

Aero Modeller

INCORPORATING

MODEL AIRCRAFT

November 1971

15p

(USA & Canada 75c.)

AN  HOBBY MAGAZINE



'SUNDOWNER' Free Flight Sportster
FOX 59 Engine Test · SCALE NEWS
CHAMPIONSHIP TECHNICALITIES



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 $\frac{1}{2}$ A motor**

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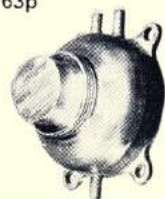
QUICKSTART

This high performance glow plug engine is in full production and is breaking all records for demand and popularity

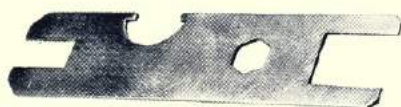
- Front rotary intake ● Twin transfer ports ● Made to top engineering standards
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accessories for the Wasp

Radial Tank/Mount
63p



General Purpose Tank
31p



Quick Glow Clip
36p

Special Wasp
Spanner 26p

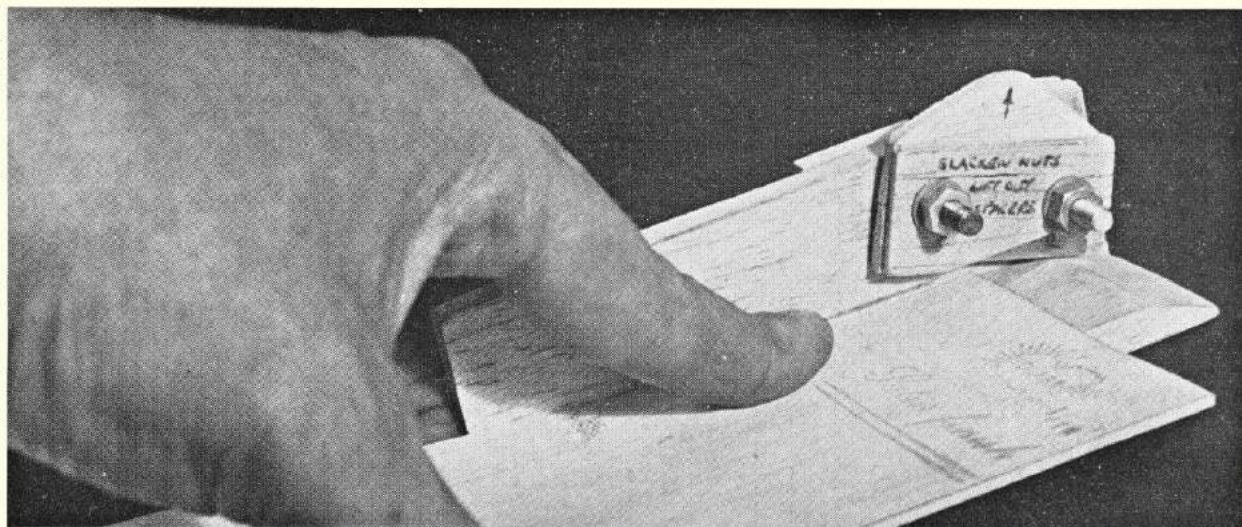
Exhaust
Manifold (comes
with collector)
60p



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SOLARBO – the name that *means* Balsa – Aeromodelling quality Balsa, that is. Selected and graded and accurately machined to the highest engineering standards. (You can even use it for standard spacers in a home-made balsa stripper). And, of course, you will find it in your model shop in a range of grades from which you can select to your individual requirements. Quarter-grain sheet, too, for stiffness. But ultra light stock is hard to come by. The table below showing weight (in ounces) of popular sizes of Balsa sheet, strip and block can be used to check, or select, a required density.

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		5"x6"	3"x6"	3"x8"	3"x10"	3"x12"	1/8" SQ.	3/16" SQ.	1/4" SQ.	1/8" SQ.	1/4" x 1/8"	1/2" x 1/8"	3/4" x 1/8"	1" x 1/8"	1" x 1/4"	1" x 1/2"	1" x 3/4"	1" x 1"	1 1/2" x 1 1/2"	2" x 2"	3" x 3"
ULTRA LIGHT	4	.375	.5675	.75	1.125	.031	.07	.125	.28	.063	.25	.5	.5	.5	2.0	4.5	8	18			
LIGHT	8	.5	.75	1.0	1.5	.042	.095	.167	.38	.083	.33	.67	.67	.67	2.7	6	10.7	24			
LIGHT MEDIUM	10	.625	.94	1.25	1.875	.05	.12	.21	.47	.10	.42	.83	.83	.83	3.3	7.5	13.3	30			
MEDIUM	12	.75	1.125	1.5	2.25	.063	.14	.25	.56	.125	.50	1.0	1.0	1.0	4.0	9	16	36			
MEDIUM HARD	14	.875	1.31	1.75	2.625	.073	.17	.29	.66	.15	.58	1.17	1.17	1.17	4.7	10.5	18.7	42			
HARD	16	1.0	1.5	2.0	3.0	.083	.19	.33	.75	.167	.66	1.33	1.33	1.33	5.3	12	21.3	48			

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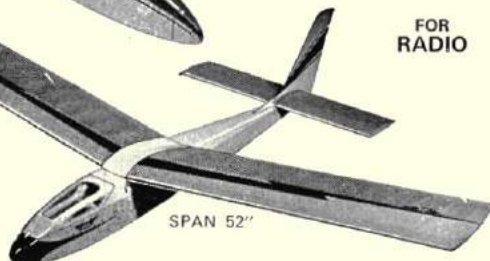
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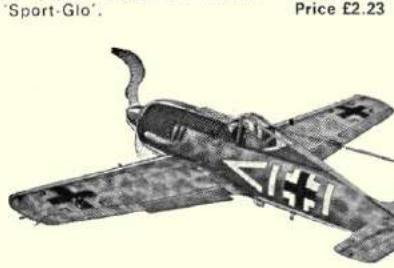
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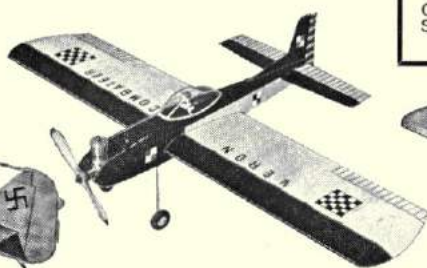
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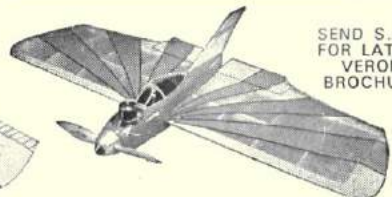
SCALE, STUNT & SPORT



F.W. 190 A.3 SPAN 33 1/2"



COMBATEER SPAN 38"



BOMB-BAT SPAN 25"

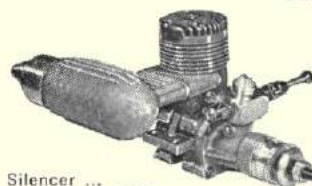


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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

November 1971

Volume XXXVI No. 430

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HOBBY MAGAZINE



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COMMENT

With the successful conclusion of the Radio Control Championships in the U.S.A., Internationalists now await decisions from the F.A.I. Models Commission on the location of future World Championships. Hosting any meeting of this magnitude is a heavy responsibility which demands a commitment in manpower and financial loading which few of the World's Modelling Organisations can undertake. 'Why should we set our National administration at risk' stated one International Delegate to us at Doylestown, 'when it is so simple to select a team and just participate'. The spokesman has personally managed at least three World Championships and many more Continental Championships to our knowledge. He has borne the full brunt of carping kick-backs from post-Championship criticisms and he has also treasured the precious few words of thanks from participants. Why indeed should any Nation adopt the mantle of a philanthropic host? We'll tell you why - it is for the sake of Aeromodelling; its well-being for the future and the advancement of International understanding. On these points the Academy of Model Aeronautics has more than justified its huge undertaking. 'Operation Friendlift' to the U.S.A. has opened a broad new vista for the future; but other Nations must not remain aloof, and the immediate concern is for 1972/3. Venues for Control Line, Indoor and Scale have yet to be defined for next year, and while Italy has offered to undertake R/C, there are no signs yet of a host for Free Flight in 1973.

on the cover

Nothing younger in design than 25 years among this happy group of vintage model fliers seen at the 1971 Nationals (and all other major rallies of the year). Musketeer, Mercury, HiBall, Miss Philly, Black Magic, Spook, de Bolt Bipe, KGS, etc. spark off fond reminiscence among the elder brethren of the modelling fraternity as they emerge to give ageless pleasure. Long live the veterans!

next month

FREE FULL-SIZE PLAN! Report on the World R/C Championships from Doylestown, U.S.A. Plans for a beginner's rubber-powered duration model Lube Tube. Scale drawings for a World War II fighter aircraft. Latest Engine News, Control Line News, Trade Notes and all the regular features, on sale November 19th.

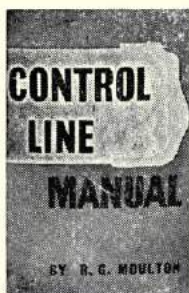
MAP

The Finest Range of Model Technical Books in the World!

7 CONTROL LINE MANUAL

R. G. Moulton.
Main chapter headings: Why Control Line?; Basic U-Control; Basic Monoline; Basic Flight Control; Learning to Fly; Aerobatics; Speed; Team Racing; Combat; Carrier; Cargo and Endurance; Scale Models; Jet. The Engine in Control Line; Towards the Indestructible; Looking after the Lines; Variations on the Theme. Plus appendix.
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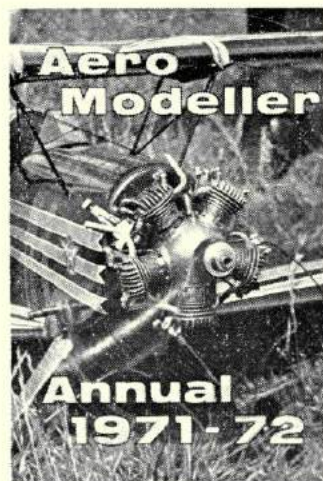
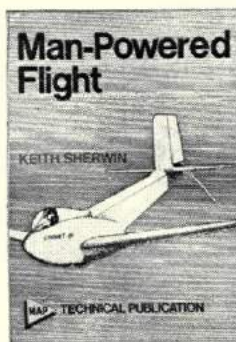
90p



155 MAN-POWERED FLIGHT

In this first book primarily aimed at the student of man-powered flight, Dr. K. Sherwin of the University of Liverpool analyses the problems of design structure and operation, adding his own theories for production of a practical pedal scooter. Over 128 specially selected illustrations collected by Aero-modeller staff convey a pictorial history of progress and combined with more than 90 text diagrams, form a scientific reference work of great value to all students of aviation.
176 pages, 8½ x 5½ in. (International A5 size) with 2 lb. strawboard covers, bound in Balacron with gold blocking on spine.

£1.75



160 AEROMODELLER ANNUAL 1971/2

Four dozen of the top model aircraft designs culled from a dozen countries give a balanced appraisal of modern aeromodelling. Survey of free flight contest tactics; How to do aerobatics with control line models; Flying radio controlled thermal soaring gliders; Making sheet balsa models; The effect of altitude on model flying; Use of twisted wings; Towing a glider with a Power Model; Variable camber power models; Engine Fuels . . . plus countless

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hints and tips. This pot pourri of all that's best in 1971 will be extremely popular with a broad range of interests in Aeromodelling. 128 pages, size 8½ x 5½ in. Coloured cover (photo) bound boards.

58 MULTI CHANNEL RADIO CONTROL

This book has been introduced to help the beginner over his problems. Here the beginner will find explained in simple terms the working of multi-channel equipment.
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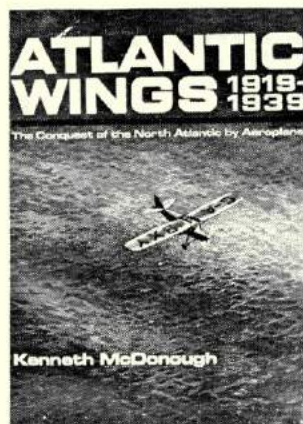
52½p



8 FLYING SCALE MODELS

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6 ATLANTIC WINGS

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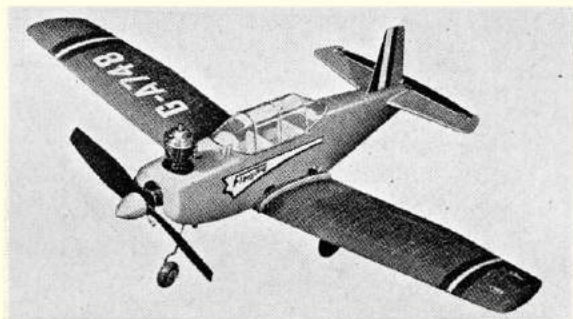
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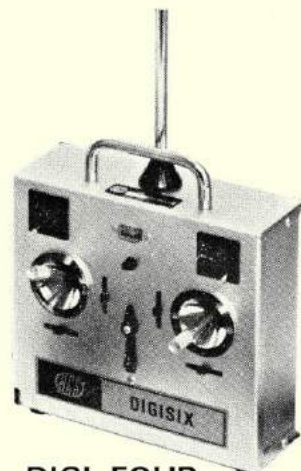
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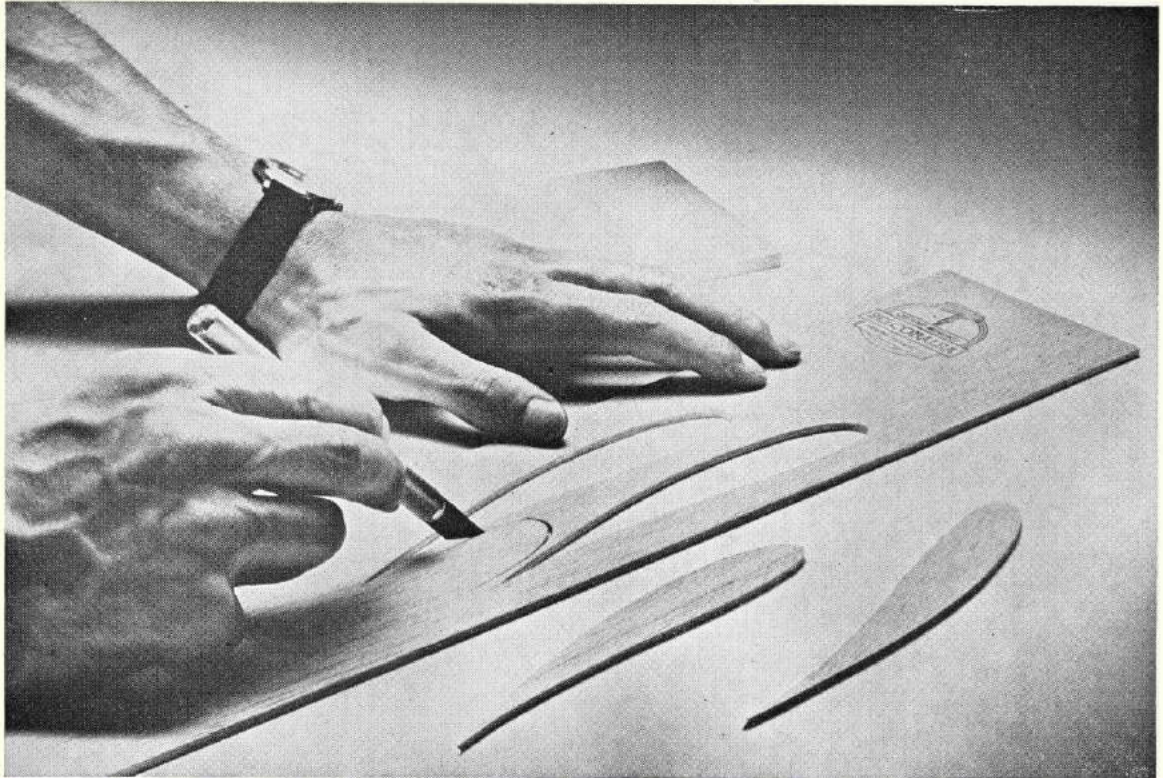
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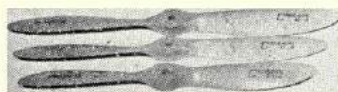
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10 x 8	28p	13 x 5	36p
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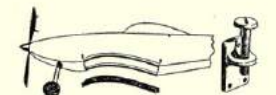
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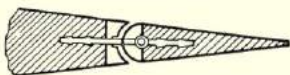
NYLON PROPELLERS

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8 x 6	32p	9 x 4	39p	9 x 6	39p
10 x 4	45p	10 x 6	45p	11 x 6	49p
11 x 6	49p	11 x 7 1/2	49p		

FIBREGLASS PROP 11 x 7 1/2 54p



Screw-Adjusting Aileron Horns	33p
Differential Aileron Horns (2)	49p
Flat Nylon Hinges (pkt. 10)	40p
Short Nylon Horn (pair)	15p
Medium Nylon Horn (pair)	15p
Long Nylon Horn (pair)	17p
Nylon Wing Fixing Bolts (2)	30p
Rubber Wing Seatings (pair)	39p



1/4" Control Surface Fairing	24p
5/16" ditto (32" long, pair)	32p
3/8" ditto (32" long, pair)	40p



STANDARD AIRSPAN WHEELS			
1 3/4" dia. pr.	68p	2" dia. pr.	76p
2 1/4" dia. pr.	85p	2 1/2" dia. pr.	95p
2 3/4" dia. pr.	£1.05	3" dia. pr.	£1.18
WHITEWALL AIRSPAN WHEELS			
1 3/4" dia. pr.	78p	2" dia. pr.	86p
2 1/4" dia. pr.	95p	2 1/2" dia. pr.	£1.05
2 3/4" dia. pr.	£1.15	3" dia. pr.	£1.28



STEERABLE NOSEGEAR

Short	£1.63
Long	£1.80
with brake	£2.25

GLOW PLUGS

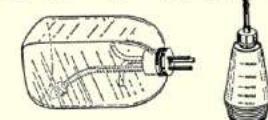
Warm (yellow)	56p
Cold (blue)	65p
Super (green)	74p
Speed (black)	82p

Black Kwinklink with 5" rod	10p
Silver Kwinklink with 5" rod	16p
Silver Kwinklink with 10" rod	20p
Nylon Kwinklink with 10" rod	8p
Black Kwinklink only (pkt. 2)	16p
Silver Kwinklink only (pkt. 2)	24p
Nylon Kwinklink only (pkt. 2)	12p



SILVERED NYLON SPINNERS

(1 1/4" UNF or 7mm thread)		
1 3/4" dia.	54p	2" dia.
2 1/4" dia.	70p	2 1/2" dia.



SEALTITE SQ. CLUNK TANKS			
4 ounce	72p	6 ounce	76p
8 ounce	80p	10 ounce	85p
Large 14 ounce		90p	
Squeeze Bottle with twist cap 49p			



Take-apart Fuel Filter	30p
Rubber Fuel Tubing (40")	16p
Silicone Fuel Tubing (20")	39p

RIPMAX REDLINE TUBING

The NEW age-resistant extra heavy wall (anti-kink) crystal clear fuel tubing, easily identified by the red line and the black and yellow reel dispensers in your model shop! Prices per ft. 1/16" 1 1/2p; 3/32" 2p; 1/8" 2 1/2p; 3/16" 3p; 1/4" 4 1/2p; 5/16" 6p.

'RMA' TUF-TANKS ROUND CLUNK

1/2 oz. ...	33p
1 oz. ...	33p
2 oz. ...	33p
4 oz. ...	35p
6 oz. ...	37p
8 oz. ...	39p
10 oz. ...	43p
12 oz. ...	48p

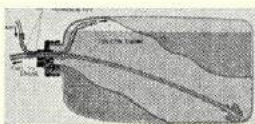
'RMA' BLIND NUTS

4 each nuts, bolts, plain and spring washers, 4BA 12 1/2p, 5BA 12 1/2p, 8BA 12 1/2p.

RIPMAX NYLON

TENSILE NYLON in white, yellow, orange, red, blue and khaki. White 35p per yd. or 99p per 3 x 1 yd.; Colours 42p per yd. or £1.20 per 3 x 1 yd. SUPALIGHT (white only) 35p per yd.; or 99p per 3 x 1 yd. ECONOMY NYLON (white only) 29p per yd.; or 82p per 3 x 1 yd.

RIPMAX-IM PRODUCTS



PROFIED CLUNK TANKS

The ideal tank shape. Neoprene plug (3 holes can be used); durable silicone flex tube and aluminium pipes.

2 1/2oz.	'Profied' Klunk Tank	37p
4oz.	'Profied' Klunk Tank	48p
6oz.	'Profied' Klunk Tank	54p
8oz.	'Profied' Klunk Tank	56p
10oz.	'Profied' Klunk Tank	58p
12oz.	'Profied' Klunk Tank	59p
3 1/2oz.	'Profied' Extra Short	59p
3/32" SILICONE TUBING (40" l'g)		
Thinwall ...	42p	Heavywall ... 42p

SCREW-UP FILTERS	
Tank type	29p
Line type	29p

ENGINE MOUNTING TEMPLATES (METAL)



Accurate patterns of engine plan views showing mounting hole positions and crankcase width. You can tell the difference between mounting holes of engines just by comparing the templates.

OS	09	OS	60F
	10		60R
	15		
	19 all	ENYA	09 all
	30		19
	35		15
	40		35
	58		60
Mounting Template for K&B 40R ... 14p			

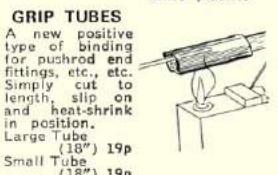


1/8" SCALE PAINTED PILOT	39p
ditto, with visor ...	48p
1/12" SCALE PAINTED PILOT	39p
(with detachable visor)	



FULL LENGTH PILOT

Seated position in regulation flying clothes. Unpainted for colouring as shown (or to choice). 1/8" scale ... 95p 1/10" scale 79p Moulded in white plastic.



GRIP TUBES

A new positive type of binding for pushrod end fittings, etc., etc. Simply cut to length, slip on and heat-shrink in position. Large Tube (18") 19p Small Tube (18") 19p

NOISELESS THROTTLE LEVER

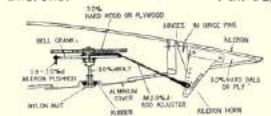
Moulded nylon throttle arm gives freedom from 'noise' on R/C models. Pack of 2 16p

NYLON HORN (RUDDER)

True geometric design for equal movement. Pack of 2 10p

SCREW-ADJUST HORNS (AILERON)

Metal and nylon. For strip ailerons. Pair 32p



DIFFERENTIAL CRANK KIT

A complete kit for providing selectable differential movement on conventional inset ailerons. 46p



COCKPIT INSTRUMENTS

True to scale and fully detailed printed instrument panel gauges (including alternative forms where applicable). 5 mm ... 39p 9 mm ... 39p 7 mm ... 39p 12 mm ... 39p

PUSH ROD EXIT GUIDES

Semi-hooded type (2) 13p

JUSTIK CABLE ANCHORS

Self-adhesive base with metal anchors bent to anchor cables, etc. Packet of 6 ... 18p

JUSTIK SERVO RAIL SUPPORT

Self-adhesive brackets for mounting servo rails. Packet of 4 18p

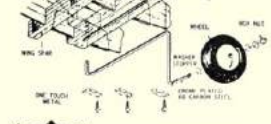


CAM LOCK FASTENERS

Complete with hardwood blocks and bolts, etc. Small (pr) 44p Medium (pr) 44p Large (pr) 44p

LOW WING U/C ASSEMBLY

15-30" 57p 35-45" 65p 49-61" 69p

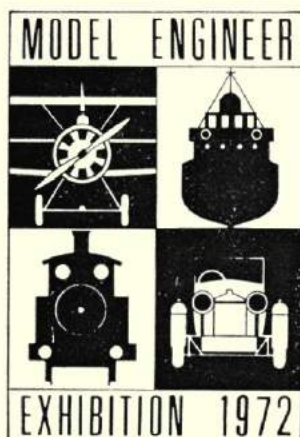


STEERABLE NOSEGEAR

Made of piano wire with hard nylon bearings (free from electrical 'noise'). Steering arm can be fitted above or below bearing. Lightweight 77p Heavyweight £1.05 Brake Assembly 29p

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KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



41st GREAT SHOW

SEYMOUR HALL, LONDON, W.1.

4th January - 15th January 1972

(Not Sunday)

**Model Aircraft, Locomotives
Boats, Traction Engines
Military Models, Crafts**

COMPETITORS

Your entries are now invited. Entry Forms on request. £300 in prizes . . . some 30 cups, trophies and other awards. Championship Cups for permanent retention. A win confers 'Expert Status!'

ENTRY CLASSES

Examples of every form of modelmaking activity can be entered. Model engineering masterpieces such as locomotives, traction engines, aircraft, boats, cars . . . or simple plastic creations . . . there is a class for you. Classes include Military Models (six classes) and Craft entries (Furniture, glass fibre, etc.).

WHAT WILL BE ON DISPLAY

THE MAIN HALL will be laid out in a completely different manner, offering a grand 'open plan' scheme with more room for models, which will be grouped under the gallery balcony and in the centre, with a WINNERS' PODIUM to display class champions. The popular S.M.E.E. PASSENGER RAILWAY enjoys its usual position, but with the added feature of the immense 2-8-4 Berkshire Superpower 10½ in. gauge locomotive based on its American prototype and destined to operate on Lord Gretton's Stapleford Park Railway. This is nearly 19 ft. long and will be on show alongside the track. Another locomotive specially built for Stapleford Park will also be on show at the entrance - The Hon. John Gretton's ROYAL SCOT - a fine scale model embodying many of his own design features.

A FLYING CIRCLE stretching right across the hall from balcony to balcony will be available for electric model aircraft flying. This will be at BALCONY LEVEL and provide splendid and spectacular sport with electric models doing nearly all that more powerful outdoor, i.e. engined models do - or so we hope!

TRADE STANDS - fewer in number than before, since 'club' and other special stands are in another hall - are tastefully grouped in three units, giving convenient access in the MAIN HALL.

Introduction of a MODEL ENGINEER WORKSHOP manned by the S.M.E.E. last year proved immensely popular and will be increased in size and scope, again with experts from S.M.E.E. in charge and assisted by M.E. consultants. Working models under compressed air will also be on show. BRYANSTON ROOM will be operating as the CLUBMEN'S CORNER with stands manned by the principal governing model bodies of the country, plus club units demonstrating, and offering combined club 'little exhibitions'. Demonstrations of power tools will also be shown. This hall will contain the TRACTION ENGINE entries, and wall showcases of small exhibits.

LECTURE HALL will be arranged as the BATTLEGROUND with four WARGAMES TABLES for regular miniature battles, where clubs will be invited to run wargames of all popular periods, with opportunities for running commentaries. MILITARIA entries will be displayed here.

BOATING MARINA: For the first time we have taken the SMALL SWIMMING POOL to operate as a nearly 100 ft. long indoor lake for boating activities. R/C boats will be demonstrated daily. Evenings will be given over to inter-club and individual contests. Pool will also be big enough for some steam powered boats to operate by arrangement.

GALLERIES will provide sitting out space, spectator room and house additional club displays including our favourite BOYS' EXHIBITION. Furniture and craft entries under the auspices of Woodworker will be on show.

SOUVENIR GUIDE

Another CHRISTMAS EXTRA issue of *Model Engineer* will be coming out 2nd Friday in December with entries, trade stands, articles galore to assist the visitor and solace the stay-at-home.

PRIZE POOL ALLOCATION

Classes attracting six or more entries will enjoy prizes to value of 1st £5; 2nd £3; 3rd £1. With over 12 entries 1st £7; 2nd £4; 3rd £2; 4th £1. Classes under six will have 1st & 2nd only, or at discretion of the judges may be combined with other classes.

REFRESHMENTS

Snack Bar in the Balcony Cafe with teas, soft drinks, sandwiches, cakes. Restaurant Service (licensed) available on ground floor. Parties may book in advance.

ADMISSION

Price of admission at the door will be 25p adult, 15p child. A child is regarded as anyone at school. Children under 5 who have not started school and are accompanied will not be charged.

Reduced admission charges for pre-booking is under:

Single and small number pre-booking tickets available from these offices. Adult 22½p, Child 12½p. Parties of more than 10: Adult 20p, Child 10p. Teachers i/c parties free - one per 10 in party.

A combined family ticket can also be bought in advance.

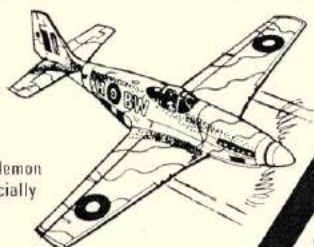
Advance Booking and details from:

**EXHIBITION MANAGER,
M.A.P. Ltd. 13/35 BRIDGE STREET,
HEMEL HEMPSTEAD, HERTS.**

Great news from

Revell - 3 New Big $\frac{1}{32}$ Scale Planes!

HI52 NORTH AMERICAN MUSTANG III



This winged demon was built specially to R.A.F. requirements.

With its powerful Rolls-Royce Merlin 1680 h.p. engine, and heavy fire power the Mustang soon proved the equal or better of even her most formidable antagonists. Now in a superbly detailed Revell kit, including detailed cockpit and pilot figure; removable engine cowl showing the famous R-R Merlin power unit and Malcolm 'bubble' canopy. Like the Thunderbolt this kit includes official R.A.F. markings.
Scale: 1/32.
PRICE
95p
or less.

**Bigger
scale-
SUPER
DETAIL!**

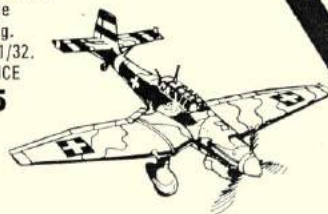
H153 STUKA JUNKERS JU87B

This splendid new big scale kit captures in every detail one of the most terrifying dive bombers of all time. This infamous Axis death-dealer howled vertically from the skies to strike terror and devastation across Europe, scattering armies and demoralising civilian refugees. Not surprisingly, the Luftwaffe was only too pleased to supply its Axis comrades with such a weapon, and this Revell kit is a replica of the Stuka's that flew under Hungarian markings.

Full cockpit detail, crew figures and the famous Junkers

'Jumo' engine, with removable cowl.
Scale: 1/32.
PRICE

£1-15
or less.



H151 THUNDERBOLT 'RAZORBACK' P-47D



The biggest, heaviest single-seat fighter of World War II, the Thunderbolt 'Razorback' was superbly armed with eight 50 calibre machine guns and among the first supersonic combat planes. It proved the ideal fighter-bomber, and was flown by the R.A.F. in many daring low level attacks in support of assault troops. In hit-and-run raids on strategic targets only the Thunderbolt's rugged construction enabled it to survive vicious enemy fire and still get back to base. Kit features include removable cowl revealing the detailed Pratt & Whitney engine, pilot figure and authentic R.A.F. S.E. Asia Command markings.
Scale: 1/32.
PRICE
£1-15
or less.

Make even better models! Post this coupon with P.O. for 15p and receive the **REVELL FULL COLOUR CATALOGUE**—now

with expert hints and tips for perfect modelling.
REVELL (G.B.) LTD.
Cranborne Road,
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For a faultless finish... always ask for Revell paints and cement.

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AGE LAST BIRTHDAY

A

Revell

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NEW FROM AIRFIX!

Get this 24th scale SUPER KIT!



The first of the new Airfix Super kits flies in—the Spitfire Mk 1A!

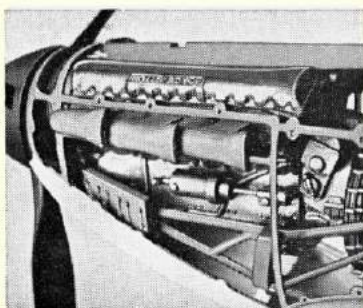
With 150 detailed parts, here is perfection in aircraft modelling!

This magnificent 24th scale model features a superbly detailed cockpit, Browning machine guns complete with ammunition boxes and a super detailed Rolls-Royce Merlin engine beneath removable panels. A propeller motorising unit is available.

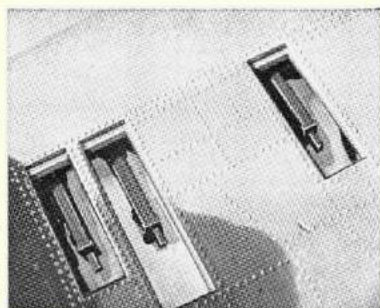
This new Airfix Super kit is undoubtedly one of the finest aircraft kits ever produced and a 'must' for all keen modellers.



Superbly detailed cockpit



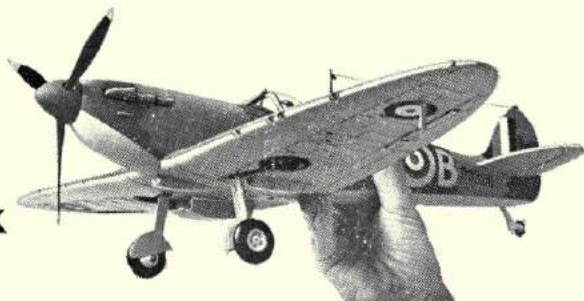
Rolls-Royce Engine detail



The Browning guns



**Get every
detail right
with Airfix**



Heard at the HANGAR DOORS

BRITISH standing in International radio control gained a welcome uplift at Doylestown, Pennsylvania, U.S.A., when the Hardaker/Birch/Cooper team earned a deserved 4th place among 22 Nations in the Aerobatic Championships. David Hardaker's 10th individual placing is specially encouraging. His style of flying evoked considerable comment and obviously impressed the Judges. This was the first World Championships held in the U.S.A. for 16 years; made possible by the generous sponsorship of the Academy of Model Aeronautics who organised a mass airlift out of Europe for 75 per cent of the entry. Supporting Limited International events for Pylon Racing and Thermal Soaring also brought further British success with 2nd, 3rd in the exciting races for the 'Sopwith' Trophy and 2nd, 6th in Glider. We shall be reporting this momentous meeting next month in full detail. Here's a summary of the results:

1971 WORLD R/C AEROBATICS (KING OF THE BELGIANS TROPHY)	
22 Nations	60 Competitors
Pts.	
1. B. Giezendanner (Switzerland)	20315
2. W. Matt (Liechtenstein)	20275
3. P. Kraft (U.S.A.)	19455
4. H. Prettnner (Austria)	19095
5. J. Wester (W. Germany)	19090



6. J. Whitley (U.S.A.)	18750
10. D. Hardaker (U.K.)	17990
13. M. Birch (U.K.)	17405
20. T. Cooper (U.K.)	16415
Team Results: (MAP Trophy) 1. U.S.A.	
2. Switzerland. 3. Germany. 4. U.K.	
5. Austria.	

1971 R/C PYLON RACE INTERNATIONAL (SOPWITH TROPHY)

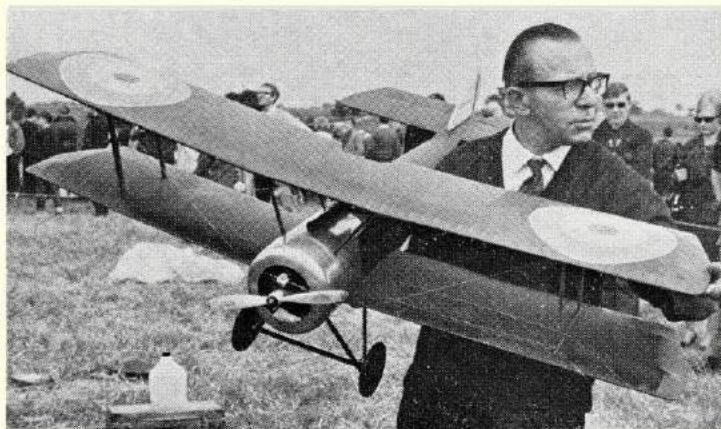
7 Nations	16 Competitors
1. R. Violet (U.S.A.)	16pts, 1:57.5
2. A. Mann (U.K.)	15pts, 2:05
3. A. Dowdeswell (U.K.)	13pts, 2:28
4. T. Prather (U.S.A.)	
5. B. Smith (U.S.A.)	
11. P. Pilsworth (U.K.)	

1971 THERMAL SOARING INTERNATIONAL

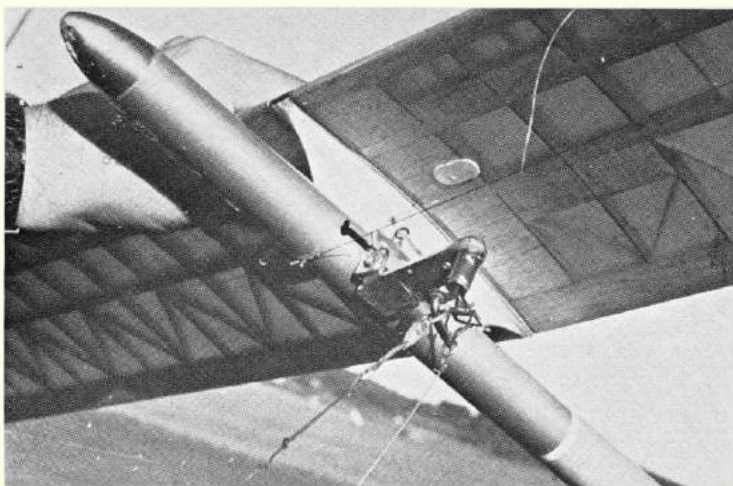
5 Nations	12 Competitors
1. S. Pimenoff (Finland)	1082
2. D. Dyer (U.K.)	1070
3. O. Heithecker (U.S.A.)	920
6. G. Dallimer (U.K.)	756

British R/C team at Doylestown, U.S.A. after the last flight had been made in the Contest. Team manager Roger Hargreaves, Terry Cooper, David Hardaker and Mike Birch are seen with young helper 'John' proudly holding David's model which placed highest for the British team in gaining its fourth place among twenty-two nations.

IT IS WITH much regret that we have to announce the death of Jack Carter, a modeller of forty years standing. Jack's speciality for many years had been control line scale aircraft, and indeed the first indication of illness occurred on his return from the 1971 National Championships (where his 4th scale Spinks Akromaster took sixth place). A severe coronary followed and he spent a month in hospital. On September 11th he suffered another heart attack which proved to be fatal—Jack being just 54 years of age. Our last personal recollection of Jack was at the Old Warden Scale Rally where he was demonstrating his familiar models to friends and interested spectators alike. A disabled person, Jack never lost his enthusiasm for his hobby and his absence at the many rallies will be sorely missed. We extend our deepest sympathies to his wife in her sad loss.



The late Jack Carter, seen enjoying his favourite hobby — flying his large scale Sopwith Pup at the Old Warden Scale Meeting.



The offset towhook used for a circling tow on Sandor Kosorus' (Yugoslavia) A/2 glider. Aluminium tube 'front end' also employed.

FREE FLIGHT TECHNIQUES

Part II

A/2 GLIDER and WAKEFIELD

as seen at the World Champs by John O'Donnell

GLIDER WAS CERTAINLY the class most influenced by the organisational decision to hold the contest during the early morning and late evening. This implied that the beginning and end of the contest would be relatively liftless – and that sinking speed could be all-important. Many entrants had arrived prepared for this situation with models suitable for a 'performance' event, rather than the usual thermal riding affair. These models were usually of very high aspect ratio – and many had solid wings.

There was plenty of SPL influence to be seen in the search for glide performance. One of the SPL co-designers, Herbert Schmidt was competing in person. His derivative of the basic design had true 3D turbulators, little balsa *pyramids* all the way along the L.E.! Paul Lagan had a different approach, even if the same tremendous wing span (94 in.), in employing a Jedelsky style airfoil on his solid winged model.

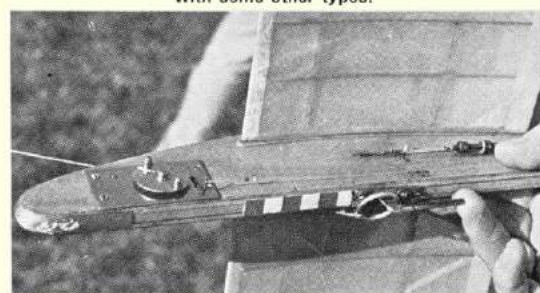
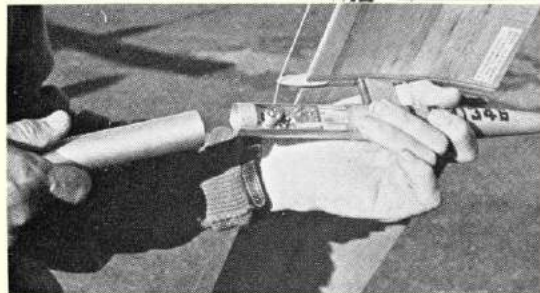
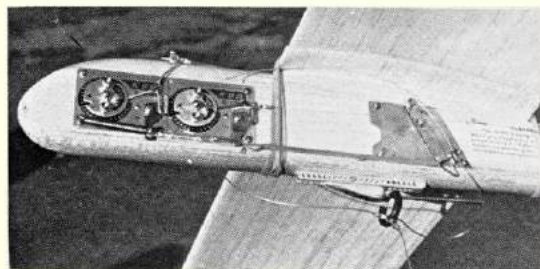
Elton Drew's dead air model was illustrated in the September issue and resembled a cross between SPL and

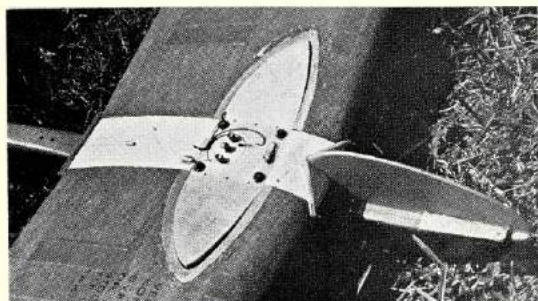
normal British ideas. The wing planform was influenced by Urs Schaller's ideas for achieving an elliptical lift distribution. The tip panels have half the area of the inner panels. Taper is such that the chords at the dihedral break and tip are 87 and 60 per cent (respectively) of the root chord. In comparison Tony Young's model looked as deceptively simple as his normal models. His calm weather version had 5 in. constant chord right to the 'sawn-off' tips, that were capped with ply ribs to help preserve the section. Other interesting features were a double D/T timer system to guard against failure, and an anti-falloff system consisting of a metal plate (on the fuselage side) to receive a magnet linked by a line to the tow ring.

There were other approaches to the calm weather rounds. The circling tow technique is no longer a novelty, having been used when appropriate by several continental countries. Such a tow is usually accomplished by means of an offset towhook, the effect of which is balanced by rudder when towed fast. Such a setup was seen on several models including those of Yugoslavian Sandor Kosorus and Frenchman Jean Marie Berthe. The latter's model was christened *Super Flamingo*, perhaps in honour of its distinctive 'bird' airfoil with characteristic 'bump' on the lower surface. These two models also illustrate a feature seen on models from many countries. This was the use of aluminium tubing for the forward fuselage. Joining problems were usually solved by having a separate tailboom. The joints were often flexible, or rubber-banded, to reduce susceptibility to damage.

Recently, however, another method of achieving the circular tow has appeared. Although rather more complicated

Above left: Tony Young's still-air A/2 uses a double timer system for safety. Steel plate is mounted on opposite side for the magnetic 'anti fall off' line used. Lower left: Elton Drew has internal timer on his still-air design. Below: Dvorak uses tongues in ply ribs to attach his wings to the fuselage. Silk covering employed. Very simple towhook contrasts strongly with some other types!





Close-up of Svend Grönlund-Fredriksen's A/2 with wing tongue on top of wing, fitting in a recess. Wing lower surface rests on a ledge and can bend downwards without damage.

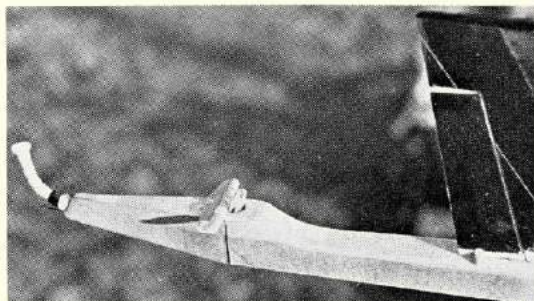
to make it has several advantages, being much safer to use and permitting a catapult release to gain valuable height on launch. The system is based on a spring loaded towhook connected directly to the rudder. The rudder position is dependent on the towhook movement, which in turn depends on towline tension.

With no pull on the hook, the rudder remains in its normal glide setting. Under the light load of an ordinary tow, the hook extends sufficiently to pull the rudder straight – an anti-falloff arm is fitted through the towhook so as to lock the ring in position. This arm does not disengage with the towhook extension appropriate to a normal tow. To release the model it is necessary to pull hard enough on the line to extend the towhook further which disengages the 'safety' arm and also moves the rudder further across than the glide setting. This gives a fast catapult release with the model swinging tightly enough to perform a climbing turn rather than a stall. With removal of line tension the rudder then returns to its normal glide position.

In use the model can be towed up straight and 'over-head'. If the line is then slackened the rudder will go across, and the model will glide in a more-or-less normal circle with the line attached. The slack line describes a cone round the tower who only has to move quite slowly downwind. When the model has done one or two circles and is again facing into wind, it is simply towed up again and the process repeated. If the model does not lose height on glide, the resultant line tension tells the flier that the air is helpful and the model can be released as already described.

All the Russians had models fitted up with this system but as most of the mechanics are internal, they do not show well on photographs. However, Andres Lepp produced a 'five times full size' engineering drawing of his hook assembly that has been redrawn in *Free Flight News* 71/8. Lepp's model also had an auto-aileron to assist the catapult launch, and appears to have been added to an existing model only when found necessary. This same flier had four A/2s all with dural spines neatly etched (engraved?) for identification. The wires for mounting the wings did not merely pass through holes in the spine and root ribs. The wires had a threaded collar affixed to their centre, and the whole screwed into position. This gave a positive fixing without transportation problems.

Giora Hetzberg, member of Israel's A/2 team, had an essentially similar hook system, but one that he claimed was



American team member uses a torque-controlled variable incidence tailplane on his Wakefield – whole of the tail end moves to achieve this.

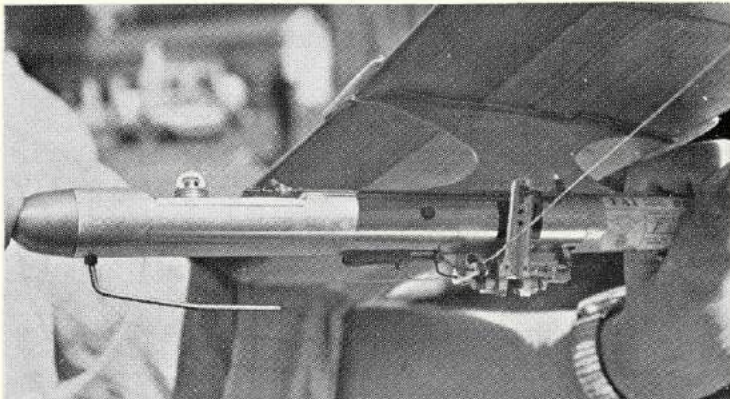
much simpler. It was bent from wire and soldered together, rather than 'machined'. Furthermore the whole unit was retained in the model by a couple of pins and could be moved fore and aft to adjust the hook position. His gadgetry was adjusted so that it took about 0.8 to 1 kilogram pull to release the anti-falloff device, and 3 kilograms to provide extra rudder on release. Ivan Horejsi of Czechoslovakia had the same device and spent much time explaining it to on-lookers.

The Russians had one extra refinement worthy of mention. They used a second ring and pennant, connected to the usual ring by a short length of line. Both rings went on the hook and were retained by the anti-falloff arm. When the latter disengaged the 'extra' ring and pennant separated and provided a visual indication to the tower as to the state of the system. This of course implies that the springloading was set so as to release the 'safety lock' well before giving the extra rudder for catapult release. It is interesting to compare these intricate systems with that used on Dvorak's winning model.

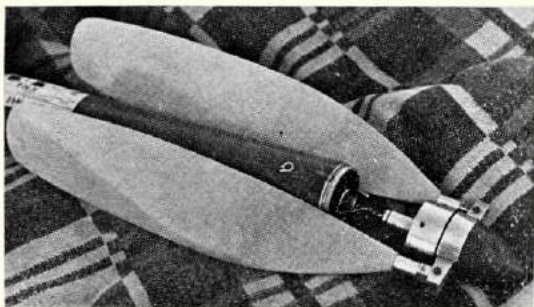
A number of A/2s were seen with internal D/T timers, this may give a slight drag reduction – but it certainly helps keep the timer clean and helps reduce timer failures. Most of these hidden timers are fitted behind hatches as on Niilo Munnakka's 'thermal' model. Elton Drew managed to find an alternative way, by having a removable 'nose cone' on his still-air model, in the manner seen once before on Schmidt's model. This contrasted strongly with the simple cutout in the aluminium tube used in several other models.

An interesting variation on the tongue and box principle was seen on a model of Denmark's Svend Grönlund-Fredriksen. The box was 'top-less' and in fact was little more than a recess in the upper surface of the wing. The wing roots rested on a narrow 'shelf' on the edge of the fuselage. With elastic bands at the leading and trailing edges (to keep the wing positioned correctly) tow loads were resisted by tongues and shelf, whilst the freedom to bend downwards provided for D/T landings and 'blowing-over'.

Finally, mention must be made of the A/2 that had everything – at least in the way of gadgets. 'Tam' Thompson, of Canada, had a model with variable wing incidence – set symmetrically for ease of towing, then moving so that the inner wing (of the glide circle) had more incidence to resist spinning in lift. The wing tips were spring loaded against stops – and could be 'shimmed' to adjust their washout relative to the inner panels. There was an optional device



Another user of the offset towhook arrangement was Frenchman Jean Marie Berthe on his 'Super Flamenco' design – note wing section from which the name is derived. Timer mounted on top of fuselage and let-in for protection.



to give extra negative incidence to the tail whilst on tow, to assist prolonged 'kiting' in calm weather. Finally there were central and offset (adjustable of course) towhooks for normal or circling tow. I don't know if he flew this model in the contest – where one very bad flight ruined his hopes of a high position.

First mention in any Wakefield dissertation must surely go to Reiner Hofsass who appeared with a new idea, or at least one that no-one can remember seeing ever before. This device is a timer operated prop-lock set to release one to two seconds after the model is given the customary javelin launch. Yes – the model is thrown with the prop folded, and it starts to revolve just as the launch impetus starts to wear off. This technique obviously gives a useful gain in height. The time at which the prop starts is fairly critical and is better too soon than too late. Waiting until the model's nose drops could well be disastrous! The same timer operates V.I.T. and A/R 'as normal'. Hofsass only had this prop-lock on his reserve model which he did not use in the contest – so having missed the chance of photographing a launch on test I could not rectify it afterwards! The model that Hofsass flew to fourth place was the very high aspect ratio solid wing model that he has used extensively in recent years. It is different to most continental models in having the well-worn look to which English modellers are accustomed!

General trends in Wakefield design amount to the extensive use of tubular (circular sections) fuselages, low pylons, polyhedral and 16 strands of Pirelli. To this list should now be added the frequent use of V.I.T. and A/R triggered by a clockwork timer, usually a Seelig. This description fitted quite a good percentage of the entry. There were very few using torque-operated V.I.T. systems – and I only came across two to photograph. Mike Thomas (Canada) had a development of the Xenakis approach. The mode of operation is the same but most of the parts were machined from alloy or magnesium. This model also boasted a very small, neat and light D/T timer made from an extensively modified 'telephone call timer' available in Canada. Frank Parmenter had a torque-controlled system involving a very neat arrangement whereby the whole rear-end of the fuselage moved.

There was a profusion of Wakefields with aluminium, or dural motor tubes. I saw one model, that of South African Kingsley Appleby, with a glass fibre tube that he reckoned was lighter than the aluminium one on his other model. These fuselages are obviously intended to withstand the rigours of motor breakages. The alternative of a 'conventional' winding tube was employed by very few entrants. Apart from British fliers, Christian Schwartzbach, Paul Lagan and Frank Parmenter are the only examples that come to mind. Parmenter and one or two others were seen to give their motors a preliminary stretch before winding. In Frank's case, at least, the motors had already been 'run-in' previously.

There is little else that can be said about the rubber itself. Pirelli seems universal with 16 strands of 6 x 1 mm. being the standard choice. The North Koreans, however, had 1/8 in. or 3 mm. wide rubber and lots of strands. Paul Lagan used a home-made torque meter, with a dial made from a coffee-jar lid, to check his rubber quality whilst winding. – his winder contrasts strongly with the specially made 5 to 1 example of Dieter Siebenmann. A few solo-winding rigs were seen – and saved being dependent on having a helper available whilst testing.

Propeller assemblies varied from the simple to the complex. There were plenty of impressive examples of involved metalwork in the hubs and noseblocks. The free-wheel/fold system, often employing the so-called 'Montreal stop' is

Mike Thomas' Wakefield had 'auto everything'. Above, the tail boom and motor tube are shown, with fitting for rubber attachment to gadgetry. Below, the aforementioned fitting in place of the tail boom to operate the V.I.T. and auto rudder. The D/T timer was made from a telephone alarm timer.

Austrian Hans Martin produced a nicely machined nose block on his Wakefield which also operates the auto-rudder. Tubular aluminium motor tube used.

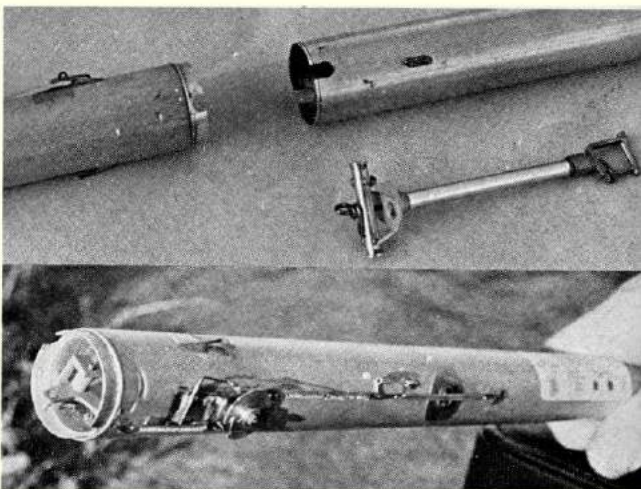
becoming more common although there were still numerous people faithful to the spring-and-screw method.

Bryan Spooner had experienced trouble in trying to hold both of his outrigger prop blades extended ready for launch – and now has them inter-connected by nylon monofilaments so the extending one compels the other to follow suit. He and many others used propellers based on the well-publicised Swartzbach layout. Christian himself still used his original 22 x 28 1/2 in. (nominal) prop on his 'Wounded Knee' design. This is the prop that was described in his article for the N.F.F.S. Symposium in 1968. He also had a 24 in. diameter prop with the same nominal 28 1/2 in. pitch on another model. Before leaving the subject of propellers it may be worth mentioning that some models had auto-rudder tripped by the prop stop. Hans Martin and at least one of the North Koreans (Kim Dong Sik) had this arrangement. Other models had a 'waiting stop' so that the prop could not revolve whilst the flier waited for lift.

By now it should be appreciated that free-flight at world championship level is hardly in the balsa-wood-and-tissue-paper category any more. This year the 'plastic age' really started to make itself manifest. The most shining examples (in more ways than one!) were several American models resplendent in *Super Monokote* covering. This material was used by all three of their power team, plus John Allen in Wakefield and Hugh Langevin in A/2. In retrospect they were wondering if the covering could be a contributory factor in the trim changes suffered by their power fliers. The British equivalent, *Solarfilm*, was used by Maurice Doyle of Ireland – but he also used *Modelspan* tissue underneath to improve the rigidity of the finished wing.

Glass-fibre rods were little used by British standards, there were not very many in A/2 – and only a couple of 'converts' in power (Lagan and Guilloteau). In a different way the North Koreans were notable for the amount of Sunghua – a hardwood rather like pine – that was employed in their Wakefields. One very clever structural idea that I heard about was not obvious at all. John Foley used pieces of expanded polystyrene foam to 'fill in' the D box of his power wings. A few bays near the centre so treated made a considerable difference to the wing strength, especially on D/T landings, at a very small weight penalty.

'Ground equipment' was very much on the lines of that seen at Weiner Nenstadt a couple of years ago. The Danes and Americans still used powered starters for their F.A.I. power models, and the Russians used hand cranked devices. Practically everyone else flicked by hand. Thermistors and bubble-machines were common enough to have all but hand-held versions excluded from the launching area. The Americans had the most sophisticated 'electronics' – but the Russians had the best communications system with a walky-talky link between their thermal detector and flier. The North Koreans and many others had the radio, but usually used them to contact their retrieving crews. The only new addition to the thermal detection scene was the lengthy streamers introduced by the Americans and hastily copied by the Canadians – the streamers were many feet long, made of very thin mylar (from a capacitor), and 'lifted' in rising air. A paper on their use is part of this year's NFFS Symposium!





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

Dear John,

I have just built the A.P.S. Sopwith Camel (FSP/441) by R. Saunders and it is virtually complete except for minor details. I have been looking at some original photographs of the real plane, and notice that the metal parts are mottled. I have used metal for the cowl and engine parts and although it looks good, could you please explain what the mottle is and how I might apply it to my model.

A. Dobson

Hitchin, Herts.

The effect you mention is known as engine turning and is a common feature on many aeroplanes of yesteryear. The easy way to reproduce this, is to attach an ink eraser to the shaft of a small electric motor, and buff the metal, spot by spot, until neat rows of circles are achieved. This takes a long time and much patience, but the end result is worthwhile. Alternatively, you could use emery cloth and buff the surface in a circular motion by hand.

These and other scale hints can be found in our publication 'Flying Scale Models' by R. G. Moulton, price 62½p.

Dear John,

Over the years, I have built a great many orthodox models such as rubber powered gliders, control-liners, and free flight power, but I've grown interested in model helicopters. I wonder if you have ever published any plans for helicopters or similar rotary-winged craft such as Autogyros.

S. Sheppard

Newport, Monmouthshire.

The new revised Aeromodeller Plans Handbook No. 1 is now available, price 15p post free from ourselves and contains details and photographs of a few helicopter models of varying sizes.

However, you will find that the majority of rotary wing model plans we offer are Autogyros, mainly because they are the easiest rotary-winged aircraft to fly successfully in model form, as well as being simpler to make. All such models require a small amount of metal-work in their construction around the rotor-head, so a soldering iron will be an essential part of your equipment.

Dear John,

Having nearly completed the APS Harriot, which I found to be truthfully recommended for scale beginners like myself, I found it very easy to make and just hope it flies as well as it looks! I do not like the complicated colour scheme suggested. Do you know of any alternatives?

F. Sturgess

I.O.W., Hants.

We can suggest a few schemes as used by Belgian aces, though it is difficult to confirm the exact shades. We advise blue overall for Coppens' machine, or canary yellow overall for De Meulmeester's machine. Roundels are red, yellow and black, with red outermost. For lightness cover the model in blue or yellow tissue. Further schemes can be found in Profile Publication No. 109.

Dear John,

I am very attracted to the A.P.S. plan of the Chatterbox by Vic Smeed, however, it was designed for Radio Control and as I cannot yet afford R/C is it at all possible to convert this little model to Free Flight?

Newton Abbot, Devon.

S. Wilkinson

The Chatterbox is a very stable design with sturdy construction, and could certainly be flown as a free-flight sports model. The only alterations needed would be to make the fin and rudder as one unit but with a small trim tab approximately two inches high and half an inch wide cut in the trailing edge of the rudder. This will be adequate to provide a circular flight pattern. Keep the tailplane as light as possible - remember that you have no batteries or other R/C equipment to move around to position the C.G. correctly.

Dear John,

I recently made a small glider, but found that the fuselage had 'pulled-over' to one side, and it is now out of line. What causes this to happen, and how can I avoid it? This is the second model I have built, the first from plans and not a kit.

Bradford, Yorks.

T. Beamish

The reason for your warped fuselage probably lies in your selection of the balsa wood for the longerons - the pieces of wood which run along the full length of the fuselage. If one longeron (or fuselage side) were very hard, and the other soft, the fuselage would, of course, be out of alignment - the 'soft' side bending while the 'hard' side remains straight. Avoid this by matching your balsa strip - choose wood of the same density (checked by pushing your thumb-nail into the wood) and of the same degree of 'springiness', checked by flexing whilst held side by side - they should have the same amount of 'whip'.

Dear John,

I am building a Scimitar (MA/270), which is a 45 in. span stunter, which when finished will be powered by an

O.S. 19. The question is, what length lines should I fly it on? Also, my O.S. 19 seems to run very hot, is this normal for a glow? And, if not, what can be done about it?

Rugby, Warks.

R. A. Davis

Suggest you use lightweight (three stranded) Laystrate control line wire for your model, 50-55 feet long. Glow engines tend to run very hot, but provided the engine cooling is not obstructed by a cowl, there is unlikely to be anything wrong. However, if still in doubt, the fuel being used could be suspect. A high nitro-methane content fuel will make your engine run hotter, so will too little oil. If you 'brew' your own fuel, the latter is a point to watch - do not use less than 25% unless you know EXACTLY what you are doing!

Dear John,

I have become very interested in team racing recently and my friend and I would like to enter some contests. The problem is, which is the best (or easiest) class to enter.

P. Ball

The easiest class to race in is undoubtedly Goodyear, as the models are simple profile fuselage jobs and you have no worries concerning fuel economy - a major stumbling block in the other 'purer' classes where speed must be offset against economy. 'B' Rat racing is expensive, very fast and has little, if any, support presently, while there are few contests for 'A' rat racing as there are no 'official' rules. However, if you use a 2.5 cc engine in a Goodyear racer, it can, of course, be flown in 'A' class racing, so if this class does catch on, you have a model suitable for two events.

Motor choice depends on your pocket of course, and whether you prefer a diesel or glow engine. Diesels are probably easier for the novice to operate as a pressurised fuel system is not needed and high nitro methane content fuels are, of course, not required. Diesels are generally more reliable. A glow engine on the other hand gives (usually) higher airspeed and several are available at quite reasonable prices.

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 (5/-) to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

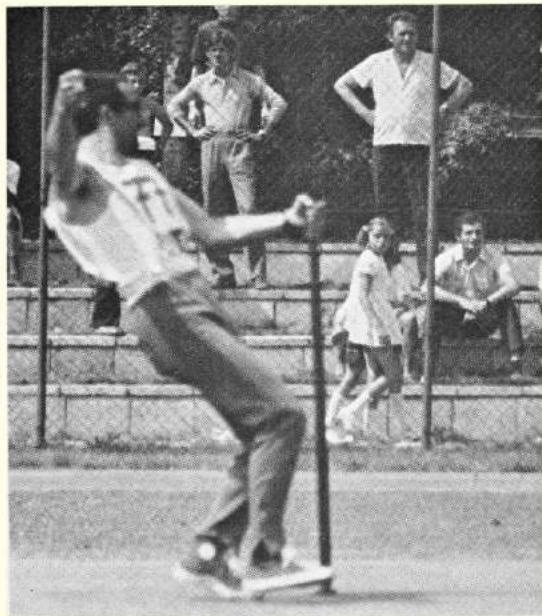
ADDRESS

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

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

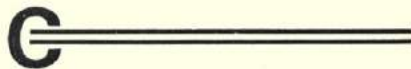
SEND TO: GOLDEN WINGS CLUB, AEROMODELLER, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

10/71 15p in the £1 Rebate
plan purchase coupon
for Golden Wing Members



Pietro Fontana puts real effort into whipping his speed model up to maximum speed. Judging by the way he swings round on the pylon, it's just as well that it is bolted securely to the concrete!

CONTROL LINE NEWS



A Good Big'un is better than a good little'un

Thanks to the efforts of certain of our Northern racing friends, Class B team race is attracting a few more followers—but strangely not so much newcomers, more (dare we say it?) *Old Timers* coming out of 'retirement' to relive the fun of the late 50s, early 60s.

Their approach is not unnaturally the 'hare' one, using ETA 29s to provide the 'urge', and a variety of fuel additives to curb the motors appetite. The competitors culled from the F.A.I. team race circuit prefer the 'tortoise' line of thought, using over-bored diesels (frequently in F.A.I. class models) to achieve a non-stop run at around the 90 m.p.h. mark. The trouble is, they are frequently so successful—but

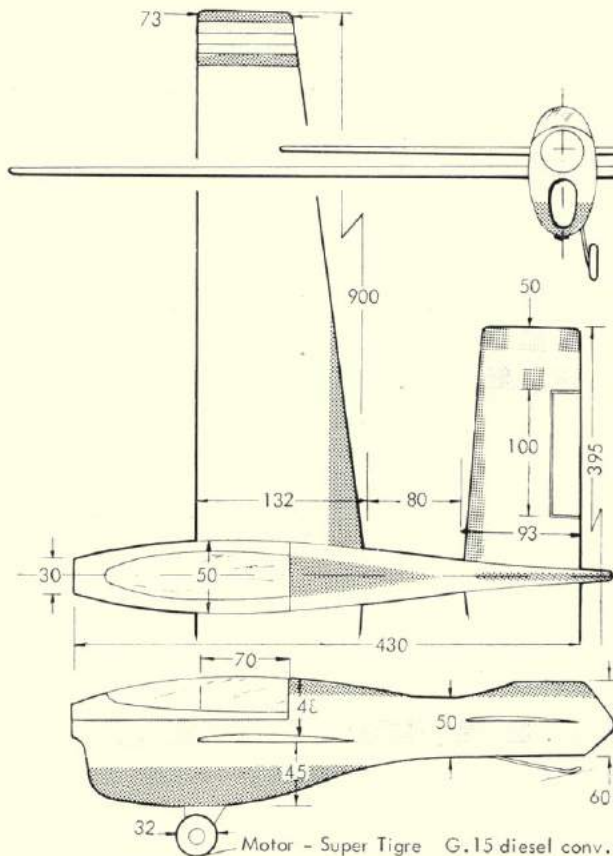
Goodyear Changes

The new S.M.A.E. rule book, currently being revised and reprinted contains some important rule changes for Goodyear racing enthusiasts. Firstly, and as was expected after the furore at the Nationals, F.A.I. team race procedure has been adopted for flying conduct and circle marking. This means, of course, that whipping is not allowed (hopefully stopped?) and should do much to improve the standard of flying.

Another rule change which could conceivably alter many competitor's approach to this contest is that *three* pit stops in *100* laps are now required, with *five* in the 200 lap finals. This would at first glance seem to give the diesel engines a greater advantage over the not-so-reliable glows, but the increased distances (another 25 per cent) will help to emphasise the glow motor's superior speed. The purpose behind the rule is to give the pit man more work and provide closer racing. It *should* succeed in this aim, although piloting skill will need to be improved in some areas when you have three models making so many landings—a three up race between F.A.I. team racers averaging only 25 laps to the tank does get hectic, and many Goodyears do not land as well as their 'pukka' racing equivalents.

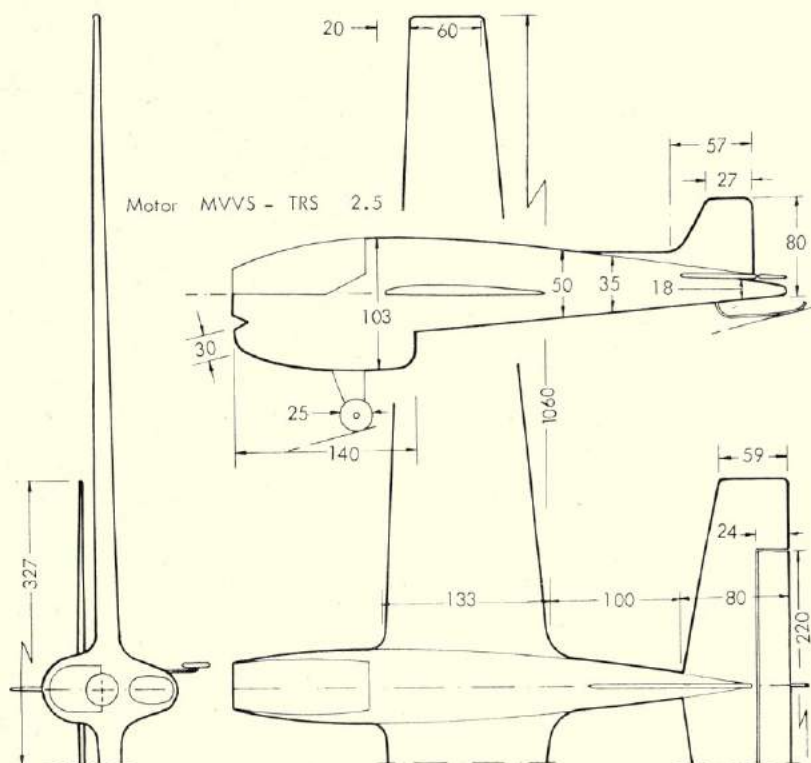
One further rule addition relates to scale documentation—the onus being placed on the competitor to prove that his model is within the 5 per cent scale tolerance, and a three-view from an accepted published source will be required in case of spot checks or processing. A minimum area rule has also been introduced as a safeguard against inaccurate 3-views (and very many are inaccurate, our own drawings excepted—naturally!).

BRENDEL/GLODECK'S (West Germany) third placed team racer at the '71 Criterium achieved a best heat time of 4:49, but was slowed in the final by a loose carburettor (all dimensions in millimetres).



... including a last look at the 1971 CRITERIUM OF EUROPE

SAFFLER/KODYTEK of Czechoslovakia came second at Pecs, again with a best heat time of 4.49. A typical Continental design with its pod and boom layout featuring straight-through cylinder cooling and rearward wheel. (All dimensions in millimetres.)



utterly boring to watch! A race is a race, but when all that is required of a pit man is to start his motor once then walk away while the model drones on for the full 70 laps, then something is wrong. Perhaps there is a case for raising the minimum capacity to 4 c.c.s for this event? A 'B' class revival with F.A.I. models and (presumably) oversized F.A.I. motors can hardly be called a 'B' revival.

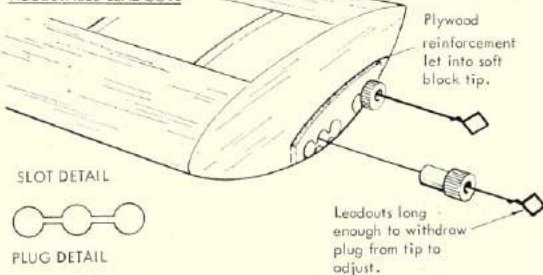
But why no newcomers to true 'B' racing? Perhaps the chemistry involved in brewing a potent but economical fuel puts off the beginner—a situation which if true could easily be remedied by the introduction of a standard fuel. Better that than an all diesel affair...

Cranfield goes International!

Welcome visitors to the F.A.I. team race circle at the annual Cranfield Rally were the Geswendtner brothers from Denmark—well known competitors at World Championships and International events. As expected they flew well, producing a heat time of 4:34.8, followed by a finals time of 9:59.6—good enough for second place behind Heaton and Ross. What was more interesting than their Kosmic 15 powered model was their approach to the meeting. The model was kept in its box next to the circle all day, they flew immediately when requested and only had a single test flight before the final. Oh yes—their flying and pitwork were superb as well. In short they knew their motor and did not need constant practising and re-adjusting—if only all competitors were like this the organisation job would be a lot easier!

The Italian stunt flier Clemente Cappi uses a neat method of obtaining adjustable leadout wires which enables him to easily trim his models to suit the conditions—as explained in the sketch below, provided by Steve Blake. Steve's own ideas on leadouts, utilising fishing swivels, are also shown beneath.

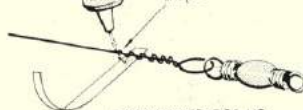
ADJUSTABLE LEADOUTS



PLUG DETAIL

Make from two pieces hard plastic tube push fit in soft block tip.

Wrap with strip of heavy tissue covered with balsacem and form to smooth shape.



COLOUR RED FOR UP
BLACK FOR DOWN

Finished

Leadouts bound and soldered



a fascinating
do-it-yourself
survey of the
weather conditions

explained by

E. R. YARHAM,

F.R.G.S.

photographed by

R. K. PILSBURY,

A.R.P.S.

Typical Cirrostratus formation, complete with a halo – a common phenomenon with this cloud structure. Note how transparent the cloud is (and the smooth appearance) usually totally or partly covering the sky.

NOWADAYS THE OFFICIAL weather reports are fairly reliable, but we can get too dependant upon them. There is far more *interest* in making an intelligent study of natural phenomena, and in the signs of the sky, in order to get some idea of the kind of weather we are likely to get.

It is unwise to rely entirely on the barometer, although that instrument can be quite a useful ally. Merely 'going up' or 'going down' is unimportant; it is the speed of the rise or fall which counts. A rapid rise presages unsettled weather, sometimes after a fine brief spell; a slow rise suggests that fine weather is approaching.

A rise accompanied by a north wind or a colder and drier atmosphere portends better weather, but with a moist atmosphere and low temperature it means wind and rain are on the way. Mild calm weather, followed by a fall, is indicative of squally weather. Stormy weather invariably follows a fall of 1/10 in. per hour, or 3/10 in. in from three to four hours. In winter it may herald snow, and almost certainly rain. The following couplet admirably sums up the significance of barometric movements:

*Long foretold, long last,
Short notice, soon past.*

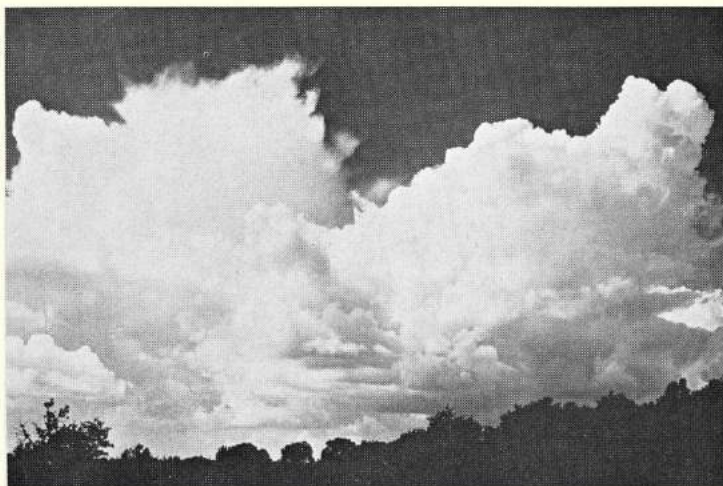
'Mackerel sky' is a sky covered with Alto Cumulus cloud arranged in regular waves and showing blue cloud in the gaps, often occurring during warm and dry weather.

The barometer rises for winds in the west-north-west and north, but falls when they are in the south-west, south, and south-east. Anti-cyclones are associated with fine weather, cyclones with unsettled conditions. The latter are by far the more common in Britain.

As a cyclone approaches the weather is 'muggy', but, as it moves away bright and exhilarating. Halos round the sun and moon invariably foretell a cyclone. The barometer falls and the sun is 'watery' (with denser cloud). The wind is in the south-east in most cases, and there are

sudden gusts or squalls and drizzle as an introduction. This slight rain is followed by a heavy downpour, with a driving wind, which jumps to the west or west-north-west, and the barometer rises. Often the wind gets stronger than ever with heavier rain, but with the wind in that part of the heavens it is a sign that the worst of the cyclone will soon pass and the air will become sharper. Then patches of hard blue appear in the sky, and rocky cumulus clouds are seen – there may also be a few clearing showers with a gentle breeze.





Cumulus clouds are generally dense, with sharp outlines, developing vertically in the form of rising mounds or towers—the bulging upper part often resembles a cauliflower. The sunlit parts of these clouds are mostly brilliant white, while the base is dark and nearly horizontal.

*When the wind veers against
the sun*

Trust it not, for back 'twill run. That is an old saying which augurs a cyclone. On the other hand, an anti-cyclone is marked by the veering of light breezes with the sun. When a cyclone is moving up, the winds back to the south-east and move forward as it passes—but when an anticyclone is establishing itself, with settled weather, the winds blow east to north or from south to north.

In summer, anticyclonic weather is marked by blue sky, hot sun, and little wind, while in winter on the other hand, frost, fog, and sometimes easterly winds, with a gloomy black sky, accompany it. The wind may move to the south-east in summer

bringing very hot weather from the Continent.

A minor cyclonic phenomenon is the 'secondary', which can be recognised by angry gusts of wind and rain, changing to a steady downpour. The barometer may be steady or even rising. Light streaks and curls, wisps of cloud, and a sky becoming overcast, as with a vapour, are signs of approaching cyclonic conditions. The vapour grows to cloudiness, and if the sky looks oily, or like a beach after the tide has retreated, it is a sign of wind. If watery, be prepared for rain!

The study of cloud forms is fascinating and provides invaluable data about coming weather. The highest type, *cirrus*, ranges anything from 27,000 to 50,000 ft.

One feature of these clouds are the 'mares tails' characteristics. If their under surface is level with streaks upward, rain is indicated; if the streaks point downwards, it will usually be windy and dry.

Cirrus often settles down into *cirrus stratus*, with the look of 'shoals of fish', and the average height is 29,000 ft. These clouds sometimes resemble whales, and when pointing north and south the weather will probably continue fine. When pointing east and west they predict wind and rain, and the sun and moon have halos.

Lower still comes the pretty *mackerel sky* which often occurs during warm and dry weather, although it may herald a shower or two—'not long wet, not long dry'. Another old couplet runs

Approaching cyclonic conditions – and a sign of unsettled weather. Halos around the sun or moon combined with a very 'close' atmosphere are the advance warning signs of a cyclone. As the barometric pressure falls the wind may freshen into sudden gusts or squalls with light rain, to be followed by a heavy downpour with a strong west or west-north-west wind.





Typical fair weather cumulus, which herald good conditions. Note how these clouds have a 'fluffy' appearance, likened to a wool pack or gigantic mountain – quite a contrast to the sharply defined cumulus shown on the previous page. If this cumulus turns into nimbus by increasing in size and then flattening out while becoming darker, then rain is due.

Mackerel sky and mares' tails

Make lofty ships carry low sails

The wind is usually in the direction of the tails. When the weather is hot, clouds moving in different directions presage thunder.

The majestic piled clouds of a summer's day sometimes compared to a wool pack or gigantic mountains, are generally a good sign. One or two variations are worth remembering.

If these cumulus clouds grow big during the day, and diminish at evening, fine weather may be expected. If they increase and then flatten out and become darker, forming the *nimbus* (rain) cloud, there will be rain in the evening. Sometimes cumulus are piled and rocky, and not so woolly as usual – and this is a sign of squalls. When the clouds rise towards sunset, thunder often occurs during the night. In winter, if the day is fine and cumulus appear in the south, they speak of snow.

During a cyclonic disturbance, even if it is still raining, look to the horizon. The sky clearing in the form of an arch is an infallible proof of fine weather nearing. The arch grows, sweeps over the sky, and the sun appears – this has proved to be true time and again. Another phenomenon, difficult to account for, is the way in which a full moon clears the sky. 'A full moon eats clouds' is true ninety-nine times out of a hundred – even after a day of rain, at moon-rise the sky will clear.

In the days of sail, mariners studied the signs of the weather even more than now and found

that a change often takes place at the hours of three, six, nine and twelve. If it rains at three o'clock it will keep on till six, and if it does not clear up then it will continue till nine, and so on. Observation of this may save you a drenching!

Generally speaking, soft quiet tones at sunset betoken fine or settled weather. A yellow sunset is a forerunner of wind, and a pale yellow sunset of rain. The tag 'evening red and morning grey, help the traveller on his way' may be hackneyed, but it is one of the most reliable. A red morning is almost certain to be followed by unsettled weather.

Flowers and animals are sensitive to weather changes. In the garden tulips, poppies, marigolds, anemones, and in the wild state daisies, dandelions, the yellow hawkweeds, and scarlet pimpernels, draw their petals closer when rain is about. Clover and wood-sorrel foliage is sensitive to rain and cold wind. Under those conditions the leaflets fall and huddle round the stem.

On a fine evening butterflies rest upon the heads of flowers; when rain is close they hide themselves deep inside the flowers or among the leaves.

The *Prognostications Everlasting* (circ. 1556) of Leonard Digges are interesting, and 20th-century observation bears out most of them:

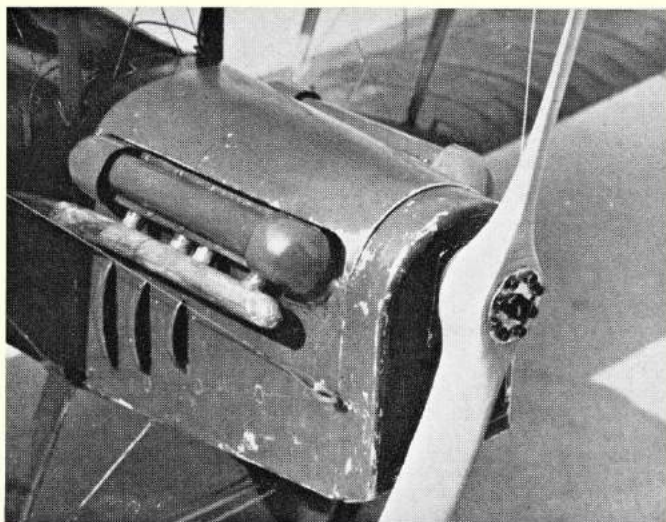
Some have observed evil weather to follow when watry fowles leave the Sea desiring Lande: the crying of Fowles about Waters making a great

Noyse with their Wynges; also the seas swelling with uncustomed Waves: if Beastes eate greedely, making a noyse, breathing up to the ayre with open nostrils, rayne foloweth. Also the busy heving of Moules: the appearing or coming out of Wormes: Hennes resorting to the perche or reste, covered with dust, declare rayne foloweth.

Now, thus armed with a new fund of knowledge, you may set forth to the flying field, confident in your ability to predict the weather! However, just as a precaution, we suggest you take the usual raincoat, leggings and boots in addition to your model equipment!

Cirrus clouds are the highest forming clouds and have a distinctive 'mares tails' appearance.





Nose of the author's B.E.12b - note the general 'war worn' look with paint scratched and dirty exhaust pipes. Cylinder bank cowls are moulded from the acetate sheet. The aluminium disc on the dummy propeller has nuts epoxied on.

Part IX

Important Detail Parts

FLYING SCALE MODELS

by Eric Coates

WITHOUT DOUBT the accuracy and skill with which the detailed parts are executed decides whether the model looks like a realistic replica; or just a toy aeroplane. I have seen the most beautifully constructed scale models, with unblemished finishes, from which the air of realism was completely lacking due, I am sure, to lack of suitable attention to detail. This was noticeable even at the World Championship at Cranfield last year where, with the exception of the top half dozen or so models, the gleaming new toy image was most apparent. Aeroplanes in service, particularly wartime military service, rapidly become very shabby as reference to photographs in the files of the Imperial War Museum photographic library will reveal. Paint scratched or eroded away, dents, ill-fitting cowlings are very much in evidence.

Now I would be the last to uphold the B.E. as a shining example of scale model craftsmanship (it was built far too quickly for that) but it does possess an air of realism, both on the ground and in the air, that many scale models on which many more hours have obviously been spent fail to capture. It is very difficult to put into words just how the air of realism is achieved. Obviously it takes time; spread over a number of models and one cannot expect to achieve it 100 per cent first time. However, in this and next month's articles I intend to discuss the major details

at some length and explain what I think is the best way of reproducing them in a manner suitable for a free flight model where, as ever, weight is of paramount importance.

For the sake of convenience we will start at the nose and work our way back to the tail. This is not necessarily the order in which one should go about the job. This can only be decided by the builder and of course is dictated somewhat by the nature of the prototype. Quite a lot of detail work in fact should be carried out before the painting operation and as mentioned in the seventh article, however, I would recommend test flying the model before any detail work whatsoever is commenced.

Propellers

It is usually quite impossible for the motor in a scale model to operate with a scale propeller. Even though the good old long stroke Mills engines may swing a propeller of scale diameter it almost certainly cannot turn one of such fearsome pitch and blade area, used by vintage aeroplanes, at anything like the revolutions necessary to fly the model. We, therefore, need two propellers: one for flying, and one for scale appearance. The flying prop can be any of the proprietary brands, preferably nylon, about 3 to 4 in. pitch and as large a diameter as the

Blackburn White Falcon, built earlier this year by Eric to 1/12th scale, is 40 in. span and powered by the faithful Mills .75 - whose cylinder head can just be seen lurking in the bulkhead area above the nicely detailed dummy rotary engine. Construction of those distinctive wheels will be covered in next month's issue.





A Blackburn Ripon built to 1/12th scale in 1958 by Eric, uses glass-fibre cowl – very strong and no skill with a hammer needed to produce one of these!

engine will swing; but not exceeding scale diameter of course.

We shall have to make our scale propeller. Even if we do not intend to enter scale contests, for which a scale propeller is essential for static judging, this is a worthwhile exercise even if just for the photographs. Most of the propellers on the aeroplanes we are interested in were made of laminated wood. Sometimes this was left uncovered and varnished – very common on '14-18' jobs, or covered with fabric and doped which was usually the case on later aeroplanes. Very few metal propellers were used before the Second War. If our prototype has a fabric covered propeller we are in easy street – just carve one from a lump of suitable hardwood; mahogany, beech or birch are ideal, and paint accordingly. For a small model, laminated props can be made from compressed laminated wood which goes under the name of Jabroc or Hydulignum. Its most common use these days is for press tools and rubber die presses used for forming light alloy in the aircraft industry. One cannot carve it, but it can be efficiently worked with a rasp; finishing with sandpaper and it takes a lovely polish. Unfortunately the laminations are too close pitched for any but the smallest scales. A propeller was usually made from between 6 and 8 laminations. Therefore, for larger models, of around 1/10 scale, we shall have to lay our own blank up from laminations of mahogany, about $\frac{1}{16}$ in. thick, just like the real thing. Use a good wood glue such as Aerolite and clamp whilst setting, then carve as per a solid prop. The result is very rewarding.

Most propellers had metal capping, usually brass, on their leading edges. On small props this can be represented by brassy paint (gold plus grey). But again on larger props genuine brass sheathing looks far better. The final finishing touch is in the hub. A centre plate is cut from either brass or light alloy and the lightening

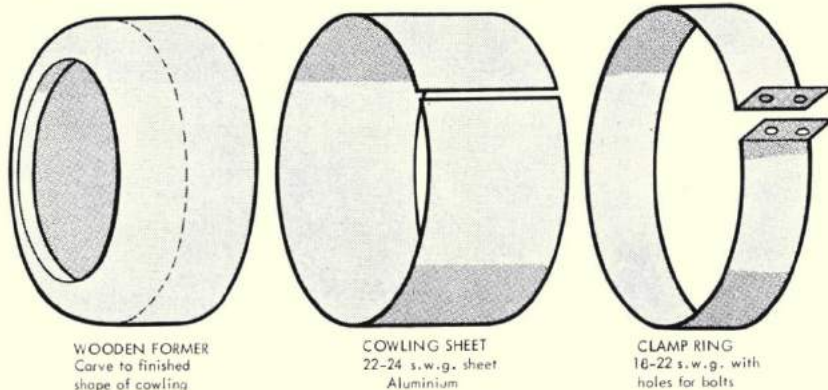
holes, if any, drilled. Nuts of the appropriate size are epoxied to the disc (as can be seen in the photograph of the B.E.), and the whole epoxied to the front of the propeller. Usually the scale hub is of greater thickness than the amount of crankshaft projecting from the driving plate, therefore, the scale propeller can just be a push fit onto the crankshaft.

Cowls

I suppose this item causes more anguish than any other in scale model construction. I am sure more scale prototypes are rejected because of the difficulty of reproducing the cowl, or the exposed engine because of the lack of one, than any other feature. If all cowls were as simple as the A.W. FK8 we would be laughing!

Cowls can be made of any, or a combination of, three materials: aluminium, wood or glass fibre. Aluminium is the strongest and best and essential if it is to remain unpainted. It is, however, undoubtedly the most difficult to work. It is relatively simple when double curvature is not present and foil can be glued over a sheet balsa surface; as described in Part 8. For a removable part such as a cowl top, as on the B.E., it is a simple matter to bend and cut a piece of 22 or 24 s.w.g. aluminium plate to shape. Whilst on the subject of removable cowls I find the neatest and quickest way of retention is by means of a large press stud fastener of the type used on some types of battery. Solder a strip of tin to the backs of both the male and female parts of the stud and then epoxy one half to the underside of the cowl and the other half to a structure, built up from the bearers, so as to allow the two halves of the fastener to mate when the cowl is tight home. The strips of tin are essential to give a large enough area for the epoxy to take the load. If one tries to glue the press stud directly to the cowl it will pull off the first time you remove the cowl.

To go back to aluminium cowl manufacture. Any degree of double curvature will require form blocks to be made. A male block is the simplest and should be carved from suitable hardwood to the finished size of the cowl less the metal thickness; usually 22 s.w.g. Probably the most common cowl shape we are called to reproduce is the circular job used to surround the rotary engines of the First War period or the radials of a later period. The form block for these is best produced on a lathe but can be carved if this luxury is not available. The various stages of bashing the metal to the shape we require it are illustrated in figs 1 – 6. All other forms of double curvature can be beaten in a similar manner, with a suitable block and a fair amount of patience. Sometimes it is necessary to 'lose' metal as the shape is formed. This is best done by judicious nicks in the area of



The only 'special' tools needed to make a circular aluminium cowl are the wooden former and a clamp ring. Cut the material to be used in a strip long enough to wrap right round the block, and approx. $\frac{1}{16}$ in. wider than the total cowl width. Bend this strip around a suitable object 1 in. smaller in diameter than the hardwood pattern so that it finally fits close to the pattern, with the edges just meeting.

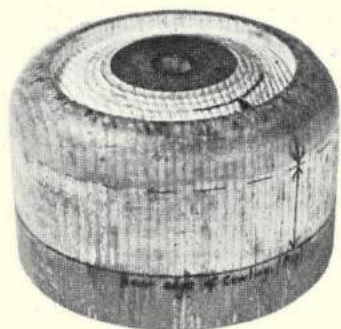


FIG 1. Turn or carve the hardwood pattern to the final cowl shape required, less the thickness of the aluminium sheet.

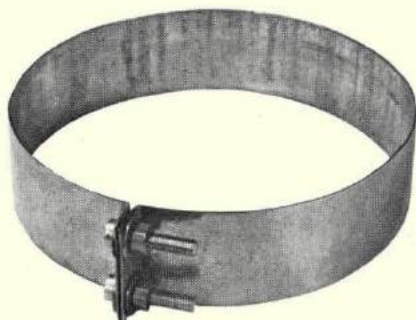


FIG 2. Make a clamp ring from heavier gauge material, allowing for the final diameter. Make as deep as possible – see dimension 'B' in next picture.

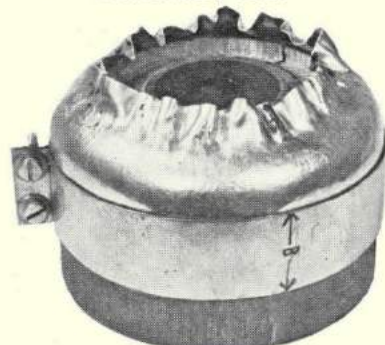


FIG 3. Using a small ball peen hammer, beat the aluminium from the outside towards the centre with the clamp ring bolted firmly in position.

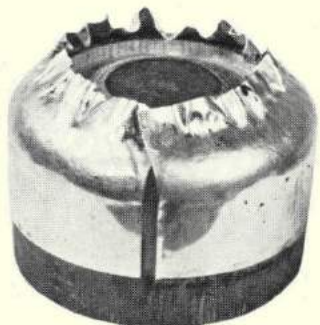


FIG 4. Without the clamp ring, the job would look like this. No need for concern – just keep tapping it to shape, gradually folding the top edge over.

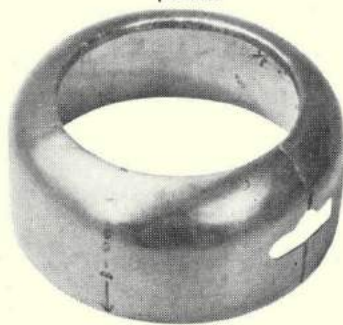


FIG 5. Polish all the hammer marks off with a fine buffing wheel, or by hand with emery cloth. Trim all edges, including the join seam.

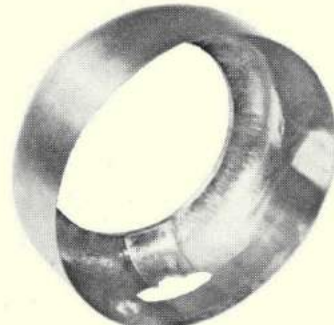


FIG 6. Finish the seam off with a patch of aluminium epoxied to the inside. Give a final polish if the cowl is to be left 'natural'.

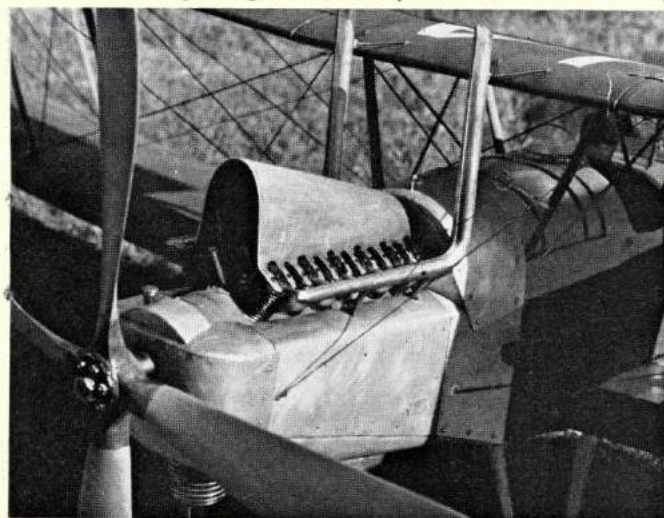
superfluity. These are not noticed when the job is finished and polished. If access to an aluminium welding facility is available then the nicks can be welded, prior to polishing, for a stronger job. With regard to materials always use aluminium and not light alloy which is far too hard to work. The aluminium should be normalised before working. A simple way to do this is to rub soap over the metal and heat, either by means of a blowlamp or a gas ring, until the soap has turned black all over,

then quench in cold water. The soap is used merely as a temperature indicator; it does not impart magical softening qualities to the metal. During beating you may find that the metal work hardens. A further normalising treatment at this stage will make the going much easier. A hide mallet rather than a hammer should be used for beating.

Wooden cowls do not require much saying about them. They are, of course, by far the easiest to make but generally balsa wood is not a satisfactory material. Being at the front end its one major attribute, weight, is of no advantage. Its soft surface is soon damaged by a 'nose scraper' landing which I am afraid occurs all too often on a free flight model. Balsa is best used, where applicable, as a core material on which some other harder material such as metal is laid. In this form it does an excellent job in stabilising the engine bearers. Where balsa is used 'naked' it should be extremely well filled, using primer surfacer, before painting. This will give it a polished metal look – when new at any rate!

The other material for cowls which has crept into fairly general use in the last decade is fibreglass. The cowlings of my Ripon and the Rumpler C.V., both built in the 1950's, were of this material but I must admit I have not used it recently. This is more because the cowls, of models I have made in the last few years, have lent themselves to other methods rather than anything else. Although the actual fabrication of the glass fibre cowl is relatively easy the preparation of the mould is a fairly long job.

The R.E.8 has a typical semi-enclosed engine installation, in this case an R.A.F. V12. J. Moreley's model is most realistic with the engine cylinders having 'wound wire' fins, pressed aluminium exhaust pipes and a simple bent aluminium hood.





Nose of Terry Manley's AW FK8 reveals simple slab sided cowl shape 'plated' with thin dural on top of balsa sheet. Realistic radiator is formed from brass tubing epoxied together.

found Vaseline to do this job as well as any of the proprietary agents.

The glasscloth used for the lay-up should be of the finest weave obtainable. Most grades used for motor car repairs are far too thick; as is chopped strand mat. The resin used should be of the liquid hardener variety. Again the automobile variety with the hardener combined with a filler powder is not suitable as it will not flow through the pores of the glass cloth. Apply a gel coat to the inside of the mould and allow to set before laying up the glasscloth. Two or three layers should be laid up, brushing the resin well in. If tumblehome is present the mould will have to be broken up to release the cowl, otherwise it can be withdrawn allowing the mould to be used again if needed.

Permanent cowls should be attached to the fuselage with wood screws and epoxy resin adhesive, suitable formers being provided for the attachment.

Detailed portions of cowls can be made from a multitude of materials glued on. For non-stressed parts moulded acetate sheet is very useful. The small fairing at each end of the cylinder blocks of the B.E.12b were made in this manner.

Engine details

Dummy engine manufacture is a subject within itself and one can only hope to gloss over the major items here.

The fashionable period for complete engine nudity was the 1920's and early 30's; when the radial engine dominated the scene. Reproduction of such engines is not as difficult as it first appears but when embarking on such a job, bear in mind that your handiwork in this region is in for a good bashing and the lower 'pots' will be removed every time in a heavy landing. Most engines of the 1914-18 period were either totally enclosed or only partially exposed.

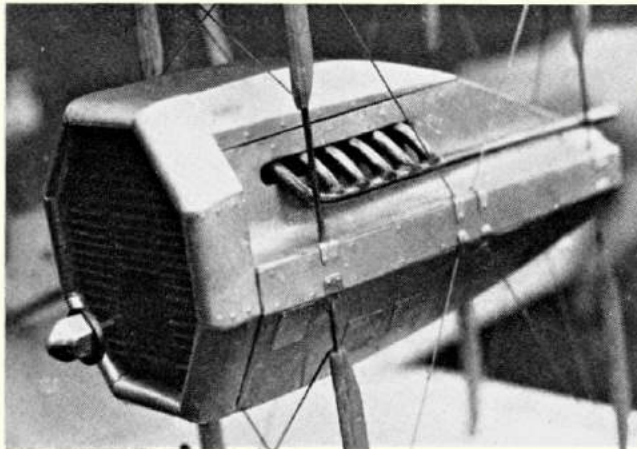
Crankcases are simple - just carve the appropriate shape from balsa and paint accordingly. Cylinders are a little more tricky and because there are a lot of them, tedious. The simplest method is to smear lengths of the correct sized dowel with contact adhesive and wind on black insulated electrical wire of the appropriate gauge. The wire should be similarly pre-coated with contact

continued on page 626

First a male former is carved from wood. Balsa can be used in this case for ease of working as we are not going to beat the living daylight out of it! This time, however, the male mould, as it is known, should be carved exactly to size. Any blisters or excrescences we require can be added at this stage. The whole should now be grainfilled and polished - how well this is done will determine the finish on our glassfibre cowl.

A female mould has now to be cast from plaster of paris, obtained from the local chemist. A suitable cardboard box, or tin, at least $\frac{1}{4}$ in. deeper than the male mould should be now found. The plaster of paris is mixed with water to a creamy consistency and poured into the mould box. The male mould is now pressed into the liquid plaster of paris and held there for a few minutes until set. If any tumblehome (i.e. the top of the cowling is narrower than the widest point) is present then the male mould should be slit, vertically, into three pieces to facilitate withdrawal. The male mould is now withdrawn to reveal the female mould in which we lay up our glassfibre cowl. If any air-bells are present fill these, and then apply release agent to the mould. I have

Nacelle of a Vickers Vimy built by Terry Manley illustrates the good use of 'dirty painted' exhaust pipes. Note also the radiator louvres and authentic plated effect of shim aluminium with embossed rivets.



topical twists

by 'Pylonius'

illustrated by 'Sherry'



'I know it's not perfect, but it is his first model'.

Un-Sporting

ALL THIS TALK about giving model flying the status of a sport is all too mercenary for my liking. I like to be a bit snobbish about our hobby, and I am prepared to sacrifice the dubious financial advantages that may accrue from putting our activity on the same level as mindless ball chasing pursuits such as cricket and football. It may be necessary to send model flying teams abroad in order to prove that the only thing we are good at in this country is football, but I think we have got a bit of a cheek expecting the State to underwrite the excursions considering the oodles of money spent every day on radio gear.

All in all, we would be far better off plying our non-sporting hobby in what is left of our own back garden. The gardens abroad, for all the sportiveness, seem always to be microscopic and inevitably tree-bound, which makes you wonder if the idea is to qualify the hobby as a sport on the strength of the tree climbing athletics involved.

Then again, if, as many progressives hope, we attain to a model Olympics, just imagine the further humiliations that would inevitably be heaped on the long suffering, sport-loving-but-why, British public: *'British hopes of achieving at least one bronze medal in the Model Flying Olympics, now being held in Lower Nepal, were dashed when Tom Flip, the British Chuck Gliding Champion, pulled a hamstring and had to retire from his heat. There is now little hope of Britain doing better than bottom place, just below the South Tibetans who surprised everyone with the creditable performances of their Yak skin covered models.'*

Where There's a Wheel . . .

I suppose we must accept in the interests of realism and ultimate performance the retractable undercarriage to be a most vital piece of equipment, upon the universal installation and infallible functioning of which the future of model flying depends. Trouble is, though, that in spite of all the money the avid affluents are prepared to pay to get this milestone of progress behind them, there are many technical difficulties to be surmounted.

The answer I suggest is to overcome the scale problems involved by building a model as big as a full sized plane. To a small model aircraft the average field is as bumpy and rugged as the lunar landscape, which means it has to land on a surface which, scale wise, only an intrepid stunt flyer would face - no wonder the legs give way. But given a model large enough for the flyer to jump in, this difficulty would not arise. And look at all the money he would save himself in radio gear.

Objection Over-riden

When it comes to the love of the countryside the model flyer has a somewhat jaundiced view. A tree to him is not a piece of living poetry but a fiendish device to ensnare his beloved models, and that field of corn, which might inspire the brush of a Van Gogh, is to him a morass of iniquity where many a gallant model has perished in the suns and storms of late summer. His idea of pastoral bliss is a huge expanse of soft grasses with not a beauteous feature in sight, be it of nature or man devised.

But attainment always falling short of perfection, as it does, we had come to regard choppy Chobham, an almost treeless wilderness, as the ideal model flying field, situated far from the madding crowd and other unwelcome obstructions. But modern progress being what it is, nothing even dimly agreeable can be allowed to go on for long, even if it is only a few people flying model planes on a piece of sandy scrubland. What we needed to make the place a real twentieth century wilderness was a dirty big motorway. Not routed along the outskirts, mind you, that would hardly have had the same devastating effect, but right over those haunts we had all come to know so well.

The only consolation we have is rather a bitter one. You might be sure that, given a few years, the destination of that roadway will be just as urbanised and polluted as the place of origin, which is hard luck on those who hope to get away from it all - they won't even have Chobham.

Happy Blow Down

Reading about the Beaufort Scale, used by those top people who not only want to know which way the wind is blowing but how hard, it occurred to me that we modellers have no such index of relative wind speed, although one could be readily compiled, possibly on the following lines: *Flyable, Well . . . , Shouldn't have come, Last time*, and so on.

For some reason, perhaps known only to meteorologists, the wind speed is always at its highest on a Sunday. Monday is usually spitefully calm, with the wind livening up during the week until on Sunday it is absolutely raging outside, just as you are raging inside, putting the best face possible on that long overdue do-it-yourself job.

But things are changing. Toiling up a slope some time ago, full of the joys of a flyable day, I came across a character sitting at the top with a face as long as his kite. He shook his head in gloomy resignation. *'No wind this morning.'*

'But that's marvellous.'

'What. With a blooming aerobatic glider?'



designed by

Peter Scott

for .020 cu. in. motors

SUN

DOWNER

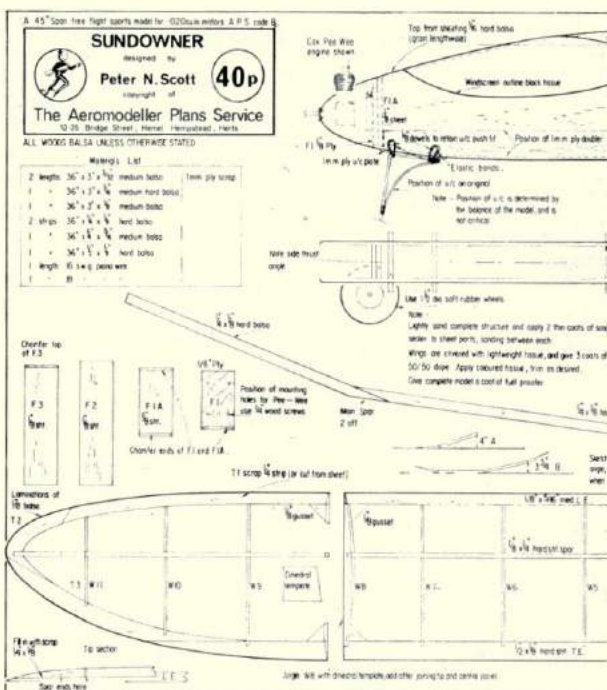
a 45 in. span free-flight
model for beginners,
sports flyers or sufferers
from nostalgia alike!

FREE FLIGHT SPORTSTERS never lose their charm – there is nothing quite so relaxing as flying late into the evening equipped with nothing more than a little fuel sloshing around in the bottom of its container, and of course a well charged battery! Vintage flying is another satisfying sport, but the inherent drawbacks are the relative bulk of the models and their potential proneness to damage. *Sundowner* was thus designed to capture the spirit of the vintage model but on a scale suitable for the ever popular Cox Pee Wee power, and without structural complications or weaknesses. The resulting model really satisfies these demands and its flight performance proved to exceed all expectations. Genuine 'rise-off-ground' take-offs are easily accomplished over short grass, while landings are equally smooth with no 'nose-over' tendencies. The climb is most stable and the glide impressive – so you really can relax with this model, no 'will-it-won't-it' scares as you release it to the skies!

If you've built a few models before, follow your own favourite sequence; if not, follow these notes and you can't miss – construction really is straightforward. Commence with the wings, building a port and starboard section in turn; balsa cement is the quickest, simplest adhesive to use for this purpose. Make-up the two halves of the main spar, using scarf joints at the tip dihedral breaks. Build the centre panels first, remembering to angle R1 with the aid of the dihedral template. (Note: the T.E. is best shaped before assembly; and R8 is added after the tip and centre panels have been joined.) When making the tip panels, prop-up the centre panel by 4 in. under R1 to incorporate the polyhedral angle. Some care is needed when making the tip outline from pieces W1 to W3, but the result is very strong; a piece of the same section as the spar extends from R11 down to W2. Add R8, and the gussets, and one wing-half is complete. Repeat for the other side, then the two halves can be joined by pinning one centre panel to the bench and propping-up the other 3½ in.

under R8. Add the dihedral braces and the centre section sheeting to complete the wing construction. Sand the L.E. and tips to section, and give the complete wing a light sanding. Cover with lightweight tissue, and give three coats of 50/50 dope/thinner; coloured tissue trim was used on the original to give the 'scalloped' effect (using the last coat of dope to adhere this to the covering), then a coat of fuel-proofer is applied.

The fuselage is very robust, and straightforward. Only a dozen pieces are required, so cut all these out before assembling. The sides are from ⅜ in. medium grade straight-grained balsa, the bottom and

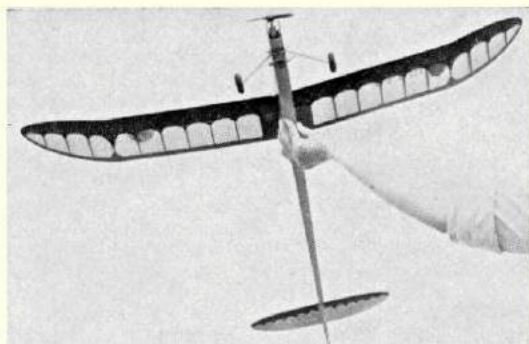


FULL SIZE COPIES OF THE 1/5TH SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. FSP 1137, PRICE 40p PLUS 5p POSTAGE, FROM AEROMODELLER PLANS SERVICE, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

the tailplane horizontal by a simple 'eyeball' alignment on the wing, as viewed from the tail end. Glue the subfin to the bottom of the fuselage, and when everything is dry, fit the trim tabs and skid, securing each with a little epoxy resin. Remove the wing, and give the fuselage and tail assembly two light coats of sanding sealer, sanding gently after each coat has dried. This will produce a smooth surface finish, which will not require tissue covering for either strength or appearance – unless a coloured fuselage is desired. The 'windows' are black heavyweight tissue doped on to the fuselage; coloured tissue cut in the same pattern as that applied to the wing can be doped on to the tail if desired. Give the complete fuselage and tail a coat of fuel proofer, two around the engine bay.

The undercarriage is made out of four pieces of wire – the assembly may seem unduly complicated but is both practical and helps to lend a touch of 'authenticity'. Use some fine tinned copper wire to bind the components together before soldering them – L2 to L1, L3 to L1, then the L4 pieces to L1 and L3. The pieces of electrical insulation sleeving pushed over L1 and L3 before making the final bends are worthwhile, to prevent undue marking of the bottom of the fuselage. Use 1½ in. diameter soft rubber wheels.

Screw the engine to F1 in the positions shown, using four short (¼ in. to ½ in.) wood screws. Attach the wing to the fuselage, hold the U/C in place temporarily with masking tape, and test for balance by supporting the wing tips under the spar. The U/C position may be altered from that shown on the plan without affecting ground stability or appearance, and by using the U/C to balance the model rather than, say, lead weights or plasticine, the overall weight can be kept down. When satisfied that the model balances horizontally (and if a *small* amount of balast has to be added to the nose or tail to achieve this, no matter), remove the U/C, drill the holes for the dowels (which are again a 'push-fit'), and finally glue on the U/C plate, which extends across the width of the fuselage. Remember to give these items a dab of



The high aspect ratio wing and long fuselage are evident in this picture. Very good glide available from this lightly-loaded design.

fuel proofer before test flying. The completed model should weigh not more than about 7 oz.

Flying

If you are blessed with a pet 'met-man' and a friendly local farmer, choose a calm day and long grass for testing. Adjust the glide trim with packing under the L.E. or T.E. of the wing (to cure a dive or stall respectively). Fill the tank with the model turned on its side, through the 'top' vent until fuel runs out through the 'bottom' one – this will give about ⅓rd of a tankful of fuel, which should give an adequate engine run. Any of the standard Cox props as supplied for the Pee Wee are suitable, although the 4 in. x 2½ in. has been found to give the best results. Use the trib tab to give a left-left flight pattern (about ½ in. to the left is enough for this, assuring there are no built-in warps and the sidethrust angle is as shown). Take-offs and landings on smooth grass are a pleasure, and the low wing loading gives a good glide. Please remember to add a name and address label: most people are honest – if you lose your model and it's found, you stand a better chance of getting it back that way.

FLYING SCALE MODELS

continued from page 622

adhesive. Valve gear is simulated with bits of wire, tin and spruce.

Exhaust pipes are best made from thin aluminium tube, stubs being epoxied in place. Bending can be usually performed cold. Open ends can be plugged with wood. Plugs and epoxy are suitably camouflaged by 'dirty painting' – this is not the pornographic sort but a mixture of dirty pink and black, plastered on thick and rubbed about with the finger until a suitable burnt streaky effect is produced; with patches of aluminium showing through. This type of paint application takes a bit of practice. If not satisfied with the first attempt wash it off with thinners and have another go. The best effects are obtained fingering when the dope is almost dry and tears to the touch.

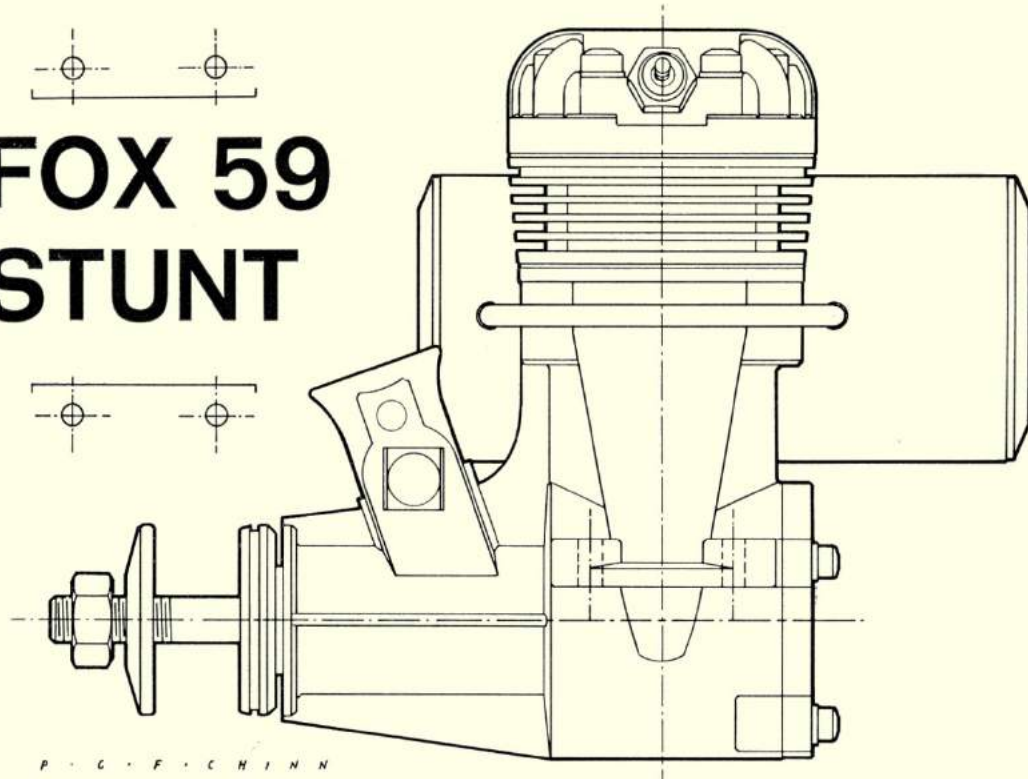
Radiators, where applicable, have to be treated strictly on their merits. Some are plain honeycombed; as on the B.E. whereas others have an elaborate arrangement of shutters; as on the Vimy. Perhaps the most well known shuttered radiator is the Wolsley Viper installation on the S.E.5.a. The shutters are best made from strips of 1 m.m. ply and laid over the radiator, between the vertical members, which can be made of the same material. The shutters look best when glued approxi-

mately 30° to the horizontal. The radiator itself is of soft balsa, the honeycomb being simulated by means of a hard, sharp pointed, pencil poked in a random fashion over the front surface. If the radiator is not of the shuttered variety then brass gauze makes a neater radiator front at the same time allowing cooling air to pass through to the engine. The sides of the radiator should be 'metalized' by one of the methods previously described.

Before embarking on a detailed reproduction of an engine I would recommend, if at all possible, a visit to the Aeronautical Collection at the Science Museum. In addition to the many aeroplanes on display there is an extensive collection of aero engines on view. Virtually every British piston engine is represented and quite a few of the prominent foreign types also – two or three photographs of the appropriate engine can save an awful lot of guesswork.

Scale drawings and photographs of aeroplanes very rarely show, in a manner satisfactory to the modeller, the power plant. Unlike many foreign museums there is no restriction whatsoever on photography in any British establishment even if now a small admission charge is to be levied.

FOX 59 STUNT



ENGINE TEST by Peter Chinn

of one of the largest control-line aerobatic motors

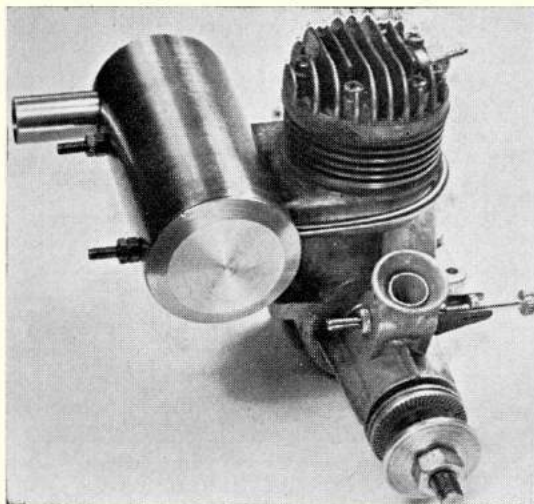
BACK IN THE LATE NINETEEN-FORTIES when control-line stunt flying was at the peak of its popularity, the favoured power unit for top-class competition work was a large engine of around .60 cu. in. capacity, with the American Super-Cyclone and Atwood Champion (or Glo-Devil) proving particularly successful – especially in the U.S. Then came the slower flying, large-area model, with coupled flaps, that flew on its wing rather than its prop, and the engine that dropped neatly into this new formula and set a standard for the best part of two decades afterwards, was the Fox 35.

For the past two or three seasons, however, it has been apparent that there is now a trend towards larger models and a swing back to more powerful engines for international contest work. This was clearly confirmed at this year's Criterium of Europe meeting where nearly two-thirds of the models entered were powered by engines in the .40-.50 cu. in. group.

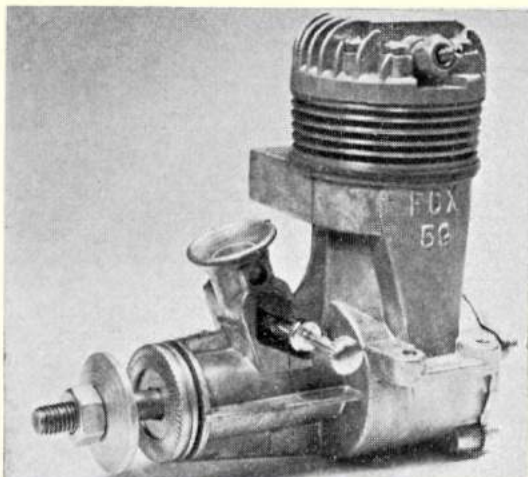
In the January issue *Engine Test* we featured one of the recent additions to this new generation of C/L stunt engines in the shape of the O.S. Max-H. 40-S. This month we are dealing with a much larger engine of considerably older lineage, the Fox 59 Stunt.

The present stunt type Fox 59 actually dates back to 1954 when the factory brought out the first front

rotary-valve plain bearing model. Prior to this, the Fox 59 had been a rear induction twin ballbearing engine: originally (in 1947) with a disc valve and spark ignition and then (in 1951) with a drum valve and glow ignition. Since 1954, numerous modifications have been made to the 59 Stunt, including a switch from lapped cast-iron pistons to ringed alumin-



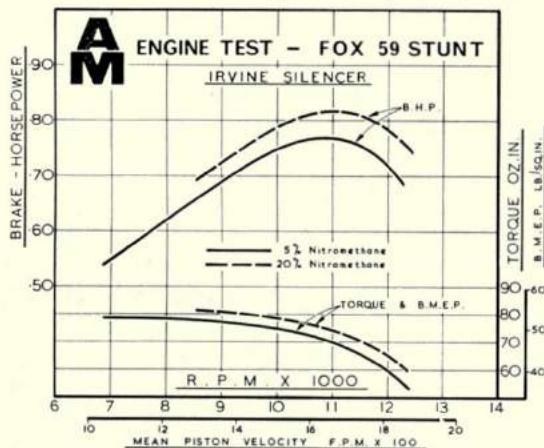
Fox 59 Stunt as tested with Irvine silencer. Discoloured cylinder head (fried castor-oil) is characteristic of this model.



The highly individual Fox 59 cylinder shape - the engine could never be mistaken for any other make. Uses Desaxe cylinder arrangement, very wide exhaust ports, narrow transfer, and an unusual combustion chamber shape - as seen in photo below.

ium ones (originally pressure diecast, then gravity cast and now machined from bar stock) and changes to crankcase, crankshaft and connecting-rod design and to port timing and compression ratio. Despite all these changes, the present Fox 59 still bears a strong family resemblance to the first Fox 59 marketed nearly twenty-five years ago. This is entirely due to the engine's distinctive crankcase and cylinder styling, including the very deeply finned cylinder head with ignition plug installed in its side, the big rectangular exhaust duct, narrow tapered transfer passage and high placed beam mounting lugs.

Other out-of-the-rut features of the Fox 59 are its cylinder porting (exhaust port area twice that of the transfer ports and extending well over half way around the cylinder bore) its Desaxe cylinder arrangement and its asymmetric domed seven-screw cylinder head. Cylinder port timings are conservative (exhaust period 121 degrees of crank angle, transfer 108 degree) contrasting with a 55 deg. ABDC - 55 deg. ATDC rotary valve timing and a fairly generous (for a stunt engine) carburettor effective choke area of approximately 27 sq. mm.



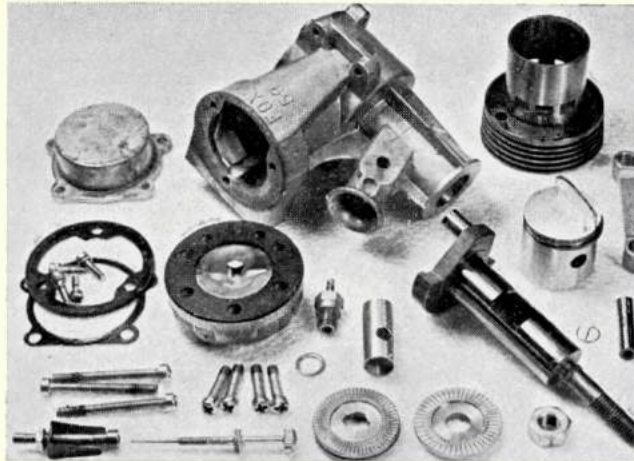
Performance

For the initial running-in period we used, in the interests of cool running and good lubrication (and economy), a plain 3-to-1 mixture of methanol and castor-oil, without nitromethane. It was soon evident, however, that a straight mix would not suit this engine too well for regular use. With (after adequate running in) the engine leaned out to maximum r.p.m., there was, on straight fuel, a marked loss of power when the plug lead was removed and, using a Top-Flite Power-Prop of the recommended size (11 x 8), the 59 was hard-pressed to struggle up to 9,400 r.p.m.

The Fox company does, in fact, recommend the use of a fuel of medium nitromethane content (specifically Fox Missile Mist) for the 59. 'Missile-Mist' is not available in the U.K. and the equivalent would be a blend having a nitro content of around 20-25 per cent. Such a fuel is apt to be rather expensive outside the U.S.A., so we tried a compromise in the shape of the 5 per cent pure nitromethane (equivalent to 7-8 per cent commercial denatured nitro) blend normally used for our tests of stunt engines. This helped matters considerably, adding 300-400 revs. There was still a slight drop when the battery lead was removed but the engine regained power as it warmed up. Nevertheless one is bound to have some doubts as to whether 5 per cent nitro would be adequate under C/L stunt flying conditions where the engine is set up to suddenly switch from a rich, cool, reduced power setting for level flight to a leaned-out full power two-stroke through manoeuvres.

Here we must mention that the engine under review has a lower compression ratio than some earlier models, which would almost certainly have some effect on the engine's fuel requirements. The best advice that one can offer, therefore, is that the Fox 59 owner should try fuels of varying nitro rating in order to establish the mixture best suited to his particular engine and operating conditions.

As the performance curves show, although more power was available when using a fuel containing 20 per cent nitromethane compared with one of only 5 per cent nitro rating, the increase was not such as to make 20 per cent nitro necessary solely in the interests of power. The improvement when using 5 per cent as opposed to no nitro at all was just as good and, from the economy standpoint, the average user would, therefore, do well to use the lowest



nitro percentage consistent with his particular engine's ability to function satisfactorily through manoeuvres.

All our tests were carried out with an Irvine silencer fitted. This has a generous outlet area (almost 100 sq. mm.) and does not absorb too much power. On props matched to the engine's b.h.p. peaking speed, r.p.m. loss was in the region of 300-400.

The handling characteristics of the Fox 59 Stunt were fairly orthodox. Starting was straightforward once the engine was sufficiently run in. It responded best to a fairly generous prime when cold and to just choking the intake for one flick of the prop when restarting warm. Hot restarts, as with many new engines, were a little slow at first, but were quite O.K. once the piston rings had bedded in sufficiently to improve hot compression.

Prop revs recorded by the Fox 59 Stunt, using 5 per cent nitro fuel and the Irvine silencer, included 9,200 r.p.m. on an 11 x 8 Rev-Up, 9,500 on an 11 x 8 Top-Flite maple, 9,700 r.p.m. on an 11 x 8 Power-Prop maple, 10,300 r.p.m. on an 11 x 8 Power-Prop standard, 9,500 r.p.m. on an 11 x 7½ Bartels fibre-glass, 10,000 on an 11 x 7½ Rev-Up, 10,700 on an 11 x 7½ Power-Prop maple, 10,250 on an 11 x 7 Top-Flite maple, 10,300 on an 11 x 7 Power-Prop maple, 10,500 on an 11 x 6 P.A.W. Trucut and 11,100 on an 11 x 6 Top-Flite maple.

The Fox 59 Stunt is one of the very few large engines still manufactured that was designed and developed specifically for C/L aerobatics and, as such, is lighter (only 11.8 oz.) than more recently designed 10 c.c. class motors intended primarily for R/C work. It offers a good power/weight ratio and is reasonably priced.

Power/Weight Ratio (as tested with Irvine silencer):

0.86 b.h.p./lb. on 5 per cent nitromethane fuel.

0.91 b.h.p./lb. on 20 per cent nitromethane fuel.

Specific Output (as tested with Irvine silencer):

80 b.h.p./litre on 5 per cent nitromethane fuel.

85 b.h.p./litre on 20 per cent nitromethane fuel.

SPECIFICATION

Type: Single cylinder, air-cooled glowplug ignition two-stroke. Shaft type rotary-valve induction and bronze bushed main bearing.

Bore: 0.907 in.

Stroke: 0.906 in.

Swapt Volume: 0.5852 cu. in. (9.590 c.c.)

Stroke/Bore Ratio: 0.999:1

Checked Weights: 335 grammes - 11.82 oz.

(less silencer)

408 grammes - 14.40 oz.

(with Irvine silencer)

General Structural Data

Pressure diecast aluminium alloy crankcase/main bearing unit with cast-in bronze main bearing bush. Detachable rear crankcase cover secured with four screws. Hardened steel counterbalanced crankshaft with 0.502 in. dia. journal, 0.406 in. bore gas passage and 0.250 in. dia. solid crankpin. Machined aluminium alloy piston with baffle and two compression rings. Hardened steel 0.219 in. dia. tubular gudgeon-pin retained by wire circlips in piston. Machined aluminium alloy connecting-rod with plain eyes. Hardened steel cylinder with integral cooling fins. Pressure diecast aluminium alloy cylinder head with deep cooling fins, inclined side-mounted, glowplug and secured with seven head screws three of which pass through cylinder fins to tie complete cylinder assembly to crankcase. Aluminium alloy carburettor choke restrictor retained by spraybar assembly. Steel prop driver. Beam mounting lugs.

OPTIONAL EXTRA

Irvine machined aluminium alloy expansion chamber type silencer with side outlet available from U.K. distributor.

TEST CONDITIONS

Running time prior to test: Approx. 2 hours.

Fuels used: (i) 5 per cent pure nitromethane 25 per cent Duckhams Racing Castor-oil 70 per cent methanol.

(ii) 20 per cent pure nitromethane, 25 per cent Duckhams Racing Castor-oil, 55 per cent methanol.

Glowplugs used: Fox standard long-reach as supplied.

Air temperature: 13 deg. C.

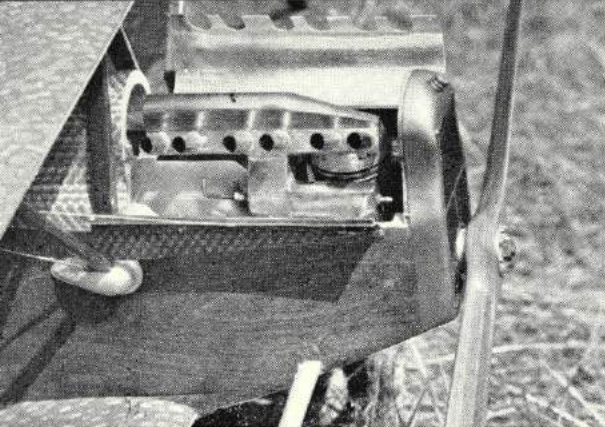
Barometric Pressure: 30.10 in. Hg.

Silencer: Irvine Mk. I as recommended.

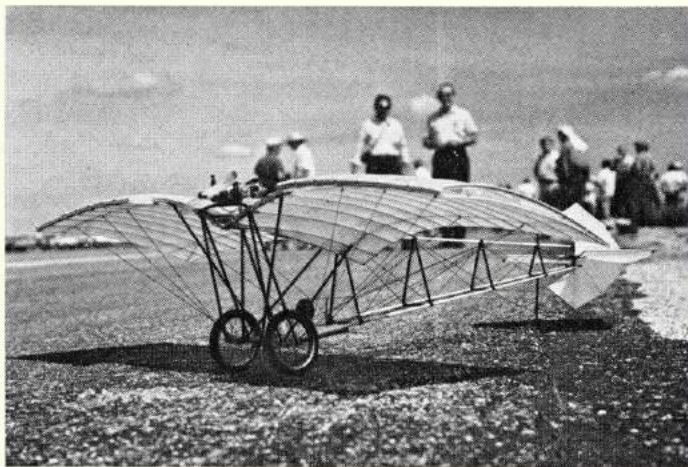
CONTEST CALENDAR

- October 17th** LONDON AREA GALA. F/F: F.A.I. R/G/P (Rds from 10 a.m.). Cd'H. A/I. Open Power, Chuck glider C/L: F.A.I. T/R Combat, Goodyear, Stunt, H'cap speed. R/C: Class II scale, 25p entry, Juivers 15p, 10 a.m. start, Venue R.A.F. Wyton (4 miles N.W. St. Ives, Hunts.). S.M.A.E. & R.A.F.M.A.A. members only.
- October 17th** WHITEFIELD M.A.C. 'KNOCK-OUT' GALA. Open R/G/P to Whitefield K.O. rules. Chuck Glider (N.W. rules), Combat. S.M.A.E. members only. Entry by 11 a.m. Trophy plus plaques all events. Details M. C. Reeves, 25 Ashmont Drive, Mizzzy Road, Rochdale, Lancs.
- October 24th** SOUTHERN GALA. Open R/G/P, ½A Power, Chuck Glider, ½A Team Race and/or Goodyear, F.A.I. T/R, C/L Stunts, Combat, R/C Aerobatics at R.A.F. Odiham, Hants.
- October 24th** NORTHERN AREA GOODYEAR MARATHON. One-hour event for C/L Goodyear racers. Details (S.A.E.) from J. C. Horton, 10 Lawn Avenue, Burley-in-Wharfedale, Ilkley, Yorks LS29 7ET. Venue Topcliffe - no spectators.
- October 31st** MIDLAND AREA R/C & C/L MEET. R/C: F.A.I. Pylon Trophy, Spins & Spot landing. 'Le Mans' - details T. Isom, 64 Cuffling Drive, Leicester (phone 873 835). C/L: Stunt, Combat - details B. Parkinson, 14

- Kenilworth Drive, Beeston, Notts (phone 252 645). 10 a.m. start (Pylon 12.0 p.m.). Money Prizes. Pre-entry 25p, field entry 50p. Venue Wymeswold Aerodrome, Leics. (on Horton-Wymeswold road east of Loughborough).
- November 7th** WHARFEDALE '12th RUFFORTH 1000'. One thousand lap C/L race Class B, A-rat, Goodyear and F.A.I. racers. 60 ft. lines and 30 c.c. max. tank capacity. No spectators. Details J. C. Horton, address above, Venue R.A.F. Rufforth, Yorks.
- November 14th** OPEN F/F COMP. Open G/P (3 x 3 min.), Cd'H (5 x 2 min.). Experimental Open Rubber (one flight unlimited duration - launch 4.00-4.10 p.m. No attempts). Chobham Common, 10 a.m. start, 3.45 finish (except Open Rubber).
- November 28th** ST. ALBANS M.A.C. WINTER GALA. F.A.I. R/G/P: Five rounds, 10.30 a.m. start. Also ½A, A31, Cd'H, Vintage (S.M.A.E. rules). Venue Chobham Common.
- SCOTTISH EVENT**
- October 17th** TEAM RACE MEETING. Class ½A, F.A.I. and B. 2 p.m. at East Kilbride.
- November 7th** R/C PYLON RACING at Irvine, 2 p.m. Further details from F.A.A. Secretary, J. E. Glen of 5 Brownhill View, Bonkle, Newmains, Wishaw, Lanarkshire ML2 9QJ.



Above, beautiful turned aluminium engine cowl on Josh Titus' R/C Ansaldo SVA-5. Note how the engine silencer incorporates the scale manifold - real smoke comes out of those exhaust pipes! Super Tigre 60 with 16 in. x 4 in. prop fitted, together with Kraft R/C, but model not flown at Nationals. At right, a 2 in. = 1 ft. scale 'La Demoiselle' for free flight built by John Arthur, powered by a Cox .049. Just look at those bracing wires!



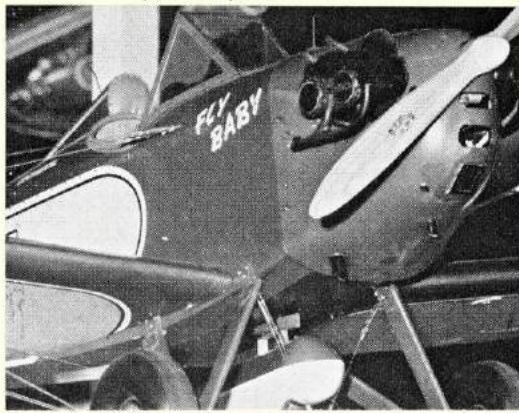
Above, Paul Martin's most ambitious and impressive R/C model - a Boeing 707. Power is supplied by two Super Tigre 60s, neatly embedded in the inner jet nacelles - only the prop nut gives the game away when the engine is running.

Right, beat that for realism! The 15 lb. Boeing lifts off from its multi-wheeled undercarriage - which seconds later retracts under its home-built pneumatic operation.

Below, Dave Platt was out of luck with his highly pointed Me109 - stall on take-off removed the nose section, which he then repaired for the next day, when the retract u/c collapsed. Micro Avionics R/C and O.S.60 Gold Head used in the 9½ lb. ship.



Below, Walt Moucha's 84 in. span 'Fly Baby' which placed sixth in the R/C event is the same model which placed 5th at the '70 Scale Internationals at Cranfield. Very nicely detailed Volkswagen engine. Note turnbuckles on bracing wires rivets, prop 'decal', etc. - all add up to an almost perfect replica.

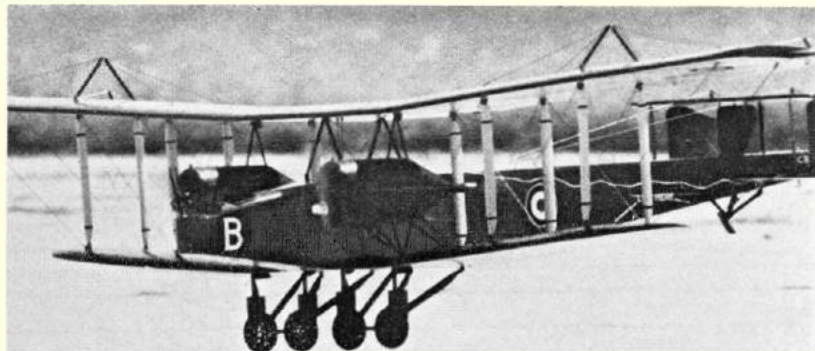




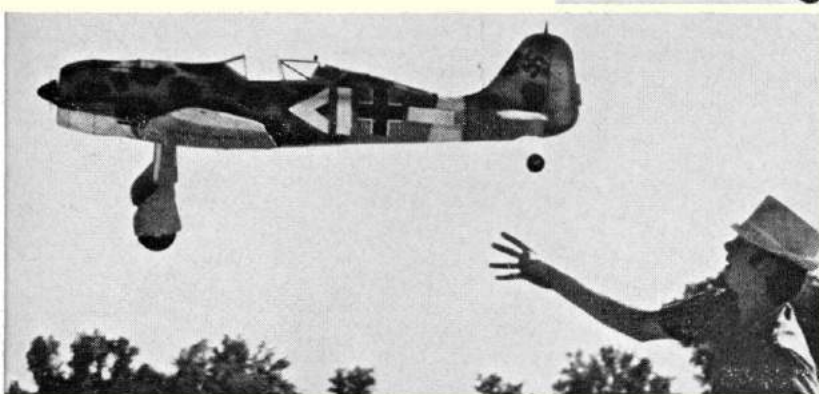
Above, a Super Tigre 60 lies buried beneath the aluminum, engine-turned cowl of Ed Ellis' 'Spirit of St. Louis'. Dummy engine and beaten spinner are works of art in themselves. Model flies well with Kraft R/C despite weighing 10½ lb. At left, superb 47½ in. span rubber powered Bristol M-1D to 1.55 in. = 1 ft. scale. Built by Ronald Martelet, this is a regular F/F scale competitor, and flies as well as it looks.

RADIO CONTROL THE U.S. NATS

of the incredible machinery at



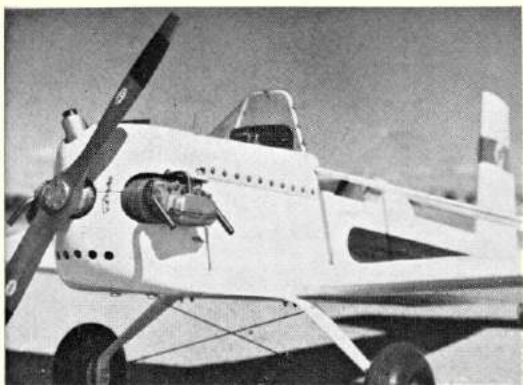
Above, the *Best Flight Achievement* award went to the Handley Page 0/400 by Ralph Jackson which was powered by a pair of O.S.30's completely buried in the engine nacelles. Even the wings fold as per original! Very stable in flight, weighing just 8½ lb.

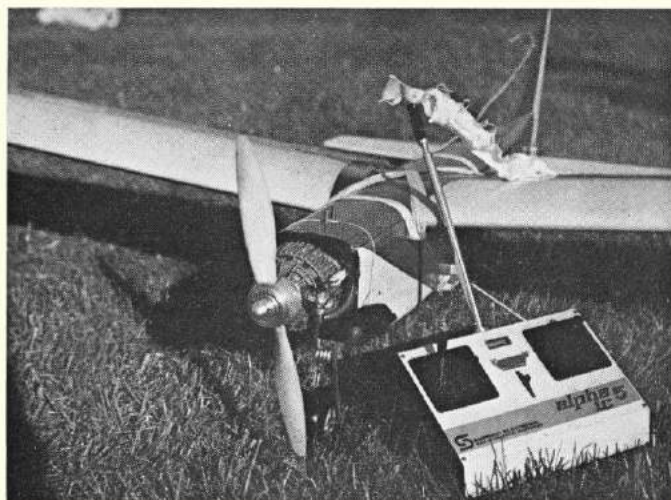


Left, no, it's *not* R/C! 17-year-old John Glab launches his enormous (2 in. = 1ft.) Focke Wulf free flight model. Brave man . . . !

Below, another view of Glab's F.W.190A shows its huge size (for F/F) - 68 in. span and weighing 3½ lb. Power supplied by a McCoy 19. What do you say to that Mr. Coates? Certainly one of the most spectacular achievements to be seen at the meeting.

Below, quarter-scale 'Volsplane' was made by John Roth and is powered by a Ross Twin. Note how dummy Volkswagen cylinder head/rocker box cover is grafted on to the cylinders of the Ross. Very simple subject built to such a large scale is difficult to fault, particularly as it flies well - hence its 3rd place in R/C event.





WANKEL POWER

in which Rex Boyer
takes to the air with
the O.S./Graupner
Wankel rotary engine

Cast alloy radial mounting ring of the Wankel proved easy to mount on the Tauri, despite 'conventional' bearers having been originally installed. Compact size of the receiver and servos made R/C installation very simple.

LOOKING AROUND the model room for something suitable in which to test the Mainstream ALPHA 5 proportional R/C gear, my eyes came to rest on a modified A.P.S. *Tauri* which had been butchered (by simply sawing off the original nose and epoxying a plywood facing to the truncated fuselage) to make it possible to install the OS/Graupner Wankel engine. After due consideration it was thought that two birds could be killed with one stone, so off came the dust, in went the Alpha 5 (4 servos) and a series of bench runs on the Wankel commenced.

We had heard all sorts of tales about Wankel engines, some good, some bad. To make life easier an electric starter was used to fire up the engine when it was the order of the day for a cold start. Once run was soon found that flooding, as distinct from priming, however, the mixture could be leaned out immediately the engine came to working temperature – which did not take long. The major problem was found to be getting your fingers in to adjust the needle valve, situated as it is right against a very hot silencer, and I do mean hot.

After much 'bench running' in the airframe a 10 in. x 6 in. prop was found to give about the best results. An 8 in. x 6 in. naturally gave better r.p.m., but the engine temperature, to say the least, got very high! Fuel used at all times consisted of 5 per cent nitro, 20 per cent castor oil, and the remainder Methanol.

On the question of plugs, it was found that maximum power was realised with the Graupner plug supplied, but without a doubt the best low speed running, coupled with almost as much full power, was with a Merco plug. It is possible to run the engine at minimum r.p.m. for a full tank of fuel (some 15 minutes) and then, just before the tank is empty, snap the throttle wide open and ZING!! You have full power. In fact, I found that the Wankel is just about the most progressive-throttling engine I have ever used.

Now to the flight testing. Not knowing just how much power the engine gave, and also with the *Tauri* being a bit on the heavy side, the first flight was made with a hand launch. It was very quickly evident that there was ample power available and the climb-away was, to say the least, rapid. Having gained safe height the in-flight throttling of the engine was tried, where it was found that the model would maintain height on just about $\frac{1}{4}$ throttle, and pulled right back, the

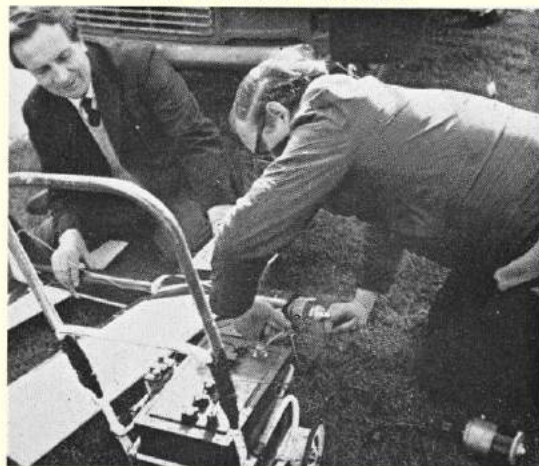
approach could be made slow and flat. Many snap throttle-openings were tried in that first flight, just to see if the engine behaved as well in the air as on the bench, and it certainly does.

I have long since learned how to start it almost instantaneously and on occasions have even flick started it, just to prove it could be done – but being basically a coward at heart this is not a common sight! Since learning the hard way that propellers fast chop up fingers, I nearly always use the electric starter – in fact, my popularity at the local club can be definitely attributed to this handy device.

Of the radio gear, there is nothing to say! It just gets changed and flown (frequently!) with absolutely no problems – even when the speed of the *Tauri* and the inexperience of the pilot has given the equipment some pretty stringent range checks, it has always performed perfectly.

So there it is, a unique but very useful, usable engine, quite economical on fuel, backed up with a set of reliable R/C equipment – what more does one need?

Disused baby's wheel chair takes the effort out of transporting a bulky 12 volt battery for the electric starter! Engine would start by hand, but a mechanical starter proved preferable to preserve one's digits.





FREE FLIGHT COMMENT

by John O'Donnell

Alan Jack has managed to find yet another adaption for the ubiquitous glass-fibre rod – in this case neatly grafted on to the rear end of the rolled balsa motor tube of his Wakefield.

COVERAGE OF THE 'Domestic scene' has suffered over the last couple of months due to the demands of the World Championship reports, so these *Comments* will attempt to redress the balance to some extent. Maintaining some measure of completeness means encompassing a lot of ground – and will preclude my mentioning many winners by name. Reference to the tabulated results should help 'complete the picture' for those interested.

First meeting after the Nationals was the York Rally, held at Elvington on 6th June. After two years of staging this meeting in the Autumn (and suffering from mist, wind and date clashes) the host club advanced the date for 1971. They must have regretted the move as they could hardly have picked worse weather! It was overcast, wet at times, and windy and moreover the wind was blowing in an unfortunate direction that took models across the narrow (even if two miles long) airfield, over a couple of derelict hangars, and on to cultivated farmland. This combination, not unnaturally, kept many potential entrants from participating – and others from persevering.

With the substantial prizes guaranteed by the York Club this situation could have been a financial disaster as well – except for their system of charging a combined admission-cum-entry fee. This idea seems acceptable to the modellers, and yet yielded sufficient revenue to enable the loss on the meeting to be kept within bounds. The 'big money' was offered in the Glider event, flown to five flights, and naturally attracted most entrants. Conditions were difficult; with gusts violent enough to break glider wings on tow, and strong turbulence. There was lift present but it was hardly plentiful, as a mere seven maxs recorded in the whole event reveals.

David Barnes of Liverpool, and still a junior, proved a clearcut winner of Glider with two maxs and three quite respectable other flights. He was flying a glass-fibre rod version of the *Accipitor*, that was unusual in its use of silk covering on the wings. Norman Duncan placed second, despite a late start, by managing a row of relatively modest flights, that permitted quick recovery. Third was Martin Dilly, on holiday in the North, and missing his own club's F.A.I. Gala at Chobham (a meeting about which I have seen or heard nothing, directly or otherwise). Only another half-dozen of the glider fliers finished their flights, with most retirements coming after only one or two flights.

Chuck glider was quite well supported – as often happens in the North when the weather is rough. It would seem that modellers will compete in this event rather than risk loss or damage in other categories. Tony Cordes won by virtue of managing two maxs of 1½ minutes. I need hardly say what his model used for a fuselage! Norman Duncan collected his second second-place, with Barry Kershaw 'below par' at third.

The Rubber and Power events were fought out by a comparative handful of entrants with the top two positions decided by the odd flight 'dropped' out of the three. Russell Peers won, despite his first flight being clocked-off early when the model disappeared into a patch of mist. As the model remained in the downwind crops he was forced to change to a much larger reserve. Alan Jack started well, but a broken wing necessitated use of an inferior reserve, and a poor last flight.

Power provided a surprise with the day's only perfect score coming from Brian Hooley flying an all-sheeted F.A.I. model. Power unit was a stock G15 doing 22,500 rpm on a homemade 7½ in. x 2½ in. glass fibre prop. Although the high revs might be attributed to the low pitch, Brian chose the size on the basis of height gained on test with a range of prop pitches. Several modellers have been seen with

homemade g/f props of late, the usual technique being to cast a two-piece mould round an existing prop, then impregnate a 'bundle' of glass strands with resin and shape them by clamping between the mould halves. Brian used 'Plastic Padding' for the mould with Isopon resin, and glass strands pulled out from coarse mat for the actual prop.

I had a very expensive day – all to record just two maxs in the power event. My OS35 model was disturbed by a gust just after launch with a disastrous effect on both the power pattern and model. This forced me to fly the HP15D F.A.I. model as reserve – and to spend the rest of the day searching the heavily cropped farmland for it. I did get it back after the harvest, with neither the model nor motor improved by their exposure to the elements. Bradley of Grimsby flew a rather small model to total enough to take second place – a few seconds above my own score.

The June Area Centralised meeting seemed to have reasonable flying weather throughout the country – if the score sheets are any guide. There were two perfect scores in the Wakefield (or F.A.I. Rubber, or F1B) event for the Western Cup. The fly-off was quite decisive with Bill McGarvey managing over seven minutes on the 'unlimited' eighth flight. He flew at Chobham in very nice weather, and picked his own lift on some flights at least. The model was quite conventional and several seasons old.

Runner-up was Barry Halford flying with the East Anglian area at Walton. They had very changeable weather, starting warm and calm, then having heavy rain prior to a pleasant enough afternoon. By fly-off time it was getting cold and windy – and Barry could only record 1:49. He had also lost



Pete Whitehead of the York Club did well to achieve second place in A/2 glider at the Syerston meeting, being beaten only by J. O'D out of 76 entries. No perfect scores were recorded.

a new model on his sixth max under a large black storm cloud.

The Open Power contest for the *White Cup* was won by Andrew Brewster who topped the eight-way fly-off with over 5½ minutes. This could have been over seven if he had used a longer fuse on his T.D. 049 *Mini Weaver* surfaced model. Conditions at Topcliffe were overcast and murky all day with drizzle at times – ideal for open Rubber events but not those for which thermals were needed. Pete Branigan, Russell Peers and Mike Duce took the next three power positions, all flying with the NW Area at Cork in very similar weather. Branigan used a T.D.15 in his second-place open model.

There were exactly the same number of fly-off qualifiers in the glider event – and again the winner (Peter Williams) could have recorded a longer flight if he had not D/T'd early – in this case the D/T timer proved the limiting factor. Clifford James was second, well in front of Trevor Payne (flying midst the full-sized gliders at Henlow).

June 20th appears to have been very windy at both ends of the country. The *St. Albans Gala* at Chobham had conditions bad enough for the max to be cut to two minutes, and still prove heavy on models. Further details were in last month's *Club News*.

Perhaps fortunately, I couldn't raise a co-driver to go to Chobham, so went to the comparatively local (only 60 miles or so) *Chester Slope-Soaring* meeting at Clwyd. The free-flight events at this contest have been declining in popularity over recent years, whilst the Radio side has grown steadily in both quality and quantity. On this occasion the R/C models could cope with the extremely windy, gusty and turbulent conditions – and yield a viable competition. Free-flight, on the other hand, was all but 'blown out'. There were several people present with magnet-steered model who either regarded the weather as impossible or 'the game not being worth the candle'. In either case they declined to fly.

This left the senior event to consist of three entries, all from Whitefield. Two of my club members had expendable models – but were sadly lacking in pre-contest trimming. I had the right answer for the conditions – a chuck glider thrown in the usual fashion but from the crest of the ridge. It got away every time – but was tossed about like a falling leaf in the lee of the hill! The Junior contest was a flyover for young Chris Salomon flying a *Mercury Swan*, which drifted backwards into the hill very quickly!

The F/F event was hardly a contest in the true meaning of the term – and brings no nearer the 'better answer' that the Chester club are seeking. They want to turn the F/F event at their Slope soaring rally into something worthwhile, before feeling obliged to go 'all-radio'.

Out of chronological sequence – but worthy of an early mention because of its novelty and implications – was a *Syke-v-Whitefield Junior*. Readers of *Club News* may have noticed that the reports from the Sykes Club make much of the fact that this is an *all-Junior* group. Recently they challenged the junior members of my club to a team event to be flown locally on the moors near Rochdale.

In the present day, a single junior entry in a contest is a rarity. At this inter-club gathering, glider has seven participants and chuck glider three! Whilst the standard of con-

struction and flying is reflected in the scores, this is secondary to the fact that there are obviously junior modelers willing and able to build and fly. Why their activities are not more obvious to the general modelling movement is perhaps a difficult question to answer. Resisting the temptation to write a dissertation on this topic I will merely say that Whitefield's Steven Restall won Glider despite losing his *Caprice* on his second flight, and Keith Lord of Syke won *Chuck Glider* – and also flew *Power* and *Glider*. On the points systems used, Whitefield proved the team winners, and retained the *Freshmans Trophy* put up for this contest.

The undoubted success of this meeting should certainly provide some 'food for thought' for those concerned with the 'Junior Problems'. Reader's reactions should be interesting!



On the whole the British Contest flier is no more continental-minded than the proverbial man-in-the-street. There has been British participation in some of the numerous International meetings held throughout Europe – but generally this has been spasmodic and often secondary to holiday considerations.

The recent *Pierre Trebod* contest (held at Marigny-le-Grand aerodrome, in northern France on August 28th and 29th) made an invigorating contrast. There were a round dozen British participants – from quite a representative section of the F.A.I. enthusiasts as well as competitors from Denmark, Germany, Belgium, Canada, Holland and of course the host country. Moreover, results were more than heartening.

Andrew Brewster of Leeds won the *White Cup* for open power at Topcliffe with all-elliptical design. Note angle of wind sock in the background!



Second in the Wakefield event at Syerston was Alan Jack – this time with a more conventional wound-balsa fuselaged model.



Kate Warren prepares to launch her husband's A/2 at the two-day F.A.I. meeting. Mike eventually placed eleventh.



Ray Monks showed his real form (after what must have been a disappointing trip to Saxe) by winning the Power event, with a string of 10 consecutive maxes. These really 'tried for size' the latest F.A.I. fly-off scheme of reducing engine runs - as Ray clinched the contest by maxing off the first fly-off with but a 4 second motor run. There were still four fliers in the battle at this stage, and Alan Landeau very nearly pushed Ray to yet another flight.

Most of the contest was held in 'normal' thermal conditions, and Ray used his old elliptical tipped G15 model for his 7 maxes on 10 second runs. For the fly-offs he flew a West German influenced model with fully sheeted surfaces, and powered by a Rossi 15. This model nearly didn't make the trip across the Channel, as a premature D/T whilst testing the previous weekend caused a mid-air wing failure and much other damage. It was obviously worth the effort to repair the model in time!

Tony Young and Pete Jellis were very well placed in A/2, at second and fourth respectively. I understand that Tony had some time-keeping difficulties that left him far from pleased despite his high position. Pete Jellis was using a circling tow technique that got out of hand on one occasion, and he had to tow the model in to save the flight. John Mabey also did well to place fourth in Wakefield - just a week after winning the same class at the 2-day SMAE F.A.I. Meeting at Syerston. Surprisingly neither A/2 nor Wakefield at the *Pierre Trebod* was won on a perfect score.

The 'atmosphere' of such a contest can only be appreciated by those who have attended similar functions - but perhaps something of an approximation can be covered by Roy Collin's eye-witness account of the meeting as follows:

The contest took place at Marigny-le-Grand near Sezanne France on the 28th-29th August. Contestants came from Great Britain, Denmark, Germany, Belgium, Canada, Holland as well as the host country.

We were greeted on the Friday evening by Monsieur Magnette who showed us the facilities of the pleasantly wooded camp site, which included an ex-airforce building with wash room, showers and also a bar.

A trip to the flying field the same evening showed it to be a fine site with very long runways and good recovery conditions also at right angles to the runway.

The contest began with a warm breeze which was taking models well out of the flying field, though many models got away in strong lifts others missed good air completely and few people kept a clean score in A/2 and Rubber.

Sunday flying started at 7.30am with very little drift and the morning mist soon cleared. Koster's power model (which he is still sorting out) made a max, doing one great circle in three minutes. At times throughout the morning it was possible to stay under the models for the duration of the flight, but A/2 and Rubber were still having a harder task to max than Power.

Power was another Rossi benefit and was the only class to have a fly-off which was to the diminishing engine run rule. Five fliers were in the fly-off and all maxed on 8 second runs. Owing to a misunderstanding Ray Monks was suddenly confronted with getting his model in the air in two minutes. With good team effort and help from the French he made it. Four fliers maxed at 6 second runs but Ray was the only one to make it with a 4 second run, his model gliding as superbly as ever. Poor Landeau missed a max in his final round by two seconds.

The contest was well organised, with a wonderful feeling of friendship. On Saturday evening we were all invited to a get-together with much singing, and wine flowing freely.

The weekend ended with a prize giving ceremony and prizes were given to at least the first ten competitors and Champagne to all. The Victors had their Cups filled with Champagne, Ray making a very good effort when he started off the drinking from his, while the French sang one of their drinking songs.

It was a very enjoyable contest and happy social gathering.

RESULTS

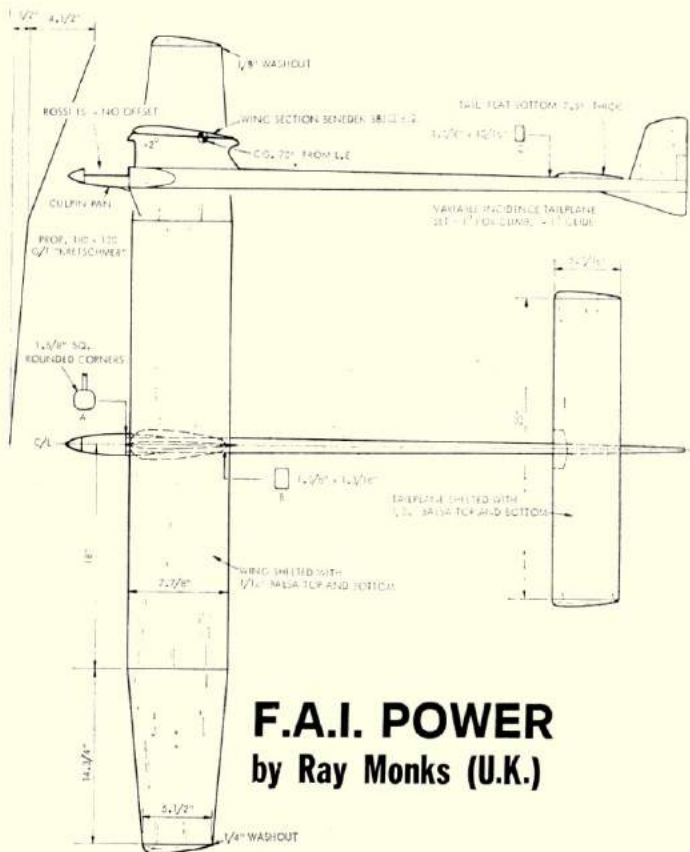
YORK RALLY, ELVINGTON, 6 June, 1971

Glider (26 entries): 1. D. Barnes (Liverpool) 12:02, 2. N. Duncan (West Lancs) 9:53, 3. M. Dilly (Croydon) 9:19. Rubber (10 entries): 1. R. Peers (Falcons) 8:48, 2. A. Jack (Tynemouth) 8:26, 3. M. Sanderson (Grimsby) 7:15. Power (6 entries): 1. B. Hooley (Whitefield) 9:00, 2. Bradley (Grimsby) 6:10, 3. J. O'Donnell (Whitefield) 6:00. Coupe d'Hiver (5 entries): 1. F. Elton (Leeds) 6:37, 2. R. Hymers (Darlington) 4:47, 3. H. Tubbs (Leeds) 4:22. Chuck Glider (15 entries): 1. A. Cordes (Tynemouth) 4:41, 2. N. Duncan (West Lancs) 4:16, 3. B. Kershaw (Wigan) 3:47.

S.M.A.E. AREA - CENTRALISED MEETING, 13 June, 1971

Weston Cup (Wakefield - 69 entries): 1. W. H. McGarvey (Croydon) M+7:23, 2. B. Halford (Norwich) M+1:49, 3. J. R. Mabey (Croydon) 20:08. White Cup (Open Power - 44 entries): 1. A. Brewster (Leeds) M+5:35, 2. P. Branigan (Liverpool) M+4:32, 3. R. Peers (Falcons) M+4:25. Open Glider (115 entries): 1. C. P. Williams (Richmond) M+5:06, 2. C. James (Hayes) M+4:47, 3. T. Payne (Northampton) M+3:09.

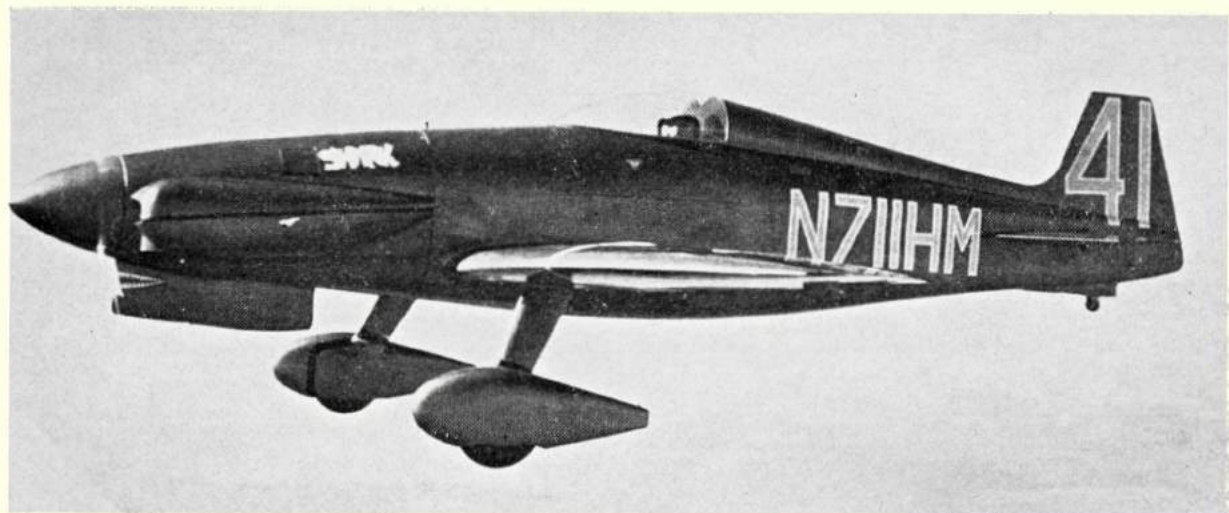
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F.A.I. POWER by Ray Monks (U.K.)

Ray Monks is seen below with the model which created 'history' by becoming the first power ship to max off a 4-second engine run (drawn above). Actually, although this model was used in the fly-off, Ray used his usual elliptically-tipped design powered by a Super Tigre G15 to clinch his seven consecutive maxes.





AIRCRAFT DESCRIBED No. 208

MACE R-2 'SHARK', F.I. RACER

described and drawn by PAT LLOYD

THE 'SHARK' could be said to be Harvey Mace's farewell design to competitive flying, as at the age of 50 and with 34 years' involvement in aviation, he has decided to undertake a new venture in commercial fishing. Back to two dimensions as it were!

Since World War II when he flew Mustangs out of Leiston, Suffolk, he has been mainly an 'aggie' pilot, flying crop dusters which of course is ideal training for racing, calling as it does for lightning reflexes, steady nerves and low flying. This background plus the occasional *up and at them spirit* resulted in the R-1, and now the R-2.

The R-1 midget was built back in 1966 with a wood wing of around 16 ft. span and a steel tube fuselage. With a similarity to George Owl's *Owl Racer* (drawings of which are to follow in the near future—Ed.) ownership passed to Bud Pedigo shortly after, in whose hands it showed a best speed of 193.27 mph at Reno — only to be fined for low flying. At the end of 1969 the design and construction of R-2 were undertaken, with the whole Mace family helping.

The main consideration was a hoped-for 200 mph qualifying speed, together with a 'clean' look, on the old chestnut theme that 'if it looks good it must be good'.

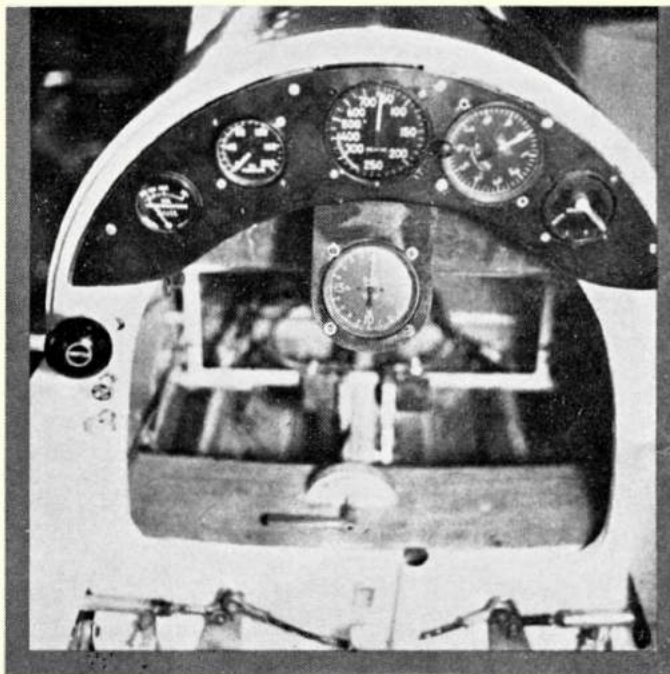
The unusual elliptical-shaped wing was chosen for its looks and suggested efficiency, with a 16 ft. span (a dimension strongly favoured by home builders, presumably because it may be built in a normal garage), while the chord more or less 'happened' due to the need to meet the 66 sq. ft. total area specified by the governing body, the Pylon Racing Pilots' Association. In fact, the area was set at 70 sq. ft. in order to avoid any possible controversy concerning the measurement of the elliptical wing during a race meeting processing session. Another unusual feature is that the wing outer panels (four feet at each tip) are detachable for ease of transport, an immediate

Heading: If ever the term 'lean and hungry' applied to an aircraft, then this must be it! Machine weighs just 540 lbs. 'dry', 800 lbs. gross, and has a take-off run of 800-900 ft. Landing speed is 65-70 m.p.h. and 1,500 feet of runway is required. Simple cockpit layout seen at right.

advantage in that the wing root streamlining is entirely 'undisturbed'. The attachment point gap, small as it is, is readily sealed by tape, as are any other gaps and joints. The fuselage has two side members which are built up of spruce strips and ply to provide two stress-bearing members that continue

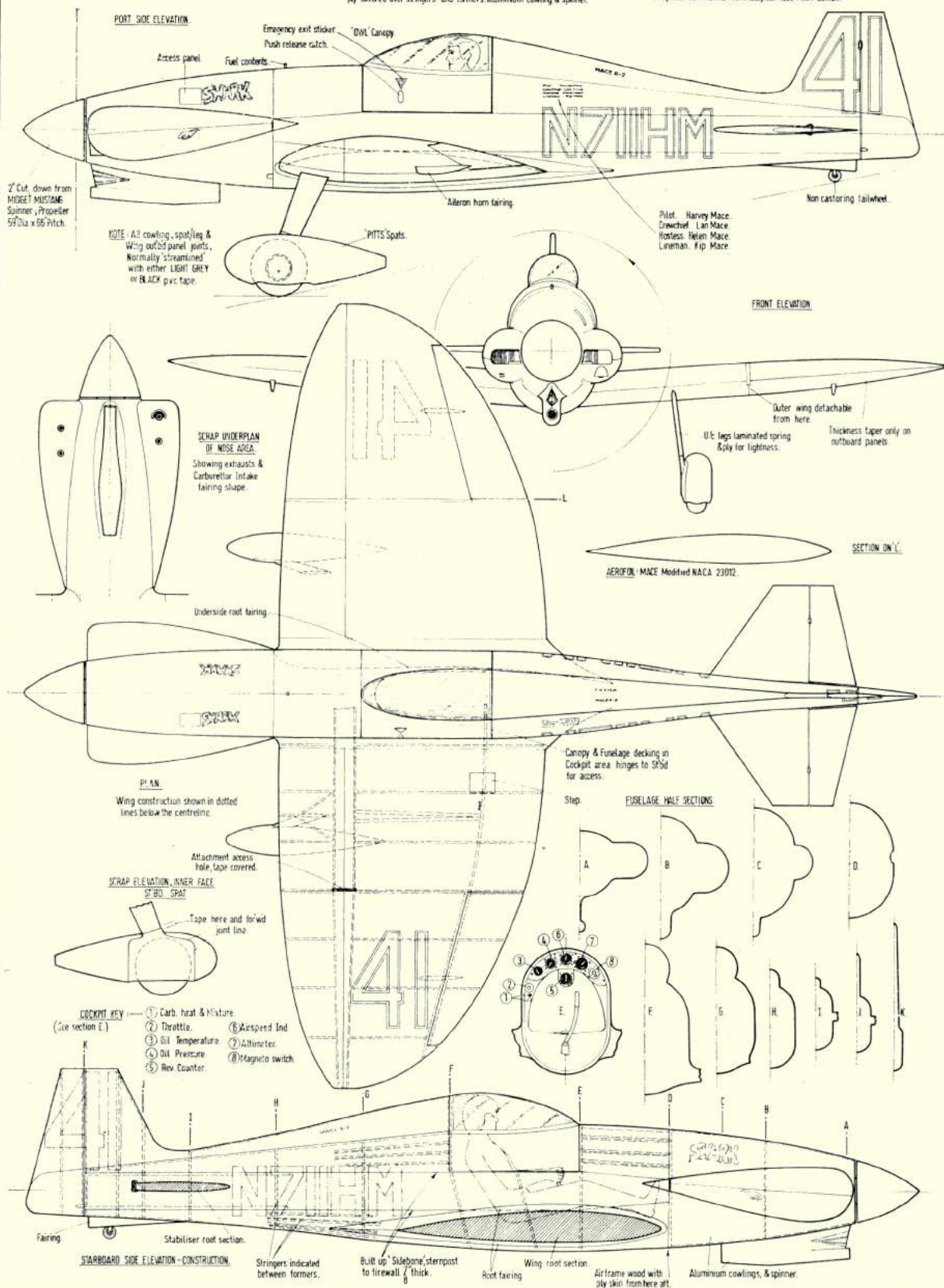
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REPRINTS OF THIS FEATURE PLUS FULL SIZE DYE LINE PRINTS OF THE 1/12 SCALE ORIGINAL ARE AVAILABLE AS PLAN PACK A 2931. PRICE 35p FROM AERO MODELLER PLAN SERVICE, 13/35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.



5. Box spar with detachable outboard sections of 48" each side.
 Ply ribs on 12" centres. Wing skinned with $\frac{1}{8}$ " Birch ply.
 Fuselage from built up formers attached to 'sidebones'. All
 ply covered over stringers and formers. Aluminum cowling & spinner.

Entire aircraft, 1969 General Motors. DARK METALLIC GREY.
 Numerals, registration, etc. PALE YELLOW, with a $\frac{1}{8}$ " WHITE
 Outline. Sharkmouth & eye detail: RED, WHITE, Edged in BLACK.
 Propeller: NAT METAL. Front face, rear face MATT BLACK.



MACE R-2 'Shark', F.1. Racer.

Drawn by: A. A. P. LLOYD.
 With acknowledgement to RUSS A. BROWN



FREE FLIGHT COMMENTS

continued from page 635

Syke junior members with their gliders - Keith Lord on the left with his 'Lively Lady'. Keen competition spirit amongst these enthusiasts.



CHESTER MAC SLOPE-SOARING, CLWYD, 20 June 1971
F/F Senior (Agg 4 flights) 1. J. O'Donnell (Whitefield) 2:35, 2. A. Moss/B. Worthington (Whitefield) 0:26. **F/F Junior** (Agg 4 flights) 1. C. Salomon 0:51. **Gosling Trophy** (Best Single flight) J. O'Donnell (Whitefield) 1:19. (There was also R/C Single, Intermediate, Multi.)

SOUTHAMPTON GALA, BEAULIEU, 11 July 1971
Open Rubber (16 entries - 7 in fly-off) 1. J. O'Donnell (Whitefield) M+5:54, 2. N. Clark (Richmond) M+5:32, 3. M. Fuller (C/M) M+5:25. **Open Power** (17 entries) 1. R. Peers (Falcons) 9:00, 2. P. Stewart (Crookham) 8:49, 3. L. Larrimore 8:30. **Open Glider** (35 entries - 8 in fly-off) 1. D. Glue (Brighton) M+16:07, 2. J. Baguley (Hayes) M+10:31, 3. D. Hewitt (Portsmouth) M+8:59. **Coupe d'Hiver** (8 entries) 1. M. Fantham (Richmond) 6:00, 2. J. O'Donnell (Whitefield) 5:51, 3. D. Hewitt (Portsmouth) 5:34. **Chuck Glider** (13 entries) 1. M. Fantham (Richmond) 3:54, 2. J. Punter (Hayes) 3:33, 3. M. Keevil (North Surrey) 3:22. **A/1 Glider** (12 entries) 1. A. Turner (Southampton) M+4:48, 2. D. Glue (Brighton) M+2:31, 3. M. Keevil (North Surrey) 9:00.

NORTH EAST GALA, OUSTON, 18 July 1971
Open Rubber (16 entries) 1. R. Pollard (Tynemouth) M+4:26, 2. J. O'Donnell (Whitefield) M+3:35, 3. K. Brown (Liverpool) 8:52. **Open Power** (14 entries) 1. R. Peers (Falcons) 9:00, 2. B. Martin (Tynemouth) 7:37, 3. J. McCann (Tynemouth) 7:24. **Open Glider** (25 entries) 1. P. Whitehead (York) 4:00, 2. A. Evans (Liverpool) 3:43, 3. D. Hanley (York) 3:56. **Chuck Glider** (8 entries) 1. E. B. Jones (C/M) 5:15, 2. B. Kershaw (Wigan) 5:10, 3. N. Duncan (West Lancs) 4:09.

NORTHERN AREA F.A.I. MEETING, TOPCLIFFE, 25 July 1971
Wakefield (13 entries) 1. J. O'Donnell (Whitefield) 20:29, 2. R. Pollard (Tynemouth) 20:25, 3. A. Jack (Tynemouth) 19:54. **A/2 Glider** (32 entries) 1. M. C. Reeves (Whitefield) 18:51, 2. C. James (Hayes) 18:37, 3. J. Boon (Falcons) 18:19. **F.A.I. Power** 1. R. Monks (Birmingham) 19:58, 2. R. Peers (Falcons) 19:15, 3. B. Martin (Tynemouth) 19:11. **Junior** 1. D. Barnes (Liverpool) 15:39. **Team** 1. Whitefield (Hookey, O'Donnell, Reeves) 43:05.

SYKE v. WHITEFIELD JUNIOR CONTEST, LOBDEN MOOR, ROCHDALE, 1 August 1971
Open Glider (7 entries) 1. S. Restall (Whitefield) 5:11, 2. S. Williams (Whitefield) 4:25, 3. K. Whalley (Whitefield) 4:09. **Open Power** (1 entry) K. Lord (Syke) 3:37. **Chuck Glider** (3 entries) 1. K. Lord (Syke) 2:44, 2. M. Gleeson (Syke) 1:58, 3. M. Kinder (Syke) 0:42. **Team** ('Freshman' Trophy) 1. Whitefield 13:45, 2. Syke 9:46.

FOURTH S.M.A.E. AREA CENTRALISED MEETING, 8 August 1971
Astral Trophy (15 entries) 1. J. McCann (Tynemouth) 21:00+3:31, 2. D. Wain (South Bristol) 20:40, 3. J. West (Brighton) 19:32. **Coupe d'Hiver** (44 entries) 1. M. Fantham (Richmond) 10:00+1:36, 2. D. Tipper (St. Albans) 9:08, 3. J. O'Donnell (Whitefield) 8:58. **M.E. Cup** (40 teams) 1. Norwich 'A' 35:29, 2. Croydon 'A' 31:39, 3. Crookham 'A' 30:45. **Individual Scores** 1. P. Stewart (Crookham) M+5:58, 2. G. Pink (South Bristol) M+4:08, 3. J. O'Donnell (Whitefield) M+3:05. **Plugge Cup** (position after 4 events) 1. Birmingham 983 points, 2. Croydon 858 points, 3. Norwich 832 points.

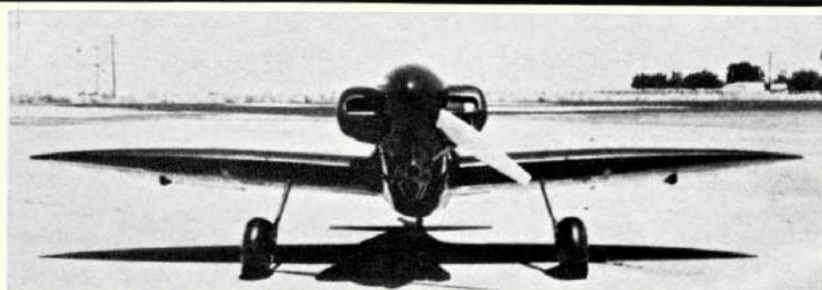
S.M.A.E. TWO-DAY F.A.I. MEETING, SYERSTOW, 21/22 August 1971
Wakefield 1. J. Mabey (Croydon) 19:07, 2. A. Jack (Tynemouth) 18:36, 3. D. Digby (North Surrey) 18:08. **A/2 Glider** 1. J. O'Donnell (Whitefield) 20:05, 2. P. Whitefield (York) 19:39, 3. J. Punter (Hayes) 18:42. **F.A.I. Power** 1. P. Buskell (Surbiton) 20:12, 2. J. West (Brighton) 19:29, 3. R. Bailey (St. Albans) 19:19.

PIERRE TREBOD INTERNATIONAL, 28/29 August 1971
F.A.I. Power (19 entrants) 1. R. Monks (U.K.), 2. A. Landeau (France), 3. M. Jean (France), 4. R. Stabier (Germany), 10. R. Collins (U.K.), 14. M. Green (U.K.). **A/2 Glider** (45 entrants) 1. P. De Boer (Holland), 2. A. Young (U.K.), 3. J. M. Berthe (France), 4. P. Jellis (U.K.), 38. J. Mabey (U.K.), 45. W. Parker (U.K.). **Wakefield** (27 entrants) 1. E. Gouverne (France), 2. L. Dupuis (France), 3. Y. Germain (France), 4. J. Mabey (U.K.), 10. W. Parker (U.K.), 19. A. Wells (U.K.).

MACE 'SHARK'

continued from page 636

'Clean' frontal view of the Shark reveals wide track undercarriage, mounted in the wing as per 'Rivets'.



down each side from firewall to sternpost. 'Sidebones' Harvey calls them, and they closely approximate the sheet sides that we use frequently in our models. They are 8 in. wide at the sternpost, tapered to 5 in. at the firewall.

In effect we have a slabsided fuselage to which is added semi-circular formers top and bottom of the sidebones. Stringers link the formers, and all is then clad with 1/8th ply. Cowlings are aluminium while the fuel tank is glass fibre and the undercarriage legs are laminated from spring steel and plywood, the primary aim being lightness. A further unusual feature is the wing mounted undercarriage legs, pioneered by Rivets designer Bill Falk. To save weight, the ply skin was not fabric covered, all the

finishing being applied to the ply direct. The tail wheel is sprung, but does not castor. Even with the whole family helping, Shark was only test-flown 12 days before the Reno 1970 meet. I think it was Harvey's idea to 'show them' and retire, which he certainly did, qualifying in 11th place out of 24 entries at 198.53 mph and later coming 2nd in the semi-finals. All this with a very new aeroplane, only flown for about two hours previously, and which so nearly equalled its 'designed' speed of 200 mph.

After the Reno meet the Shark was sold to help finance Harvey's new venture. Regrettably the airline pilot who bought Shark managed to kill himself in another plane - so yet another racing plane comes up in an estate duty deal!



A familiar name to *Aeromodeller* readers, in characteristic role taking home the booty! John O'Donnell receives his prizes from June Pickering - he won the Open Rubber and combined A/I Coupe d'Hiver classes.

WOODFORD RALLY '71

Keen competition despite adverse conditions

UNLIKE MOST OTHER MEETINGS, the N.W. Area's annual Woodford Rally is not run purely as a model aircraft contest. It is also intended to be a public attraction, an advertisement for the hobby, and to act as a revenue-raiser to finance other activities of the Area. To achieve these ambitions demands not only organisation but also co-operation from 'the elements'. This last item was sadly lacking in 1971, and both the flying and the public attendance suffered in consequence.

The morning started dull and overcast, with a good stiff breeze blowing in a rather unfortunate direction. Conducting the F/F events from mid-airfield was the compromise between most use of the drome, recovery considerations, and the avoidance of prohibited areas. The location did however, mean over-flying the C/L circles. Mid-afternoon had what could only be described as a torrential down-pour that stopped all flying for about an hour. Activities were able to re-commence less than half an hour before the close of the F/F events and there was a certain amount of feverish activity from those anxious to complete their scores.

As the airfield still contains a number of parked 'Victor' bombers awaiting restoration, Hawker Siddley maintained their ban on the flying of F/F power models. This meant a somewhat restricted list of events. Hardest fought of the duration contests was that for Open Rubber, despite (or perhaps because of) a complete absence of 'treble max's'. There were several models left downwind including those of John O'Donnell and Russell Peers - the price they paid for taking the top two positions. The odd down-draught apiece proved decisive. Ted Prince could have managed second if his propeller had folded correctly on his final flight.

Glider proved a clearcut victory for Brian Spencer with three very good flights from his 8 year old A/2. This is a perfectly straightforward design with balsa fuselage, multi-spar (5 of 1/4 in. sq. - spruce inner and balsa outer) wings

and a KSB timer. The model survived two landings in trees. Dave Hambley also had two max's but a significantly worse third flight. His design features quite low aspect ratio by modern standards, and a much deeper fuselage pod than usual. Third was Terry Dilks - over two minutes behind. A broken 30lb. towline cost John Boon a max - and second place.

Chuck glider saw but a few seconds separate Barry Kershaw and Roy Roberts with good scores in the conditions. Barry used soap-bubbles as an aid to flying at the right time. Martin Dilly provided a 'new' name (for this event) at third place.

The combined Coupe d'Hiver-cum-A/I glider event was surprising in that the rubber-powered models occupied the first two positions. O'Donnell's *Hatband* showed that it had not been too affected by several weeks out earlier in the year and subsequent re-covering. Brian Maxwell was the runner-up. Tailless was again a combined event, and proved all but a flyover for Tony Slater.

Control line also suffered from the weather. Combat was worst afflicted since wet paper streamers would not hold together. To complete the event on time, it was decided to abandon uncompleted heats and to 'draw' names to obtain the 'last eight'. These then flew as normal. This decision caused understandable discontent in some quarters - but was considered better than having to draw for the actual prizes themselves. Ultimate winner was Vernon Hunt flying a *Warlord* with a Copeman Oliver turning a Tornado 8 x 6. John Alcock was second, with the equal third places going to Richard Baker and David Underwood.

The running of the F.A.I. team race event provided a complete contrast in outlook. Although delayed, no short-cuts were taken. The finals were not concluded until 7 o'clock - long after most people had vacated the drome. The actual contest administrators were very strict, as shown by the processing of models between heats at the finals, and the disqualification of the Langworth/Muncaster team in the final. This left the top two places to be decided between Place/Haworth and King/Rudd. The former proved the winner by 20 seconds flying a 3 year old model powered by a



Winner of the Free Flight Champion title was John 'Bungee' Carter, seen here with his A/2 glider.

Sam Skitt (left) and Dennis Ward, won the Goodyear event with their Supre Tigre G15RV powered *Falcon Special* - not many examples of this particular engine seen in Goodyear events, the front rotary version being more popular.



At right, Dave Hambley placed second in Glider with his deep-podded A/2 design. Far right is John Dixon, winner of the Handicap Speed event with his Rossi powered F.A.I. model.

Haworth-modified ETA fitted with a Bartell 7 x 7 1/2 Drazek type prop. An engine shut-off was fitted, but not used. Many entrants were generally slow and short of laps, as confirmed by the heat times.

Goodyear racing attracted the same number of entries as F.A.I. Team Race, but had a higher percentage return a time. Final Goodyear winners were the team of Sam Skitt and Dennis Ward, flying a *Falcon Special* with a G15 RV and Frog 7in. x 6in. nylon prop. John Shaw/Gerry Johnson were a close second with an *Owl Racer* and a similar engine, but a thinned Super Record 7in. x 6in. wooden prop. Third was Martin Radcliffe/John Dixon using a *Shoe-string*, front induction G15 and 7in. x 6in. Tornado nylon cut to 6 1/2in. dia.

C/L Speed was run on a handicap basis and was topped by John Dixon flying an F.A.I. class model. This had a standard Rossi 15 (1970 series), complete with Rossi pipe, Fireball cold plug, and a Punctilio 6in. x 6 1/2in. prop modified to 5 1/2in. x 6 1/2in. The model had a full length Harter pan, weighed 17oz., and had a Miebach centrifugal fuel switch. 'Official' speed is not available but 132 m.p.h. is reputed.

Flying Stunt over the runway did not encourage prospective entrants, and the event provided no surprises. Jim Mannal won, with Steve Blake and Brian Turner filling the next positions.

Scale models are always a popular crowd pleaser, and for this reason have long been a regular feature of Woodford. The Control Line results were very close with but three points (in 230 odd) separating first from third. Wally Cordwell just proved the winner with his large *Gloster Gladiator* powered by a Merco 61. This model suffered a rather heavy landing through the dummy engine coming loose in flight and dislodging the throttle. Both the next two competitors, Bob Evans and T. Wilkinson, preferred German prototypes for their entries – a Ju87 and FW190 respectively.

R/C Scale was topped by Dennis Foskett with a *Fairchild PT19 Cornell* equipped with a ST60 and Sprengbrock radio. Tom Littler and John Cooper took the other awards with a 'Tony' and 'FW190' respectively.

Mention must be made of an event that was not held – R/C Multi Aerobatics. Although pre-advertised and included in the Rally Programme, the organising club (LARCAS) reckoned that spectator-appeal and modeller satisfaction could be better satisfied by the 'fly-for-fun' approach. Even this was handled as sports flying as distinct from any form of competition. LARCAS did condescend to judge anyone who demanded to participate in the advertised contest – but the prizes went unclaimed!

Wally Cordwell of the Three Kings Club took top honours in the C/L scale event with his 'weathered' *Gloster Gladiator*, which has been in evidence at many rallies this year.



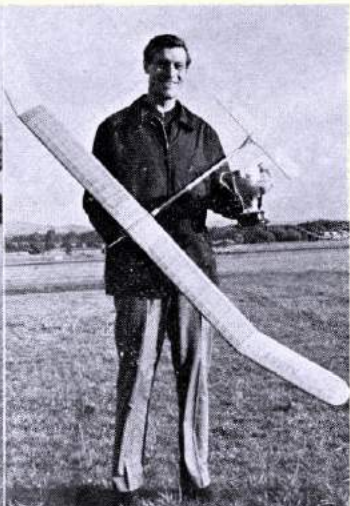
By current standards Woodford has a very formal prize-giving. This year the awards were distributed by local glamour girl June Pickering, who acted as a last-minute stand-in when the appointed *Miss Aeromodelling* (Angela Jay) was unable to attend. The Senior Gala Championship was won by John Carter (who flew in all the F/F events except tailless) – whilst the Junior title went to David Barnes. The presentations were barely concluded when bright sun and blue skies appeared – half a day too late!

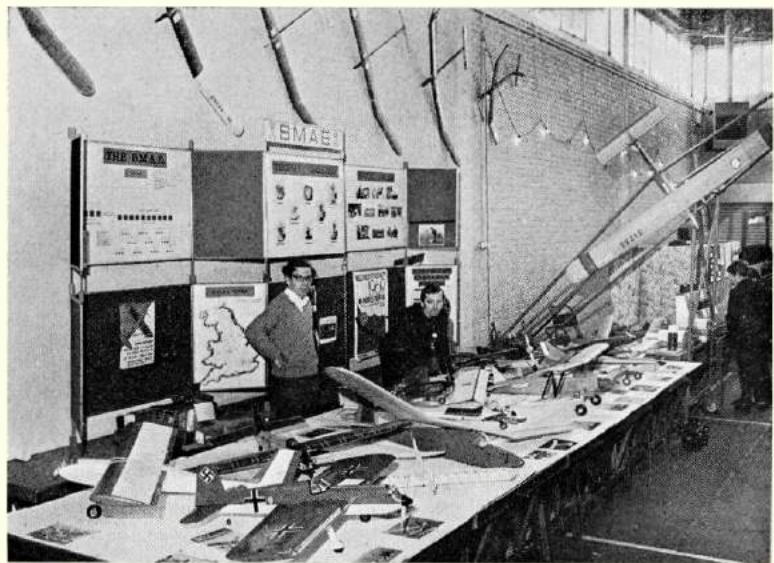
RESULTS

Rally F/F Champion – J. Carter (Spitfires), Junior Champion – D. Barnes (Liverpool). **Glider**: 1. B. Spencer (Ashton) 8.25, 2. D. Hambley (York) 7.37, 3. T. Dilks (Spitfires) 5.31. **Rubber**: 1. J. O'Donnell (Whitefield) 8.40, 2. R. Peers (Falcons) 8.27, 3. J. Carter (Spitfires) 8.05. **Chuch Glider**: 1. B. Kershaw (Wigan) 5.02, 2. R. Roberts (Wigan) 4.51, 3. M. Dilly (Croydon) 3.57. **Combined A/1 Glider-Coupe d'Hiver**: 1. J. O'Donnell (Whitefield) 6.45, 2. B. Maxwell (WLFSS) 5.07, 3. G. Jennings (Leeds) 4.27. **Tailless Rubber/Glider**: 1. A. Slater (Leatherhead) 3.54, 2. D. Bloom (Shrewsbury) 4.0. **C/L Scale**: 1. W. Cordwell (Three Kings) *Gladiator*-239, 2. R. Evans (Three Kings) Ju 87-237, 3. T. Wilkinson (Norwich) FW190-236. **C/L Stunt**: 1. J. Mannal, 2. S. Blake, 3. B. Turner. **C/L Handicap**: 1. J. Dixon (F.A.I.), 2. J. Penton (5cc.), **R/C Scale**: 1. Dennis Foskett (PT19), 2. Tom Littler (Tony), 3. John Cooper (FW190). **C/L Combat**: 1. Hunt (ACE), 2. Alcock (Bilston), 3. Baker (Cambridge) and Underwood (Hinckley). **Goodyear Racing**: 1. Skitt/Ward (MARS) 8:09.4, 2. Shaw/Johnson (FACCT) 8:15.0, Radcliffe/Dixon (Feltham) 9:40. **F.A.I. Team Race**: 1. Place/Haworth (Wharfedale) 10:17, 2. King/Rudd (Feltham) 10:38.8, 3. Langworth/Muncaster (Wharfedale) Disq.

Vernon Hunt (left) used his familiar *Warlord* design to demolish the opposition, finally beating John Alcock (right) in the final. No prizes for guessing the engines used.

Brian Spence won Glider with his 8 year old A/2, despite landing in trees twice out of his three flights! Wings have five 1/2 in. section spars – spruce at centre, balsa at tips.





CLUB NEWS

First class display by the Norwich club at an Exhibition organised by a local Model Engineering club. Professional-looking display unit advertising the S.M.A.E. is in fact the property of the Society, and is loaned out to clubs for this type of event. Clubs wishing to utilise this facility should contact the Society's P.R.O., Ian Peacock.

IT SEEMS TO ME that the model the beginner seems to opt for today should never be flown by a beginner! He may make a workmanlike job of it, but that first outing to the flying field all too often ends in disaster. A fast, heavy, highly vulnerable model certainly needs an expert hand to guide it safely through those initial flights, and this, I feel, is where the value of joining a club comes in. There is always *someone* sufficiently expert in the branch of the hobby you have chosen, willing to give you that essential early guidance. And even if no club is to hand, the regulars on your local flying field will only be too happy to give you valuable advice. Whatever you do don't just chuck it and risk it.

We begin this month with a short report from the **Handsworth M.A.C.**, (Birmingham). Graham Bryant tells us that the F.A.I. T/R team of Bryan/Haycock came 4th at Burtonwood and 3rd at the London Area Champs, flying their new ETA model. Not satisfied with these placings, however, new and more potent machinery is being produced to step them up, notwithstanding the fact that lack of competitive practice is having a retarding effect. The club is hopefully looking for new members, who should contact Mr. Bryant at 31 Woodridge, Birchfield, Birmingham, B6 6LN.

Still in circulatory vein we next have a few quotes from the newsletter of the **Three Kings Aeromodellers**. Apparently the Goodyear Team Race, run by the club on July 4th, turned up trumps; providing an exciting day for flyers and spectators alike. Wal Cordwell, with son pitting, had a bit of engine trouble. Reason, later discovered, was the front bearing going round with the crankshaft - what might be called the wanky rotary principal. Final was between Tony Goodger and Dave Woods: 100 laps with 3 pit stops. Turned out to be a close match. Tony had the fastest model, powered with a Veco .19 glow, but suffered the starting troubles that seem to beset hot glow motors. Dave Woods's ETA Elite gave a tortoise and hare touch to the proceedings with a series of very prompt restarts, winning the race in a time of 14m. 55s. Another July event of note was a display put on at Sywell Aerodrome. Lined up against a background of full-size light aircraft were some of Three Kings most dramatic looking models. For instance, Bob Ivan's talented circus, consisting of a *Stuka*, *Boeing Crewmaker*, and newly restored 60 in. *Hawker Fury* in Spanish colours - a near hovering performer. A highly talented newcomer to the club is Mike Smith. The 5 c.c. motor he has made is a mechanical work of art. What the newsletter writer found so fascinating was the double piston ring feature of the in-line twin. We are told that all parts were machined from solid, and everything home made but for the ball races and glow plugs.

If anyone, like me, has been wondering just what is meant by 'Eyeball' Scale, elucidation comes in the newsletter of the **Wolves M.A.C.** It is the sort of scale impression given at a distance of six foot, as opposed to the usual nose rubbing concours scrutiny. However, Scale is but one of the activities which have kept the members usefully engaged throughout the long, hot summer; there has been much Radio and Free Flight participation since

the club acquired the use of Pendeford Airport. In spite of the added dimension given by the airport, C/L has in no way been neglected. A fact which is amply testified by the successes gained in the Nationals: Dave Day, the Gold Trophy; Ken Venables the *Knokke No. 2*; and Mike Gagg won the Mouse Race. A Fly-In on July 3rd was sponsored by the *Fordhouses and Oxley Community Assoc.* Not, alas, a financial success, but highly rewarding from the recruiting point of view - and did that groundsman produce a fine mown control circle!

The **Lees Bees Club** (Portsmouth) have sent along a copy of their 1971 Summer programme. It takes the form of a neat little booklet, and is just the sort of thing to add tone to the club. Members are fortunate in having the use of the H.M.S. *Daedalus* field, where a whole series of contests were held during the summer months. Conditions of use seem very reasonable (families allowed in, etc.) and the regulations, printed in the booklet, more commonsense than anything.

Newest club magazine to reach us is *Airflow*, produced by the **Esher & D.M.F.C.** At present it is in newsletter form, but Mr. P. W. Maddocks, the P.R.O., tells us that, in future, it is intended to publish it quarterly as a complete magazine. Quite a bit of space is given in the current edition to the big effort that the club put into the Bourne End Carnival back in June. By way of coincidence, the Carnival President, Sir Bernard Chacksfield, who officially greeted the Esher members, is also the President of the S.M.A.E. Other clubs lending their support came from Epsom and High Wycombe. The static display, held in a marquee, consisted of some twenty models, each of which was labelled to denote type and to give relevant information. Harold Rice of the Epsom club did sterling work in giving static demonstrations of his *Intruder's* radio equipment to the public, and allowing them to work the controls. In the flying displays the public were treated to the sight of many advanced radio models in full aerobatic action - even one with retractable landing gear. Also showing their paces and smooth lines were some fine examples of the control liner's art, particularly Albert Briggs's four engined *Devastator*, which turned out to be a real crowd thriller. Altogether a most successful venture in public relations. In a more private sense the club is working towards the purchase of its own R/C flying site - certainly the answer to the problems of noise and danger which occur on public sites.

Going west from Maidenhead to Gloucester, Frank Smart has taken much of his old pioneering spirit with him, much to the benefit of the **Glevum M.A.C.** Already he has formed a new combat group, aptly called *Gloucester Gladiators*. Wing motif on a 5½ in. black spot or roundel, which, no doubt, will become a sinister symbol to the opposition. The team, which numbers six at present, made its debut at the Nationals with five entries. The team has entered all Western Area rallies, but only to find Combat virtually extinct. A good show, though, at Finchley, where a few eyebrows got a touch of up elevation at the fineness of the newcomers. Progress due to bags of practice at the local Rugby pitch, plus the friendly competition they get from visiting Cheltenham Combateers.

What are the mysteries of the East? Well, we only know of one, and that is where can an Indian model flyer get hold of the plans of a K.K. *Spectre* and a K.K. *Marquis*? Request comes from Mr. A. T. Lingaraj, No. 2 Carleton Road, Cooke Town, Bangalore 5, S. India. Plans are not all that abundant in this inscrutable part of the world, and Mr. Lingaraj, who has set his heart on these two models, is prepared to give good value in kind for these coveted plans. Any offers?

'The best laid plans, etc.' is often all too true a maxim when it comes to the realisation of all those carefully prepared club contest plans - the blighters just don't turn up. A lament on these lines comes from Mr. A. E. Frost, the Secretary of the **Swansea M.A.C.** A contest for *A* Combat, *A* Combat, Stunt and Rat Race scheduled for Saturday, August 21st, brought forth only five 'A' Combat entries - none for the other events. And if it had not been for the chap who came all the way up from Southampton, it would only have been four. A wealth of good flying, however, in the single event; a case of the quality making up for the lack of width. Mr. Frost is anxious to contact any nearby clubs who might have an interest in inter-club events. He can be contacted at 41 Marlborough Road, Brynmill, Swansea Galm. SA2 0DZ. The club flies weekend afternoons at Bishop Gore Canteen field in Sketty. All welcome.

A report sent in by Mr. J. Glen, Secretary of the **Scottish Aeromodelling Association**, on the Scottish Open Championships held at Leven, gives no hint of free flight participation; covering Radio and C/L only. A two-day event this, with the main Radio event held on the Saturday: F.A.I. Aerobatics. Bill Waggett of Durham flew a *Super Star* into first place. He was followed into second place by another aptly named sky pattern, *Lew Weaver*, also flying a *Super Star*. The next day, Sunday, was devoted to less serious things, such as Limbo. But again, it was the big guns, Messrs. Waggett and Weaver. They got the tape down to such minimal height that further regression would have meant a tunnelling operation on the part of the models. Result declared a draw. And the dominating two W's met again in the finals of the Pylon Race, this time with *Lew Weaver* avenging his defeat in Aerobatics. Last event was a cracker: dropping eggs on target. Most contestants placed the squelchy missiles in paper cups strapped to the top of the model, presumably going inverted over the target. Two people, though, went all scientific with servo operated hatches. It was a case of the eggs hatching out almost bang on target, nearest being J. Cooper, just 3 yards off. Whilst all these fun and games were going on the Combat boys were fighting their way through the preliminary rounds. Final was between D. Hill and M. Davidson. Both planes very equal and still in fighting trim at the end of the bout; Dave Hill winning by but one unkindly cut. Events were sponsored by the Leven Town Council, and cups and prizes were awarded by the Provost. Yet more contesting from Scotland with news of a Soar In at Faulkland on 18th July. The fates, in their perverse way, threw up the first calm day the S.A.A. has had all season. It was 3 p.m. before the air woke up to its responsibilities, and round one, the Pylon race, was got under way. Won by Andy Lewis with a *Faz Fli*. Round two, a looping contest, resulted in a tie between D. Lyall of Edinburgh, flying a *Foka*, and J. Walter of Irvine, flying a *Nebula*. Andy Lewis won the third round, Limbo, and in doing so amassed enough points to come top of the event overall. Second J. Walter and third D. Lyall. A good entry for this event, but how that wind came up to provide ideal soaring conditions once the comp was over.

A letter from the well-known Australian modeller, Arthur Gorrie, reminds us that the 19th July was the day of the 21st Anniversary of the forming of the **Newtown Model Aeronautical Association**, which is situated just two miles outside the centre of Brisbane. Members have quite a proud record to look back upon; not only in sustaining a successful and spirited model flying club over such a long period of time, but also in their successes at National and International level. Perhaps the highlight of achievement was the winning of the Wakefield at Cranfield in 1958 by Bond Baker, who also placed third in F.A.I. Power at the same meeting.

Another Scottish report from Mr. J. E. Glen has come to hand. This time on the Paisley Trophy and Caledonian Shield held at Hartfield Moss on Sunday, August 29th. The Paisley Trophy is an Open All-in affair for Rubber, Glider and Power. Weather was ideal, and makes the order of the day. Won by B. Grimsley with a full house, 9 min. Glider score. Two entries only for the Club Caledonian Shield: Clyde Valley Flyers and Scotmac; the former winning all three events: Power, Rubber and Glider. This gives Clyde Valley a commanding lead, with only C/L to come. 'Happenings' during the day: A 400 ft. spin without damage to the plane. A massive spot in the blue, overrun landing just one field away. Someone winding his beard in with the rubber - an obvious lack of trim.

Dr. M. D. O'Hara, M.B., B.Ch., is newsheet editor of the

Model Aeronautical Council of Ireland. He also writes in a hand of undocotorlike legibility. Thus I am aware that a few months ago I misquoted him slightly when I stated that enthusiasm was poor in Northern Ireland. Perhaps I got the thing out of context, but I am reminded that the model scene in that part of the world is, in fact, a quite lively one.

Mr. R. A. Poll, the P.R.O. of the **Waveney M.F.C.**, writes to give news of recent club activities. The club display teams have had quite a busy summer at a number of fetes and carnivals, including the Beccles Regatta and Carnival and a Norwich Conservative Fete. The club is fortunate in having two flying areas at its disposal: a patch on a privately-owned flying field - ideal for R/C - and an area of grassland for C/L and F/F flying. Members seem to be taking advantage of that scarce commodity, free flight space, by taking more and more to this form of flying.

The newsletter of the **East Anglian Area** is mostly taken up with contest reports. Predominating clubs in the field are Norwich and Anglia, with Haverling intervening. Five clubs, however, listed in the Summer Gala result sheet, making up a rather thin entry but a goodly tribal gathering. Oodles of strong sun took its toll of sensitive flying services, and there were a few nasty crunches to record. Main event, Combined F.A.I., was won by D. Smalley of Norwich, flying a Wakefield.

Star Skippers, the magazine covering the junior scene around New York, gives some good basic advice to youthful purchasers of scale kits. For instance, they are told not to fall for the obvious charms of the sleek, low-wing fighter, or the super detailed model, but to go for the high-wing light plane, such as the *Cessna* or *Puss Moth*. Very much the whole approach of the *Star Skippers* is one of simplicity, concentrating on the types of models young people can adequately cope with.

I am always amazed at the technical ingenuity that goes into the free flight gadget, and enjoy the illustrations of such that appear from time to time in *Free Flight News*, and wish that I had the time and ability to make one up. The Russian tow hook system described by John O'Donnell in this issue, is drawn in full detail and is obviously one for the expert machinist. The magazine provides the usual set of excellent plans, and gives detailed results of the major meetings.

Talking earlier on the reluctance of some of our contest flyers to travel to the far off meeting, there seems no such inhibitions in the United States if the Taft field scene described in **San Diego's Orbiter's El Torbellino** is anything to go by. Modellers in the States don't just attend a meeting, they up house and live it in. And they happily fly in temperatures in the upper 80s, warps and all.

S.A.M. Journal issues from the **Society of Antique Modellers**. Just as I was about to apply for the Presidency it occurred to me that the antiquity referred to the reproduced models of yesteryear rather than the decrepitude of the members. Anybody interested in old timers are asked to send in contributions to the journal. The address is Jim Amis, 851 N. Edgemoor, Wichita, Kansas 67208.

More next month.

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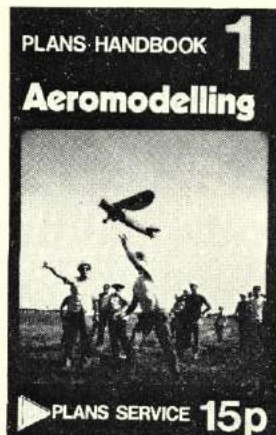
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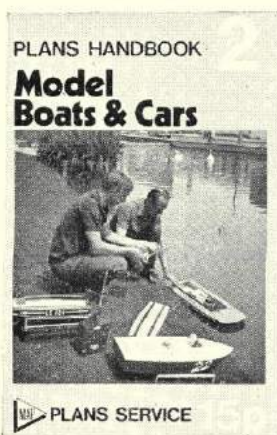
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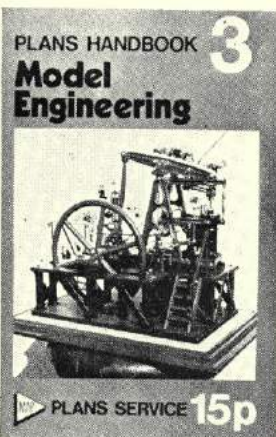
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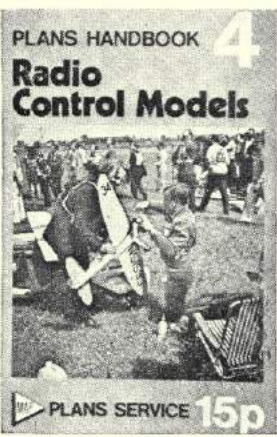
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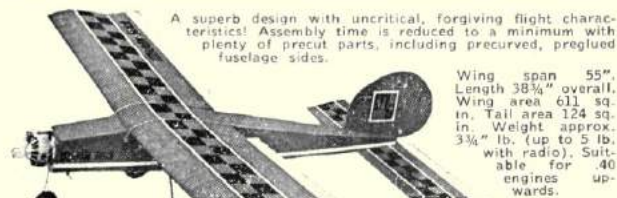
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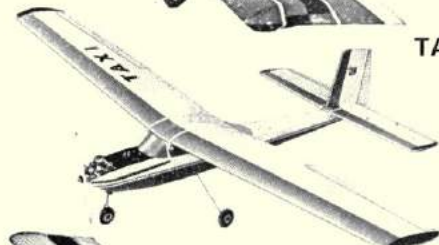
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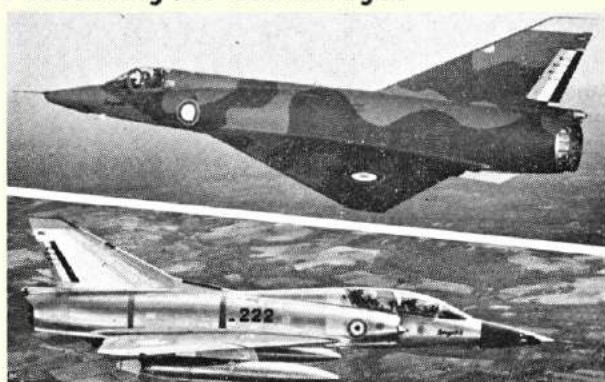
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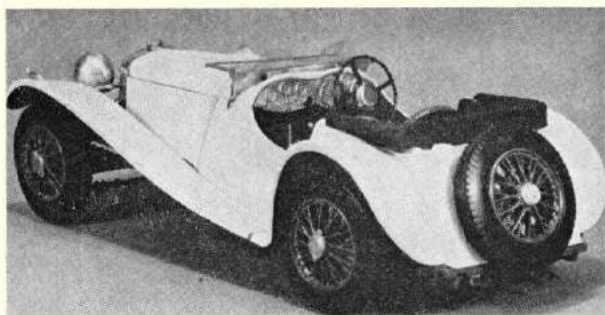
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The classic shape of the SS100—forerunner of the Jaguars, makes a special review feature in November *SCALE MODELS*. Built from a Willis Finestech Kit, the all-metal model is distinctly 'different' and creates a challenge for the perfectionist. No less impressive is the latest Tamiya kit from Japan which, as a change from aircraft and tanks, is a superb 1/72nd scale replica of the Vosper Fast Patrol Boat, the 'Perkasa'. This plastic kit is crammed with a wealth of detail as readers will discover. Aircraft fans also have a full share of reference data, old and new. Peter Gray describes the markings of Jasta 5, the colourful Albatros fighter of World War One with 1/72nd scale drawings and hitherto unpublished photos. The modern Phantom is similarly treated with U.S. Navy and Marine Insignia by Joe Thompson who concludes a three-part series on modelling the McDonnell F-4. Latest tank kit is the Panzer IV H by Nichimo and it establishes new standards in fine detailing as the in-depth review tells. Add to this selection, Geoffrey Deason on Card Modelling, highlights of the U.S. National Champs for scale aircraft and the Naviga European Champs for Scale Ships plus Book Reviews, latest kit survey, decals, etc., and November issue promises a full edition, on sale October 8th.

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161 'Aeromodellers', April '53 to date, 112 'Model Aircraft', Feb. '58-final, 29 M.A.N. (U.S.A.) Jan. '63-Aug. '65, 60 R.C.M.&E. No. 1-Dec. '65. Plans, books, S.A.E. with enquiries. Offers or exchange for lightweight cycle, Crowsley, Mill Hill, Edenbridge, Kent. Tel. 2393 (daytime). K.

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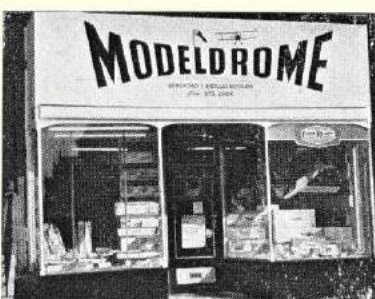
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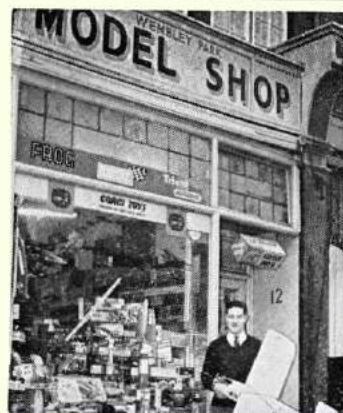
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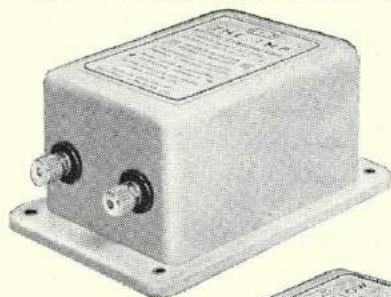
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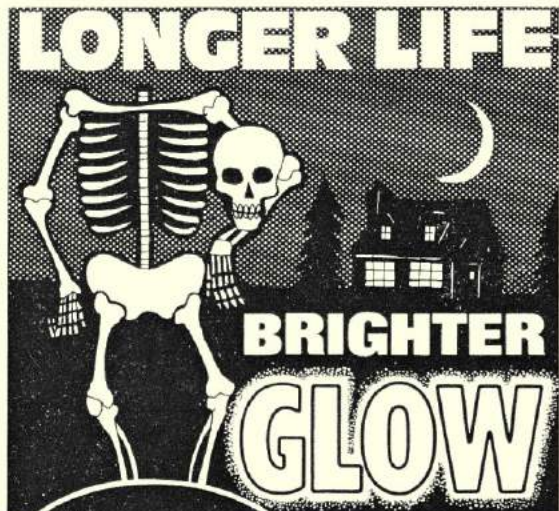
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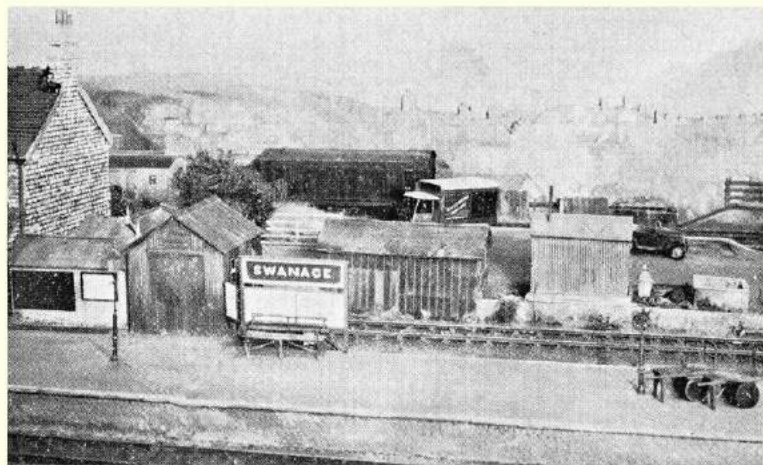
If you were not one of the 29,537 people who saw a mass display of railway layouts at the first MODEL RAILWAYS EXHIBITION, the November issue of this magazine is a must. Many of the eye-catching modelling features displayed at Central Hall, Westminster, are pictured in a special feature – depicted in full colour.

Of course, if you were amongst the nearly thirty-thousand visitors, it should offer special attraction in the pleasure of recapturing some of the splendid details and layouts on display!

Other topics included in the November issue of MODEL RAILWAYS are obtaining the effect of space on a narrow baseboard, a lesson in perspective modelling, a new train of thought about model railway wiring, making superstructures to 2 mm./1 ft. scale and stone walls that please the eye.

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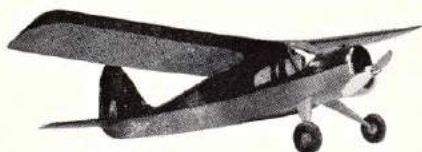
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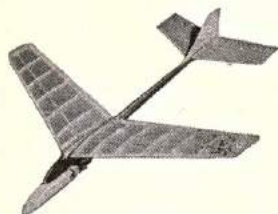
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