parts, tissue, adhesives, decals, etc., plus a two-colour exploded drawing and plan. Quality of the prefabrication is exceptional! The Nancy is also complete with auto-rudder and dethermaliser.



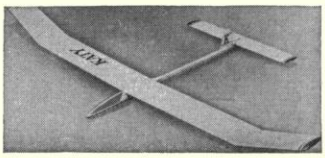


JOLLY A1 £4.30

A 45" span Quickie model. This kit is extensively prefabricated and very complete Model takes pylon mount for conversion to power. Kit contains quickbuild plan, printed and die-cut balsa, ply parts, strip, dowel, wire parts, tissue, cement, decals, etc. Also **BEGINNER** Price* 39" span semi-scale appearance sports glider; prefabricated kit form.

KATY A2 £9.30

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

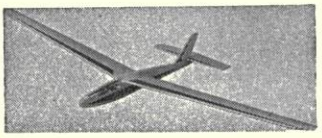


CIRRUS £22.40

Giant 118" span. A fabulous kit with finished fuselage mouldings in ABS plastic, precut wood parts, complete hardware, moulded canopy, control horn, cement, covering material, etc. etc.
Also **CUMULUS** 2800 ..... £49.95
110" span. Injection moulded parts. Ideal for R/C!

FOKA (SCALE GLIDER) £16.80

Wingspan 102". This outstanding kit includes a Finished One Piece Fuselage moulded in high-impact plastic with other parts in balsa and ply (mostly fully shaped). Also prefabricated wire parts, canopy, hardware, adhesives, covering material, decals, etc. Detailed plan plus an Overlay Plan showing R/C installation.



ALSO

BEGINNER 38" span £3.29
UHU Mark III 43" span ... £3.39
FOUGA SYLPHE (Jetex) ... £2.10

Float Kit (models to 5 lb.) £5.80
Glider Tow Hooks:
Small (10) 19p Large (10) 23p
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Fully pretuned sub-miniature superregen receivers for the smaller budget where interference from other modellers is not a problem.

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** Includes matched pair of superhet crystals (extra crystals £2.75).*

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HEARD AT THE HANGAR DOORS

DESPITE DECIDEDLY inclement weather over Easter, the *R.C.M.&E. Expo '73,* held at Sywell, was an unqualified success with a record-breaking crowd attending the two days of non-stop activity and the well-supported Trade Show. The general interest in both model and full-size aviation was outstanding – as was the quality of the entries in the first-ever helicopter competition held in the U.K. The July issue of our sister magazine *Radio Control Models and Electronics* will carry a full description of the contest and the latest to be seen on the R/C Trade scene, but we append here the results, as judged by helicopter pioneer Dieter Schluter, Maynard Hill the well-known American R/C record breaker and full-size helicopter fleet owner, Allan Mann:

Best flight performance with a commercial helicopter kit
1. M. Charles (Kingston-on-Thames) 66 points
2. D. Wright (Birmingham) 61 points
3. D. Langridge (Brighton) 28 points

(all entrants flew the Schuco Hegi Huey Cobra)

Best new concept in design
1. J. B. Morley (Byfleet, Surrey)
2. T. Valentine (Ickenham)
3. A. Ambrose (Ashtead, Surrey)

Best improvement in helicopter design
K. Sinfield (Sywell, Northants)

GREAT OPPORTUNITY for a young British aeromodeller! An Austrian enthusiast offers a holiday at his home in Lustenau, a small town near Bregenz situated near Lake Kanstanz, close to the Swiss border. The purpose is to give his 18-year-old son the opportunity to gain experience in talking English, so the British visitor would have no costs to bear other than his travel. If you are aged 18-20, have some time to spare between July 8th and the end of July, then we would be pleased to forward your letters.

IN CONJUNCTION with ourselves, Orion Travel offers a fully-inclusive visit to the World Free Flight Championships in Austria and the very attractive tour, of which details are given below, will allow British enthusiasts a convenient opportunity to follow the fortunes of the British team. Cost per person is £79.90 and includes: *Return air travel* in economy class by scheduled services of Austrian Airlines – London/Vienna/London, including in-flight catering: *International Route Charge*: *Return transfers* by private coach between Vienna Schwechat Airport and the hotel on arrival and departure: *Seven nights' accommodation* in ordinary twin-bedded room at the Hotel Josefsplatz, Baden, including continental breakfast, service charge and taxes: *Return transfers* by private coach on each of six days between Baden and the championships in Wiener Neustadt in the morning and evening: *Airport departure taxes*: *Services of Orion Travel* tour manager travelling with the group throughout.

Flight details:

Monday, August 13th – Flight OS 456 depart London Heathrow 18.45, arrive Vienna 20.45.

Monday, August 20th – Flight OS 455 arrive London Heathrow 18.00.

All times quoted are local and flights will be the DC9 aircraft of Austrian Airlines.

WE HAVE been asked to remind contest modellers that they would be well advised to carry proof of third-party insurance cover when attending competitions, and not to merely take their S.M.A.E. cards. This is because although possession of an S.M.A.E. card shows that an individual was insured when his membership application was made, it is no proof that the insurance cover is still valid – it may well have expired since joining. Take your current insurance policy (or photostat of a club scheme) and you will be saved the embarrassment of being refused permission to fly.

MORE GOOD news for combat fliers! The Dutch Daedalus club inform us that they will be holding their International Combat contest again at Spaarndam on August 18th-19th. Combat enthusiasts who attended the meeting last year remember it as one of the best organised and best run contests ever, so it is bound to be a huge success once again. Interested parties should contact E. Mejeir at Halberestraat 10, Amersterdam for information and entry forms for further details. Let's hope for a large British contingent once more!

MODELLING MECCA over the Spring Bank Holiday will, of course, be the British National Championships, to be held at R.A.F. Lindholme (see map below). With the promise of many overseas visitors, and being an 'all-in' meeting once again (i.e. free flight, radio control and control line events will all be held at the same venue), this promises to be a really great weekend. The airfield will be available from 09.00 hours on Saturday, May 26th, while the programme of events is as follows:

Saturday, May 26th (from 13.00 hours)

Free Flight: F.A.I. Rubber, Glider, Power, ½A Power, Hand-launch Glider.

Radio Control: Aerobatics.

Sunday, May 27th

Free Flight: F.A.I. Rubber, Glider, Power, A/1 Glider, Coupe d' Hiver, Junior Kit and Scale.

Radio Control: Aerobatics, Pylon Racing, Scale.

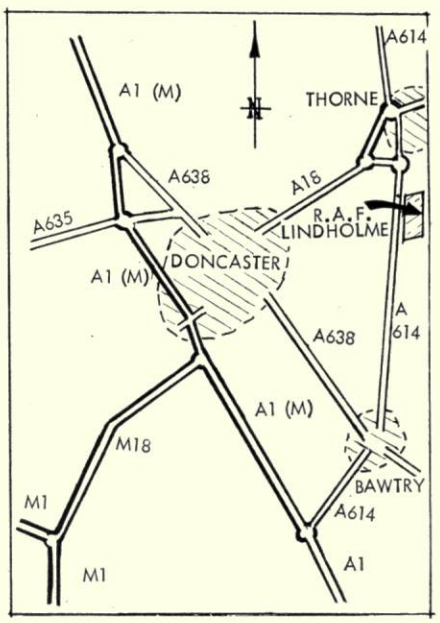
Control Line: Combat, Speed, Aerobatics, F.A.I. and ½A Team Race, Scale.

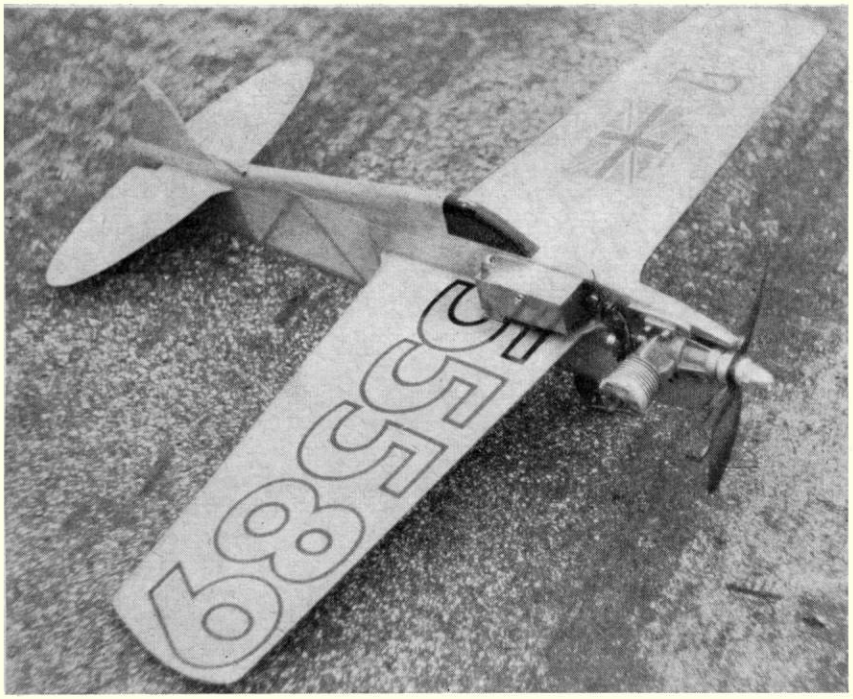
Monday, May 28th

Free Flight: Open Rubber, Glider, Power, Tailless, Vintage, Scale.

Radio Control: Aerobatics (including Team Trials), Scale, Pylon Racing.

Control Line: Combat, Aerobatics, Speed, Class B and Goodyear Team Race, Carrier Deck Landing, Junior Stunt.





David Giles' contest proven Goodyear Racer, the

MIKE ARGANDER SPECIAL

Easy to build and fly. Fit a hot 2.5-3.5 c.c. engine and away you go!

Early development model of David's Mike Argander Special, which utilised built up rear fuselage for lightness. This idea has been dropped in favour of the all-sheet construction now employed, which is far stiffer and only marginally heavier. Goodyear racers take quite a pounding. Kosmic 15 diesel used for power.

THE ORIGINS of the No. 39 *Mike Argander Special* (full size that is!) date back to 1947 when an aeroplane oddly named *Pffft* was built as a low-wing monoplane for the Goodyear Formula 1 class. Later is was extensively rebuilt by Mike Argander, renamed the *Argander Special* and was voted the 'racer showing most promise' at the 1949 National Air Races, being noted for its exceptional finish and clean aerodynamic form. During its career it has been variously named *The Sorensen Special, Sorensen Deerfly, Keith Sorenson's Mike Argander Special,* and latterly just *Deerfly.*

Various models of this machine have been built by the designer and others, all proving to fly extremely sweetly, having the 'feel' of an F.A.I. class teamracer, an essential feature of a good 'Goodyear' – especially as it always seems to be windy at British rallies!

Construction should commence by cutting the wing blank from soft $\frac{3}{8}$ in. sheet, ensuring that the sheets chosen are straight and free of warps. Attach the hardwood leading edge to the blank using P.V.A. glue and leave to dry. Cut the fuselage from $\frac{1}{2}$ in sheet, medium to hard stock, once again ensuring that the wood is straight. Cut the tailplane and fin from hard, springy balsa.

Return to the wing blank and cut the hatch for the bellcrank. Fashion leadout ways by cutting right through the blank, removing the thin strips, then cut out the centre portion and replace the upper and lower strips. At this stage epoxy the leadout tubes in position Cut out recesses for the bellcrank supports and channel the blank for pushrod clearance. Next epoxy the bottom bellcrank mount into the wing, make up bellcrank assembly and leaving leadouts over-length. Install the bellcrank. Space with washers, then add top bellcrank mount followed by a nut on the pivot bolt. Put a blob of epoxy on the bolt head and nut to prevent any chance of loosening. Lubricate pivot, leadout connections and pushrod with a small amount of grease or Vaseline, then fill in hatch with four pieces of 1/16 in. sheet.

Mark a line all round the edges of the wing blank $\frac{1}{4}$in. up from the bottom, mark fuselage position, area covered by cheek and mark a line $\frac{1}{8}$ in. inboard of pushrod channel. Carve and sand wing to section, using these lines as a guide. An accurate and smooth section is essential: leave centre section areas square for accurate and strong location.

Now return to the fuselage and cut apertures for the tailplane, wing, engine bearers and undercarriage mount. Epoxy the bearers in position, replacing the piece of balsa at the front, and epoxy the 1/16 in. doubler in position.

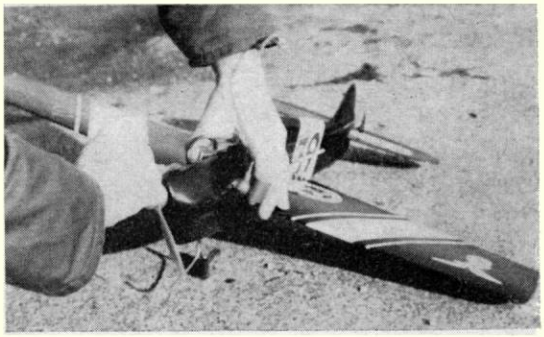
Having made up the dural engine mounting blocks, roughen them on the back with a file, wash in solvent to degrease and mount carefully to engine. Epoxy the blocks to the bearers in the required position, using the engines as a jig, sighting to ensure zero thrustline. Now remove and spot through woodscrew holes and about 1/16 in. deep into bearers, to clear excess epoxy. Drill small pilot holes in bearers and insert woodscrews, cleaned with solvent, and spread lightly with epoxy. Ensure heads are underflush, otherwise engine will not sit down properly.

Add $\frac{1}{2}$ in. sheet laminations for side cheek, also epoxy the fin in position, making a fillet of epoxy at the joint to fair into top of fuselage. Carve cheek to shape (see section A-A and top view on plan) blend into spinner as required and round off remainder of fuselage outline. Make up and fit tailskid. Epoxy 1/16 in. ply into top of undercarriage aperture and bend up undercarriage leg as shown on the plan. Note that the wheel is inboard of the leg and use a good quality solder for the skid as this joint takes a terrible beating. The beech U/C block is grooved vertically at the front and drilled at the rear to enable the U/C to sit centrally as shown. Bind the U/C to the block, fill the groove with $\frac{1}{8}$ in. sheet then epoxy the 1/16 in. ply patch onto the fuselage, thus making a box for the U/C mount to sit in. Epoxy U/C mount into box, use plenty of adhesive to ensure filling of all crevices – the excess adhesive which will squeeze out can be wiped away with a damp cloth. Blend block into general lines of fuselage as required.

Sand tailplane to symmetrical airfoil shape and separate the elevators. Glue tailplane into fuselage, thread elevator joiner through fuselage, then hinge elevators using nylon. Epoxy joiner to elevators, covering with nylon patches as shown. Slide wing through fuselage, checking for squareness and good closeness of fit, especially the cheek to wing joint. Glue in position using P.V.A. adhesive. Epoxy the gusset between cowl cheek and leading edge – accurate fitting is essential. Form fillets of epoxy to blend gusset to cheek and leading edge.

Glue a triangular fillet of balsa over the pushrod channel to blend the wing into the fuselage, this completes the main construction. Next it is necessary to decide, if using a pressurised refuelling system, where to put the filler valve; ours is epoxied into the cheek, in a position to suit the pitman.

Sand the model all over – sanding of individual units before assembly should mean that only a small amount of work is necessary to give a smooth surface – always try to achieve a finish on the wood that you would like to see on the finished airframe. Give the model a coat of clear dope and sand down using 400 grade wet or dry paper. Cover entire nose section and wing root area with gauze bandage doped on, or ·003 in. glass fibre cloth, and rub down. Finishing can now be effected using your favourite method – I normally tissue cover, with lightweight Modelspan doped on, give five coats of 50/50 doped thinners, rub down, one coat of sanding sealer, rub down and then finish off with either a car spray aerosol or Humbrol enamel. Add transfers, numbers etc., not forgetting that the rules call for a realistic colour scheme mine is copied from the ill-fated *Miss Dara*. Finally fuel proof with Ronseal or Helmsman 1-pack polyurethane.



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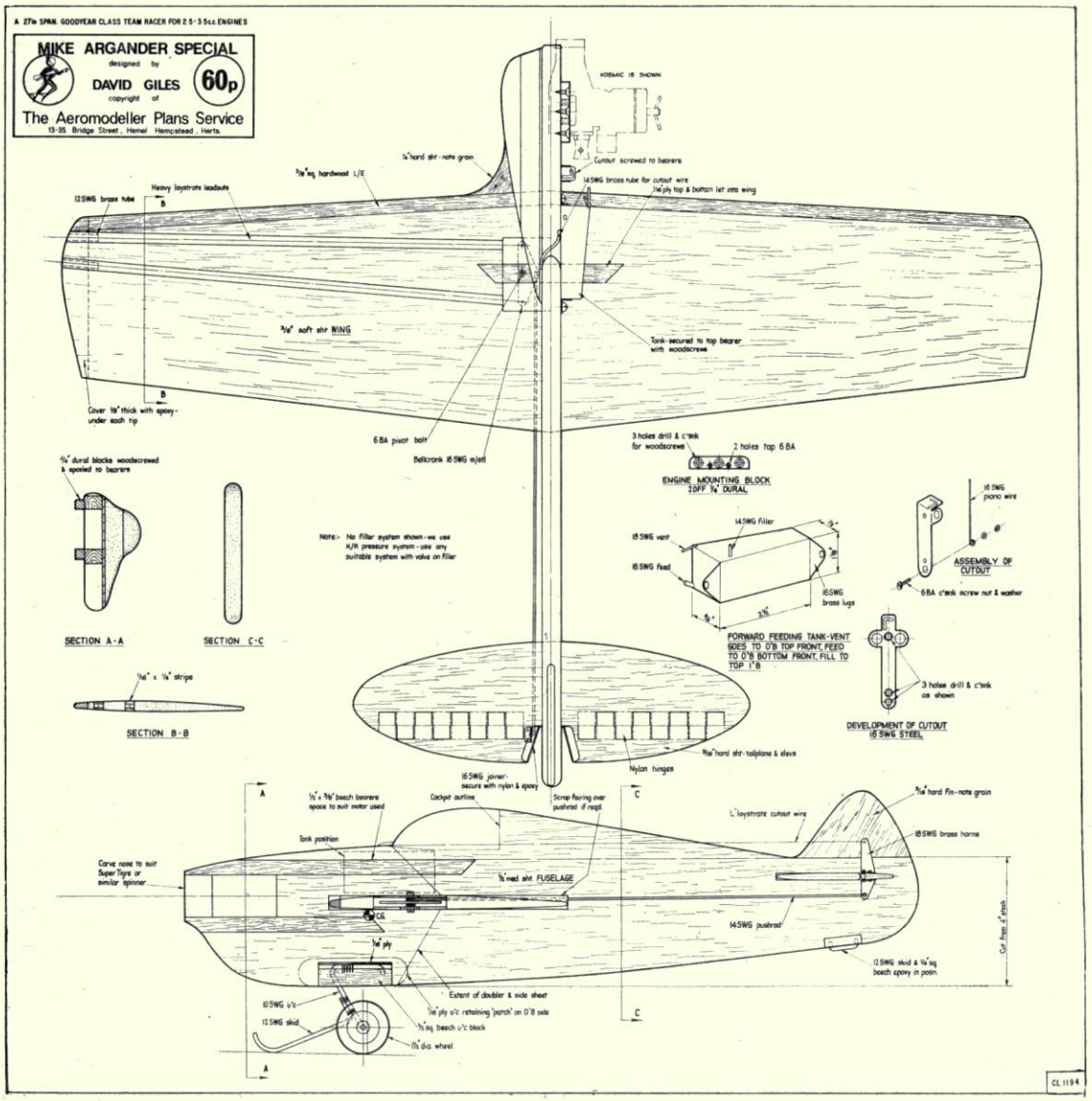
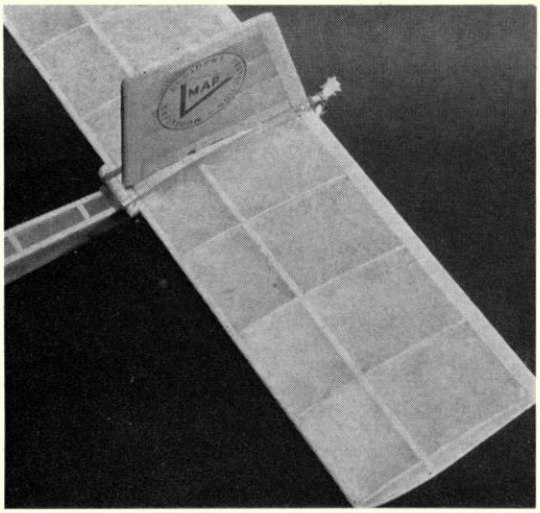




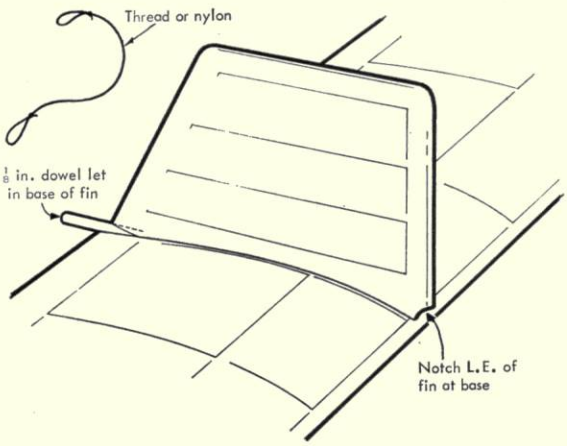
back to . . .

SQUARE ONE

Continuing our beginners' series, this month detailing the fitting of a dethermaliser to a glider

THE TROUBLE with a free-flight model is that as soon as one has it at a good altitude and flying nicely, the problem of getting it back again immediately arises! The **Mercury Swan** kit does not provide any means of bringing the model to the ground again once you have released it from the towline, it is just a matter of luck when and where it lands. Under 'still air' conditions this is not too

FIGURE 1



important, it probably won't go too far, but if your flying field is rather small or if there is a bit of a wind blowing, then it could be another story. Most important of all, you may get caught in a thermal, a current of warm air which will carry your model aloft, a phenomenon which free-flight competition fliers long for, and spend much time and ingenuity seeking. How do you detect a thermal? You certainly cannot see it! When flying your model, particularly on a hot day, have you ever noticed how the model which has been flying quite smoothly suddenly seems to rock as if it had hit a bump, and then seems to hang in space, or even gets noticeably higher? The answer is that it has found such a patch of warm air, and is now said to be in lift. If shortly afterwards your machine suddenly loses height rapidly, often with the degree of turn tightened up, then it has flown into a downdraught, the thermal's opposite number, a layer of cold air, and it is this which is to blame.

Obviously, the strength of the thermal determines the fate of your glider – it could well be carried to several hundred feet and then fly out of sight, which is when at least you will be glad that you took our advise and wrote your name and address on it . . . However, you can take better safeguards than this, and the best solution is to fit a de-thermaliser, often referred to simply as a 'D/T'. This in its commonest form is simply a system which, after a pre-determined time, lifts up the trailing edge of the tail-plane, causing the model to reach a fully stalled state, so that it descends vertically yet at a slow controlled rate which will not damage it on contact with the ground. The timing device may be a special clockwork timer, or just a piece of slow burning fuse – we shall use the latter method as it is simpler and much cheaper, but remember that if using a fuse, then a snuffer tube must be employed. This is to prevent causing fires, both of surrounding countryside and of the model itself!

Although the following details apply specifically to the **Swan** glider the same principles can be applied to virtually any glider or rubber-powered model.

Modifications

Firstly, refer to **Figures 1** and **2** which are largely self-explanatory. Drill a ⅛in. diameter hole at the joint of the fin and tailplane trailing edges, and glue in a piece of ⅛in. dowel, leaving at least a ½in. overhang. Notch the leading edge of the fin to allow the tailplane to rotate against its new pivot.

Now, using balsa cement, glue two plywood platforms to the top of the fuselage so that the tailplane may be seated on them. Make quite sure that they are perfectly horizontal or else the tail will be tilted. Next, sand a piece of 3/16 × 3/16 balsa to a

FIGURE 2

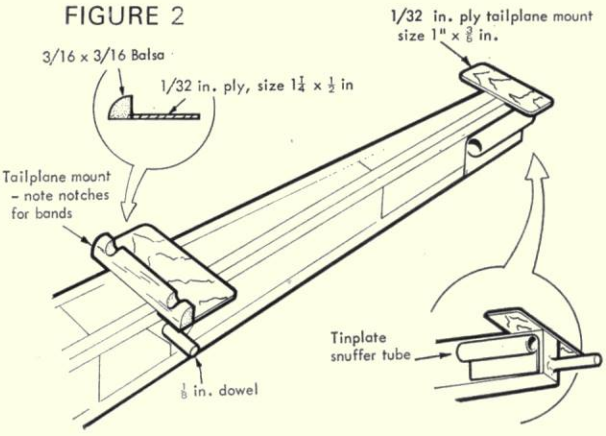
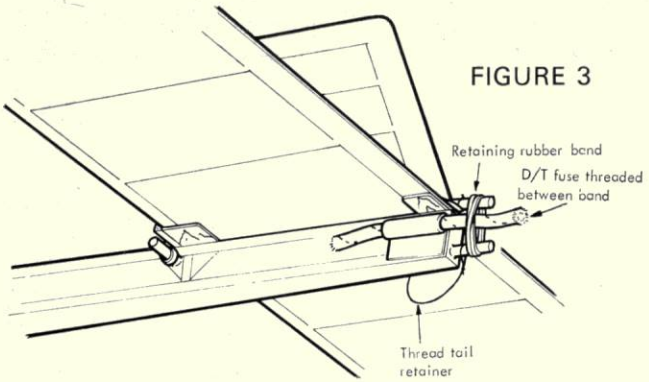


FIGURE 3



D section and glue in front of the first tailplane platform. Cut two notches as shown for the rubber bands which retain the tail.

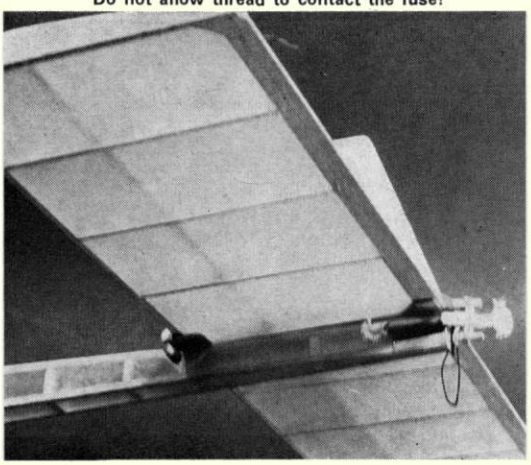
The fuselage already has two reinforcing gussets below the tail position which is most convenient as you may drill through the forward ones to accept a piece of $\frac{1}{8}$in. dowel for the retaining bands! Now we come to the snuffer tube and this too is easy. Just take an empty tin can, wash it thoroughly, then carefully cut off the top and bottom using tin snips or even an old pair of big scissors. Mind your fingers on the jagged edges. Now cut out a strip approximately 1in. wide and wrap one end around the shank of a 3/16in. diameter drill or dowel, so that you have a tube with a flange formed. Using an epoxy adhesive, glue this in the position shown.

Operation

Refer to **Figures 3** and **4.** Firstly take a piece of nylon from your tow line or just use thick thread, and make two small loops 4in. apart. Place the tail in position and slip one loop over each of the two protruding dowels. Stretch several rubber bands from the dowel on the tailplane to the dowel below the front platform. This will cause the tail to be tilted up to an angle of approximately 30-40° (held by the nylon line) – make sure that the tail pops up readily to this position. Now using a very small elastic band $\frac{1}{2}$in. long) around the two dowels at the rear end of the fuselage, hold the tailplane in the normal position.

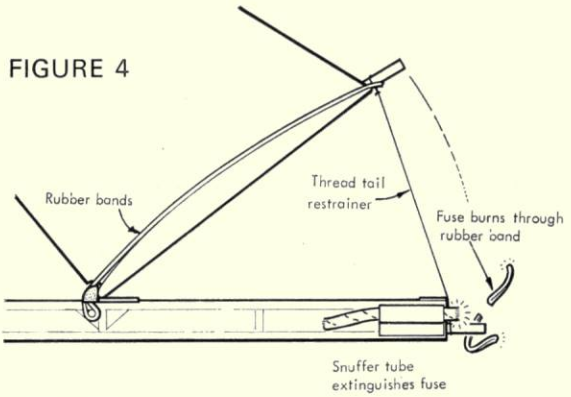
Your model shop will supply you with a hank of D/T fuse which you will find is like thick white string with a red line running around its circumference.

Before and after! Below, the D/T fuse fitted between the tail retaining bands, and threaded through the snuffer tube. Do not allow thread to contact the fuse!



Take a length of approximately 3in. long, and pass between the loops of the small tail retaining band, then feed through the snuffer tube. Carefully light the D/T fuse taking care not to set fire to the model! Each segment of the fuse burns for approximately 90 seconds, so you may determine the length of your next flight simply by pulling the fuse through the snuffer tube to vary the distance of the burning fuse from the elastic band. As the fuse burns down it will melt the rubber band which then releases the tailplane to its new position. The fuse continues to burn until it reaches the snuffer tube when it will promptly be extinguished as the tinplate conducts the heat away.

FIGURE 4



Test this operation carefully to make sure that all is well and that the fuse is always extinguished by the snuffer tube. This is most important.

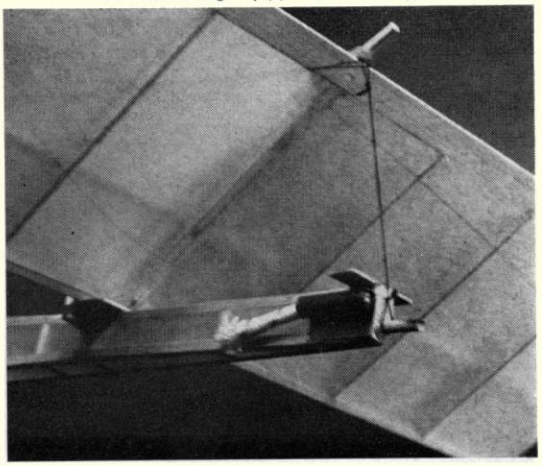
Final Checks

1. Before flying your model again, recheck the position of the centre of gravity; a little more ballast may be necessary to counteract the weight of this modification.

2. Carefully watch the glide of your model in case the trim has altered If necessary adjust the packing use and, when satisfied, glue the packing permanently in place on the respective tailplane platforms. Happy landings!

Next Month: *Basic repairs*

The fuse having burnt through the rubber band is now extinguished by the snuffer tube. Note how thread retains tail at correct angle (approx. 30-40 deg).



High aspect ratio wings, long canopy and tiny propeller are evident in this Finnish 'top of a hangar' shot taken specially for Aero Modeller.

AIRCRAFT DESCRIBED No. 221

FOURNIER RF-5

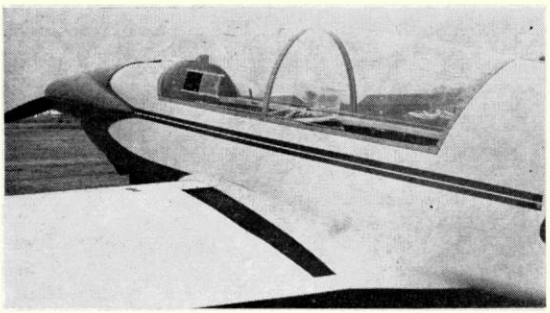
by A. CALLAGHAN

THE RF-5 is one of a range of light aircraft designed by the French enthusiast Rene Fournier, and manufactured by Sportavia-Püzer GmbH & Co KG at Dahlemer-Binz in the Eifel Mountains of Germany from 1966. Before this the aircraft were made in France by Alpavia. Since 1960, when M. Fournier first produced his RF-01 as a homebuilt, the range had developed through the RF-2 and RF-3 to include at present the RF-4D and RF-7 single-seaters, the RF-5 and the RF-5B *Sperber* two-seaters, as well as the exotic SFS-31 *Milan* high performance 'motorsegler'. All of these versions bear a very close family relationship in which aerodynamic cleanliness, careful attention to detail, and elegance of line are strikingly evident. To see any *Fournier* at close quarters is to be surprised at its compactness in every feature except wingspan. Motor, pilot, undercarriage (monowheel in all models) are all contained within sufficient space to do the job, and no more. This, together with the undoubted efficiency of the high aspect ratio wing, results in the type of performance on moderate power which compares very favourably with other light aircraft of greater bulk but much higher power. Added to this, the power-off performance of any Fournier, with the exception of the clipped-wing RF-7, would not disgrace many a pure glider.

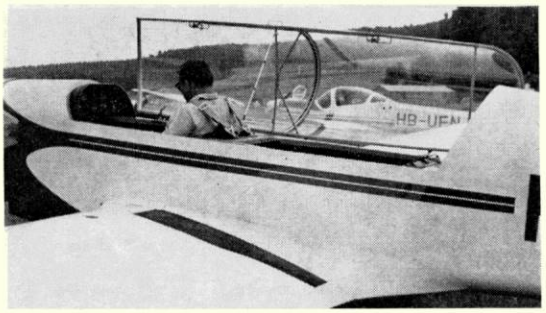
The RF-5 is a two-seat development of the RF-4. The prototype flew for the first time in January 1968 and production began late in the same year. Although the RF-5 at approximately £4,800 is not cheap as a two-seat aircraft, its operating costs are fairly low, which makes it an ideal aircraft on which to take flying instruction for a private pilot's licence. The British agents for the aircraft, *Sportair Aviation*, based at Biggin Hill and Luton, formed their own flying club which uses the RF-5 in conjunction with the RF-4 on their PPL courses.

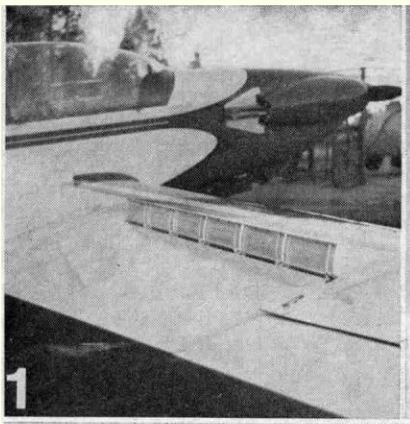
During instruction the pupil sits in the forward seat, which then becomes the pilot's seat when the aircraft is flown solo. The rear cockpit contains only a basic instrument panel as well as flying and engine controls. A shelf which will accommodate 44 lbs. of luggage is situated behind the rear seat. The front position has a full complement of instruments as well as very comprehensive radio equipment which can account for almost one-fifth of the overall price of the aircraft. Intruding into the front cockpit behind the lower instrument panel and between the pilot's feet is the glass-fibre under-

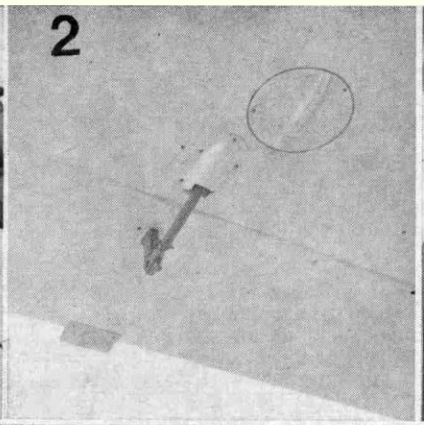
The cockpit canopy of the RF5 is simple, very clear and also very demanding for a true scale model as it exposes the whole interior, making the internal details more important than usual.

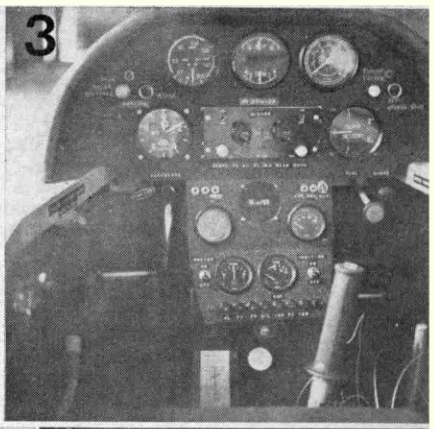


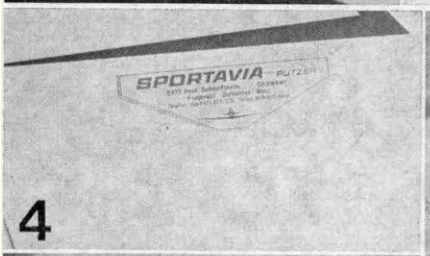
Sideways hinged for access (note the flexible straining cable in the centre which limits the range of opening), the cockpit canopy clarity is evident in this view of a Swiss RF 5.

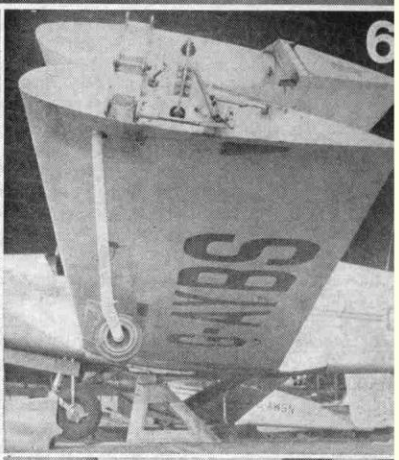




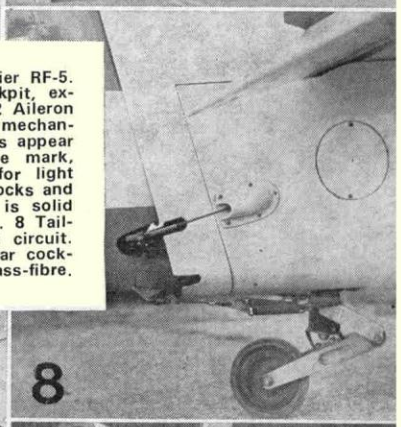


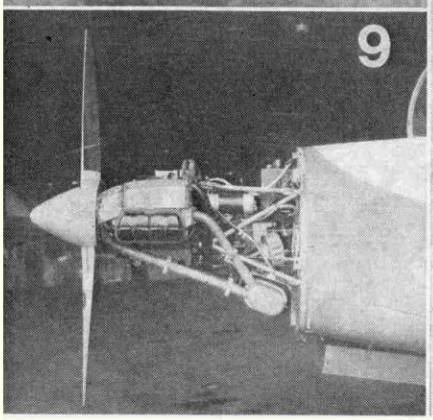


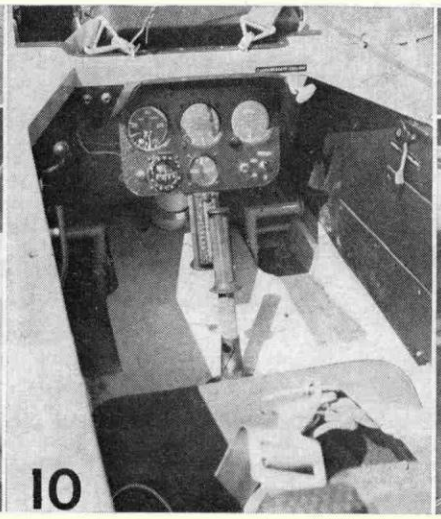


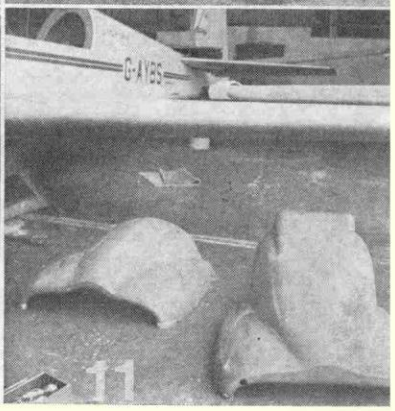


Details of particular interest to modellers of the Fournier RF-5. 1 The spoilers which are lever-actuated from the cockpit, extend along mid-span of each wing panel (see drg.). 2 Aileron pushrod detail, with circular cover over the bellcrank mechanism. 3 Forward cockpit instrumentation, slight variations appear among export versions. 4 The Sportavia-Putzer trade mark, found on the fin. 5 Rear seat detail, with recess for light baggage. 6 Wing break shows the 23015 section, wing locks and the latest outrigger made of 1 in. dia. Nylon; wheel is solid rubber. 7 Forward retracting nosegear, with handbrake. 8 Tailwheel is steered by rudder, with coil shock spring in circuit. 9 Volkswagen power unit, modified by Limbach. 10 Rear cockpit instrumentation. 11 Upper and lower cowlings in glass-fibre.







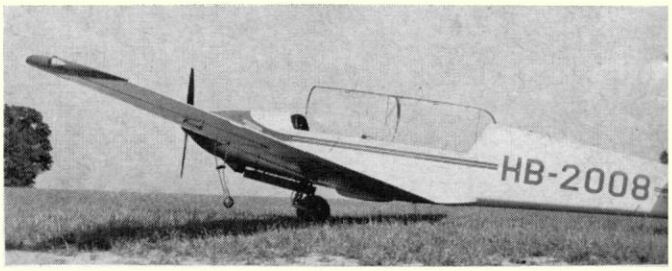


carriage bay cover. In the down position the single main-wheel is almost directly beneath the front seat, and is manually retracted forwards and upwards into the fuselage by a lever to the pilot's right. In emergency due to undercarriage failure, the main weight of the aircraft can be taken on twin strakes fitted to the underside of the fuselage in a position slightly aft of the front seat. The entire aircraft can also be put on trestles at these points in order to carry out servicing of the under-carriage and control stick linkages which would otherwise be awkward due to the low ground clearance.

The wing is a single-spar all-wood structure, partly plywood and partly fabric covered, and tapers from NACA 23015 at root to NACA 23012 at tip. There are no flaps or tabs incorporated but retractable metal spoilers are fitted on the upper surfaces at chord mid-point. The clean underside of the wing then receives a minimum of damage in the event of a gear-up landing. A 45ft. 1in. (13·74m.) span, 12·5 to 1 aspect ratio wing on any light aircraft would present an unwelcome hangarage problem, and this is overcome on the RF-5 by the use of folding wingtips. These fold inwards through 180° to lie flat, covering the spoilers, and rest upon small rubber bumpers fitted to the extreme tips. This brings the span down to a more convenient 28ft. 8in. (8·74m.). A detachable glass-fibre and aluminium shroud covers the gap at the hinge-point and is designed so that it will not fit snugly in place unless the wingtip locking-pins and levers are in the correct position; these being visible from the cockpit. Aileron linkage is maintained whilst the wings are folded. Immediately inboard of the hinges are the non-retracting undercarriage outriggers on earlier versions the small wheels were mounted on twin curved metal legs but the current RF-5 has them fitted to a solid nylon rod.

The powerplant of the RF-5, as in other *Fourniers* is a development of the Volkswagen flat-four unit, the version used being the Sportavia-Limbach SL1700E Comet which develops a maximum continuous rating of 63 h.p., driving a Hoffman two-blade, fixed-pitch metal propeller. The motor can be cut and restarted with ease in the air, and although the use of single ignition has caused certification problems for the manufacturers, particularly in the United States, the RF-5's gliding ability will make a power-off approach and landing a relatively safe affair. The RF-5 is not by any means simply a powered sailplane as can be seen from the performance figures, but in the right weather a good pilot will be able to keep it airborne for much longer than the fuel capacity would otherwise dictate; this is achieved by flying until some lift is found, cutting the motor, soaring for as long as possible, and then repeating the performance.

Since the aircraft was first introduced the exhaust system has been modified and now shows only as a small outlet pipe beneath the starboard motor fairing. Earlier models utilised twin exhaust pipes projecting rearwards, of these fairings on both sides of the nose where metal heat-shields protected the fuselage sides. The cowling consists of two glass-fibre mouldings attached by means



Two interesting registrations from Finland and Switzerland, with earlier, wire-type outriggers.

of Dzus fasteners to the motor mount. As these are completely removable, access to the motor for routine servicing is excellent.

Being an aircraft intended primarily for private use, it is likely that the RF-5 will appear in many different colour schemes through its life. The examples below seen at Biggin Hill have all appeared in an overall scheme of white with a primary colour trim used on motor cowling, wing-tips, tailplane tips, fuselage sides, top and fin leading-edge. Registration letters and a small fin flash are also in this colour.

G-AZRM: White/red trim. Registration letters slope rearwards on both sides of the fuselage.
G-AZRK: White/yellow trim. Registration letters as above. Red/White horizontally striped rudder.
G-AYBS: White/blue trim.
G-AYZX: White/blue trim. Striped rudder as above. Earlier exhaust detail.
G-AZPF: White/varied green trim.

The words 'Fournier RF-5' appear in black beneath a small front-view silhouette of the aircraft immediately aft of the fuselage registration letters.

Performance

Maximum speed at sea level – 124m.p.h. (200 km/h.)
Economy cruise ,, ,, 75m.p.h. (120 km/h.)
Stalling speed 45·5m.p.h. (73 km/h.)

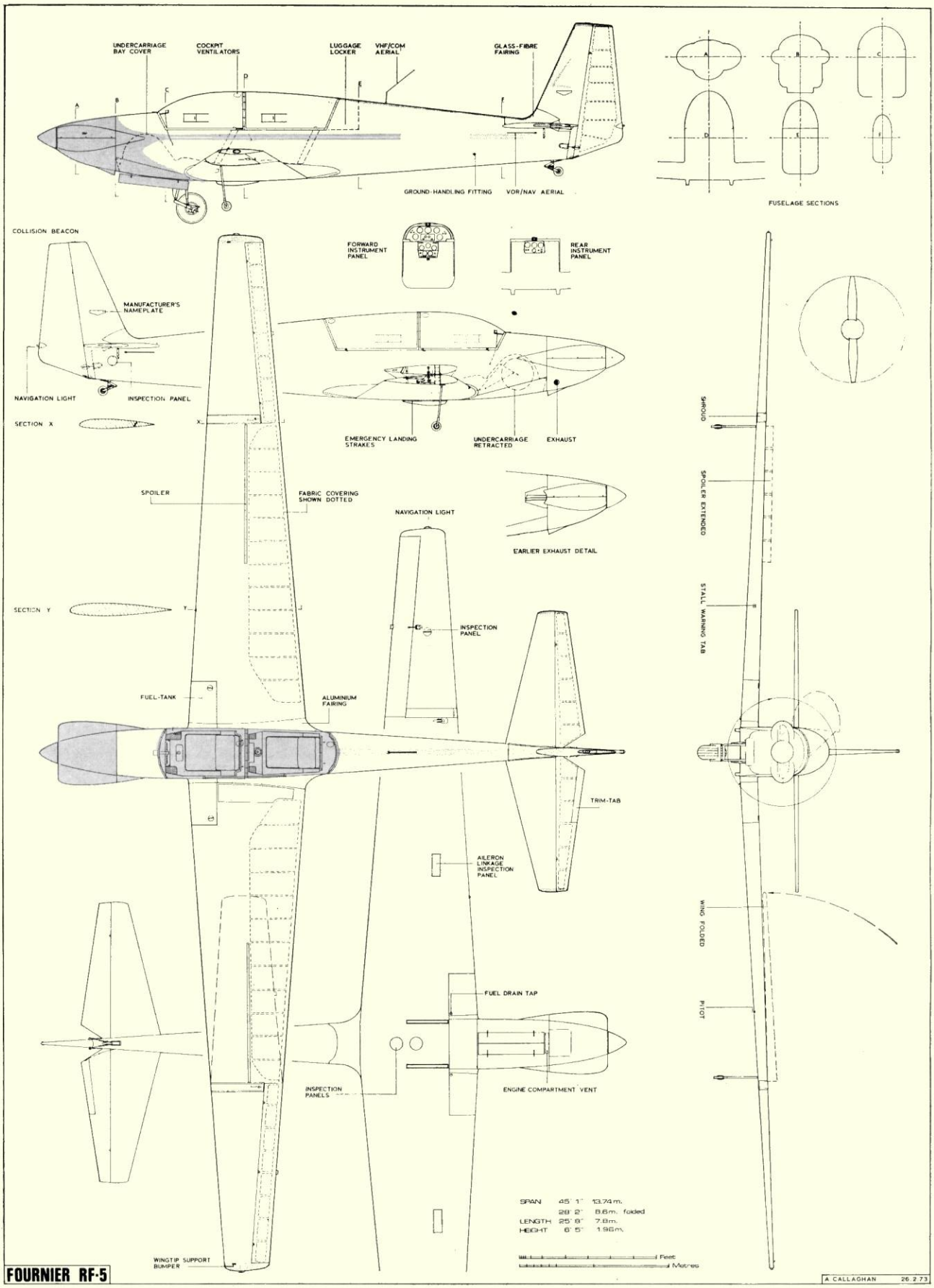
Weights

Empty – 921 lb. (418 kg.)
Maximum take-off weight – 1,455 lb. (660 kg.)

Areas

Gross wing area – 163·2 sq. ft. (15·16 m²)
Tail area – 17·44 sq. ft. (1·62 m²)

Demonstrator at the Paris Air Show in German registration.



No, it's not a multi-bladed propeller, or even a modern floral design, just a selection of blades which the author has made using the techniques described in this feature, tastefully arranged against a suitable carpet background!

First of a three-part article concerning simple design, moulding and carving of airscrews for rubber-driven model aircraft, in particular the Coupe d'Hiver class

by RON COLEMAN

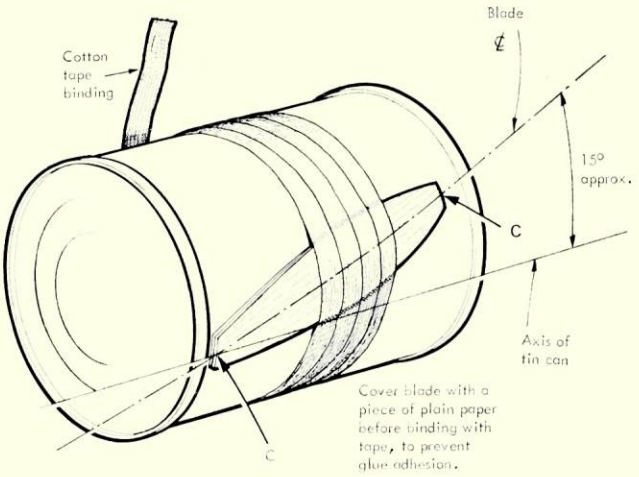
PART I – WITH A TIN CAN

MODERN ADHESIVES have made possible the laminated model airscrew so common on free-flight rubber-driven models of today. Previously, a block of balsa had to be sawn and then carved into a propeller, a lengthy task. Nowadays, it is simply the one of taking two or more thin sheets of balsa cut to the blade profile, and gluing them together in the required twisted shape.

How to get that required 'twisted' shape? One method is to use a tin can of about 6 in. in diameter and to form the blades on this, setting the centre line of the blades at about 15° to the axis of the can. See *Figure 1* and the 'sketch page'.

One great advantage of this method is the speed of production. The blade laminations, coated with PVA glue, positioned and bound onto the tin with cotton tape and placed in an oven set at 100°F. will be set and ready for final shaping in about an hour. The tin can is not affected by the heat, but conducts it rapidly throughout the wood laminations.

FIGURE 1



One problem however, is to decide the angle between the axis of the tin can and the centre line of the blade. It might not be exactly 15°. Further, how do we know that 6 in. is the suitable diameter for a given airscrew size and pitch? It may well be less.

Designing the Airscrew

On average, the diameter of a rubber-driven model airscrew is approximately one-third of the wing span. The proportion of the area of the fontal circle occupied by the blade area called the 'solidarity of the airscrew', should be such as to efficiently absorb the available power. Thus the diameter can be reduced if more, or wider, blades are used but the resulting increase in drag makes this undesirable, except for certain models. Notice the wide 'paddle' blades usually employed on rubber driven flying-scale models.

It is better to increase the diameter, and therefore the aspect-ratio, of the blades to a more reasonable proportion, which results in less drag. However, too-large a diameter, going to the other extreme with very narrow blades, results in structural weakness with blades easily breaking. Also, there are undesirable high tip speeds contrasted by low hub speeds. It is possible that centrifugal force serves to reduce tip angle, with higher speed still, and further slipping of the blades. A compromise must result, between too large and too small a diameter of around one-third the wing span.

Next, the chord or width of the blade. Make it as high an aspect-ratio as possible without losing thrust, or mechanical strength. The chord in the example discussed here is 1¾".

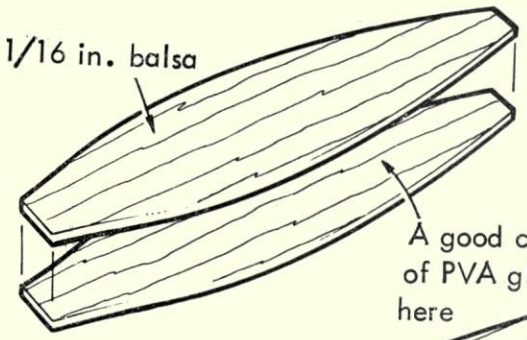
Finally, the pitch of the airscrew, often referred to as 'times diameter' – 1, 1¼ and 1½ times diameter being perhaps most common. The lower the pitch the greater may be the diameter and vice-versa. The best combination of pitch/diameter for a given model is usually found as a result of a number of carefully observed and recorded test flights. Hence a means of rapidly producing airscrew blades of differing pitch angles, and also a ready means of changing blades in the hub assembly, are both very desirable. The writer will describe a simple method for detachable blades in the second article of this series.

A Practical Example

The airscrew discussed here is 16" diameter, 22" pitch (1·⅜ times diameter) as used on the writer's *Harlequin Mk.111* Coupe d'Hiver model.

The 'pitch' is the theoretical distance

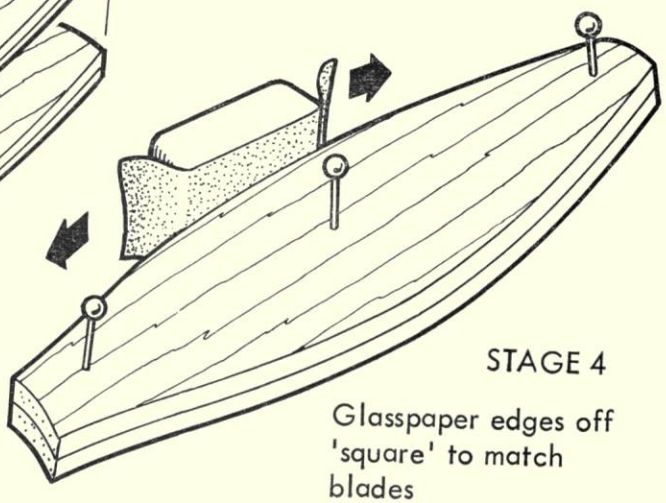
STAGE 1



STAGE 2

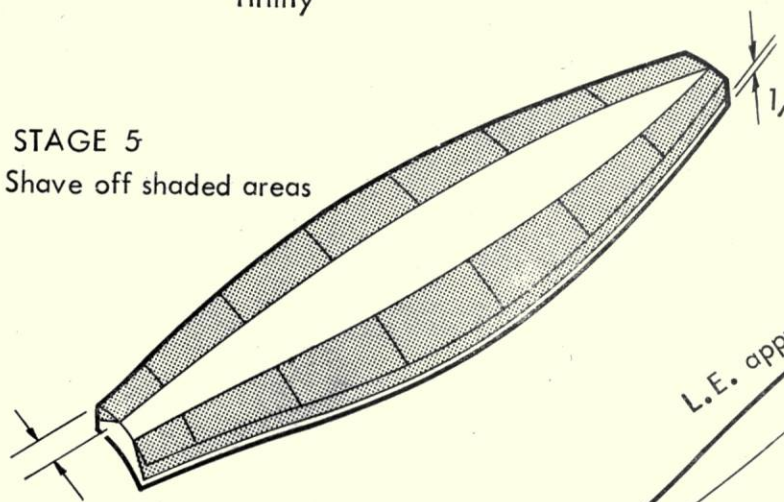
Place two laminations on tin can and bind with tape, place in oven at 100° f. for an hour. Have a piece of paper between tape and blade!

STAGE 3 Place two blades together and pin firmly



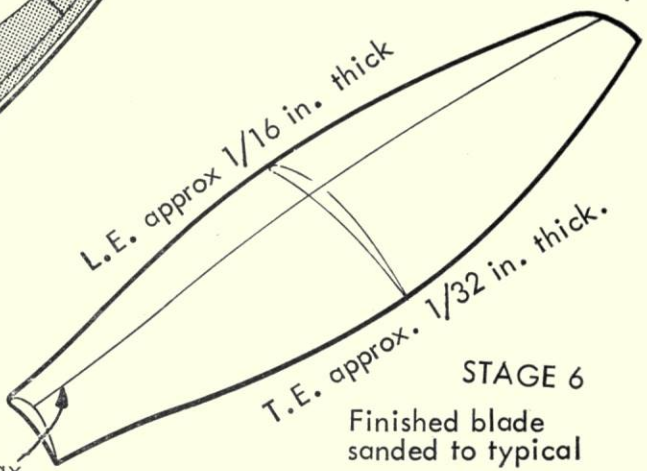
STAGE 4

Glasspaper edges off 'square' to match blades



STAGE 5
Shave off shaded areas

Approx. 1/3 of blade



Lightly mark max camber line.

STAGE 6

Finished blade sanded to typical section.

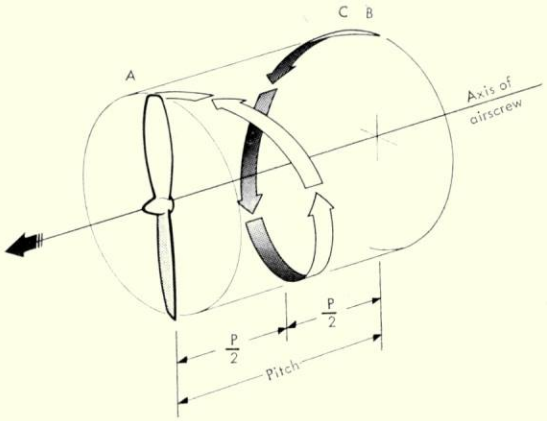
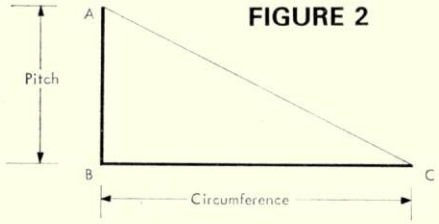


FIGURE 2



the airscrew travels forward in one revolution. The tips of the blades describe a helix as shown in *Figure 2*.

If the helix is drawn out flat it will be found to form the hypotenuse of a right-angled triangle ABC, with CB equal to the airscrew circumference and AB the pitch.

This produces rather a large drawing, and it is convenient to reduce it, making the base line BC equal to the airscrew radius, e.g. 8", which makes the setting of the blade simple and straightforward. The pitch vertical AB must be reduced in like proportion:

$$\text{Reduced Pitch Vertical AB} = \frac{AB}{BC/8} = \frac{22}{50.24/8} = 3.5"$$

See *Figure 3*. Now draw the triangle ABC making BC=8" and AB=3·5". Use a hard grade pencil and make your drawings sharp and accurate – draughting board Tee and Set Squares are also really essential.

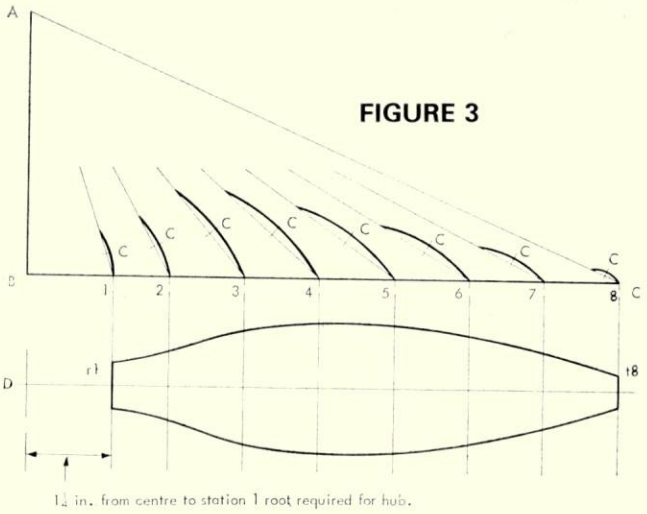


FIGURE 3

1¼ in. from centre to station 1 root required for hub.

Mark off stations 0, 1, 2, 3, etc. along base line BC at 1" intervals and draw in the pitch angels A1, A2, A3, etc. from A to the base line.

1½" below BC draw blade centre line DE parallel to BC. Drop vertical projection lines from stations 1, 2, 3, etc. on BC to cut line DE.

Mark in the maximum blade width, in this case 1¾" and at station 4.

Now draw a smooth flowing curve from the root of the blade at station 1, through the widest point at station 4, to the tip at station t8. This can be done freehand by using French Curves or any other draughting aid. Fold the paper on the centre line and trace through, using carbon paper. A source of light behind the paper helps – put it up against the window pane (!) so as to copy the top half blade shape above the centre line on to the bottom half below the line, to complete a symmetrical blade.

There is scope to indulge one's fancy in the matter of blade shape – there seems no

Establishing the two points C – C on the circumference of the tin can – these lines will determine the centre line of the blade which is being moulded, as shown in Figure 1. It may not be easy to find a tin of the exact dimensions needed, but a pretty good compromise can usually be found.

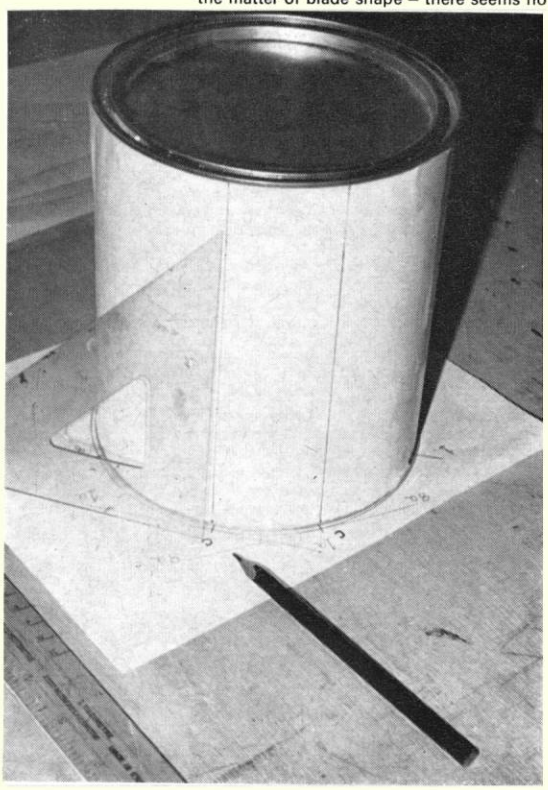
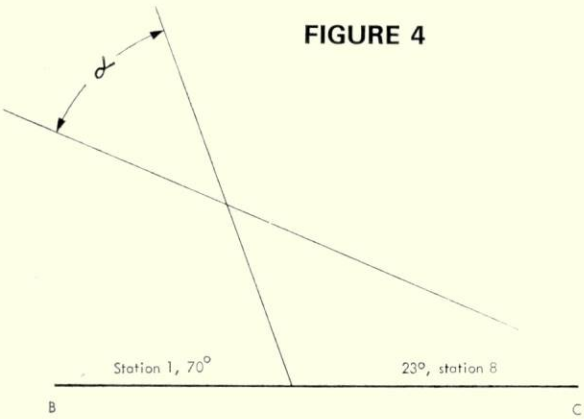


FIGURE 4



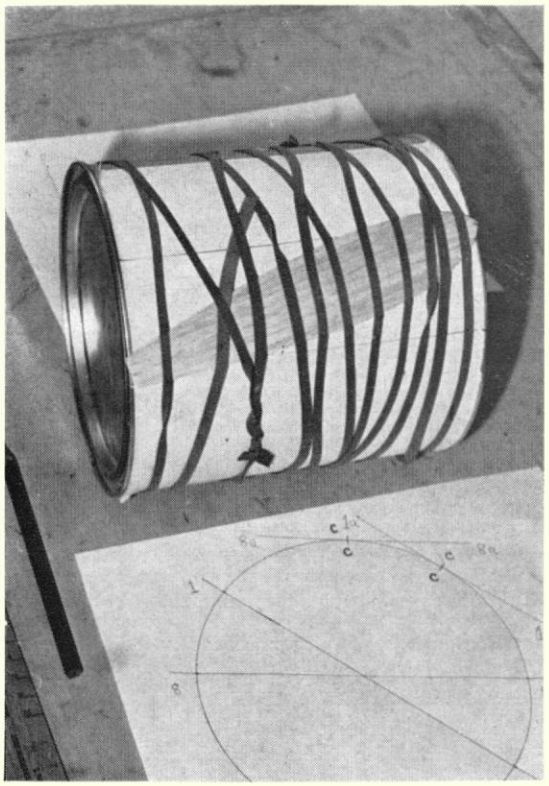
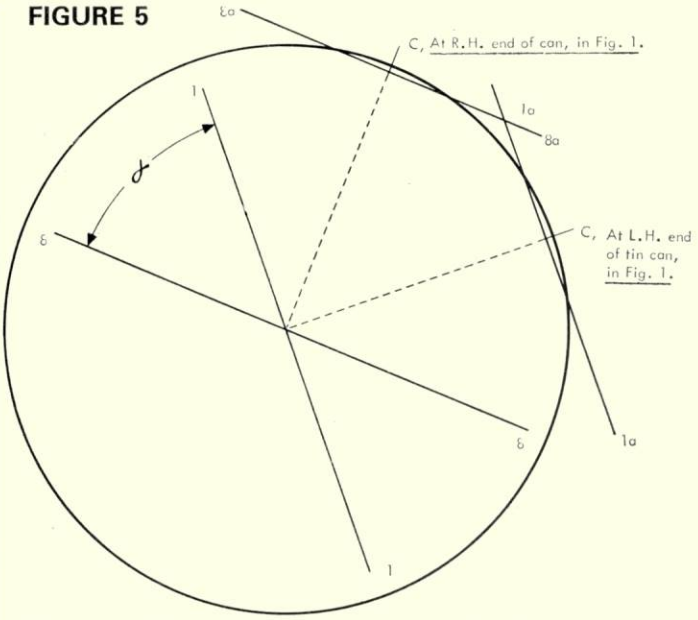


FIGURE 5



The prop blades being bound to the tin-can with tape whilst the P.V.A. adhesive sets. Note how the centre line of the blade corresponds with the positions C – C

reason why it should not be asymmetrical. The position of the maximum blade width can be varied also – making the width about 1/10 of the diameter or less. The author believes that the pressure on the blade is more evenly distributed with the shape shown. The nearer the tip the greater the speed and therefore the greater the thrust, so a decreased chord towards the tip helps to balance everything up.

Having drawn the complete blade shape transfer the chord widths on to the pitch angles at each station along line BC. Establish the centre point 'c' on each chord width. Now draw in the undercamber line at each pitch angle – a smooth curved line passing through point 'c' to each edge of the blade. The maximum camber will be about $\frac{1}{8}$ in. at the widest point and about 1/16" at root and tip.

We can now decide the diameter of the tin-can needed, and the angle at which to place the blade centre line to the tin-can axis. Refer to figures 4 and 5 as well as our design drawing.

Draw the pitch angle at station 1 root, and the angle at station 8 tip, on top of it. Then angle α is the change of angle along the blade length.

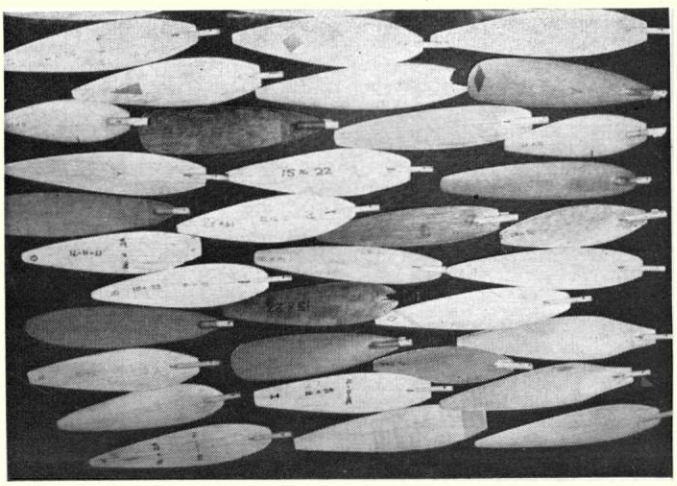
Superimpose this drawing (use tracing paper) on top of a circle drawn to the diameter of a suitable tin-can (6"). Line 1–1 is the pitch angle at station 1, and 8–8 the pitch angle at station 8. Both these lines will lie parallel to tangents of the surface of the tin-can at points c. Line 8–8 is now lifted, keeping it parallel into its new position at 8a–8a. (This will be at the right-hand end of the tin-can.) Line 1–1 is lifted to new position 1a–1a.

We now have established points c–c on the circumference of the tin-can on which the blade centre line must lie when being moulded to shape. *Figure 1.*

A smaller diameter tin-can will result in a deeper undercamber and a straighter blade – too large a tin-can will result in a flatter undercamber but a greater axis/centre-line angle and an oddly curved blade. It may not be easy to find a tin-can that exactly meets all these requirements and it is not likely that everything will match up 100% with one's drawing. However, it is possible to get very near to the desired perfection.

Preliminary balancing is a matter of ensuring that the blades match for weight. For this a scale balance capable of measuring down to $\frac{1}{4}$ gramme or less is required. Keep glass papering the heavier blade front until it matches for weight.

Now you no longer need be afraid of breaking one or two airscrews in a day's model flying. Once you have made the necessary drawings from the foregoing information, you can make your airscrews very rapidly, in fact, once the tin-cans are lined up are marked out, *en masse!*



'Airscrews en masse', he said, and 'en masse' he meant too! These are just a selection of props made by the author, using the method described. Fitting of the hub will be detailed in a future issue.

FLYING SCALE COLUMN by Eric Coates

IT IS NICE to be able to report a scale competition again so early in the season. The first part of the Column this month is devoted to the **S.M.A.E. Indoor Scale Meeting** held, by kind permission of the C.O. of R.A.F. Brize Norton, in the gymnasium at that station. The gymnasium is in fact basically half a standard R.A.F. hangar with a polished wood floor and after last year's meeting in the giant airship hangar at Cardington the flying space looked rather restricted. I should guess that the arena measured 100ft×80ft, with about a 30ft ceiling. Most models managed to perform very well within the confined space but one or two, including my own *Puss Moth*, were definitely handicapped by the proximity of the hangar walls. Although it is feasible to make most models turn well within the confines of the walls this usually involves the model carrying a fair degree of bank – so making realistic take-offs rather difficult, if not impossible, for some models.

The period from about 11.00 a.m. to 2.00 p.m. was devoted to trimming. During this time there was hardly a single minute when at least one model was not airborne, it being quite normal for 3 or 4 to be flying simultaneously. About a score of S.M.A.E. members were present most of whom had several models and I would say that in all some 50 models must have been airborne at various times during the day. Not all were outstandingly successful – the attainment of the qualifying 15 secs required for the competition clearly being beyond the ability of quite a number. Fifteen seconds rise off ground is also a vastly greater task than 15 secs from a hand launch!

Eventually 10 competitors came forward when the contest got under way, at 2.00 p.m., judged by Dennis Thumpston and Derek Goddard. I was first to fly with my *Puss*, and in fact had all my three flights straight after one another in order to be able to report the ensuing events. Lack of space prevented this model to give of its best – trimmed to turn left with the torque, just as on a powered scale model, the circle widens out as the power runs down. This resulted in hitting the wall thus losing all glide, approach and landing points. Tightening the turn prevented a satisfactory take-off performance; making hand launch a necessity in order to attain landing marks. This model was designed around a pre-war gear box unit produced by Frog for their similar (1/24th scale) ready to fly *Puss Moth*. The twin skein 4:1 step up ratio gearbox is housed in a steel pressing shaped to the nose contour of a Gipsy Major cowl. I think the old Frog fuselage and tail construction must have been much heavier than mine because when complete, my model balanced in front of the leading edge! By the time I had fitted sufficient ballast at the back end the model was scaling 2 oz – far too heavy for an indoor job of 18½ in. span. I therefore carved a balsa noseblock and 4½ in. diameter paddle bladed airscrew. Powered by 8 strands of approximately 1/32 in. sq. Pirelli I can get a motor run of about 35 secs. on 600 turns, the flying weight now being just over an ounce. Although the paddle prop is not as pretty as the almost scale unit I intended to use with the gearbox, the weight is much more acceptable.

Only competitor to use a gearbox in the competition was veteran indoor duration modeller Reg Parham. He used the much lighter unit from the later Frog *Interceptor* fighter. This was fitted to a model of the relatively unknown ultra light aeroplane of the 20's – the *Gloster Gannett*. This machine, very similar in appearance to the latter day *Currie Wot*, possesses ideal proportions for a model aeroplane. It performed beautiful long straight take offs but also had great difficulty in turning within the confines of the hangar. Unfortunately, although apparently capable of flights of up to one minute, these walls prevented the Gannett flying for the necessary 15 seconds to qualify.

Most impressive looking model and understandably scoring the highest static score, was Vic Driscol's colourful *Westland Wapiti*. Apart from the red and blue fuselage this model looked just like a half scale version of his last year's *Super Scale Trophy* winner. Unfortunately, as is so often the case, the extra weight that the decoration and detail bestowed on the model allowed only a very moderate flying score to be recorded.

At the other extreme A. J. Moorehouse's *Vickers Wildebeest*, built from the prewar *Aero-o-Kit plan*, being very light and plain in white tissue, with no detail whatsoever, flew very well indeed. Mr. Moorehouse had by far the largest collection of models at the meeting. T. Blagg of St. Albans flew his 1913 *Deperdussin* seaplane. This flew very well but, of course, was handicapped through lack of take-off points.

As at Cardington, last September, the eventful winner was Terry Manley with his *Fokker E.3*. This relatively large (23 in. span) model did not seem to mind performing tight circles and made quite good take-offs and landings to return the highest flying score. Coupled with a high static score this gave Terry a clear lead.

The growing interest in miniature indoor scale models is reflected in the number of trade items now being offered to modellers. Unfortunately the average model shop these days does not cater very well for the constructor of scale models weighing less than 10lb and powered by engines of equal c.c, but perusal of the small ads at the back of this magazine will reveal several specialist suppliers of suitable materials.

Colin Tissman's range of vintage scale plans grows month by month. Amongst his latest offerings, which have come my way, I can recommend the re-issue of the pre-war Frog *Heston Phoenix*. This will build up to a really good 12in. span flyer.

Vic Driscoll of the St. Albans club is obviously a Westland Wapiti enthusiast – he has been featured on these pages before with his free-flight power version, and now he has 'shrunk' the design to suit indoor rubber-powered flying! Placed fourth at Brize Norton, the flight performance being handicapped by a rather heavy finish.

Butch Hadland flew on 'home territory' with his Heinkel He 46, built from Doug McHard's plan, which placed second. Flew in circles of less than 40 feet diameter with ease – in fact, just how the designer flew the original in tightly banked circuits.

Veteran indoor flyer Reg Parham flew his Gloster Gannet fitted with the Frog Interceptor gearbox. Unfortunately, although a superb flyer, the model could not be trimmed to fly within the confines of the space available, failing to qualify for the contest.

Another recent addition to the list of suppliers is **John Stennard**–remember his fascinating articles on the pioneering of Brown Junior CO_2 scale models, this side of the Atlantic, a couple of years ago? John is marketing the miniature scale goodies of **Bill Hannan.**

Bill Hannan, of course, is a well known scale flyer in the U.S.A. and markets many of his own designs. These vary in construction from simple all sheet machines to some of the most complex miniatures which are definitely not for beginners to indoor scale. Of the drawings I have seen I am most captivated by the beautifully detailed *Pitts Special* – this will build into a real beauty with scale rib spacing and laminated balsa tail outlines and wing tips. Another design for the connoisseur is the graceful *Antoinette;* to me the most beautiful of all pre-war 1914 aeroplanes. This should build into a really slow flying indoor machine.

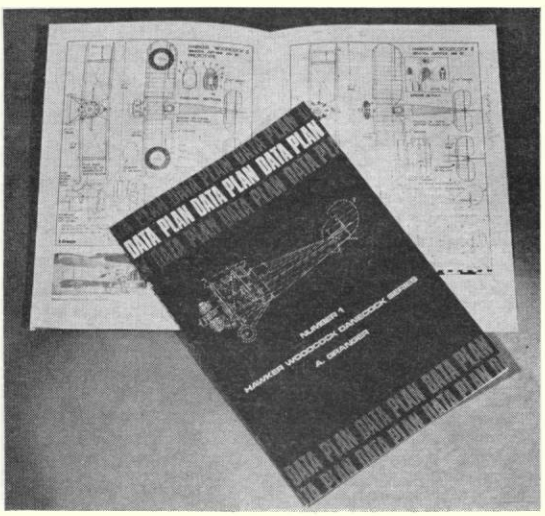
To match these really early aeroplanes some superbly made spoked wheels are available in sizes from $\frac{1}{2}$in to $1\frac{1}{2}$ins diameter. These are real gems – the tyres and rims are turned from balsa, the spokes are made from silk thread and the hubs in Teflon (P.T.F.E.). Like full sized spoked wheels they are immensely strong and weigh virtually nothing, but as they must be handmade they are not cheap (around 4 dollars per pair in the U.S.A.) but worth every cent.

For the less fastidious a heavier wheel is available with a solid centre moulded in clear perspex with a rubber tyre. For early machines spokes can be scribed on the perspex, or for later jobs, which had canvas wheel covers, they may be just painted. Naturally these wheels are much cheaper (around a dollar per pair) but are also much heavier. Many other items such as thrust races, prop shafts, washers, etc. are available. For a catalogue just drop a line to **John Stennard.**

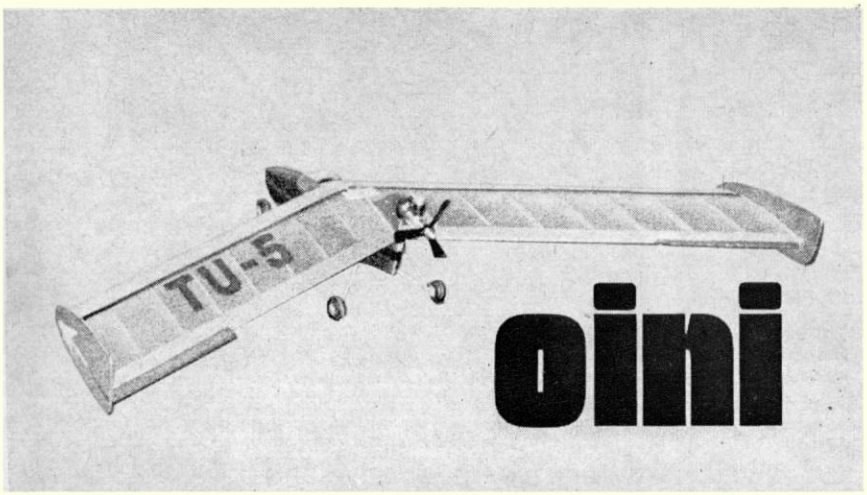
I noticed that many fliers at Brize were suffering from rubber trouble. This I think was chiefly due to lack of experience with this most temperamental form of motive power. I have had much more success since I started using multi strand motors of small cross section. I can recommend the **Micro X** rubber, packed specially for indoor flying and available from **Laurie Barr.** A multi-strand motor of say 8 strands of ·035in sq about twice the length between motor peg and prop shaft, pre-tensioned to remain taut when unwound, will allow far more turns to be applied than say a single loop of $\frac{1}{8}$in flat. Such a motor seems to give a more controlled power run also avoiding the high torque initial burst.

Of interest to all classes of scale modellers, and not only the miniature enthusiasts will be the new **Data Plan** publications. Looking through No. 1, devoted to the *Hawker Woodcock-Dovecock* series, I was very impressed with the high quality of the draughtsmanship.

Alfred Grainger's work is of the highest standard throughout. Every mark of this rather neglected subject is drawn in full to 1/72nd scale, with 1/36 scale details. One page is devoted to a coloured side elevation depicting a machine in No. 3 Squadron markings, while the many excellent photographs are very clearly reproduced. It is intended to bring out new productions on a bi-monthly basis, and I was very gratified to learn that the early editions will be devoted to interwar R.A.F. fighters; including the *Siskin, Bulldog, Grebe, Gamecock, Gauntlet* and *Fury*. All worthy flying scale subjects which have been rather neglected by other publications. This new series should redress the balance between the well documented machines which flew in the war years 1914-18 and 1939-45. If the standard of the first issue is maintained throughout the series, we scale modellers are due to a treat every other month. These publications are available from Taurus Press, and are priced at 50p each, 5p postage.



The new Data Plan series from Taurus Press should prove to be of immense interest to all scale enthusiasts, containing as they do drawings, photographs, and colour details of all the variants of the subject chosen: in this case the Hawker Woodcock and Gamecock series.



YOUR TWO

A novel tailless free-flight sports model from Switzerland, designed for 0.3-0.5 c.c. engines

by ERNIE SCHLACHTER

WANT A sports free-flight model with a difference? One that will turn the heads on the flying field? Make people say 'that will never fly' and prove them wrong? Yes? Then *Oini* is for you! Different it is too with its pusher-engine, tail-less configuration, while the swept back wings are devoid of such stability aiding features of dihedral and washout. Working on the principle of 'what isn't there can't take long to build or cost very much', *Oini* was designed purely as a fun aircraft – one to take out and fly when other forms of flying are becoming a little too serious . . . fun is what this hobby is all about!

Although other engines may be fitted, the Pee Wee is particularly suitable as being a reed-induction motor, it may be run 'backwards' with a conventional propeller – using other engines of around 0.5 c.c. capacity you will probably need a pusher propeller.

Construction is not difficult, although it is perhaps out of the absolute beginner category. The wings must be built true and warp free, and be sure to use a P.V.A. type of adhesive to prevent the $\frac{3}{32}$ in. sheeting from being distorted by shrinkage. Ribs are best made the 'sandwich' method as shown. Cut out two templates from $\frac{1}{8}$ in. ply and bend up a U-shaped piece of 16 s.w.g. piano wire. Carefully drill templates to match the arms of the 'U'. Sandwich 11 'blanks' of $\frac{1}{16}$ in. balsa between these templates, insert the wire holding piece, and rake the templates to match the sweep-back of the spar. Sand the blanks to shape, file out the spar and leading edge slots, then repeat for the opposite wing panel.

Cut the trailing edges to length, slot to accept the ribs, then pin over the plan. Cut out the main spars and insert the ribs – do not glue. Slot the ribs into the trailing edge, then line up the main spar to match the plan – packing it up $\frac{1}{16}$ in. to suit the camber of the airfoil. Apply P.V.A. glue to the spar/rib joints when satisfied that the whole assembly is true. Allow to set, then add the leading edge. While still pinned to the board, add the upper $\frac{3}{32}$ in. sheeting plus the $\frac{1}{16}$ in. sheet in-fill at the centre section area and the $\frac{1}{8}$ in. sheet gussets where shown. When dry, remove from board and add the bottom sheeting/in-fill.

As soon as both panels have been completed and the insert for the elevens made, they may be joined, ensuring that there is a $\frac{1}{8}$ in. wide slot between the spar and T.E. to suit the motor pylon.

Now for the fuselage – what there is of it! Build this by first cutting out the fuselage sides to the lines indicated, and the three formers. Bind and epoxy the noseleg to former F1, and glue the $\frac{1}{16}$ in. sheet wing seat reinforcement in position. Lay one fuselage side on the board, and glue F1 and F2 in position, making sure that they are square. When dry, add the other fuselage side. Next, insert F3 and draw the fuselage ends together around the sternpost – make sure that the curved portion is symmetrical.

Bend up the main undercarriage, and solder together as shown. Glue the ply plate behind F3, and epoxy the $\frac{3}{16}$ in. square u/c support in place. The top and bottom blocks to the forward fuselage are now added, followed by the nose piece – noting that this is laminated from three pieces of $\frac{1}{8}$ in. sheet, the centre being cut away to act as a weight box. Sheet the fuselage underside, then bind and epoxy the u/c to the $\frac{3}{16}$ in. square brace, using a tin plate clip and woodscrews at the forward position. Sand smooth all over, then add the wing dowels and cockpit canopy.

Cover the wings with lightweight tissue, but before doping, add the tip plates – this is important as otherwise the dope will distort the end ribs. Likewise cover the fuselage in lightweight tissue, and remember to use coloured tissue, not colour dope, for contrast and trim. Apply three to four coats of 50 per cent thinned dope. Cut out the elevons, cover with tissue, and attach to the wings with 'hinges' epoxied in place.

Next cut out the $\frac{1}{8}$ in. ply engine pylon and make up the engine mount, then glue between the wing halves – using epoxy adhesive for all these joints. Apply two coats of sanding sealer, rub down, then fuel-proof the entire model.

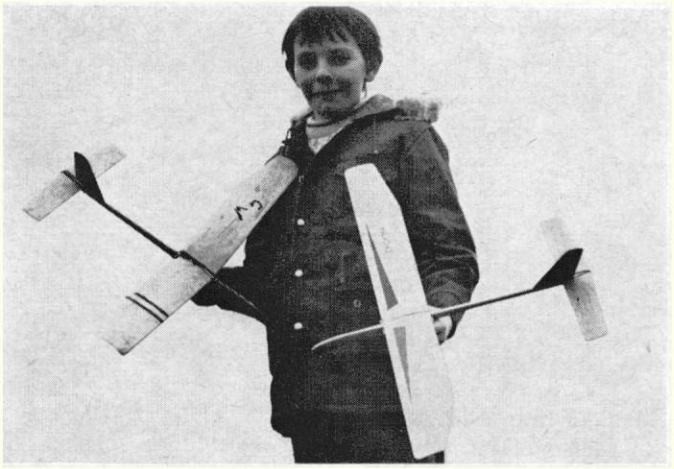
Bolt the engine in place (no sidethrust), then fix the wings to the fuselage and check the balance.

The flying procedure is just a little different from 'normal' sportsters. Bend the elevons up to the position indicated, then test glide. Trim for a fast, flat, glide with a slight turn to the right – use elevon movement to achieve this state. Forget those 'start with low power flights' instruction for this model – just check that the engine is 'pushing' and that the propeller is fitted backwards then lean out the needle to achieve full power, and off you go!

Nearly forgot! Why the name 'Oini'? Well that's how a young American girl with a strong Brooklyn accent, pronounced the designer's name. . . .

FREE PLANS!!!

Another design from IAN BARRETT's stable, this time for an ultra simple, all-sheet towline glider of just 24 in. span, designed with the absolute novice in mind:

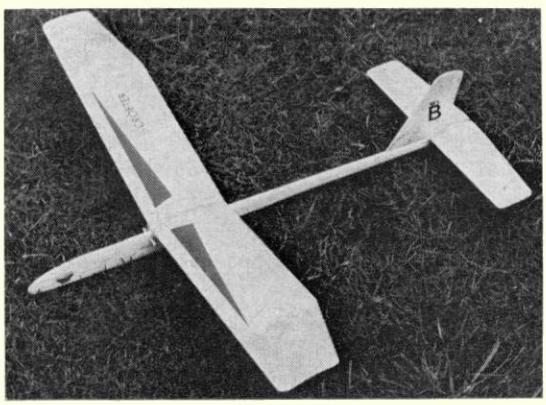


CROFTER

DEVELOPED FROM an earlier all sheet glider that had proved to have a good performance, 'Crofter' was designed for a group of young enthusiasts forming the local model club. To keep costs down, the size of the glider was arranged to make economical use of standard balsa sizes – the lowest cost per model is achieved with a batch of six (!) but even for a one-off job, little expense is entailed.

The most complicated part of the model is undoubtedly the wing construction, and accurate construction here will help achieve good performance later. Mark the wing platform onto a piece of 3 in. wide, 1/16 in. thick sheet balsa, and cut out. It is not necessary at this stage to separate the two halves. Sand the wood smooth, at the same time tapering down the upper surface towards the trailing edge. Now glue along the underside of the leading edge a piece of ½ in. wide trailing edge section, and when dry, sand the now thickened leading edge to a semi-circular section.

Before proceeding further, try the following experiment. With the flat, uncambered wing held upside down (with the leading edge stiffener uppermost) launch gently forward. The original batch of wings all flew extremely well in calm conditions, although some flutter was apparent on some wings. Even half wings flew! The reason is that a form of reflex section has been constructed, while the stiffened leading edge moves the centre of gravity forward.



Camber must next be introduced into the wing, and this is done quite simply by doping the underside. As the dope dries, shrinkage will pull the wing into a curve. If more curvature is required, try dampening the upper surface with water, but don't overdo it. When dry, smooth down the doped surface with sandpaper, and add the ribs to hold the curve.

Separate the wing halves, and butt-join them at the correct dihedral angle. Note the slight curve required along the joining edges. Stiffen the joint by a ½ in. wide strip of nylon doped to both top and bottom, and sheet-in the area between the centre-most ribs.

The remainder of the model is straightforward, the tail surfaces being cut from 1/16 in. sheet balsa and sanded to a streamline section, while the fuselage is cut from hard stock balsa. The upper surface of the fuselage is left as a straight line, acting as a datum.

Cement the fin and the flying surface platforms securely to the fuselage, then add the rubber band retaining dowels and the tow hook.

Paint the entire model with two coats of thinned dope, and sand smooth. Decorate the model with a minimum amount of coloured dope. Building time for the original batch of models took three periods of one and a half hours, including nattering time!

Flying should present little difficulty. The form of wing shape ensures a certain amount of wing tip 'wash-out' for stability. All the models built so far have shown excellent tow characteristics, the glide performance being well up to good chuck glider standard. With the model ballasted to balance as shown on the plan, little trimming should be necessary. However, a slight stall can be cured by placing a little packing under the leading edge of the tailplane, while a dive can be flattened out by packing up the trailing edge.

This model, by the way, is ideal for club 'scramble' competitions, using the 'hi-start' catapult launch technique.

Couldn't be much simpler, could it? Novel form of wing construction is very easy to make, and quite strong – will absorb many impacts with rather solid, non-flying objects! Can also be catapult-launched – but make sure that the wings are held securely in place.

Peter Chinn's

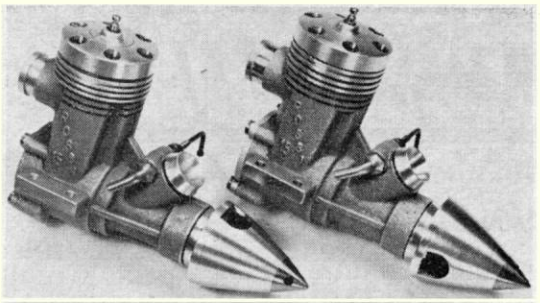
latest engine news

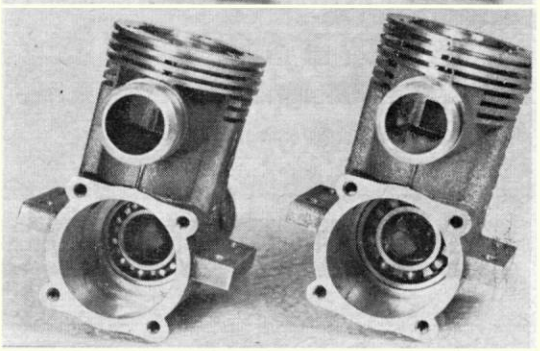
Rossi 15 Improved

A number of modifications have recently been made to the Rossi 15, as a result of which the power output of the free-flight version has been lifted above the 0·65 b.h.p. at 25-26,000 r.p.m. recorded in our Rossi 15 Engine Test report a few months ago. Indications are that this output figure should be bettered by at least 10 per cent.

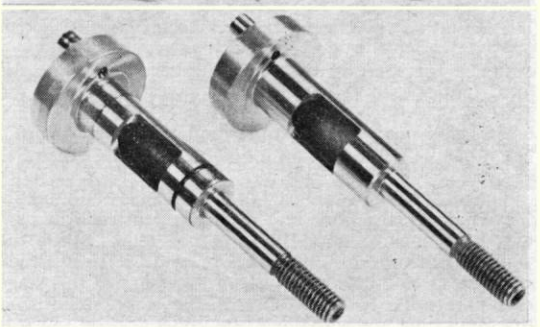
The significant modifications are concerned almost entirely with the engine's porting. The crankshaft main journal, which previously had an o.d. of 10 mm, has been increased to 10·5 mm and the valve port enlarged to extend the intake period by approximately 13° to just over 200° of crank rotation. The rotary valve now closes very much later at (a measured) 62° ATDC. Cylinder port timing is also different. According to our measurements, the opening periods are as follows (figures for previous model in parenthesis): Exhaust 152° of crank angle (150°); main transfers 136° (130°); 3rd port 136° (126°).

The larger shaft has, of course, necessitated a larger rear ball bearing. Outwardly, the new engine can be identified by minor changes to the main casting (notably in the lower-finned portion of the cylinder casing) and by the narrower gap separating the head from the top cylinder fin.

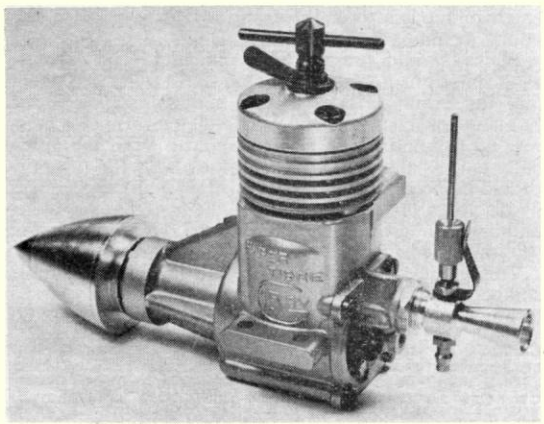




Externally, there are few differences between the latest Rossi 15s and the earlier models – the most obvious being the lower finned portion of the cylinder casing (right) and the narrower gap separating head and top cylinder fin (above right). In each case the 'new' Rossi is seen on the right.



New Rossi has larger shaft and valve port is enlarged to extend the intake period by approximately 13 deg.



Revised version of the Super Tigre G15-RV is now assembled around the new-style main casting used for the glow version. Weight has now crept up to 7¼ oz.

K&B 15 Impressions

Shortly after writing the description of the new K&B 15 (*L.E.N.*, April issue) we ran some tests on it, the overall results of which confirmed that this is strictly a 'nitro' motor. We don't think that K&B president John Brodbeck will be offended if we suggest to our FAI free-flight readers that they stick to their Rossi 15's for the present. In a recent letter, John told us that the FAI version of the K&B is still in the 'research and development' stage. Current plans call for rather more than a mere head change.

Incidentally, production of the first run of approximately 10,000 units (standard and R/C types) required a lot of new tooling and presented K&B with quite a few problems. For the next batch, the sand castings will be replaced by gravity (permanent mould) castings and it is anticipated that this and

other changes will result in better quality control and more evenly matched performance between individual examples.

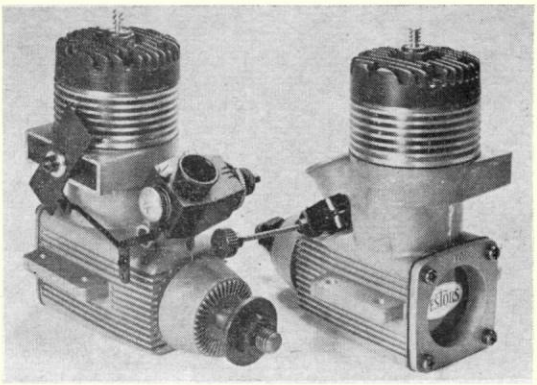
Handling qualities of our two test motors were very good and the power output of the R/C version on nitro fuel (one would suggest 25 to 50 per cent pure nitromethane) was well above the best levels previously recorded for 2·5 c.c. R/C engines, thus making it the No. 1 choice for the 'Quarter Midget' R/C pylon racing class. A detailed account of the performance of the 15 R/C model will be found in 'Radio Motor Commentary', May issue of *Radio Control Models and Electronics*.

Revised G.15-RV Diesel

The rear disc valve Super-Tigre G.15 Diesel is now being assembled around the new style main casting used for the G.15-RV glowplug engine. This has the same overall dimensions as the previous unit but is of heftier proportions with a squared-off lower cylinder casing and thicker mounting lugs. Inside, the transfer channel is widened with machined flutes each side but is slightly narrower at the bottom.

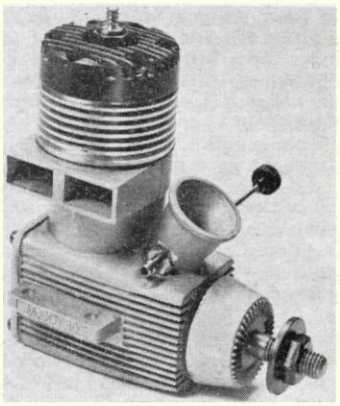
Very little else is changed. The engine continues to use an internally counterbalanced crankshaft with 10 mm main journal and ball bearings fore and aft. The porting follows the standard ST G.20 and G.15 layout with symmetrical exhaust/transfer timing and a flat crown deflectorless piston. An improvement is the adoption of a bronze bushed big-end with two holes instead of a slit for lubrication. The rotary-valve is, of course, Super-Tigre's counterbalanced hardened steel disc. A slightly different backplate is used but this has no significance in this particular engine: it is simply a modification to permit the fitting of a different type of carburettor where the 15-RV backplate casting is used for the glow versions.

This newest G.15-RV Diesel is about ½ oz. heavier than the previous version. The sample examined checked out at 213 grammes (7·5 oz.).

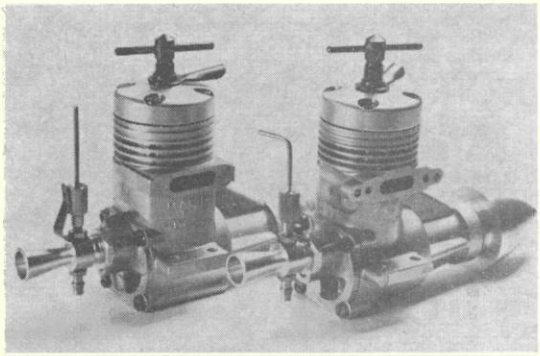


McCoy 40 'Series 21' is manufactured in both 'normal' and R/C versions (seen left) with Perry carburettor.

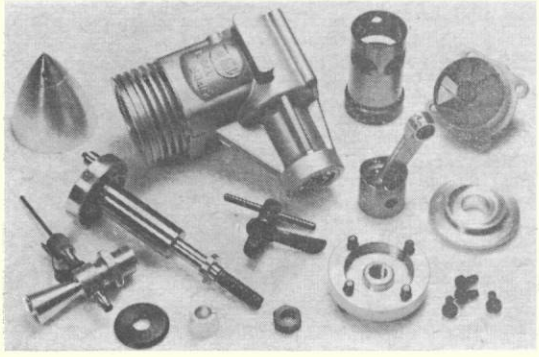
McCoy 40 Stunt 'Series 21'. Engine uses a Dykes-ringed aluminium piston and is a big improvement on previous 'Red Head Stunt' series.



The original G.15-RV Diesel was first put into production more than five years ago, aimed at the FAI team-racing fraternity. Minor modifications were made during the following months and one of these engines was then dealt with in the A.M. Engine Test series. It proved to have an unusually high peaking speed for a stock 2·5 c.c. diesel (18,500 r.p.m.) and an output of 0·36 b.h.p. was recorded. For the current model, the manufacturer is now claiming a figure of 0·45 b.h.p. at 18,000 r.p.m.



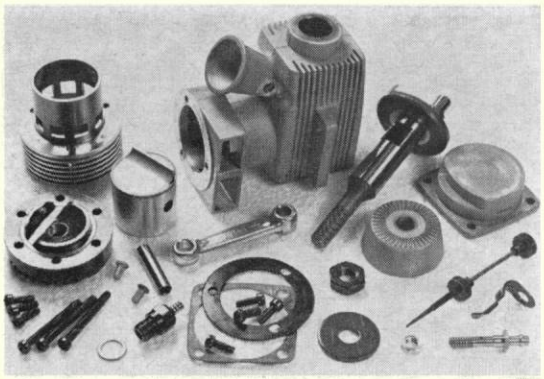
Latest G.15-RV Diesel (left) compared with previous model.



Latest version of Super-Tigre G.15-RV team-racing diesel has entirely new and stronger main casting, but few internal modifications.

McCoy 40 Stunt Series 21

This unusual looking ·40 cu. in. engine, easily distinguished from all other makes by its finned, chunky, rectangular-shaped crankcase, is one of four current medium-size McCoy 'Series 21' engines, the others being a ·19, a ·29 and a ·35. They replace the 'Red Head Stunt' range that was manufactured during 1957-1970 and although they are still plain (bronze bushed) bearing motors of fairly simple design, they have been extensively redesigned. Changes include the adoption of a Dykes-ringed aluminium piston in place of the moulded sintered iron and machined cast-iron pistons used by the previous models.



Parts of the new McCoy 40 which now features a ringed piston. No silencer is currently available for this unit.

In our experience (which extends to four examples of the Series 21 design and at least as many of the older type) this new ringed piston offers much better compression. With the old model, piston seal was often rather poor when the motor was hot, after a run and, to get a restart by hand, we have many times had to resort to an oil prime through the exhaust port or plug hole. No such troubles have been encountered with the ringed Series 21 engines, all of which have started easily, hot or cold.

The Duro-Matic Products Division of the Testor Corporation, who are the makers of McCoy engines, do not offer silencers for their engines and all our tests on the McCoy 40 were therefore carried out with an open exhaust. Using 5 per cent nitromethane fuel, we obtained a peak output of 0·55 b.h.p. at approximately 12,500 r.p.m. Maximum torque was 56 oz. in. at 7,000 r.p.m.

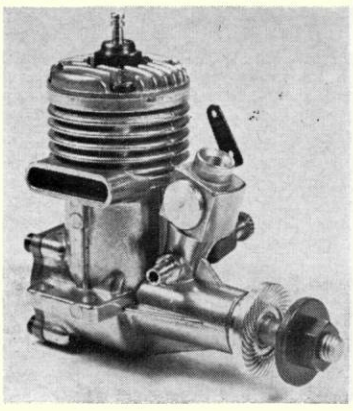
Prior to running performance tests, the 40 had been run-in on straight methanol and castor-oil and some prop r.p.m. checks were made using this fuel. It was very clear, however, that the McCoy 40 was not satisfactory on such a cool mixture. There was a substantial power loss when the plug lead was removed and the engine became excessively sensitive to needle-valve adjustment, cutting out abruptly on a weak setting. On 5 per cent nitro, there was a marked improvement although, even on this, the McCoy needed time to warm up to full power – especially on the smaller prop sizes. The same sort of thing occurred later, in cold winter weather, with a 15 per cent nitro fuel.

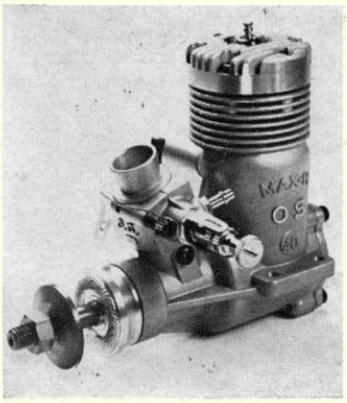
New Australian Taipan glowplugs are obtainable in four types to suit most engines.

One suspects that the McCoy, being made in sunny California, was originally set up for the local climate and that it could benefit from a higher compression ratio. This impression was communicated to Testor's chief development engineer who agreed and later sent along a modified cylinder head that helped quite a bit.

Up to the present time, the Series 21 McCoys have not been distributed through regular retail channels in the U.K. Some are in use here, however, these having been brought into Britain last year by a mail-order discount firm.

The 40 Series 21 weighs 9·6 oz. which is a little above average weight for a plain bearing Stunt 40 but it does have the advantage of a quite stout main casting that should stand up to a few knocks. The engine's bore and stroke are 0·828 × 0·740 in. giving a swept volume of 0·3985 cu. in. or 6·530 c.c. Suitable props, based on our findings and aimed at realising at least 90 per cent of the engine's peak power, would be 11 × 5, 10 × 6, 10 × 5 and 9 × 6. Figures recorded on test (5 per cent nitro fuel) included 10,500 r.p.m. on an 11 × 5 Punctilio, 11,100 on a 10 × 6 Punctilio, 11,600 on a 10 × 5 Punctilio and 12,400 r.p.m. on a 9 × 6 Top-Flite maple.





Left, lowest-priced engine in the extensive O.S. range is the Pet-III. Standard version can be converted to R/C type with addition of simple throttle-carb. shown. Right: the entirely new O.S. Max-40 R/C is very powerful and has excellent handling and throttling qualities.

Taipan Glowplugs

Until recently, the Burford Taipan glow engines have been supplied with American Fireball plugs, but these Australian-made motors now have their own plugs. Also packaged separately, Taipan plugs are well-made, use a platinum alloy filament and are being manufactured in four types: hot, medium and cool (colour coded, red, yellow and blue like the Fireball), plus a bar type R/C plug. All are of the long reach type and it should be possible to find at least one that will suit almost any engine of 2·5 c.c. or the larger capacity.

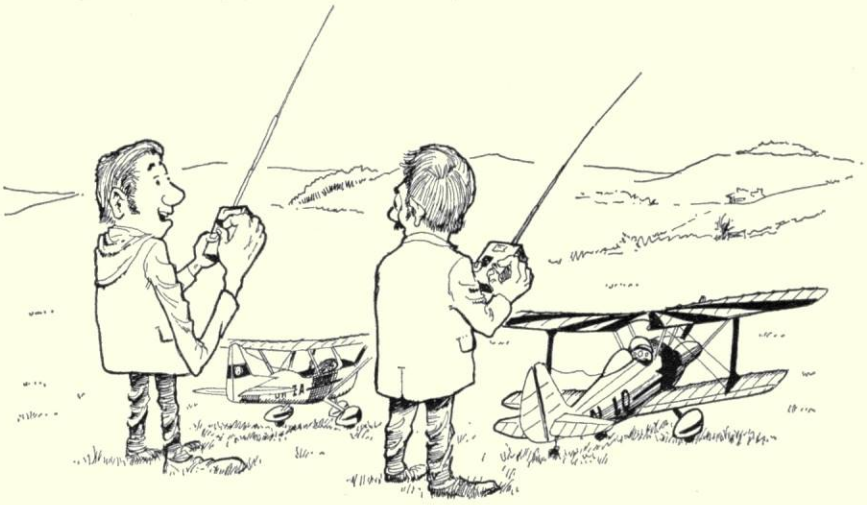
New O.S. 40

A new throttle-equipped 40 that may be of interest to C/L Carrier enthusiasts as well as R/C people, is the latest O.S. Max-40 R/C. This is a completely new motor, of lower stroke/bore ratio than the Max-H. 40P and H.40-SP and very powerful. With the standard O.S. Type 4A throttle-carb, ours bettered 0·85 b.h.p. on 5 per cent nitro fuel (0·70 with the stock OS-703 silencer fitted) and idled safely down to less than 2,000 r.p.m. using silencer pressure Very smooth and very easy to handle as well. See *Aero Modeller's* companion journal, *Radio Control Models and Electronics*, June issue, for further details.

topical twists

by 'Pylonius'

illustrated by 'Sherry'



'How did you guess I used to fly control-line?'

Above Reproach

If you wanted to get the maximum range and fullest effect from a given amount of sound you could do no better than stick it up aloft, above all the baffling and screening ground obstructions, and waggle it generously around the points of the compass. By this means quite a useful segment of the local population would get a liberal measure of your type of music. So far we have been spared the delights of the top twenty beamed around in aerial fashion, but, unfortunately, there are people who find the sweet music of the model engine more offensive to the ear than a top ten group in full, guitar bashing session. And you can imagine how uplifted they are to see a model aircraft pouring forth its decibels straight through the fanlight window.

These thoughts occurred to me the other week when an overhead 0.9cc engine (no silencer required) drilled neat but painful holes through my audio senses. Hi-fi is one thing, but Hi-fli is quite another matter. Now, if the persistant, intrusive buzzing gave tolerant old me the eebie jeebies, what effect is it likely to have on the not so tolerant outsider? Well, in my experience the long suffering public does not allow itself to suffer all that long. In fact, it would be more accurately described as the short suffering public, ever ready to defend its bastions of quietude against the old enemy, noise. Just you try holding a pop festival within love-in distance of a back garden and the public outcry would drown even a jumbo jet in full spate.

The question is: what can the poor old model flyer do to escape from the ever encroaching residential sprawl? Wherever he may fly he can be sure an open window is not far away, and behind it a sensitive, pricked up ear. One crafty thing he can do is to shelter under the greater noise of the full-size stuff. Unhappily, since the big boys got the go-ahead for the third London airport they are prepared to throw their rather larger weight around. One airport has already threatened a group of nearby model flyers with 'negotiations'. These, I imagine, would be upon a par with those held with the Red Indians, and with a similar outcome. Only trouble is, as far as model flyers are concerned there are not likely to be any 'reservations'.

Those Were the Days

Looking at the name of the famous old Wakefield model recently featured in this journal you might think it to be mis-spelled: not *Clodhopper*, which conjures up a vision of the model flitting from country yokel to country yokel, but 'Cloudhopper', evoking, less ploddingly, the sight of a model nipping nimbly from nimbus to nimbus. What happened, I suppose, was that the designer, overcome with a spasm of modesty after naming his model, somewhat pretentiously, 'Cloudhopper', thought it to be too high flown, and modified it to 'Clodhopper', making it non-U.

We do not, of course, go in for such cloud hopping antics in these inhibited times, but in order to keep up a respectable flight average in the old days you had to nudge the odd cloud or two – relying on the cumulus effect, as it were. Thus, what was in those days of gay abandon regarded as a triumph is now glumly viewed as another lost model, and although Joe Bloggs may have established a new native and all-comers record, all the praise he gets is someone saying, '*You're a blithering idiot, forgetting the D/T*'. It is a long time since we bathed in the national glory of the '*Elastic Powered Toy Plane Flies Five Miles*' newspaper headline.

Even so, there was a lot of fun in the old style contesting for anyone partial to a game of aerial bingo. The excitement of catching the bumper thermal of the afternoon is not to be found in the grim, tactical atmosphere of the modern contest arena, nor in the predictable efficiency of radio control flying. You could say that the dreams of glory for the model backwoodsman ended with the fitting of that down-to-earth device, the dethermaliser. Now the largest bumper takes you not to heaven but merely to a three minute score.

The business of losing models is also a bit old hat. The modern contestant does not fly a few pieces of balsa stuck together with hope, but a purpose-built machine, seething with contest winning devices, and programmed for specific contests during the season. No '*I think I'll have a go now the wind's dropped*' breeziness, for he needs to have his resources well deployed in advance. There are the downwind trackers to get into position and the pet timekeepers to brief – only those prepared to wait half an hour or so until the signs from the bubble machine and the miscellaneous 'pilot' gliders are propitious.

All very grim, but we could brighten the day with a contest between the bubble machines. Size and height of bubble to count. Come to think of it, it could take the place of model competitions. And think of the commercial implications as the rival washing up liquids fight it out on the telly screen with toddlers lisping the glories of bigger and better bubbles flying higher and higher.

By Jupiter!

'. . . *I found myself in the position of having an* 80*ft, balsa wing to make*. . . .' This is not a recap on a modeller's nightmare, but all part of a daydream turned in to reality: the production of a man-powered flying machine. Not recommended that you try this sort of thing in the semi-detached, otherwise it would be a nightmare, quite apart from leading you up the garden path.

'*I say, old chap, that new fence you're putting up looks just like a dirty big aeroplane wing.*'

JUPITER - Part 4

concluding Chris Roper's fascinating account of the trials and tribulations of man-powered flight.

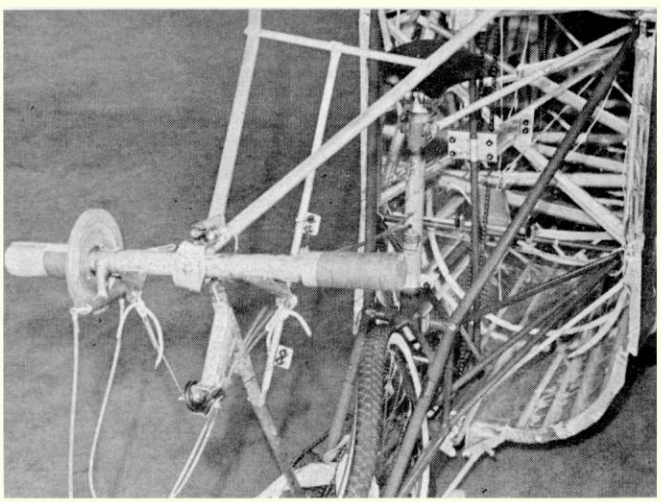
THE CONTROL SYSTEM on *Jupiter* is basically conventional, the surfaces consisting of ailerons, rudder, and an all moving tailplane although it is obvious that we could not use a conventional set of cockpit controls because the pilot's feet would already be fully occupied. The pilot's hands I arranged to be in the regular position and then made three independent motions possible. There are various ways of doing this and I considered them all, but the way I chose is, I feel, the right one. For rudder you steer like a bicycle; for aileron you bank the control bar the way you want to bank the wings, and for elevator there is a control like a motor cycle throttle twist-grip which is again operated in the natural sense. This is an improvement on any other machine because I made only half of the starboard handgrip to be the twistgrip. John Potter added a strip to each half and could thus *feel* by the position of one strip relative to the other, the actual elevator position. When you have applied a lot of aileron, it is impossible to tell whether any rudder has been applied because the handle bar will be so far from the neutral position that there will be no "reference". However, in practice this difficulty was overcome by the pilot's previous experience and ability to assess the aircraft's response.

When John Potter took over the machine, the control system was one of the things yet to be assembled, the aileron linkage proving the trickiest because the cables have to snake their way close to the drive chain, where there are guards to prevent fouling, and up into the wing and then out to the surfaces. He said that the way I had it drawn was impossible, and he was probably right, but things impossible don't worry John any more than they do me – he got the system to work!

Top: Flt./Lt. John Potter is congratulated by designer Chris Roper after the first press demo which unfortunately ended with a buckled wheel (right); note the interior structure, and the twist grip control on the handlebar.

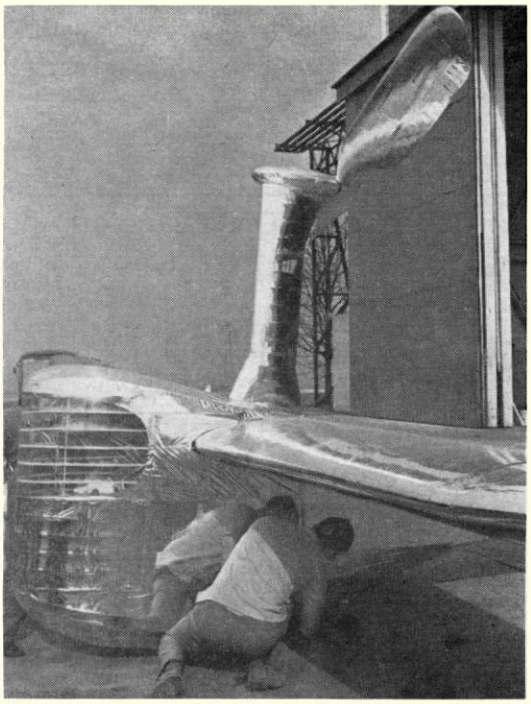
And the elevator system too, although the twist-grip had originally been made for a different elevator. The rudder control is fairly straightforward, although there is quite a kink in the line where the cables are led through a fairlead to miss the pilot's knees. It is a golden rule that one does not use a fairlead to make a cable change direction . . . but this worked all right – when you get scratches on the inside of your knees, you know that the cables are starting to fray!

John had quite a lot of repair work to do on the wings, the aft part of the centre section being worst affected, also the intermediate sections. Only the top sections could he leave without even taking the fabric off, so they are still in my original mauve coloured Melinex. Actually John had to repair the aeroplane twice, once after the previously mentioned fire-damage and again after the crash on demonstration day. This latter event wasn't intentional but it made good television . . . John aroused much enthusiasm amongst the young men at Halton, and every time I went over there, I found that he was surrounded by a crowd of willing helpers. On one occasion I took a friend of mine, Bertie Baldwin, over there and he was promptly enlisted into making sanding blocks. Dennis Hammond rebuilt the fin, rudder and pylon fairing virtually from scratch – if you wonder why he was the "vertical surface" expert, it's because he is pretty "vertical" himself being about six foot ten tall! The lads repaired the fuselage too and completed the rear fuselage and front fairing. One man repaired the propeller and obtained a better finish on it than I had, but then we read Dr. Keith Sherwin's book where he says that man-powered-aircraft propellers are better if the flow is turbulent, so a rough surface is to be preferred.



However, we stuck to our smooth one. John evoked interest from the authorities too, and the project moved several times into larger premises. I hope that everyone who has given assistance to the project over the years, and I mean everyone, can now feel that the effort they made has been worthwhile. If helping in a project which has gone on to establish a World Record does this for them, then I am glad. For enabling a 15 year dream of mine to come true, I would like them all, scattered from Woodford as they are, to know that I am more grateful than I can put into words.

With the transmission and all the control systems working, all that was now needed was a calm day to take it outside. Unfortunately Halton only has a grass surface, and the ground proved too bumpy for flight trials, so there was no alternative but to move the plane to an aerodrome that had a concrete runway. The fact that *Jupiter* is de-riggable proved very useful, and after a 20 mile move was reassembled at Benson airfield. There were still lots of little jobs that needed doing, so John would travel over to Benson with a list of outstanding jobs, a car full of helpers and a boot full of balsa and other materials. Some days I would go over there too, as on February 3rd, when it was arranged that I would come over in a week's time. Accordingly, on February 10th I went over to Halton to meet up with John, and was greeted with 12 words I will never forget, "*Congratulations Chris, you are the designer of a successful man powered aircraft*". "*How do you mean*". "*We flew yesterday, twice*". It later transpired that the first landing John had made was practically blind because the inside of the canopy had misted up. Nevertheless it was a satisfactory landing as he took off again almost immediately after the first flight. Contrary to what might be expected, the amount of work required to be done now increased. I don't think there was a single occasion when we went to Benson and just flew, there was always some little job. As stated before we were getting a loud noise from the transmission which was attributed to the chain jumping a tooth on the sprocket, and we solved this by fitting a spring loaded tensioner. I lost count of the number of wheels we buckled and we soon got quite expert at changing them. Amongst the "Firsts" that can be credited to *Jupiter* is the fact that the pilot and team were not based at the aerodrome but needed to drive 20 miles and hope the weather was calm when they got there. Especially considering this John and Ernie Moore between them clocked up a very creditable number of flights in a few months. Unfortunately, one of the "Firsts" which we cannot claim was being the first man-powered-aircraft to fly on that weekend, when we gave our demonstration flights to the Press. We had the cameras clicking at us on Sunday March 19th, but the previous day Dr. Keith Sherwin had taken off in his *Liverpuffin* without being mentioned in any National newspaper. We did however fly considerably higher as the many photographs appearing on the Monday showed. After many more development flights and the



fitting of a battery operated attitude indicator, the only instrument to date on *Jupiter*, but without any major modifications, we established another "First" by carrying payload on a man-powered-aircraft, namely envelopes or what the philatelists call "covers". John Potter and I agreed that before sharing any money which the aircraft made, we should give a portion to charity, and in this instance it is the Royal Air Force Museum which will benefit. *Jupiter* had made several flights of over a thousand yards before we invited observation of a long distance record attempt. On the day, or rather late evening, John made a short ground run to get warmed up, the aeroplane went back to the end of the runway again, and then John came past where I was standing accelerating so gradually that it seemed he was only doing another ground-run, then suddenly, up! My parents were at the side of the runway with me watching and I claim another "First" in as much as this was the first time they had seen *Jupiter* fly and everything went all right – contrary to the usual "*look Mum no hands*", followed by a snag somewhere along the line. It was a case of, "look Mum no engine", followed by almost, "*Look Mum no aeroplane*", because even an 80ft span is difficult to see when it is 1,171 yards away in the evening dusk.

Thus we gained the World Record for distance.

Top: sealing John Potter into the nose of 'Jupiter' takes delicate handling of the canopy and fairing. Silver Melinex acts as a good mirror.

With ailerons at full deflection, and rudder trying to correct the drift, 'Jupiter' terminates the Press demonstration with a dramatic crosswind landing that buckled the wheel (see opposite).

GOLDEN WINGS AEROMODELLER MODEL CLUB

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

POSTAL KIT CONTEST – August 4-5th, 1973

Here is your chance to enter a contest without travelling to a specific flying site. You can fly at your local site – wherever that may be – and entry to the competition is free!

The rules are as follows:

1. The model must be the **Mercury Swan** glider, built by the entrant, from a kit. No other models will be permitted.
2. The entrant must be under 17 years old on 5th August 1973.
3. *Flying.* The entrant can make as many contest flights as he wishes but only on *one* of the days given above. These flights must be timed (to nearest second) by someone other than the entrant and the *best three* flights used as the offical entry. The entrant must handle the tow-line himself (maximum length 164 feet), using a helper to hold the model. Timing starts from release of the towline from the glider. You may use more than one model if you wish as long as they are all built by the entrant from the **Mercury Swan** kit (i.e. you must not build a second model with your own wocd etc. using the original plan). The flights must be made from a substantially flat flying field (i.e. no hill top launches!). There is no "maximum" – just record the actual flight-time or "out-of-sight" flight time, whichever is the lesser.
4. Entries to be made on *post-cards* only. Write your name and address in BLOCK LETTERS plus your age in years and months, and put the time in *seconds* of *each* of your best three flights and their total.
   Send your post-card, correctly stamped to:
   Golden Wings Postal Contest,
   P.O. Box 35,
   Bridge Street,
   Heme Hempstead,
   Herts. HP1 1EE
   to reach there by Thursday 9th August at the latest.
5. *Prizes.* Provided there are enough entries, there will be prizes for at least the top three competitors – details in a later issue.

Remember last year there were only 4 entries to a similar contest. A poor entry this year will mean no further attempts to organise a postal contest for you – it's up to you!

Dear John,

I often see photographs in the *Aero-Modeller* of rubber-powered models being launched upwards at an angle of 30-50 deg., yet when I try this, my models, which fly well in level flight, but do not gain much height, always slide backwards and stall. What must I do different?

Brentwood, Essex. *David Bell*

Yes, I know what you mean – annoying, isn't it! Those models you saw were almost certainly high performance contest models built by long-standing experts and powered by carefully-selected rubber motors. Such models will climb almost vertically at first.

You do not say what models you were using, but level flight is all you can hope for with some. Normally, however, you should be able to get a rubber model of reasonable size (say 36-50 in. span) to climb steadily in circles throughout its power run to a height of at least 40 ft. The secret lies almost entirely with the propeller/rubber motor combination (assuming you have built an accurate, light model). Most plastic propellers are rather inefficient, being too heavy and of incorrect pitch – a hand-covered wooden one is much better. Also most rubber motors in kits unwind far too quickly – wasting power. Without knowing your model it is difficult to say exactly what to do for the best – but I will guess and say: a) lubricate and pretension your rubber motor; b) ensure that you have a very free-running propeller assembly; c) use a larger wooden propeller with paddle-like blades.

Dear John,

I am writing this letter in the hope of gaining a pen friend. He must be interested in Aeromodelling, as I have just started, my age is 12.

27 Kenwood Road,
Edmonton N9 7JB. *J. Randall*

Dear John,

A friend has just given me a very old diesel engine, but it seems to be completely stuck up with a form of glue – in fact, I cannot turn the shaft over. How can I make it free again?

Poole, Dorset. *C. Davis*

No, it's not a glue that has caused your motor to 'seize' – it is probably deposits of castor oil which have gummed up the piston/liner assembly, and even the crankshaft. Immerse the whole engine in a jar of paraffin (or better still petrol lighter fuel) and allow to soak. Leave for a couple of days, swill out carefully, then inject light machine oil (such as '3 in 1') in the exhaust ports, and carburettor. The engine should now be quite 'free'.

NATIONALS REMINDER

With the National Championships just a few days away, we would just like to remind Junior competitors of a few final details.

1. The Junior Kit contest will start at 11.00 a.m. on Sunday 27th May, although entries will be accepted up until 1.00 p.m.
2. Only models allowed in this contest will be the **Mercury Swan** glider and the **KeilKraft Senator** rubber-powered model. These models must be built from kits with no modifications other than the fitting of auto rudders (on gliders) and dethermalisers. If a fuse type of D/T is used, then a snuffer tube must be fitted. The amount and type of rubber used in the **Senator** may be to the entrants choice.
3. The actual contest site for this event will depend on the wind direction, but it will be upwind of the airfield, near the other free-flight events, and will be clearly identified.
4. The Junior Stunt competition will be held on Monday 28th May, entries being accepted until 2 p.m.
5. Any type of control line model is suitable for this event – as there are no take-off or landing points, flying wings are at no disadvantage.
6. The Stunt event will be located near the other control line events, but on the grassed area.
7. A handicap scoring system will be used to even up the differing ages of competitors.
8. Competitors for both events must be under 17 years of age on the day of the contest.
9. Competitors must bring proof of third-party insurance cover, valid for flying model aircraft.
10. Entry to both competitions is *free.*

Dear John Bridge,

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

NAME IN FULL.....

ADDRESS .....

.....

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

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

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

6/73 15p in the £1 Rebate on plan purchase coupon for Golden Wing Members G.W. No. .....

John O'Donnell's

FREE FLIGHT COMMENT

'Regular' member of Canadian Wakefield Team ('69-'71-'73) is Mike Thomas shown here wondering whether to 'piggy-back' (at '69 World Championships). Mike flew A/2 for G.B. in 1951!

'FEEDBACK' is the present-day term for the reader reaction resulting in 'Letters to the Editor' of the sort once described as brickbats or bouquets! Apart from indications that what appears in print is actually read, these opinions do provide some guidelines as to what readers want. It has to be remembered, of course, that most people are quicker to complain than they are to praise!

My 'fan mail' is rather limited – but I still find it surprising that I receive more from abroad than from this country. Perhaps the modellers who meet me at contests think that *written* comment is superfluous! From what has come through the post it seems as if some simple explanations on wing lift, C.G. positions, and glider/power turn might well be in order.

Nevertheless, as I remain convinced that there are many more people who like reading about contests than the comparative handful who are 'In the circuit', I will continue to report the various events that I attend – plus any others from which I receive reports.

★ ★ ★

The airflow round wings is a subject that could easily fill a book (and has done so) – but I will try to cover the basics simply and briefly – even if far from rigorously. If this should be read by any aerodynamicists I would crave their indulgence for the liberties I am going to take with their favourite subject!

Lift can be produced by one or more effects – and the situation regarding model wings is far from simple. As a starting point, consider a flat plate wing 'flown' at some angle ('of attack') to its direction of motion. This wing generates lift mostly by the simple displacement of air downwards (see Figure 1). Unfortunately the airflow 'breaks off' the upper surface to form undesirable vortices (see Figure 2). Adding a fairing to the upper surface smooths the flow, lets it stay attached to the wing surface for a while, and reduces the size of the eventful vortex (see Figure 3). The vortex is the main cause of wing drag.

The beneficial effect is helped by the fact that the pressure exerted by a fluid (liquid or gas) *on* a surface decreases with the speed of its flow over the surface. The airflow over the top of a cambered section has further to travel, so it goes faster and has less pressure than the flow on the lower surface. This pressure difference gives positive lift (see Fig. 4).

At high angles the incorporation of undercamber (a concave undersurface) will assist the airflow over the undersurface. It should be noted that this effect does *not* apply at low angles – as on power models when the wing is forced to fly at low incidences relative to the flight path (see Figure 5).

When the air meets the wing it has to separate and flow round the upper and lower surfaces. Where this happens can depend on both the angle of attack and the leading-edge radius. Small radius (sharp) L.E.s ensure that the flow separates there. Blunt L.E.s let the separation point change with the angle of attack.

Flow can be either laminar (smooth) or turbulent. The former has less drag, but the latter has more energy. Hence a turbulent boundary layer (the air close to the wing surface) can have sufficient energy to remain attached to the upper surface instead of breaking away as might a laminar layer.

Fig.1

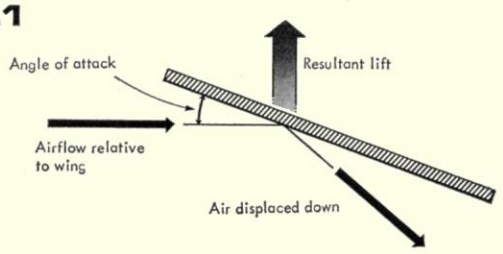


Fig.2

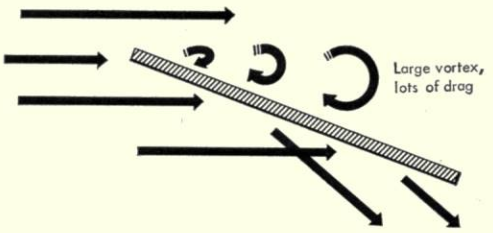


Fig.3

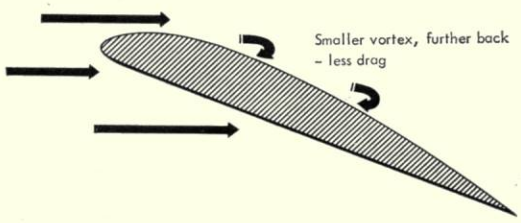
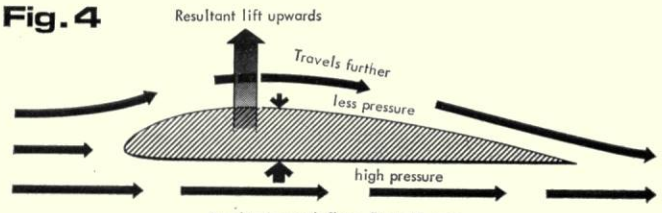


Fig.4



Idealised smooth flow. Even at zero angle of attack still gives positive lift.

Hence the turbulent flow gives rise to a smaller vortex and hence less *overall* drag. The desired turbulence can be induced by the leading-edge contour, or artificial turbulator strips – or sudden changes in the surface contour due to tissue sag between L.E. and spars, etc. (see Figure 6).

At low speeds the effect of undercamber appears to outweigh those due to the top surface. Hence the success of thin highly cambered sections on lightweight outdoor models – and in the extreme case of the indoor model.

Another special case is the triangular section used on some American (and other) chuck glider designs. The sharp L.E. defines the separation point, the flow should stay attached over the top surface before becoming turbulent at the high spot (see Figure 7).

Next month I will try to relate the C.G. position with the wing and tail incidences (angles relative to some convenient datum line on the model – usually the top or centre line of the fuselage). Climb and glide requirements often conflict – which is why so many contest power models now feature variable incidence – tails to suit both phases of their flight path!

★ ★ ★

The Contest Season proper got off to a rather inauspicious start when the **First Area Centralised Meeting,** held on 25th March, had windy weather throughout the country. From what I've heard there did not seem to be much to choose between one end of the country and the other – and this seems to be confirmed by the scores. The weather in fact proved to be less windy than the previous evening's forecast had indicated as a few 'stay-at-homes' found to their regret.

Lez Brambley's report on the **East Anglian** side of these contests contained several telling remarks.

'After weeks of fine, calm weather, the change to windy, showery conditions was felt by all who flew at Walton . . . the majority of models exceeding three minutes were landing well outside the airfield boundary . . . some exceptionally strong patches of lift . . . several line breaks, wing folds and other undesirable antics were evident . . . 14 minutes appeared a fair target (for A/2) at the start of the day. . . .'

Nevertheless Barry Halford flew exceptionally well to record seven maxes, although damage and loss forced him to use the full quota of three models. For his first three flights he flew a new design featuring long tapering wingtip panels, after which he reverted to more traditional models. Conditions after six o'clock for the flyoff were worse than liftless, and Barry's flyoff was rather an anti-climax. In the event it proved to be superfluous as the next best score (in the country) was 20:10 by Country Member Tony Brooks flying with the **London and South Midland Areas** at Bassingbourn. Third place in the National results went to John Boon with 19:42 flying at Topcliffe. He used but one model throughout – still showing something of its *Wichita* ancestry, but with such additions as a double D/T timer system. All in all there were just over 100 scores recorded in this contest – around two-thirds of last year's figure when the weather was very good indeed!

Crookham Contest modellers had a very busy and successful day at Beaulieu. Apart from being second to Norwich in the initial Plugge Cup point placings in the A/2 competition, they topped both the individual open events. Fred Chilton won the 'Frog Senior' Trophy for Open Power with a 3:17 flyoff using an old K&B 15 model – while George Welsh and

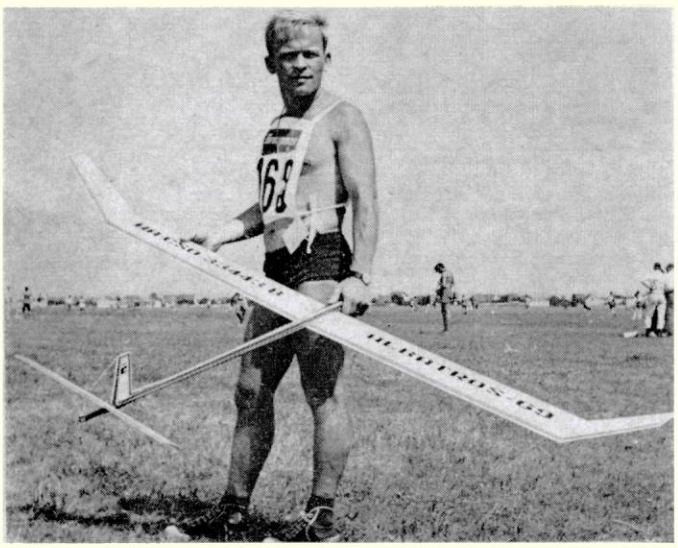


Fig.5

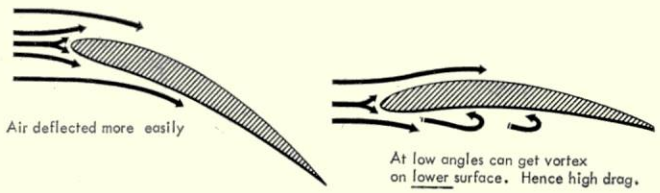


Fig.6

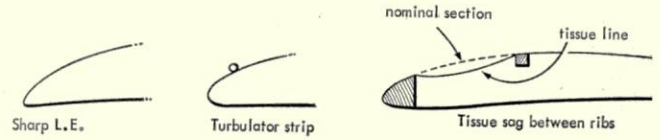
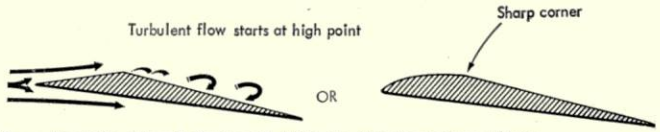


Fig.7



Gary Madelin placed first and third in the trophyless Open Rubber event. George damaged one model on landing after its first max, so was forced to complete his flight with a smallish model of *Urchin* size and style. Gary made the most of a calm spell following a late afternoon storm, and managed three rubber flights (with one 250sq.in. model) and two A/2 flights all in three-quarters of an hour! George just failed to make the three-minute mark again on his 'extra' flight – but it was, in fact, unnecessary as the only other 'qualifier', Dave Hipperson, did not take his flyoff. I understand he had lost one model and broken another in the wind at Bassingbourn. It would be inappropriate to let the rubber event pass without remarking on the indifferent support *and* the low scores. Perhaps the recent (and dramatic) fall in the quality of Pirelli is already having its effect!

The top places in power were well spread round the country. Runner-up to Chilton was Keith Harrison of Penrith who lost an ETA 29 model on his third max at Topcliffe, and had to flyoff with a much smaller reserve. In comparison Ipswich's Dave Parker gained third place with an A.P.S. *Zeus,* powered with a TD 049. After him came Russell Peers with his usual *Woodpecker,* and Andy Crisp with a P.A.W. 1.5 *diesel* model. I can remember when *glow* was the novelty!

Along with half of the **N.W. Area,** I went to Topcliffe to fly with the **Northern and N.E. Areas.** Such a situation (and indeed the combined affair at Bassingbourn) hardly seems in keeping with the basic idea of area-centralised meetings. Even the recent 100 mile journey concession needs viewing in the light of keen competitors who are prepared to drive extra miles for better facilities or organisation. It was also apparent on 25th March that the now mandatory 10 o'clock start precluded the use of the best part of the day! Apart from my having to drive half the way wearing sun-glasses, it was noticeably less windy in the morning. It always seems such a waste to drive when it's calm in order to fly in wind! The present third party insurance situation brought embarrassment to the N. Area Comp. sec. in the form of an overseas visitor complete with A/2 *and* F.A.I. Licence – but uninsured. Regretfully it was decided that he could not be allowed to compete. Before this I had scarcely thought about the need for extending insurance for foreign trips. One assumes, perhaps unjustifiably, that such matters will be laid on by the organisers of the events entered. Both the old S.M.A.E. cover and that available via M.A.P. are restricted to the U.K.!

To end on a most cheerful note I am delighted to mention that the S.M.A.E's new Records Officer, Dave Hewitt, distributed the prizewinners' plaques by post within *days* of the contest. In fact I heard that the awards were out before the results! If this quick service can be maintained it should have a significant effect on the fliers attitude to S.M.A.E. events. Prizes are appreciated *at the time* of winning them – not months afterwards! Last year's backlog is currently being distributed so the prospects look bright for the future.

E. Voros of Hungary holds his 'Albatros' A/2 glider. His dress illustrates weather experienced in early rounds, at the 1969 Weiner Neustadt World Champs.

Margat Mertes displays the A/2 of Pierre Lommer (Luxemburg) at '69 Champs. She was also present at the '71 event at Save. More photos this year?? Her husband flies A/2!

For reasons that were unconnected with the dreadful weather, I missed the wind-swept **Western Area F.A.I. Rally** at Wroughton on April Fool's Day, so this only leaves one contest outstanding – my own club's 'Knock-out Gala' held at Chetwynd on 8th April.

Originally devised as a possible answer to the 'tactical' problem, the concept of flying in pairs on a knock-out basis has much to offer. *Whitefield's* initial set of rules were drawn up after considerable discussion (much of it intended to eliminate potential loopholes) and have needed only minor refinements in practice. What has become apparent is the very real necessity for proper contest organisation of the sort unheard of by 99 per cent of present day F/F participants! There has to be a Contest Director capable of making decisions *and* announcements. A public address system is needed so the fliers can hear 'countdowns' prior to their turn to fly. We have also found that an early start is handicapped by requiring *all* the entry before a draw can be made to decide the flying order. Pre-entry might assist – but would probably result in non-arrivals giving many byes into the second round!

This year's contest was Whitefield's fifth consecutive *windy* rally – despite trying a variety of venues and dates throughout the year. Fortunately it was by no means unflyable and three-minute maxes were just about right on visibility and retrieving grounds. It was however far too cold for comfort, and brief *snow* showers alternated with bright sunny periods!

Glider had the largest entry – so needed the most flights. There were 23 in the draw – which meant eleven heats (three people in the last) first round. It would be tedious to follow the rounds in detail, but the final three left in the battle after four flights were Brian Picken, Dave Barnes and Terry Dilks. The deciding flyoff was fortunate in getting an unexpected improvement in the weather. Having lodged his *Pelican* in a tree, Dilks changed to his 1½ size *Caprice* only to have auto-rudder trouble resulting in a turn-off and tow-in. Barnes and Picken found helpful air to manage 2½ and 3 minutes respectively – both with conventional A/2s.

Surprisingly there were more entries in Power than Rubber – 10 compared with eight. The five Power 'survivors' after the first round were diminished by Brian Picken having retrieving troubles and returning too late. High second round scores led to a four-way third round flyoff to settle the outcome. Russell Peers had his ETA29 cut after launch to record a 'zero'. John Bailey was late in launching so the 'penalty' deduction dropped him to third place. This left Mike Duce to manage 2:16 with his ½A model compared with Pete Harris who got 2:50 with a fast climbing (and gliding) Super Tigre 35 powered version of his F.A.I. design.

Peter proved to be the 'man of the meeting' as he also went on to win Rubber. There were a surprising number of sub-max flights in this event – a phenomena extending to the flyoffs. There were, in fact, *two* flyoffs. The first was to settle first and second positions between Pete Harris and John Bailey. Both models were in sink with Pete's managing the 'better' score of 2:47 compared to 2:45 from John's model. The two losers from the previous round also had to flyoff for third place. Despite a flurry of snow at the critical moment Mike Duce did 3:24 to my 2:51 – even though timing must have been very difficult.

Chuck glider was flown using the conventional N.W. approach of the best five from nine launches. This gave a tie on 4:57 between Barry Kershaw and Roy Roberts, with Mike Gleeson not far behind at 4:31. Need for the flyoff did not materialise until the wind dropped and this allowed Barry to use an indoor *Sweepette* for the 'one-shot' decider. He got 55 seconds to Roy's 46 seconds – good scores at any time. Mention must also be made of Tony Slaters' efforts in his event. His lift detection was *too* good as he lost two chuck gliders in his first two flights, and that was that!

Verdict on the K.O. approach from those who have participated is that the idea is sound – and in 'normal' weather should provide a very good contest indeed. Techniques in 'flying to order' have improved with practice and few fliers incurred any penalty through launching late except in Power. Electro-mechanical starters seem an obvious solution although only one was seen. All that we ask now is for some other clubs or areas to try out the K.O. scheme.

If detailed rules are wanted they can be supplied – just ask!

Although successful as a contest, the meeting was rather 'under a cloud' as far as Whitefield was concerned. Just 10 days beforehand Comp. Sec. 'Bob' Williams succumbed to a sudden heart attack. Not widely known outside of the North West, Bob was nevertheless most active both in his own right and as 'helper' to his teenage sons, David and Steven. All three flew A/2s, and the boys' success was due in no small way to their father's influence. Friendly and popular, Bob will most certainly be missed.

RESULTS

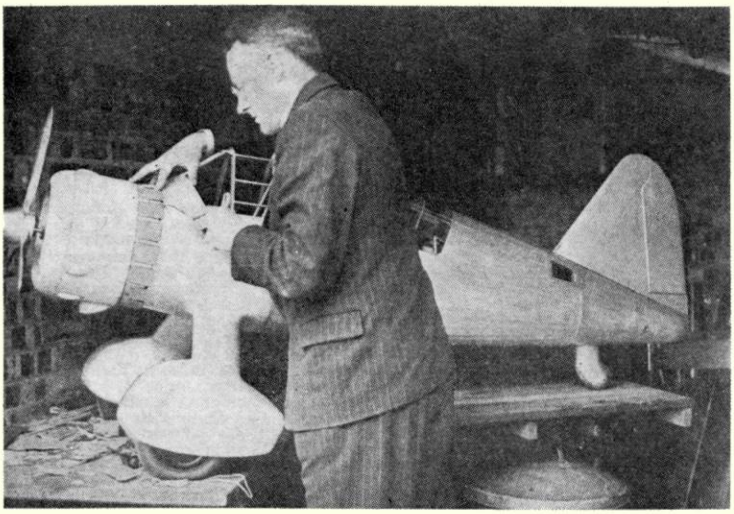
FIRST S.M.A.E. AREA CENTRALISED MEETING — 25th March, 1973

K.M.A.A. TROPHY (A/2 Glider) (110 entries, 102 scores). 1. B. Halford (Norwich) 21:00+1:22: 2. A. Brooks (C/M) 20:10; 3. J. Boon (Falcons) 19:42. **Frog Senior Trophy** (Open Power) (42 entries, 42 flew). 1. F. Chilton (Crookham) M+3:17; 2. K. Harrison (Penrith) M+2:55; 3. D. Parker (Ipswich) M+2:52. **Open Rubber** (42 entries, 39 flew). 1. G. Welsh (Crookham) M+2:52; 2. D. Hipperson (Croydon) 9:00; 3. G. Madelin (Crookham) 8:55. **Plugge Cup** (1 event). 1. Norwich 276 points; 2. Crookham 256 points; 3. Richmond 247 points.

WHITEFIELD KNOCK-OUT CONTEST — Chetwynd 8th April, 1973

OPEN RUBBER (8 entries). 1. P. Harris (Evesham) Last flight 2:47; 2. J. Bailey (Bristol & West) 2:45; 3. M. Duce (Liverpool) 3:24; 4. J. O'Donnell (Whitefield) 2:51. **Open Power** (10 entries). P. Harris (Evesham) 2:50; 2. M. Duce (Liverpool) 2:16; 3. J. Bailey (Bristol & West) 0:38; 4. R. Peers (Falcons) Nil. **Open Glider** (23 entries). 1. B. Picken (West Lancs) 3:09; 2. D. Barnes (Liverpool) 2:32; 3. T. Dilks (Falcons) Nil. **Chuck Glider** (Best 5 from 9). 1. B. Vernshaw (Wigan) 4:57+0:55; 2. R. Roberts (Wigan) 4:57+0:46; 3. M. Gleeson (Syke) 4:31.

Henry Spence was third in 1969 World Championship flyoffs with this model. Topped the U.S. Team selection Trials with 'all maxes'.



D. A. Russell

— a lifetime of pioneering spirit

At work on the huge Lysander in 1938, D. A. Russell and what was to be his most famous model – everything specially built, including the engine and wheels.

WITH THE DEATH on April 9th of Douglas Arthur Russell, aeromodelling lost one of its most influential pioneers and adventurous personalities.

He was to all intents and purposes, the founder of *Aeromodeller*, though not the first publisher. The story of his acquisition of the title is a legend. Suffice to say here, that when the Barron-Dean Publishing Co. transferred ownership of the magazine to D.A. it was more to settle his outstanding contributors' account than for hard cash. And from that beginning in 1936, *Aeromodeller*, and subsequently *Model Aeronautical Press*, *Harborough Publishing Co.* and many other companies with publishing interests flourished under his influence.

It was his series of articles on *Important factors in Aircraft Design* that led to his famous book *Design and Construction of Flying Models* a title which was reprinted in thousands and became the standard reference for many years.

As a modeller, these earlier days of his association with the magazine were perhaps his most productive. The large petrol engined low wing design became his trademark and the world famous 1/5th scale *Lysander* with a four cylinder 40 c.c. engine was a closely followed but alas unfinished project. Though business took him away from the model bench, he was always involved in mechanical development, and this covered a broad field ranging from manufacture of model engines to establishment of DAGRA, a professional model making company for industry, museums and research.

Cars were his great love and the long nosed SS Jaguar series his favourite though he was not averse to the motor cycle and surprised many a high powered business associate by arriving for an appointment on a Sunbeam S.8, in flying kit. In post war years he had a plan to beat petrol rationing with a two stroke powered mini-Jag known as 'Russon' and set up a production line which eventually faded out when hidden costs began to reveal themselves.

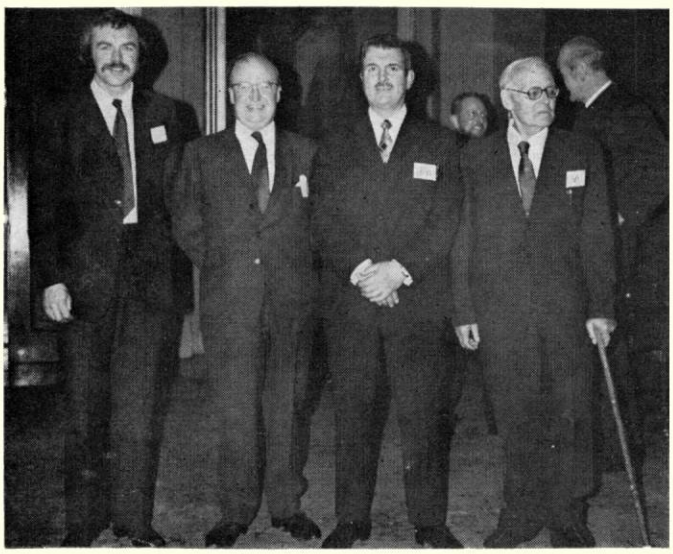
In fact, the story of the 'Russon' was the story of D.A.'s life. Almost everything he did was ahead of its time, and thus obliged to pay the penalties of pioneering.

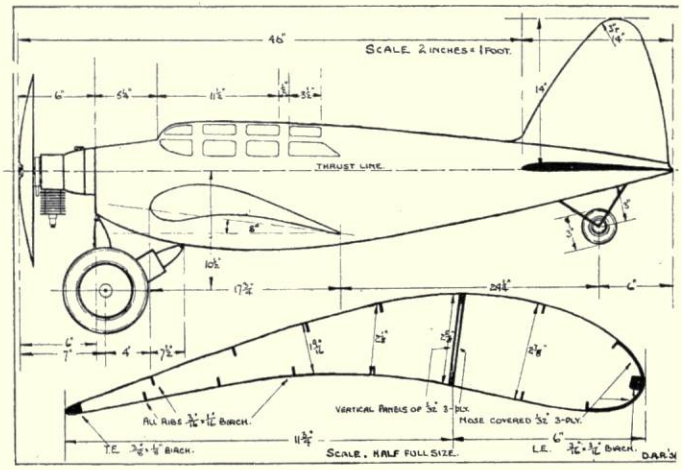
One exceptional success was the series of *Aircraft of the Fighting Powers* produced by Harborough. Still in demand, these seven volumes set a standard of style which in later years was followed by his *Harleyford* volumes dealing with specific aircraft subjects. *Make each page spread a pattern* he used to say. *Arrange the photos in symmetry and sustain a consistent style on every page.* That dictum was followed in each of the titles, sometimes with a degree of heartbreak for the author whose rare picture might have been excluded just because the aircraft faced the wrong direction!

Out of the A.F.P. books, and *Aeromodeller's* monthly plans there grew a plans service that has served modellers for over thirty years, and achieved a world wide reputation for 'solid scale' drawings and flying models.

But it was for flying *of* models that D.A. became best known when he established the Model Sportsdrome at Eaton Bray. The editorial quarters were moved from Highgate and Leicester into self built – D.A. designed offices on

At his last public engagement, to meet H.R.H. The Duke of Edinburgh at an S.M.A.E. Fellows reception, 'D A' (at right) lined up with four Aero-Modeller editors, Harry Hundelby, Ron Moulton and Peter Richardson (r to l).





The huge low wing 'petrol plane' which had to be launched from a moving car. Engine, an 18 c.c. Comet. One of 'D A's' famous pre-war models, drawn in his own style. Right, 16 mm camera at the ready, 'D A' at the Wakefield Champs in typical pose.

this 80 acre field near Leighton Buzzard in Bedfordshire. The fact that he had no permission to build and was continuously engaged in battle with the Ministry of Agriculture over use of the grazing land meant nothing to D.A. Though fined for putting up the buildings (still standing too!) the Model Sportsdrome flourished and was the centre for annual pilgrimages by modellers from all over Europe. Great Days! Each weekend would find groups of campers or day visitors dotted over the lush field, able to enjoy their flying unhindered by officialdom – D.A. was taking care of that! Few knew of the turbulent scenes which clouded the Eaton Bray project. Although at that time, it was true that the many deserted airfields in Britain offered larger areas and often more convenient access, D.A. had the foresight to see his Model Sportsdrome as becoming an exclusive flying field when all else was closed : but alas it was Eaton Bray which closed first. If it were to re-open this year, the picture would be entirely different.

Throughout these years of change, there was a steady input/output of staff, the result of which is that many artists, authors, designers, model makers and publishers in Britain can claim an association, sometimes brief, but always impressive in memory of D.A. His methods were often brusque, despite a golden persuasive voice, and his unswerveable determination to press on to the bitter end of even a doomed enterprise taught all who worked with, and for, him a valuable doctrine on life itself.

In his seventy years he covered the lifetime activities of at least three ordinary men, and in his memory there remain so many legendary stories that though no longer with us in person, his name will always be with us as the guide and mentor in Model Publishing. We are sure that aviation enthusiasts and modellers the world over will join us in extending our sympathy to his family.

MIKE ARGANDER SPECIAL

continued from page 305

The final phases of the assembly concern mainly the 'hardware'. Start by coating the underside of each wing tip with epoxy. Next drill through the elevator for horn mounting bolts, open up the holes and epoxy short lengths of brass tube in the holes to prevent crushing the wood when tightening. Now bolt horns in position and solder a washer on to the pushrod. Attach some light Laystrate to the top horn, bend cutout guide tube to shape and epoxy in position.

Make up cutout and tank and screw in position as shown, then pass light Laystrate rough guide and solder to cutout arm to actuate at 15-20 degrees down elevator. Fit the wheel and form leadout ends. Finally bolt motor in position and connect to fuel tank using Kavan thick walled rubber tubing.

Preparation and Flying

Ensure that engine, tank, lines, refuelling system etc. are in first class condition – time spent in a warm house preparing an aeroplane really pays dividends when one is out on a bleak airfield and does not need to work on an aircraft other than to find settings for the day.

My personal view is that it is more rewarding, and certainly more helpful to organisers, to fly a well-prepared aeroplane and record a time every time rather than to fly a model very fast in practice, only to fail in the race due to a fault overlooked.

Fly on light Laystrate lines in wet conditions or single strand (12·5 thou.) in normal conditions, using a close coupled handle for non-sensitive control. Preferably use a glass fibre propeller, 7×6 in. for Super Tigre, MVVS, Kosmic etc., 7×7½ in. for Eta and 7×8 in. for Oliver seems to be a good general guide. My personal preference on the Kosmic K15D is the Kaul 7×7 in. cut down to 6¼ in. diameter.

The take-off and landing technique for rearward wheel aeroplanes has been dealt with at some length in previous issues, our techniques (Bob Horwood has the bruises to prove it!) being to cut the motor just under one lap from the pit, land as near flying speed as possible and apply full down elevator about ¼ lap out. This tends to reduce the incidence of the 'floating' common to Goodyears landing too slowly, a problem that I believe occurs in part because of the large side area of most designs.

CLUB NEWS

QUITE APART from the insight Vintage modelling gives into the historic development of the model plane, it can add a further interest and competitive zest to small field flying. Many of the older rubber powered models are quite simple to replicate – it is all a question of getting hold of the right plans. They are also quite colourful in appearance and generally rugged enough to make good sports flyers. For the more advanced enthusiast there is the challenge of matching the performance of his replica with that of the original.

However to obtain a wider perspective of the evolvement of the model plane from its early beginnings there is no finer instructor than the celebrated Mr. Alwyn Greenhalgh. His welcome and much appreciated visit to the **Lee Bees M.A.C.,** has been reported to us by the club P.R.O., John Turvey. Mr. Greenhalgh brought along no less than forty-two models, original and replica, with which to illustrate his talk. Many of the smaller models were actually demonstrated in the hall. Particularly fascinating were the hot air balloon flights and the gracefully flapping ornithoptery which nudged the ceiling lights before suspiring gently to the ground. What models could not be demonstrated were shown going through their paces on film – all part of the very complete lecture. Mr. Turvey tells us that Mr. Greenhalgh gave a similar talk and demonstration to the Royal Aeronautical Society, which must surely have opened many an illustrious eye to the delights of model flying.

Irving Bullock is the Secretary of the newly formed **Hamilton M.F.C.** Hamilton, if you did not know, is in Lanarkshire, and we are pleased to welcome a Scottish club to these columns. The club is affiliated to the S.A.A., the Scottish equivalent of the S.M.A.E., Although still finding its feet, as it were, the club has some encouraging antecedents, as the 'Cadzow' club which operated in the area in the late fifties and early sixties enjoyed quite a contest reputation both above and below the border. Membership is at present a modest fifteen, senior and junior, and is mainly concerned with control line; all the scheduled 1973 events are in that category. This is not because of lack of flying space, we are assured by Mr. Bullock, for a free flight field can be obtained when the interest is forthcoming. So, if you fly control line (two sites available, one tarmac) or free flight you can get in touch with Mr. Bullock at 2, Barrack Street, Hamilton.

A journal by the name of *Ohmnibus* (ouch!) could mean nothing but the presence of Radio flying, and, understandably, the club from which the journal emanates is an R/C club. Now, if you thing I am talking Irish you are on the right track, for the club in question is the **Ulster M.A.C.** Mr. J. O. McNeill, who sends us both a report and a clutch of newsletters, hopes that *Ohmnibus* will help to put Ulster model flying on the map and also engender a more active spirit in the club. What is lacking, apparently, is a true competitive urge. Members are all too content to pursue the old fly-for-fun routines, but perhaps the season's programme, covering all aspects of Radio contest flying, from Slope to Pylon, might encourage more participation. Flying takes place mostly at Nutts Corner, and it seems a question of ducking nuts when the helicopters fly over. They constitute something of a threat to the continued use of the site for model flying, and members are asked to fly below 300 feet and be ready to get to zero altitude when a chopper is sighted.

Radio, like Topsy, is growing and growing. In the **Sittingbourne & D.M.A.C.,** for instance, the Radio section is reaching saturation point, and reluctantly, the club has had to withdraw its rule permitting visitors to use the club's R/C amenities. All this R/C interest means a lot of organisation for the contest side of things, and the club newsletter publishes a full programme for the 1973 season. Not that other interests are overlooked: Control Line is represented in the programme by a Combat event, and Free Flight by no less than six Chuck Glider contests.

A nice touch in the *South Bristol News* is the publication of a list of names and addresses of club members. Quite an impressive roll call – over 50 in all. Just what proportion are S.M.A.E., members we do not know, but we note that only such members will be allowed to take part in the club run comps. It is also pointed out in the newsletter that only S.M.A.E., members may fly on Ministry airfields. Thin content of newsletter due, apparently, to lack of subscribers. What about it members?

It is a salutory sign that Radio clubs are getting tougher and tougher on the maverick flyer. As a good example the **Flying Druids** publish a list of stringent, but sensible, rules for the Carter field in their newssheet. Main point of the rules is to keep a healthy gap between models and people. How important this is was demonstrated before me the other week when a 'well organised' model crashed – into safe, open ground on a suitable flying site, I might say – because of some quite incomprehensible control failure. The newsletter lists as many as seven Spot Landing events in 1973, plus four Aerobatic contests. First of the Spot events was won by the man who is always on the target, Tony Bull, flying his 'Bee in a Jampot', small red OS.20 Pylon Racer.

Not true that the **Watford Wayfarers M.A.C.,** is now known as the Rotary Club, but the helicopter pilots are in full spate. Unlike the pop song 'Get Down', they are all desperately trying to get up, and a luckless few have been written off in the process – the models of course. Model flyers do not even fade away. Like member Bill Garrett to whom retirement means a stepping up of his modelling activities they go on for ever. He is, incidentally, the oldest serving member in the club, and the first one to dabble in the new fangled radio control way back in the days when models carried radio sets rather than radio gear. Says here in the newsletter that the oil companies have decided not to make any more of the 80 octane, lead free fuel that the old timers at Shuttleworth use. Let us hope that there will be some special provision made.

Two nicely produced rubber plans in the current issue of the *East Anglian Newsletter;* both Open models with an in chance at any fly-off. But how much longer can we hope to keep flying such 'free ranging' models over the few beleaguered open spaces left? That is one of the issues posed in the newsletter's editorial in putting the case for support of the S.M.A.E., our governing body. Other doomwatch factors mulled over are noise and the tenuous nature of radio frequency allocations.

However to lighter matters. The newsletter includes an article on a University project to study coral starfish in the Red Sea. Best way, it seems, is by aerial survey: full size cost £5000, but much cheaper by a camera equipped Radio model. Model is 7ft span, Super Tigre 61 powered and carries a 16 mm camera. D. Miller, the aerial cine man is interested to know of anyone else experimenting in the overhead movie field. Well we know

of a Ron Williams who wrote a piece on this subject in B.A.C.'s *Airlog*, who he may be able to contact. Mr. Miller's address is 1, Whitell Way, Coton, Cambs.

The **Wharfedale & D.M.A.C.**, could be called the home of control line flying, and Mr. H. Yates has plenty of activity to report. There was, for instance, the second Club Combat Comp., held in March on a site unused for many years: Baildon Moor. Being local a lot of people were able to attend. Curious things are found hanging on pub walls besides dartboards and horse brasses. In a local club members came across a large shield which was presented for a local gala in some far off day, and the club has been lucky enough to obtain it. On the cards: a Morley/Wharfedale/Leeds ½A Goodyear contest. This will be an open event with all potent motors banned. Should provide a good proving ground for the youngsters. Is it true what Mr. Yates asserts, that the modern team racer looks like a powered chuck glider? Might be something in it as the club is putting on a chuck glider event, although the inspiration came from a paper glider contest at the last club meeting. You should see them tear up! Newest award idea is the Wharfedale *Club Activity Competition Trophy*. Points given for entering contests, with extra points for placings, points for services to the club such as timekeeping, attending displays etc. Leader at the moment is Bernie Langworth. Club newsletter coming out is to be called, very aptly, *The Circle*.

Just by way of coincidence I received a copy of *Airflow*, the newssheet of the **Esher & D.M.F.C.**, just as the club's Symposium was being featured on T.V.'s 'Nationwide'. Anyone who saw the film will have been left in no uncertainty of the extent to which, Radio-wise, modellers have conquered the three elements: air, land and water. An excellent piece of publicity work which for the first time showed our hobby to the public in an adult manner. Little wonder, then, that the club has a long waiting list of would-be members who cannot be accommodated for some time to come. But to show they are not forgotten they have been offered Associate membership which includes access to club facilities, but not insurance cover or the flying field. Symposium Secretary was Tony Major who somehow has found time to build a 78in span *Armstrong Whitley Bomber* powered by two O.S.30 glow motors. Successful test flights were made on a day in February which saw perhaps the largest collection of twin engined planes to be seen on a club flying field at any one time. In addition to putting his own model through its teething paces, Tony test flew a large *Westland Whirlwind* twin, an impressive looking but little known W.W.II plane. After that came Albert Briggs' twin diesel semi scale *Islander* and his four engine *Scimitar*. The latter model flew most impressively, but unluckily came to grief on its second flight when partial engine failure caused it to land short of the runway into a ploughed field. Since been repaired.

A New Zealand club that puts on a good flying programme is the **Christchurch M.A.C.** The events featured in *Torque*, from which the club championship points were taken, covered all the classes of model flying with which we are familiar, with perhaps the exception of Slope. Top scoring man was Kelvin Lilley who more or less swept the board in the Glider events (the most popular) including a second place in Thermal Soaring.

In *W.M.C. Patter* is a list of club reps at a recent District Meeting. In contrast with out 'and District M.A.C.' titles all the U.S. and Canadian clubs appear to have highly colourful names, such as *Prop Spinners Line Kinkers* and *Glue Angels*. Over here such names would knock our prestige for six!

Clubman.

Contest Calendar

May 18th	**S.M.A.E. INDOOR MEETING** at Cardington, Bedfordshire.
May 26th-28th	**BRITISH NATIONAL CHAMPIONSHIPS** at R.A.F. Lindholme, Yorks.
June 3rd	**S.M.A.E. R/C PYLON RACE.** F.A.I. class at North Luffenham, Rutland.
June 3rd	**K.A.R.C.S. R/C SCALE DAY.** Fly for fun and simple contest. Venue Perton Airfield (4 miles west of Wolverhampton off A41).
June 10th	**S.M.A.E. 3rd AREA CENTRALISED MEET.** F.A.I. Rubber, Open Power, Open Glider. Area venues.
June 10th	**ELLIOTT C/L GALA.** Stunt, Goodyear, Combat at Elliot Bros. Airport Works, Rochester, Kent.
June 17th	**S.M.A.E. INDOOR MEETING** at Cardington, Bedfordshire.
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	**DRUIDS R/C FLY-IN.** Prizes for helicopter, Parachute dropping contests, Display Teams, Formation Flying plus most unconventional model. Venue Middle Wallop, Hants.
June 17th	**AEROMODELLER SCALE RALLY** at Old Warden, Biggleswade, Beds.
June 24th	**COTSWOLD R/C PYLON RALLY.** F.A.I. and ½A. Pre-entry only (£1 F.A.I., 75p ½A or both £1) to T. Nichols, The Old Manor House, Hillesley, Wotton-u-Edge, Glos.
June 24th	**ST. ALBANS MAC SUMMER GALA.** F.A.I. R/G/P, C d'H, A/1 and Chuck Glider. Venue to be announced.
June 24th	**S.M.A.E. R/C AEROBATICS** at Topcliffe, Yorks.
June 24th	**FINCHLEY & DISTRICT MAC'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 Barnett, Herts. Field entry 30p.
July 1st	**COLCHESTER MAC'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. Sargeant, 17 Old Heath Road, Colchester, Essex.

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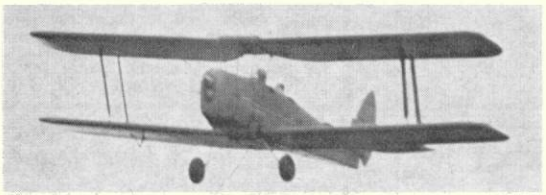

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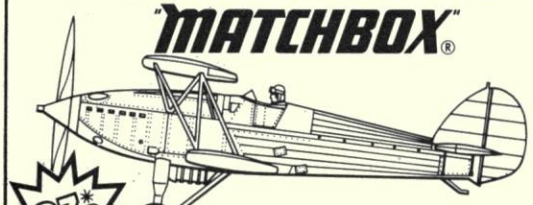

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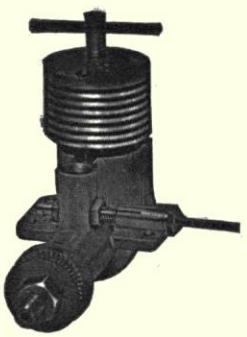

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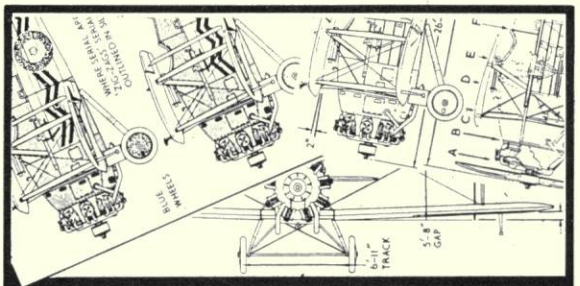

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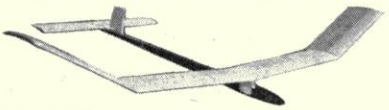

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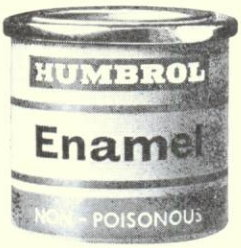

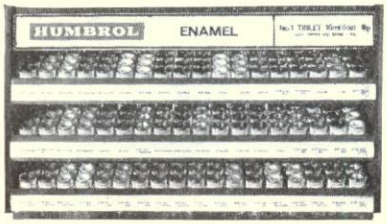

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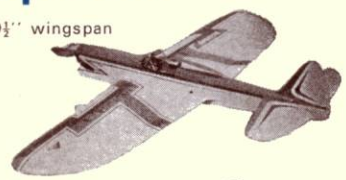

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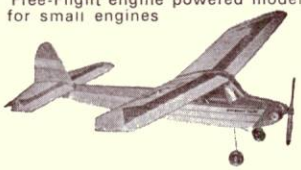

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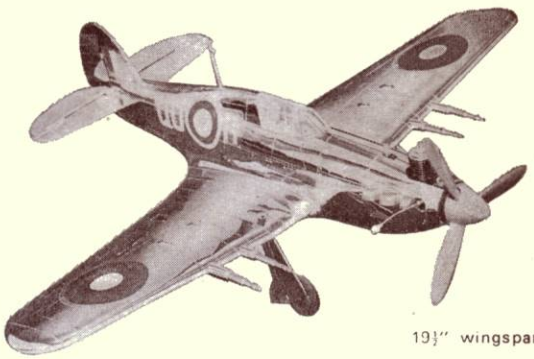

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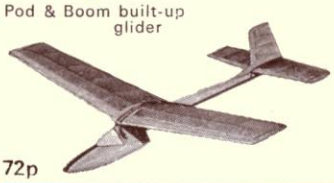

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