

Aero Modeller

October 1972

INCORPORATING
MODEL AIRCRAFT

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

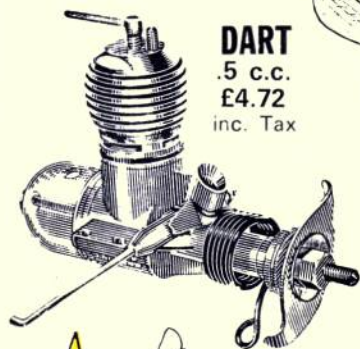


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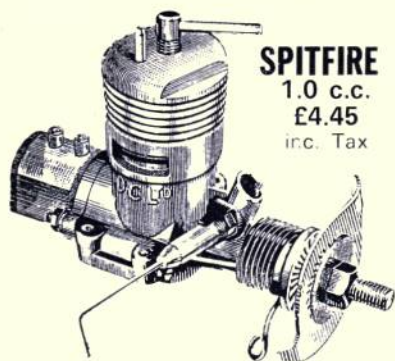
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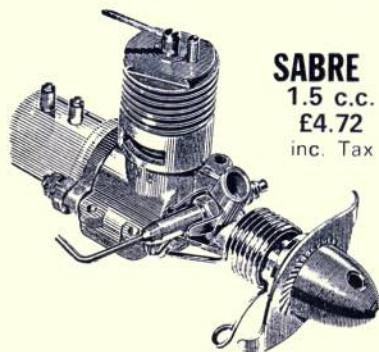
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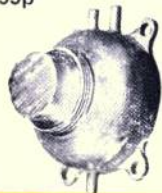
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When it comes to other types of flying models, a common factor emerges again – Solarbo Balsa remains the choice of aeromodellers the world over. Admittedly we are specialists in Balsa, and the world's largest suppliers of aeromodelling quality Balsa. But that's not the reason. It is simply that for something like 30 years Solarbo Balsa has included that little extra in quality which means so much to modellers. The brand name you know you can trust. That's why experienced modellers don't even ask for balsa – they ask for Solarbo. The name has come to mean a part of aeromodelling.

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VERON

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

October 1972
CONTENTS

Volume XXXVII No. 441

HANGAR DOORS	557
'TOURMALINE'	558
WORLD SCALE CHAMPIONSHIPS	561
ENGINE TEST - Fox 25	568
'SPIROGYRA'	570
'WEE KEE WEE'	571
AIRCRAFT DESCRIBED - PZL P-23A & B Karas	574
MORE ON THE CONTROL LINE CHAMPS	578
TOPICAL TWISTS	581
FLYING SCALE COLUMN	582
FREE FLIGHT COMMENT	585
CLUB NEWS	589
CONTEST CALENDAR	590



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Group Advertisement Manager **JOHN PATRICK**

1972 WORLD INDOOR CHAMPIONSHIPS, CARDINGTON

Provisional Results		2 Best Flights		Total
1	M. Andrews U.S.A.	36:12	34:57	71:09
2	K. Rybecky Czech	35:41	33:54	69:35
3	J. Jirasky Czech	32:37	36:12	68:49
4	J. Kalina Czech	30:24	38:18	68:42
5	S. Cannizzo U.S.A.	34:02	34:08	68:10
6	A. Popa Rumania	33:31	32:02	65:33
7	P. Romak U.S.A.	28:05	36:04	65:09
8	J. Blount U.K.	31:18	32:52	64:10
9	S. Bombol Poland	32:02	30:15	62:17
10	A. Frioli Italy	30:25	31:29	61:54
19	M. Shepherd U.K.	28:03	28:49	56:52
28	L. Barr U.K.	25:51	20:10	46:01

Team Results	
1	Czechoslovakia 68:42+68:49+69:35=207:06
2	U.S.A. 65:09+68:10+71:09=204:28
3	Rumania 61:20+65:33+58:38=185:31
4	Yugoslavia 60:02+61:51+58:15=180:08
5	Poland 51:32+62:17+54:07=167:56
6	Italy 47:49+61:54+58:11=167:54
7	U.K. 64:10+56:52+46:01=167:03
8	Finland 158:19
9	Germany 138:35
10	France 105:15
11	Netherlands 64:39
12	Australia 57:40
13	Canada 38:01
14	Japan 32:42

1972 PYLON RACING INTERNATIONAL, CRANFIELD

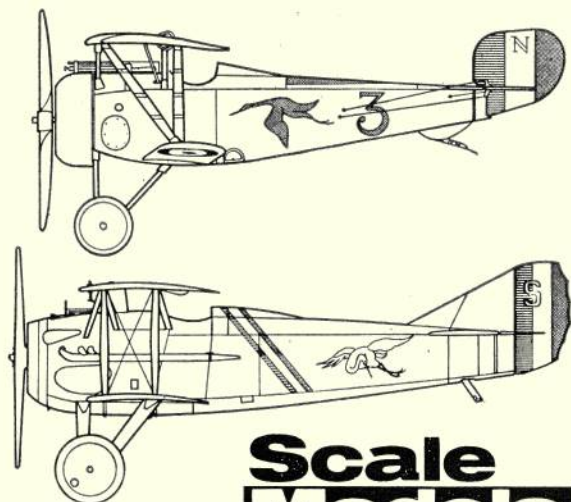
Provisional Results	
1	R. Violet U.S.A. 32 points
2	P. Greeno U.K. 28 points
3	J. Bertken U.S.A. 27 points
4	C. Wall U.K. 26 points
5	D. Beaumont U.K. 24 points
6	G. Korpi U.S.A. 23 points
7	A. Griffin U.K. 23 points
8	C. Smith U.S.A. 21 points
9	R. Nicholls U.K. 21 points
10	L. Leonard U.S.A. 20 points

on the cover

Winners both! Control line scale champion (top) was Jerzy Ostrowski with his D.H. Hornet featuring retract undercarriage and firing rockets in addition to the 'normal' refinements of throttles plus flaps. Below is the new radio control scale champ, H. Simon with his most unusual, and ambitious, subject, the Me 163. Landings were really spectacular as the machine bounced down the runway on its single metal skid.

next month

Full report on the Indoor World Championships. Plans for two fully aerobatic twin engined profile scale models. Gadget review, advice on how to build a model box for free flight models, plus all the regular features in November issue of Aeromodeller on sale October 18th.



Scale Models

French Escadrille markings 1914-18, including the famous 'Stork' Squadron variations on Nieuport 17s, SPAD VII and XIII are described in detail, complete with scale drawings and camouflage colour schemes by Norman Whitcomb. Bob Jones reviews in depth the Revell (Japan) kit for the 'Tony' fighter - another 1/32nd scale gem, full of fine moulding. Maurice Brett concludes his M.G. Midget with 1/24th scale G A drawings of the famous sports car and Bill Hearne describes the side-car features in his review of the ESCI BMW R75 kit. 'Meet the Modellers' goes north to Scotland where Owen Fee of Edinburgh produces magnificent military figures and 'New to You' covers FW 190, Morane, Lysander, Ryan Mailplane and other latest items to reach the shops.

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PLANS HANDBOOK

1

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PLANS HANDBOOK

2

Model Boats & Cars



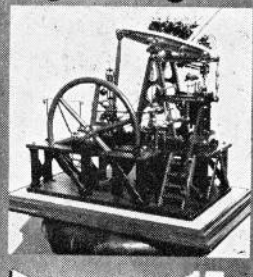
PLANS SERVICE 15p

96 pages of plans of scale and semi-scale ships, tugs, lifeboats, submarines, paddle steamers, period ships, racing yachts, hovercraft, cabin cruisers, mostly illustrated, fully described, and classed for ease of building. Working model cars and usual vehicles are included and the very range of scale car drawings, racing cars, ancient and modern. Index of drawings; useful articles on building; waterline plans; trade advertisements.

PLANS HANDBOOK

3

Model Engineering



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96 pages of working model drawings for steam locomotives, traction engines, steam engines, petrol engines, workshop equipment from LBSC, Westbury, Evans, Maskalyne, Bradley, Hughes. Plus useful model engineering information, screw-cutting tables, standard threads, letter and number drills, wire and sheet metal gauges, miscellaneous information.

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4

Radio Control Models



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96 pages include a truly full range of R/C model plans. There are 128 R/C aircraft, all illustrated, including S/C Sports Models and Trainers, Galloping Ghost Models, Competition Aerobatic Models, Multi-Sport and Trainers, Pylon Racers, S/C and M/C Scale Gliders and Soarers. 87 model boats suitable for radio control, plus do-it-yourself R/C systems.

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RUSSIAN AIRCRAFT

Undoubtedly the most ambitious research team, this book traces

work undertaken by the Harleyford the origins of Russian Air Power through both World Wars to the modern day. Masses of rare photographs are liberally sprinkled throughout the text. Captions are given in Russian as well as English. There is also a section on airships. 50 aircraft are illustrated by 1/72nd scale 3-view tone paintings, some of the drawings are in 1/144 to fit the pages. Types range from the DUX type II right through to the MIKOYAN STOL, which has flown, since publication of the book. Compiled and written by Heinz Nowarra and Geoff Duval, with drawings by W. F. Hepworth.

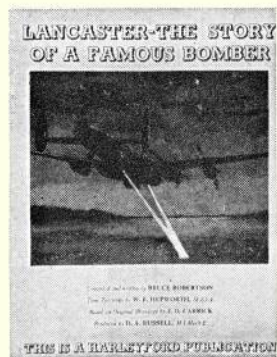


288 pages, 70 pages of 1/72 half-tone drawings. Over 600 photographs. One colour plate. **£5.25**

LANCASTER

by Bruce Robertson

Essentially the 'Lancaster Story' rather than just Lancaster, for the Lancaster evolved from the Manchester and the Mark IV and V Lancaster became the Lincoln B.1 and B.2. Thus, both the unfortunate history of the Manchester and the post-war history of successful Lincolns qualify for coverage. Since the York transport used Lancaster wings and undercarriages and the Shackleton evolved from the Lincoln, these and the Lancastrian transports are covered in the text and with photographs and drawings.



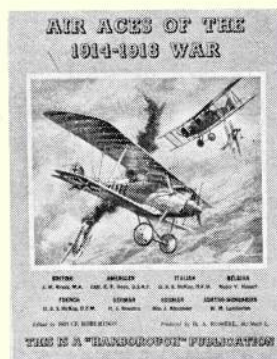
A type-by-type review gives the specification details of the series from issue of the Manchester tender in 1937 to the Shackleton. Apart from all the marks the various modifications are covered, including the famous 'Aries' and 'Thor' and the subsequent jet-engine test beds.

The fate of all 7,374 Lancasters is presented with serials, squadron numbers, service histories and final fates.

216 pages, 362 photographs, 28 pages drawings, 24 pages 1/144 scale tone paintings, colour plate. **£3.50**

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Biographies of 135 leading British, French, American, German, Italian, Belgian, Russian and Austro-Hungarian aces, and mention of over 1,000 others, each with his score. Also the background to the airforces in which they served and details of the aircraft they flew. Listed are those awarded the V.C., Congressional Medal of Honor and the Ordre pour le Mérite.



212 pages, 335 photographs, colour plate. **£3.50**



SOPWITH

by Bruce Robertson

The fascinating story of Thomas Octave Murdoch Sopwith and his famous aircraft, one of which, the Sopwith 'Camel' will perhaps be the most remembered of all W.W.I aircraft.

The book traces the development of the Sopwith Aviation Company through its long and successful history.

Text was compiled and written by noted historian Bruce Robertson, with drawings by Peter G. Cooksley. Mr. Robertson produced the book with the closest co-operation of T.O.M. himself. The majority of the photographs are from private files and have never

been seen before. Drawings are well detailed, and there are six pages of intimate details of the renowned 'Camel'.

As well as the drawings there is a type-by-type review of all Sopwith types, and a section on surviving Sopwiths and replicas. No self-respecting enthusiast can afford to be without this invaluable book.

244 pages, 28 three-view 1/72nd scale drawings. Over 400 photographs. Two colour plates. **£4**

F-W 190

by Heinz J. Nowarra

Early days and experiments of Heinrich Focke, George Wulf and FW109 designer Kurt Tank from the background to this detailed account of one of Nazi Germany's best aircraft.

Throughout the book the history of all the FW190 and Ta152 V-series experimental aircraft can be traced, together with all the operational versions and a number of other interesting projects - the 'Mistel', 'Glide-bomb' and 'Dopplerritter'.

Action, both on the Eastern front and over the rest of Europe, is vividly described and supported by translations of extracts from combat reports of several German 'ace' pilots, including reports of action against women pilots.

Supporting the narrative are schedules of complete Luftwaffe battle orders, right up to the final breakdown in 1945.

The accuracy and detail of this book could only have been achieved with access to the Focke-Wulf organisation's official files and reports.

216 pages, 360 photographs, 12 pages drawings, 24 pages 1/72 scale tone paintings, 6 pages in colour. **£3.50**

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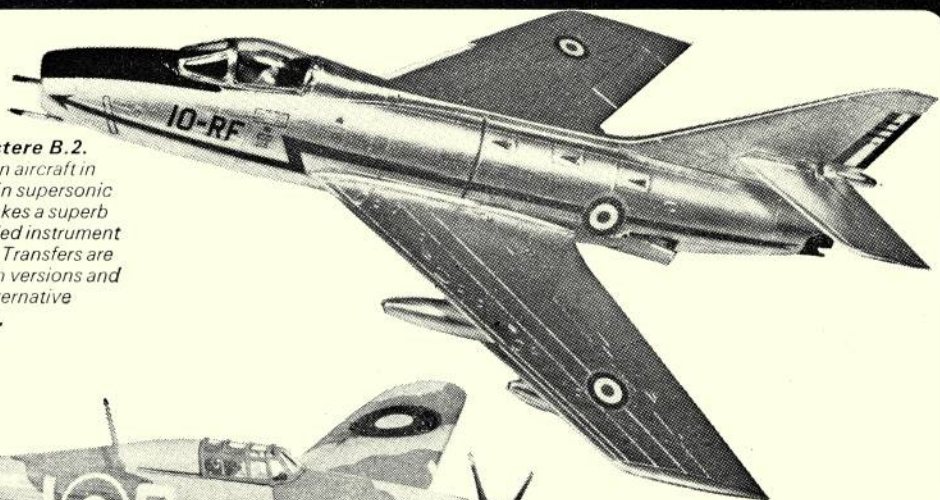
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AIRFIX NEWCOMERS

Dassault Super Mystere B.2.

This, the first production aircraft in Western Europe to attain supersonic speed in level flight, makes a superb Airfix model with detailed instrument panel and airbrake bay. Transfers are included for two French versions and two Israeli as well as alternative armaments. **Price 35p.**



Hawker Hurricane

Here is a completely new model of the famous World War II fighter — with all the optional extras! Choose Mk.I, Mk.IIB or Mk.IV. Complete with two sets of markings, this accurately detailed kit includes rockets, bombs, long range fuel tanks and the famous 40 mm tank busting cannons.

Price 25p.

M-551 Sheridan

This U.S. Army armoured reconnaissance vehicle uses the Shillelagh guided missile system and conventional 152 mm gun. A new Airfix model, it shows particularly fine surface detail, including trenching tools and movable 7.62 mm machine gun. **Price 25p.**



Morris Marina — 1.8 T.C.

A completely new model of a completely new car from British Leyland! Comprehensive 88-part kit with well detailed engine and interior — right down to gear lever and handbrake! **Price 35p.**

The world's biggest range of construction kits

Don't miss these Airfix publications!

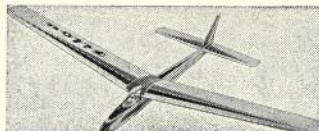
Airfix catalogue — 64 full-colour pages 15p.

Airfix magazine — a 'must' for modellers. 15p monthly.

Airfix books — 'HMS Victory', 'Mayflower' and 'Spitfire' — all available now!

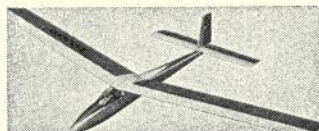


Graupner



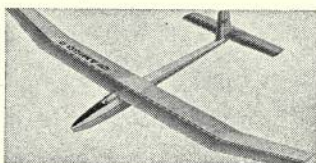
AMIGO 2 £8.30

Here is a real contest-type sailplane, 78 3/4" span and total area 694 sq. in. Extensively prefabricated, the kit includes die-cut and printed balsa and ply parts, milled and slotted stripwood, ready-formed tow hook, canopy, tissue covering, decals, etc. The Amigo 2 also adapts readily to pylon power and is ideal for R/C (R/C installation plan included).



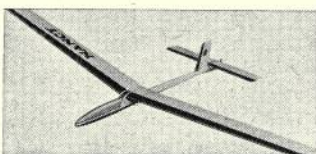
FILOU SAILPLANE £4.85

50" span sports-type sailplane which converts to auxiliary power (pylon mount 92p extra). Kit contains quickbuild plan, printed and die-cut sheets of balsa and ply, canopy, wire parts, tissue covering, decals and miscellaneous items. Model also recommended for R/C flying.



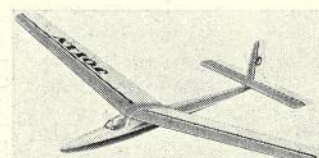
DANDY £6.90

A kit designed for rapid assembly with die-cut sheet, preshaped fuselage parts, milled and slotted stripwood, canopy, cement, tissue covering, decals, etc. Span 63". Total area 540 sq. in. Can be converted into a powered glider with pylon mount (92p) and 049 engine.



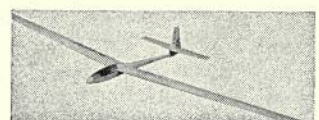
NANCY £4.15

Another design in the popular A1 class. Span 48 3/4". Kit includes milled fuselage nose section, die-cut sheets, milled stripwood, preshaped wire parts, tissue, adhesives, decals, etc., plus a two-colour exploded drawing and plan. Quality of the prefabrication is exceptional! The Nancy is also complete with auto-rudder and dethermaliser.



KATY A2 £8.15

Ultra modern towline contest glider. Quickie kit includes milled fuselage nose, wing fairings and other parts moulded in plastic, die-cut balsa parts and all other items needed to complete this super high-performance model quickly and easily. Conforms to A2 specification and includes all the latest ideas in design. Wingspan 67 1/2". Length 39". A very complete and recommended kit.



FOKA (SCALE GLIDER) £14.80

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

BEGINNER 38" span £2.70
UHL Mark III 43" span £2.80
FOUGA SYLPHIE (Jetex) ... £1.78



CIRRUS £18.75

Giant 118" span. A fabulous kit with finished fuselage mouldings in ABS plastic, pre-cut wood parts, complete hardware, moulded canopy, control horn, cement, covering material, etc., etc. Also CUMULUS 2800 £41.60 110" span. Injection moulded parts, ideal for R/C!

Graupner Tow Handle & Line 38p
Tempo Geared Winch £3.90
Full-length Pilot Doll 96p
Top Edge Nylon Hinges 80p

AT YOUR LOCAL MODEL SHOP !!

BO 209 MONSUN ... £2.95

All-sheet 21 1/2" span scale model for rubber power. Complete kit. One of the latest additions to the Graupner range featuring the latest ideas in prefabrication.

ALSO

MINI-PIPER Quickie ... £5.90

Diecut all-sheet model, 29" span.



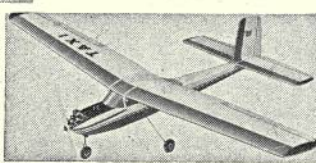
AMATEUR ... £7.65

43 1/4" span. Kit includes full-length diecut balsa fuselage sides, diecut sheet and ply, shaped wire parts, wheels, hardware, etc. Takes engines up to 1.5 c.c. for free-flight or radio control. One of the best sports-type power models available today, with semi-scale appearance and a proven flying performance. Ideal as an R/C trainer.



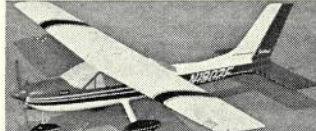
TAXI ... £12.80

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



CESSNA 177 CARDINAL £29.40

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



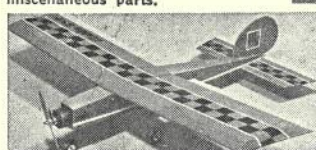
TOPSY 32" span £3.45

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



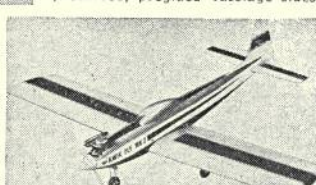
MIDDLESTICK ... £15.65

Wing span 55". Length 38 3/4" overall. Wing area 611 sq. in. Tail area 124 sq. in. Weight approx. 3 3/4 lb. (up to 5 lb. with radio). Suitable for .40 engines. Assembly time is reduced to a minimum with plenty of pre-cut parts, including precurved, preglued fuselage sides.



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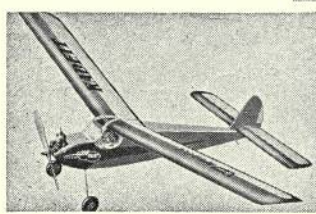


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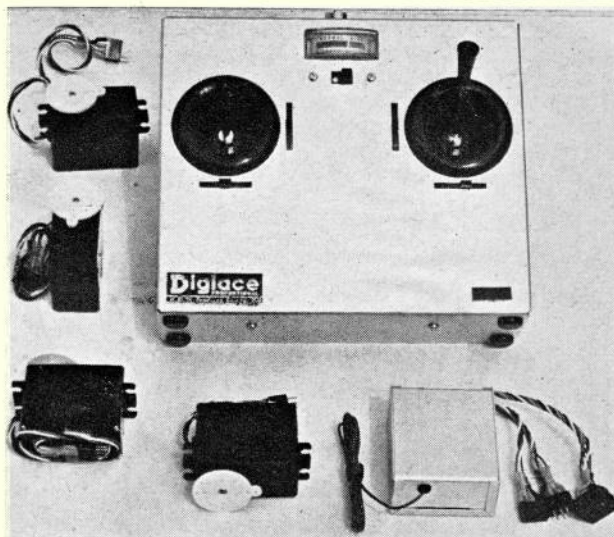


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Minimum of five crosses and a maximum of 130 crosses per coupon. You may enter as many coupons as you wish. Members of the family may send their coupons in one envelope with one Postal Order to cover all the entries.

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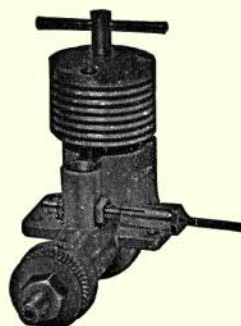
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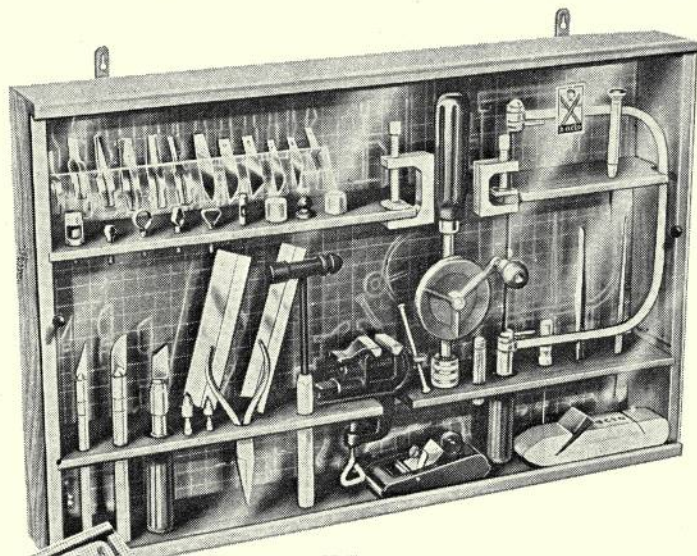
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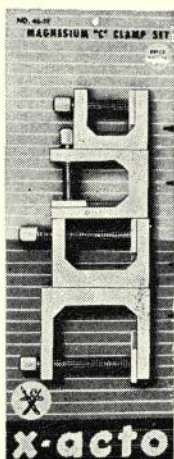
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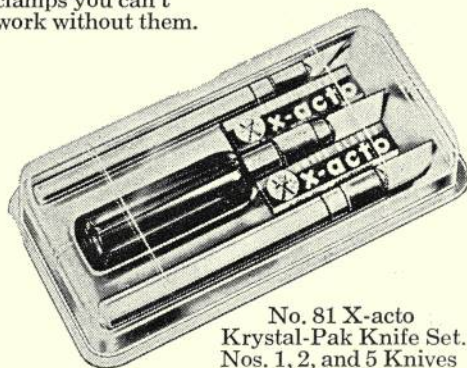
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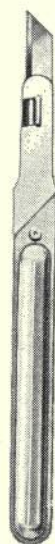
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The Birthday Present

Exactly one year after the deHavilland aircraft organisation came of age, September 25th 1942, four of their then unknown Mosquitos from 105 Squadron, gave Norway a birthday present. Led by Squadron Leader D. A. G. Parry, D.S.O., D.F.C., the Mosquitos left Leuchars in Scotland bound for the Gestapo Headquarters in Oslo. Their mission was threefold. First: to disrupt a rally due to be held there and which would be attended by Vidkun Quisling. Secondly: to destroy as many documents, traitors, collaborators and Gestapo personnel as possible. Thirdly, and perhaps most important of all: to give a much needed boost to Norwegian resistance morale.

There was a further reason why Mosquitos were chosen for this particular raid. The low level day bombing attacks employed by the Mosquito Squadrons had not, until this point in time, yielded many spectacular successes. Its whole future as a day bomber was therefore being hotly criticised at top defence command levels. The Oslo raid helped to swing opinions over towards the Mosquito's retention in the role for which it had been specifically designed.

The Mosquitos flew at sea level, in order to deceive enemy radar, and were given to expect full cloud cover at 2,000 feet and no enemy aircraft. Their expectations were not fulfilled. They met with cloudless skies and Focke Wulfe 190's.

Four Mosquitos attacked the target in pairs, Squadron Leader Parry and Pilot

Officer Rowlands leading. They flew over Oslo at rooftop height towards the headquarters - easily discernible due to the large dome and Nazi flag surmounting the building. One enemy aircraft engaged the leaders and two more 190's dived hard on the second pair. Flt. Sgt. Carter's aircraft had fallen slightly behind and was hit badly - with a FW 190 on his tail and one engine blazing, he turned towards Sweden, only to crash in a lake - his aircraft was subsequently salvaged by the Germans. The others bombed the target with an accuracy which captured the imagination of both the Norwegians and the British.

At least 4 bombs entered the roof of the Gestapo buildings before the 3 remaining Mosquitos turned and streaked home along the valleys of Norway. The pace was fantastic; and indicated air speed of 330 mph; with the Mosquitos steadily drawing away from the fighters. One of the chasing 190's crashed near Oslo and the pilot was killed. At the time rumours circulated that it had been shot down by a Mosquito - an impossibility since these Mosquitos did not carry any armament and were originally designed to rely on speed as their main defence. Subsequently, the crash was attributed to either the Mosquito's slip stream forcing the fighter out of control or the effect of the bomb blasts over the Gestapo HQ.

The three remaining Mosquitos returned safely to England, the total 1,100 mile journey having taken 4½ hours; and the following day the 6 a.m. news carried details of the raid and told the

British Public that they had a new light bomber. At 22 years of age deHavilland had given the Germans a birthday present it would be hard to live down, and the British, one which they would never forget: The Mosquito.

Revell's new 1/32 scale model of the Mosquito IVb Series 2 "GBE" is a faithful reproduction of an aircraft attached to the famous 105 Squadron that carried out the above raid. With a wingspan of over 20 inches and details such as removable cowlings displaying a Rolls Royce Merlin engine, detailed cockpit interior and movable wheels and propellers, it cannot fail to take pride of place in any model collection.

Revell also make the Focke Wulfe 190D in 1/32 and 1/72 scale - and these are just two of over 200 kits in Revell's action packed range, many of which are famous World War II aircraft.

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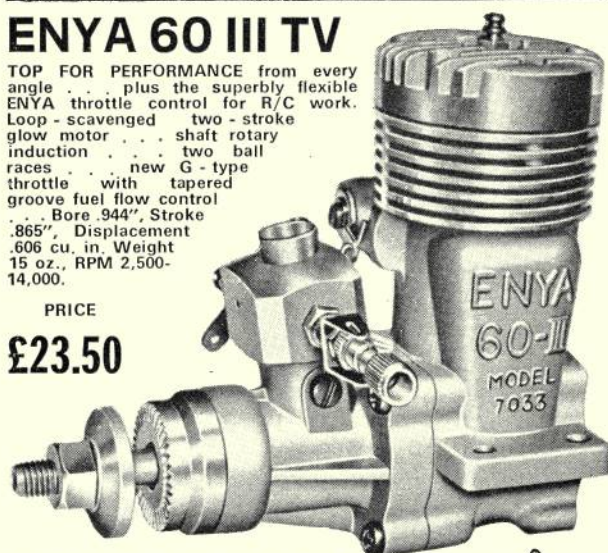
ENYA MODEL ENGINES

ENYA 60 III TV

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

PRICE

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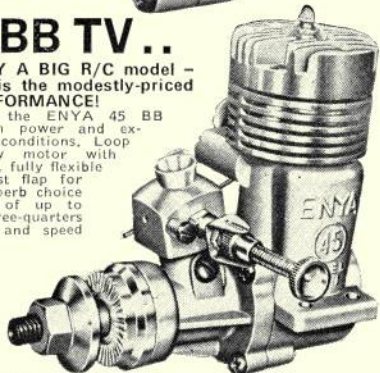


ENYA 45 BB TV..

POWER ENOUGH TO FLY A BIG R/C model - or C/L scale, etc. This is the modestly-priced engine with the BIG PERFORMANCE! Expert aeromodelers pick the ENYA 45 BB for its easy starting, high power and extreme reliability under all conditions. Loop scavenged two-stroke glow motor with twin ball race main bearings, fully flexible throttle and coupled exhaust flap for precise speed control. A superb choice for radio control models of up to 5 ft. span, with over three-quarters of a horsepower available and speed range 2,000 to 13,000 r.p.m.

PRICE

£15.25



CHOOSING YOUR ENYA ENGINE...

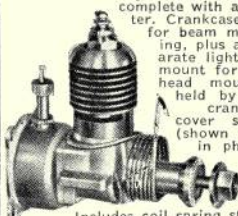
The 'gen' table below gives the leading specification and performance figures for the complete ENYA range - plus recommended propeller sizes for control line, free-flight or R/C models. Use these figures to get the best possible engine-propeller-model combination. Note that while performance figures are given for the Standard versions of the 35 BB III, 45 BB and 60 III, only the TV versions of these models are available in this country.

with PROVEN WINNING POWER

Precision-made by master craftsmen, ENYA engines are WORLD FAMOUS for their easy starting, smooth running, reliable performance and long, long life. A COMPLETE RANGE for you to choose from.

ENYA 049

A superb little sports glow motor with rear rotary valve induction complete with air filter. Crankcase lugs for beam mounting, plus a separate light alloy mount for bulk head mounting held by rear crankcase cover screws (shown fitted in photo).



Includes coil spring starter

19 TV £8.45

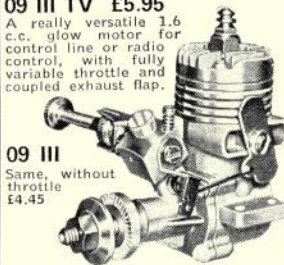
The ideal choice for the small to medium size radio control model. Easy starting, fully flexible throttle control and matching 9 or 10-inch diameter props (4 in. pitch). Bronze bearing, front rotary induction.



19 (without throttle) £6.75

09 III TV £5.95

A really versatile 1.6 c.c. glow motor for control line or radio control, with fully variable throttle and coupled exhaust flap.

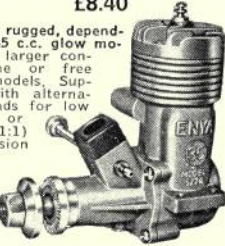


09 III

Same, without throttle £4.45

35 III £8.40

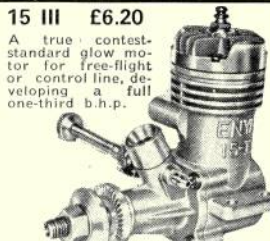
A really rugged, dependable 5.85 c.c. glow motor for larger control line or free flight models. Supplied with alternative heads for low (7.5:1) or high (9.1:1) compression ratio.



35 III TV (with throttle) £10.50

15 III £6.20

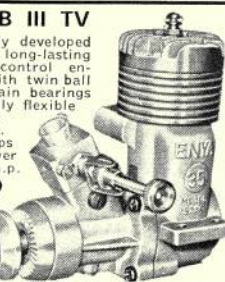
A true contest-standard glow motor for free-flight or control line, developing a full one-third b.h.p.



15 III TV (with throttle) £7.95

35 BB III TV

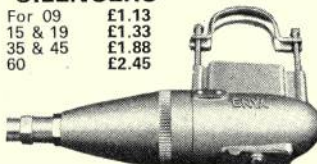
Specially developed as a long-lasting radio control engine with twin ball race main bearings and fully flexible throttle control. Develops well over 0.5 b.h.p.



£11.90

SILENCERS

For 09 £1.13
15 & 19 £1.33
35 & 45 £1.88
60 £2.45



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The ENYA range of engines are manufactured in Japan, but the widest possible range of spares are held in this country by RIPMAX - so any servicing required can be quick and simple. Spares can always be ordered through your local model shop for prompt delivery (if not immediately available over the counter).

RECOMMENDED GLOW PLUGS
For all standard engines KLG 63p
For all TV (R/C) engines PMM 63p

Model	Main bearing	Bore x Stroke (in.)	Displacement (cu. in.)	Weight oz.		Compression ratio	Max. power H.P. T.V.	R.P.M.		PROPER SIZE OF PROPELLER		
				Std.	T.V.			Standard	T.V. type	C/L Stunt	Free-Flight	R/C
ENYA 049	Light alloy	0.413 x 0.370	0.049 (0.8cc)	1.9	—	8:1	0.06	8,000~17,000	—	5 1/2 x 6 x 3	6 x 3	6 x 3
ENYA 09.III	Bronze	0.512 x 0.480	0.099 (1.62cc)	3.4	4.1	7.5:1	0.20	8,000~16,000	2,000~13,000	7-8 x 6-4	7-8 x 4-3	8 x 4-3
ENYA 15.III	Bronze	0.590 x 0.551	0.15 (2.47cc)	4.8	5.2	7.5:1	0.33	8,000~16,000	2,000~13,000	8 x 6-5	8 x 4	8.5-9 x 4
ENYA 19.V	Bronze	0.654 x 0.590	0.198 (3.25cc)	5.3	5.7	7.5:1	0.42	8,000~16,000	2,000~13,000	8-9 x 6-5	9 x 4	9-10 x 4
ENYA 35.III	Bronze	0.803 x 0.704	0.357 (5.85cc)	7.7	8.6	low 7.5:1 high 9.0:1	0.80	8,000~16,000	2,000~13,000	10 x 6	10-11 x 5-3	10-11 x 6-4
ENYA 35BB	Bronze	0.803 x 0.704	0.357 (5.85cc)	7.7	8.6	low 7.5:1 high 9.0:1	0.80	8,000~16,000	2,000~13,000	10 x 6	10-11 x 5-3	10-11 x 6-4
ENYA 35BB	2 ball race	0.803 x 0.704	0.357 (5.85cc)	8.6	9.1	low 7.5:1 high 9.5:1	0.85	10,000~17,000	2,000~13,000	10 x 6	10-11 x 5-3	10-11 x 6-4
ENYA 45BB	2 ball race	0.878 x 0.756	0.457 (7.5cc)	9.1	10.0	8.0:1	0.90	8,000~15,000	2,000~13,000	11 x 6	—	11 x 6-5
ENYA 60.III	2 ball race	0.944 x 0.865	0.606 (9.95cc)	13.7	15.0	8.5:1	1.45	9,000~14,000	2,000~13,500	11-13 x 6-5	12-13 x 6-5	11-12 x 8-6

SEE THEM ALL AT YOUR LOCAL MODEL SHOP!

In case of difficulty write: RIPMAX MODELS & ACCESSORIES, 80 HIGHGATE ROAD, LONDON, N.W.5

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Build your own super flying machine around an empty bottle of Squezy, Sunlight Lemon Liquid, or Domestos!

The only constraints are that rubber bands be the power source if necessary (no diesels, jets, etc.), that any materials used can be found in model shops and of course, that your machine is built around any empty Squezy, Sunlight Lemon Liquid, or Domestos bottle. (It's important to rinse out the bottles before use, especially Domestos).

Make your plane simple, easy to make, original in design, able to fly in a stable manner and withstand the odd crash without too much damage; in short a fun, easy to build model.

When you've built your 'Flying Machine', attach the coupon to it, pack carefully in a box and send to: P. D. U. Flying Machines, Lever House, New Fetter Lane, London EC4P 4EY.

A copy of the full rules may be obtained from the above address.

Entries will be judged by a panel of experts including the editor of Aeromodeller, and the results will appear in the Aeromodeller March issue. So start building now! Entries must be received by November 30th 1972 and cannot be returned. The property copyright and design right in all entries shall rest in Lever Brothers Ltd.

To: P.D.U. Flying Machines,
 Lever House, New Fetter Lane, London
 EC4P 4EY.

I agree to abide by the rules of the
 competition.

NAME _____

ADDRESS _____

Heard at the HANGAR DOORS

During the World Champs for Scale Models at Toulouse, the model club from AeroSpatiale produced some remarkable models of the local products – all ducted fan. The Super Caravelle is not shown here; but an A-300B Airbus and Concorde prototype should be enough to whet the reader's appetite!



TRAGIC, although, regrettably, not unique, accident occurred on August 11th when Graham Lee, a 25-year-old enthusiast, was killed flying his control line model, which hit overhead power cables. Graham, a member of the Sibley M.A.C., was flying his *Pinto* model on the club's 20-acre field at Ratcliffe-on-Soar, which has telegraph poles running parallel to one side. Running backwards to maintain his line tension brought him close to these wires, with fatal results. The Power lines were not on the traditional metal pylons. In this case, three wires were carried 19 ft. from the ground by wooden poles, with a total load of 11,000 volts. In the words of the Sibley Club treasurer, who was helping Graham on the test outing of the *Pinto*, 'There was a blinding flash, and Graham collapsed to the ground.' Attempts at revival proved unsuccessful and Mr. Lee, who was married only eight months ago, was found dead on arrival at Leicester Royal Infirmary. At the inquest, the coroner recorded a verdict of 'Accidental Death' and the pathologist said Mr. Lee died from cardiac arrest caused by shock. Mr. Lee had been a member of Sibley Model Aero Club for six months. As a mark of respect, the club cancelled a summer party in the village on August 19. A spokesman for Leicester and Rutland Constabulary said: 'We cannot stress too strongly the danger of flying cable operated model aircraft near electricity cables. All aero model enthusiasts should remember this.' The lesson to be learned from this sad accident is obvious, and has been repeated many times before. NEVER, under any circumstances, fly anywhere near overhead cables – it is not even necessary to touch the wires to be electrocuted, especially in damp conditions.

WORLD CHAMPS for indoor models at Cardington broke all records for the 65 cm, one gramme class. During test flights, Pete Andrews (U.S.A.) made 41 minutes, but conditions cooled for the two-day event and their best contest flight was last World Champion Jiri Kalina's 38.18. This achievement in the very last hour of the contest clinched the team position for the Czechs, who held a slim margin over the U.S.A. 14 Nations were represented and many new National Records established, including 19 minutes for S. Nonaka, of Japan, 19.34 for Mike Thomas, of Canada, and 19.02 for W. Beekmeyer, of the Netherlands – each of whom were competing in the event without prior experience of the 65 cm class under such a high ceiling. Similarly, the Australian entry from Boyd Felstead was sent, untested, to proxy flyers Manny Radoff and Ev Rodemsky, who made a creditable 28.48 with the new model. The British Team placed lower than expected, at seventh. Laurie Barr was plagued with rubber motor breakages and power problems, which led to times way below his normal level. There were many remarkable achievements during the course of the 202 recorded flights, and numerous new developments in the art of extracting duration from ultra light structures. Full story and pictures in next month's edition. Held simultaneously at Cranfield, the 2nd International Pylon Racing event for the 'Sopwith Trophy' could not have been a greater contrast. Won after 64 heats by Bob Violet, of U.S.A., with Phil Greeno (U.K.) snapping at his heels, this fast and furious event became a U.K. versus U.S.A. challenge out of the six participating Nations. The tempo of Pylon is rivalled only by the not-dissimilar control-line team

racing class and all the physical and psychological features came to light in the passions which prevailed from start to finish. At one stage, flagmen refused to do their job – the models were too close for comfort, and some thunderous crashes illustrated the hazards involved. As a second 'trial' for the regulations, the event ought to result in many rule modifications to eliminate ambiguities and avoid disputes. Enthusiasm for Pylon is tremendous and it is obvious that it will soon reach a World Championship status.

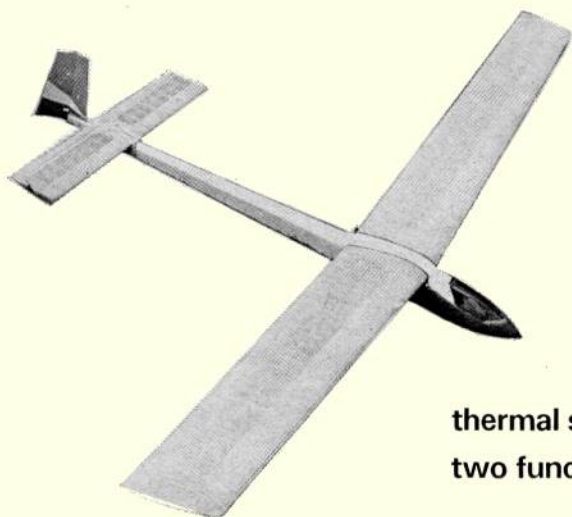
See our companion magazine, R.C.M.&E., for full report, with further details in next month's *Aeromodeller*.

JIM SCOTT, the genial proprietor of Complete-a-Pac, died after a brief illness, on August 24th, at the early age of 41. A staunch supporter of flying scale, Jim started his business many years back when he offered to prepare packs of wood to go with our more popular ATS plans. This service became so popular that he progressively extended his range to include other plans, including his own series. The packs became more comprehensive, and the business eventually eclipsed his original shoe shop activities. Distribution of Complete-a-Pac is currently world-wide – a classic example of one man's enterprise producing the right material at the right time, in the right quality and quantity. Thousands of customers will be relieved to know that his son, David, will continue the business from the Earlston address. All modellers will join us in extending heartfelt sympathy to Evelyn Scott and her three sons in their tragic loss.

Trevor Faulkner's

TOURMALINE

an attractive $85\frac{1}{2}$ in. wingspan slope or
thermal soaring glider for single channel or up to
two function radio control



IN THE FEBRUARY issue, the designer described how he, an ardent free-flight enthusiast, tried his hand at minimal cost radio control flying. Approaching the subject with perhaps a little trepidation after so many years of 'pure' flying he found that there was indeed a great deal of pleasure and relaxation in flying a radio controlled soarer and that his free-flight experience made the transition to controlled flying considerably easier.

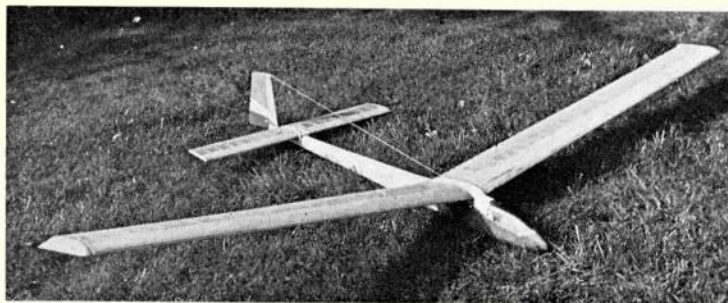
The photographs of Trevor's elegant soarer and his accompanying text inspired many readers to request plans of his design, hence the *Tourmaline*!

This model is the direct descendant of a series of proven free-flight designs and has proved sufficiently docile to be used as a trainer if the flier has a basic knowledge of practical trimming, and can build soundly. The design is something of a reaction against what its originator considers the rather stark 'first models' usually flown by beginners. It has numerous advantages which commend it; namely it will soar in very light winds, even if built quite sturdily beginners will find it easier to accustom themselves to a rather less demanding wind-speed for earlier flights, the *Tourmaline* flying when most 'trainers' and multi jobs are grounded for lack of lift. Secondly, it can be trimmed over a wide range of C.G. positions to give higher flying speeds when experience is gained, and although quite a large model, it will take a lot of punishment, and need not be considered as a disposable step to something better. Finally, and perhaps one of its chief attractions, is that it can be used in either 1 or 2 channel form, making it a design capable of accommodating a wide range of equipment (single channel, single channel plus trim, single function propo. plus trim, and of course, two function proportional).

Except for the fuselage, this model is entirely conventional, although it is fair to say that it is more of a 'builder's model' than a beginners 'quick and easy' design. Formers F4, 5 & 6, are very simple but must be built accurately using a tri-square, to achieve this. File the slots for the alignment strips with a small flat ($\frac{1}{8}$ in.) file to ensure a snug fit. Rough cut the side components, join them and then cut to the final finished shape, using the hardest $\frac{1}{4}$ in. stock for the forward section with straight-grained medium sheet aft. The bottom is treated in the same way, but here the scarfed area which marries with the $\frac{1}{2}$ in. sheet must be marked and sanded too.

Plot the position of the spruce ($\frac{1}{8}$ in. sq.) strips, checking with a long true straight edge. Use this edge again after gluing, as this section spruce tends to be a little inclined to 'wave'. Mark the positions of all formers on the inside faces of the sides, noting that they are perpendicular to the datum line, not the base. Assemble formers F2, 4, 5, 6 & 7 between the sides, using P.V.A. glue throughout except where specified, and leave the rig to dry overnight. Next, add the bottom and top pieces, also former F1. Check that the latter is symmetrically disposed, and that the curves of the sides are equal. Finally, add the $\frac{1}{2}$ in. sheet, remembering to fret out the slot for the nose profile first.

Now to deal with the unusual bit: remove the protruding corners of formers F4-7, and with a long sanding block chamfer the edges of the sides, top and bottom. Check progress frequently, as the accuracy of this simple process will aid the ease of assembly in the next stage. The width of the oblique corner pieces is taken from the job itself, cutting them 'nose to tail' fashion from hard straight balsa, $\frac{3}{32}$ in. thick. Glue the two lower strips in place first, and



Long, slim fuselage and cockpit canopy add to the appearance of this versatile soarer. Will fly in conditions when many other models are grounded due to lack of lift, yet may be ballasted up to increase speed and penetration on high-lift producing slopes.

Add the scrap block material where necessary to complete the 'timber' stage of the basic fuselage. Give the rear of the fuselage (from the glass fibre reinforcement) two coats of well plasticized dope, sand smooth and then cover with lightweight nylon. Dope again before applying the glass fibre, as handling is bound to dirty the nylon.

The resin must be worked well into the wood and the first 1 in. of nylon before applying the glass cloth or mat you opt to use. Cloth is much easier to handle if cut on the bias, as this gives a greater flexibility when covering complex shapes. Do not hesitate to give at least two layers of glass material as nose weight will be needed anyway and it is much better to make the ballast do something useful rather than just sit there as a passenger. When the resin has cured thoroughly, begin work on the surface with files, rasps, Surform, etc., finishing with varying grades of wet or dry paper, blending the glass fibre into the nylon area without any 'stepping' in the surface.

The canopy is only shown in outline as individuals may prefer to use block balsa, a one-off moulded job, or adapt a commercial vac-formed unit. The original had a $\frac{1}{8}$ in. perspex moulding which needed no framework, and was held down at the L.E. under an alloy strip profiled around the cockpit L.E. and projecting $\frac{1}{4}$ in. A band over the wing dowels held the rear in place. If necessary, mount a canopy onto a sub-frame, and secure in any way convenient, provided it is reliable and neat.

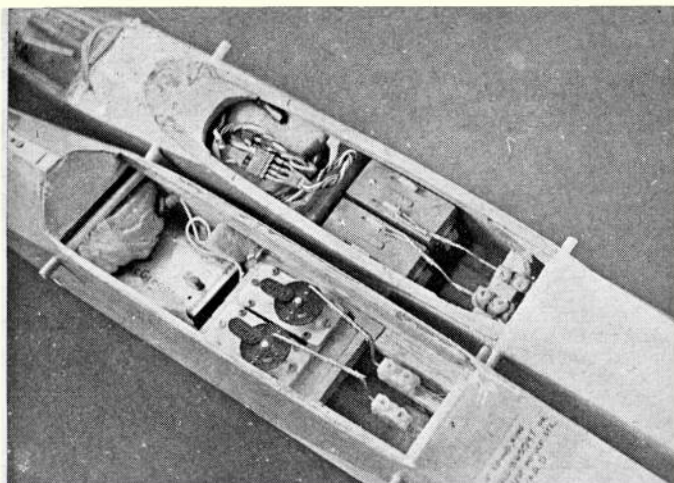
As most of the wing components are above 36 in. long, you are faced with a choice between 48 in. stock, or scarfing lengths together. This process has

hold in place with adhesive tape or pins until dry.

Give an extra layer of P.V.A. to the inside of this joint, and take this last chance to check on the soundness of the glue between formers, sides and bottom. Add the hardwood strip to take tow-hook screws. Cut and add cross-pieces in region of F2, then cut out profile B, gluing it in place to 'B' cross-pieces. Make up the push-rods to match your equipment, adding a rear bearing if required. After this, add the final (top) oblique corner strips, then insert the push rod(s), gluing rear bearing (previously threaded onto elevator rod if used) in position in rear of fuselage. The two remaining oblique strips are then glued in place, taking care in joining the inclined strips recessed in F2 to the main upper lengths. Consult the diagrams on the plan to see the method of changing the section in the area of the wing seat.

FULL-SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. RC 1167, PRICE 50p PLUS 5p POSTAGE FROM AEROMODELLER PLANS SERVICE, 13/35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

[illegible]



Two function Sprengbrock proportional R/C is now fitted in the prototype Tourmaline above, while below the original equipment, a MacGregor superhet receiver with Minimate and Minimo servos are seen – the cheapest single channel servos available and which have performed faultless service.

much in its favour, as lighter material may be employed for the outboard sections with advantage. Make accurate saw-cuts in the two pieces to be joined whilst holding them in exact vertical register. With a little experience, you will find that such joints are easy to make, and are very strong if the scarf is arranged to be no less than four times the width involved. If joining sheet, use the angles and configuration as per the fuselage sides.

As stated earlier, the construction is conventional, but it may help to suggest that the $\frac{1}{4}$ in. washout should be built in as early as possible, and not 'warped' in afterwards – these latter methods do no more than set up stresses which tend to relieve themselves with time, and certainly not symmetrically. Curve the $\frac{3}{32}$ in. sq. diagonals by gently burnishing one side before fitting. The brass tubes are also best fitted absolutely truly: in aid of this, clearance holes are made in the relevant ribs, and the two wing halves tubes and ply tube bearers are assembled with pieces of *straight* 10swg wire linking them. This unit is then laid on a flat surface whilst the ply bearers are glued in place. After this, the tubes are epoxied into the bearers, and secured to nearby spars with scrap wood and cement or glass fibre and resin. The finished unit looks rather like a 'no dihedral' multi wing, but when the angled wing joiners are substituted for the straight, an accurate construction is certain.

Make whichever version of tailplane is required, but keep the weight down. Ribs may be either $\frac{1}{8}$ in. med. or $\frac{1}{32}$ in. hard quarter grain, but the L.E. sheet must be very light. Set in the ply as shown to

avoid the 'Kinky Look'. The end ribs have no slots and are glued as rectangles onto the sheeted tail framework.

Covering

The wing should be covered with either heavy-weight Modelspan or silk *on* light-weight Modelspan tissue. If using the latter method, brush the silk into close contact with the doped tissue using a DRY soft brush (a shaving brush is ideal), then apply final coats of dope with a little extra plasticizer (castor oil) added. Trevor prefers to use a very thin dope mix about 30/70 dope to thinners, building up the finish gradually. What is most important is the curing, and both wing and tailplane should be secured to a board or jig to maintain their correct rig. At least two weeks should be allowed, and it is worthwhile in the long term to continue the process for another month or so between flights. Cover the fin and rudder with light-weight tissue.

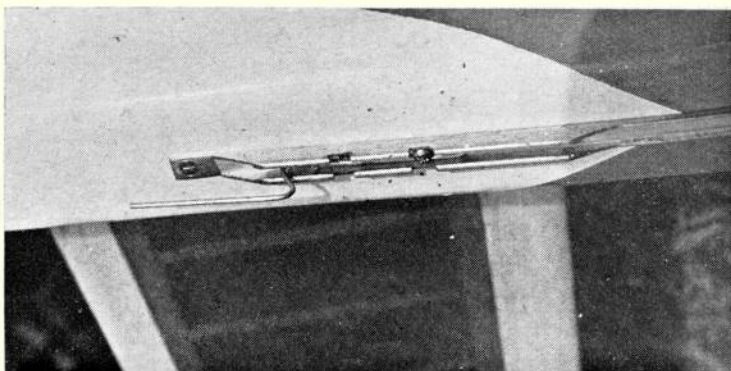
As for the colour scheme, if you can devise an attractive combination of colour and shape, and at the same time, improve visibility, then do so. If you like to have some guidance as to the original's scheme, you will find that selection of coloured tissue on wings and tail will give tonal contrasts on the under surfaces which 'read' well against the sky, and give a flattering illusion of an increase in aspect ratio! Fluorescent enamel on tips and fin were of great help to the designer in finding the model in the early days of downwind landings.

Flying

Set the centre of gravity initially at 50 per cent of the wing chord. Trim by handlaunching in the usual way aiming for a long straight glide with no suspicion of a stall beginning. This rough trim should see you through early flights, and allow the inexperienced flier to leave the controls alone if the model seems to be in an unfortunate attitude (given a spot of height, of course!) At first, allow no more than 20° rudder each way; the moment arm is pretty powerful, and in conjunction with the dihedral specified will turn the model decisively. If using single channel equipment just get the turn started, then release the button. The model 'grooves' into turns, tending to hold them on for another 90° or so once the angle of bank is set.

The elevator is designed to act as a trim tab, but is capable of smooth and powerful control of flying speed. The airfoil used, (Gö 477) may not be very well known, but has a wide usable range of both C.G. and elevator settings.

Always check that the flying surfaces are seated correctly before each flight, and use plenty of rubber bands to avoid movement in the air . . . and you're well on the way to logging up a whole lot of hours.



Close-up of the two hook assembly reveals it to be a modified curtain track, screwed to the underside of the fuselage. Not surprisingly, Trevor is one of the most prolific contributors to our Gadget Review column!



1972 World Control Line Scale Championships

POLAND and GERMANY take individual honours at TOULOUSE . . . reported by Dennis Thumpston and Ron Moulton

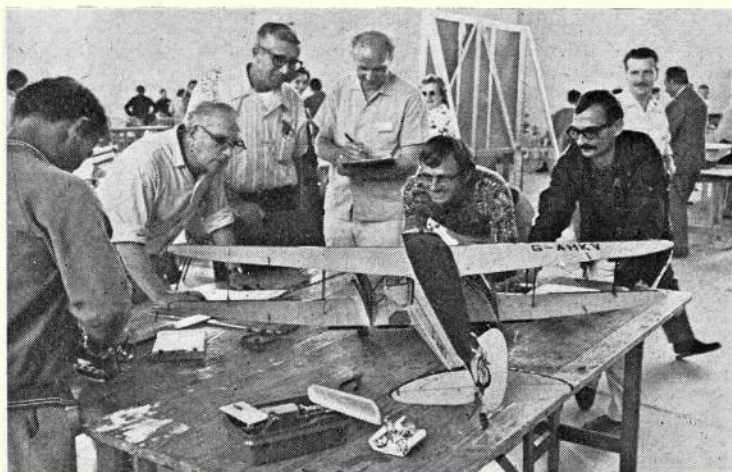
AFTER THE PROMISING start at Cranfield in 1970, it might have been expected that two more years of Scale rules used in many nations would have produced an enlarged entry. But, in fact, Italy dropped out of the running and the U.S.S.R. team stepped in to maintain the numbers at the bare minimum possible of five nations for a World Champs. This must have been disappointing for the French organisers, who had at their disposal the Air France training base of Moutaudran and the excellent domestic accommodation of the adjacent civil air school. A superbly smooth and huge disc of concrete surface was conveniently located as an aircraft turning point off the single runway, and this became the control-line site.

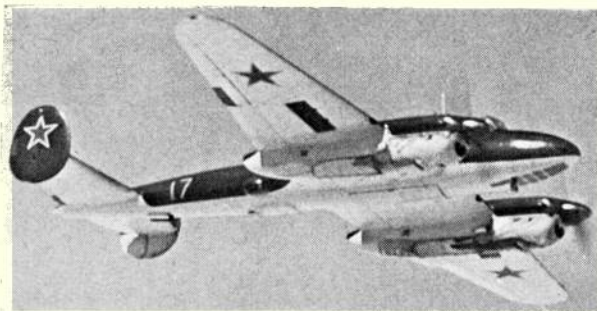
It was warm (in the 80s), calm, until the last round when wind rose to 6 m/sec, and congenial, but not

without drama. Copious cups of tea from the hospitable Staples' family caravan and a delightful 'mateyness' among the control-line flyers made this half of the event much more like a friendly rally than a World Champs, and the trouble-free progress plus a lack of crowd attention tended to diminish the importance of the control-line occasion.

It was not completely without incident, however. Polish models went astray - could not be fitted into aircraft baggage compartments and needed all the local Air France influence to arrive on time. The U.S.S.R. entry of a MiG.21 was too large even for the Il-62 to carry from Moscow and was substituted by a much smaller Stormovik. Then the rising temperatures played havoc with transistor circuits for undercarriage and flap controls in the complex Russian models, and practically every one of the many

Control-line judges give Matter's de Havilland Rapide the once-over before getting down to fine details. Matter, at left, like other contestants had given his explanation of the special points he wanted the judges to observe. Top: a telephoto close-up of Chaevsky flying the 'Auntie' An-2 with slight flap for slow flight.





Boris Krasnorutsky (2nd in team race World Champs), flew the Pe-2, seen here with gear up and bomb doors closed. Heat played havoc with his transistorised circuits. Right: the surprising Amiot flown by Faix, home-built engines and complex retract gear.

retractable units in the whole control-line entry had trouble at some time during the contest. Circle marshals Souliac and Couprie kept the event running very smoothly indeed, with the score-girls posting results commendably quickly and the only time the timetable slipped, it was really due to that 'other' half of radio control, of which readers must refer to our companion magazine *R.C.M.&E.* Now to the facts as we saw them around the control-line circle:

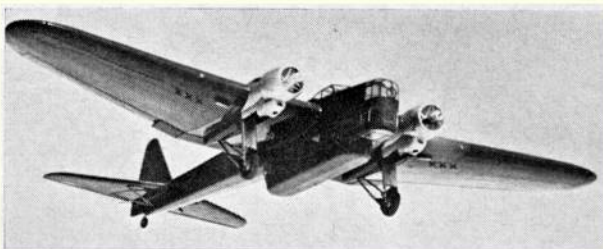
The five nations which entered teams presented themselves for static judging to commence on Thursday, August 3rd in the gymnasium of the vast *l'Ecole Nationale de l'Aviation Civile*. The overall standard of the models was high, and the appearance of the Russian models for the first time in an international scale event aroused considerable speculation. Arkadij Chaevsky's *Antonov AN-2* in particular attracted much comment – a radial-engined cabin biplane frequently used for crop spraying, the five-year-old 'Auntie Antonov' was very accurate and beautifully finished. It could well have come from the factory showroom or museum. Accuracy of dimensions was, in fact, one of the hallmarks of all three Russian models, although the other two, both twin-engined military types, the *Il-2 Stormovik* and the *PE-2* sported far too shiny a finish. Chaevsky's documentation included factory drawings specially authorised in Antonov's own manuscript – plus the *Aeromodelleur* scale drawing!

The British team, headed by Mick Reeves flying the same *Zlin 526a* with which he became World Champion at Cranfield in 1970, also included Derek Goddard with his realistically finished *Tiger Moth* featuring accurate interior fuselage construction and working wingtip slats, and Mick Staples with his very pretty *Miles Magister*, although due to its rather small size, it lacked a certain amount of fine scale detail. The American team consisted of Mike Stott with a very attractive 1/6th scale *Myers 145* low wing cabin type, Malvin Meador with a rather small *Spitfire II* which nevertheless was well finished and

Right: Meador's *Spitfire* with half flap for slow flight, and gas-operated gear sagging slightly. Below: Burnstine's *Havoc* (remember his Grumman *Mohawk* on A/M cover years ago?) played havoc with its owner and deserved better luck.

featured retractable undercarriage and flaps, and Harold Burnstine with a *Douglas A20 Havoc*, an attractive aeroplane, but the complex fuselage shape is difficult to reproduce, particularly where it fairs into the fin.

The French team again included Jacques Matter with his well-known 'AA' *DH 89a Dragon Rapide*, with flaps, cabin lights and full cabin detail; Roland Barboyan with a nice high-wing cabin monoplane, the *Brochet MB 110*, and Claude Faix with a most interesting model of the twin-engined *Amiot 144 M*

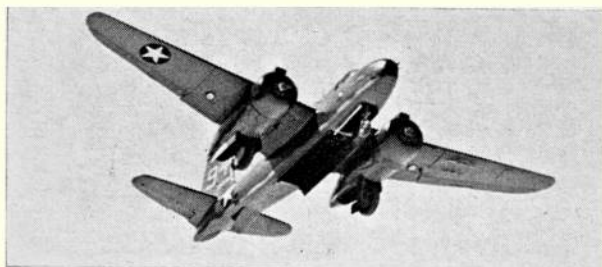


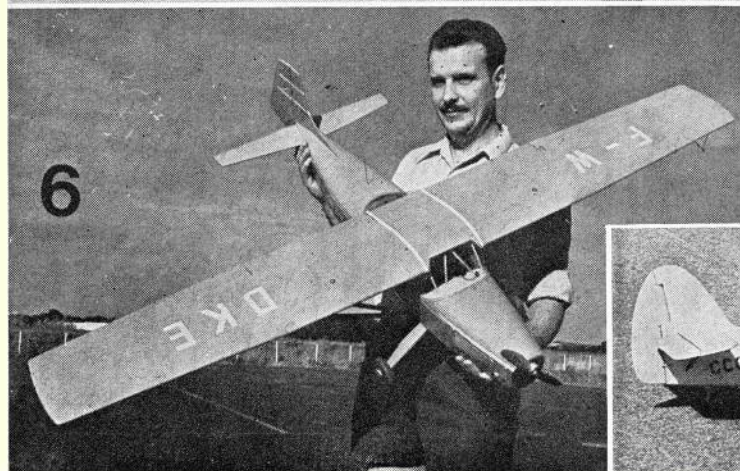
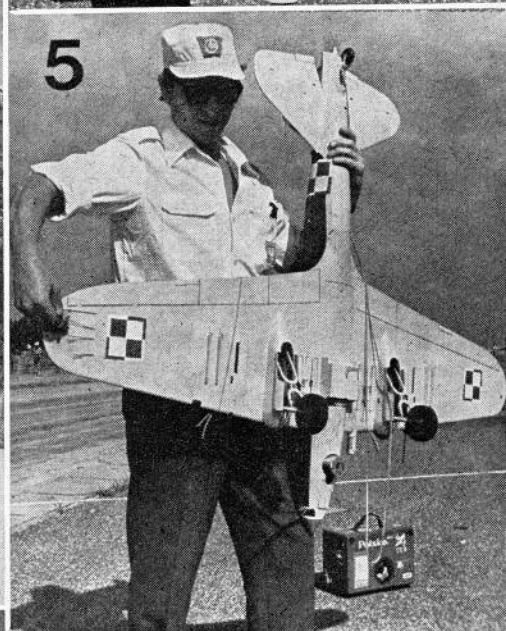
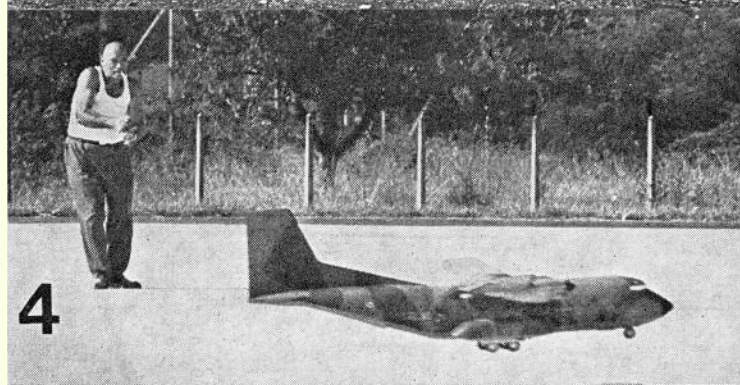
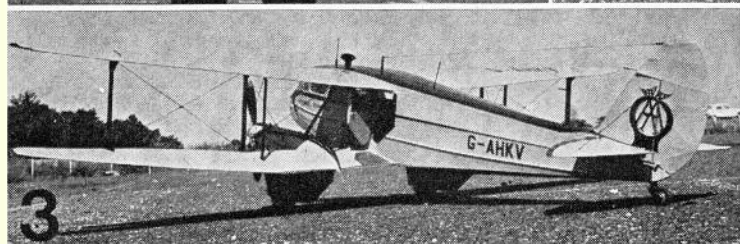
bomber finished in a very shiny chocolate brown (referred to by the less complimentary as the 'cow-pat!'). The prototype was a one-off experimental aeroplane, and Claude's documentation proved that the original was in fact finished in this way, the rivet and panel marks being filled in with mastic and a shiny paint being applied, presumably for improved performance – quite a cunning choice of subject! The interior of the model was very fine with full cabin detail throughout, including all crew members' positions, also an accurately reproduced working undercarriage spun cowlings and home built motors although there were no dummy engines.

The Polish team had still not arrived by Thursday night, due apparently to problems at the customs, and in fact it was not until the static judging of the rest of the models had just been completed at mid-day on Friday that, to the accompaniment of rousing cheers from the other competitors, they finally appeared in the judging hall bearing their models aloft. And what an excellent trio of models they were! Jerzy Ostrowski again entered his rocket-firing *DH 103 Hornet* with which to took second place at Cranfield, an immaculate model marred only by the pro-



Opposite: 1, Uminski's aerobatic *Yak 18PS*, with scale prop. 2, Burnstine and the *Sad Sack* – he felt like that too when the engine played up. 3, Door open and ready for passengers – Matter's *Rapide*, bright black and yellow. 4, Not in the event – or it might have been in the top three was this huge *Transall* which even flew on one engine. 5, Podgorski's *Stormovik*, full of gimmicks, a four-line model. 6, Barboyan's *Brochet*, red finish smooth and well made but not spectacular. 7, Chaevsky and his museum quality *An-2* wait their turn.







Left, the Antanov An-2 in action. It had an opening door, with parachutist, made short landings and flew slow. Right: 8, Krasnorutsky and the Pe-2 with gear down, compare with pic on page 562. 9, Winner Jerzy Ostrowski with the familiar D.H. Hornet. 10, Mechanical starter used on the Meyers by Stott. Smart gold/white model has retract gear. Ten of fifteen entrants had retract gear including Meador (11) with Spitfire being checked out by Maxey Hester starting. 12, L'equipe Anglais with Goddard and Staples under a Union Jack umbrella. 13, Claude Faix with the 'Chocolate Bomber', its smooth surfaces had to be substantiated by documents.

jecting cylinder heads. The artificial horizon on the instrument panel actually works! Lech Podgorski's S.T.60-engined Ilyushin IL 2m3 was beautifully finished, and he had reproduced the lapped panelling construction very accurately by applying fine card to the basic structure. Andrzej Uminski entered a Yak 18 PS low-wing, radial-engined aerobatic special with retractable undercarriage.

At the end of the static judging, Ostrowski's *Hornet* was leading, followed by Podgorski, and only two points behind came Chaevsky of U.S.S.R., then Scott of U.S.A. Reeves was the best of the British team, in sixth place.

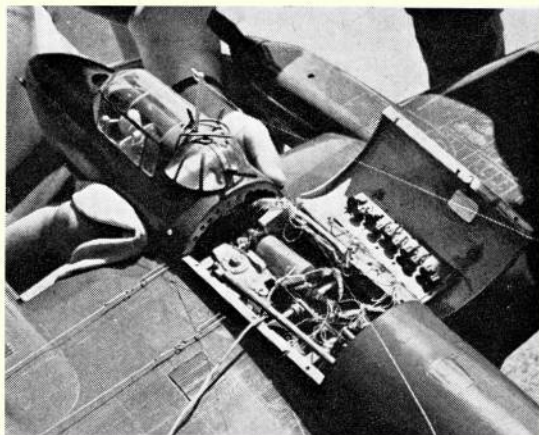
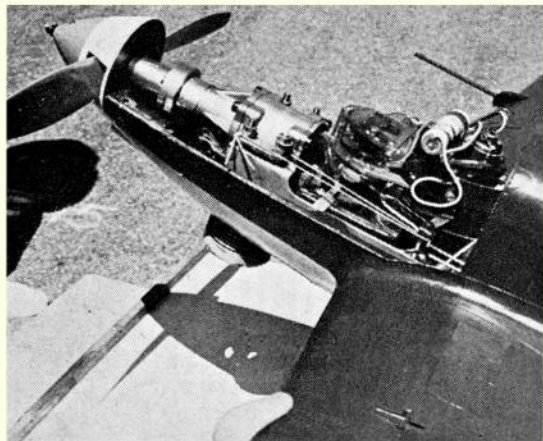
Flying

Saturday morning saw cloudless blue skies and zero wind giving perfect flying conditions, and these prevailed throughout the day. Mick Reeves was first off, and the *Zlin* took off beautifully, lifted wheels and flaps and commenced the nominated manoeuvres. The three inverted laps were good, and Mick seemed set for a good score when disaster struck. In an endeavour to recover from inverted in a rounded realistic manner rather than in a tight manoeuvre, Mick lost flying speed, the model stalled and crashed vertically into the tarmac, being damaged beyond repair, and this really spelt finish to the British hopes. Next out was Barsukov for U.S.S.R. and the *Stormovik* performed impeccably, using retract gear, flaps and dropping bombs. Perhaps the only fault was the fast landing, the engine only being throttled back

after the touch-down. This flight turned out to be the best of the round and was in fact only bettered by Barsukov himself in the second round when he put up the best score of the meeting. Uminski's *Yak* flew moderately well, but tended to hunt longitudinally in flight, and the undercarriage retraction operated far too quickly. The elevation of the three 45-degree laps and also the wingover was not great enough.

Burnstine's *Havoc* had motor trouble and he called an attempt and, in fact, when he took his second attempt at the end of the round, lack of power caused the model to sink back to earth after take-off and the requisite 10 laps were not flown. The 'Chocolate Bomber' of Claude Faix was next out and after a good, long, smooth take-off, the *Amiot* performed very smoothly, retracting undercarriage and flaps, qualifying for multi motor points and performing a fine touch and go. Taxi performance was good and he was in fact third in flying points. Derek Goddard did not want to risk failing to qualify with his *Tiger Moth* on the first flight, and accordingly he nominated only three safe options, one of which was automatic operation of slots in flight - these open near to the stall as on the full size. The model pitched slightly in flight, but the landing was a good

Control-line or electronic? The Polish *Stormovik* (left) by Podgorski with its relays and servo motors and Krasnorutsky's Pe-2 with transistor bank suffering in the heat.







three-pointer and the taxi demonstration was one of the best of the meeting. However, it transpired that this was to be Derek's best flight, and he was not able to get into the top placings.

Chaevsky's pretty *Antonov* biplane was a really complex model. The various electrically controlled functions, viz. brakes, flaps, parachute dropping and throttle were controlled by toggle switches mounted on a control box strapped to the flyer's chest. The model taxied well, although the throttle control was not proportional, and the brakes brought the model to a halt effortlessly before taking off. The take-off was rather jumpy, but in flight the *Antonov* was smooth, if rather fast. The highlight was the parachute drop – the cabin door on the port side of the fuselage slowly opened, the parachutist left the aircraft and floated down to earth. Both touch and go and landing were rather bouncy, but the flight score was quite good.

Ostrowski's *Hornet* made no mistakes and the whole flight was consistently good, his nominated options being retractable undercarriage, multi-engines, wingover, touch and go, and rocket firing. The rockets were particularly impressive, although they were not especially appreciated by the American team whose models were narrowly missed by the projectiles, one of which was subsequently posted as 'missing'. The flight score was sufficiently high, when coupled with the static score, for Ostrowski not to have to take his second round flight as he was in a virtually impregnable position. Meador's little *Spitfire* performed surprisingly well considering its size –

there was a slight tendency to pitch in flight, but the flaps and undercarriage worked well – unfortunately, a good flight ended in a too realistic landing when the model nosed over on touch down.

Matter's *Rapide* flew well, if rather fast, but he had trouble in attaining the requisite elevation in the 45 degree laps, although he qualified for multi engine points. Mick Staples had throttle trouble and the 'Maggy' was reluctant to return to earth on low throttle, performing innumerable touch and go's before finally running out of fuel. Last of the Russian team, Krasnorutsky of team racing fame, flew his twin-engined *Pe2* well – the taxi was a little jerky but the flight was smooth and undercarriage retraction worked well. One flap obstinately refused to lift, and the parachute failed to open, but the flight score was in the upper bracket.

Podgorski, with the *Ilyushin*, flew extremely well using retractable gear, flaps, working landing light and bomb dropping. The four sets of bomb-bay doors in the underside of the wing were very finely made, but unfortunately, the bombs 'hung up' and only dropped on landing, which could have been rather uncomfortable in full-size practice! Nevertheless, the landing was good, and, in fact, the *Il-2* was the only model to consistently make three pointers. Mike Stott's *Meyers 145* taxied very smoothly on its gas operated tricycle undercarriage, but when flap was lifted after take off, it caused a certain amount of pitching, and this first flight did not score very highly. One wheel refused to retract after the touch and go, and the landing was of the crash variety. Last of the first round flights was Barboyon of France who made quite a good flight with the *Brochet MB.110*, in fact, his best of the meeting. The take off was excellent, but the model tends to wobble laterally in flight and both the touch and go and landing were rather bouncy, possibly because of the very well sprung undercarriage.

The second round was flown immediately after with the weather still holding, apart from the occasional gusty spell caused by the local *autant* wind, a speciality of the region, which goes as quickly as it comes. The only people to improve on their flight scores during this round were Mick Staples, who

WORLD CONTROL LINE SCALE CHAMPIONSHIPS 1972

	Name	Nation	Aircraft	Fidelity	Craftsm	Com- plexity	Static Judging Total	1st Flight	2nd Flight	3rd Flight	Total	Engine
1	J. Ostrowski	Poland	<i>D.H. Hornet</i>	1005.5	1004.5	399.5	2449.5	1671	—	—	4120.5	2 x Merco 61
2	L. Podgorski	Poland	<i>Ilyushin Il-2m3</i>	984	992	331	2307	(1245)	(1049)	1590	3897	Super Tigre 60
3	C. Faix	France	<i>Amiot 144</i>	880.5	897	393	2170.5	1658	—	—	3828.5	2 x O.D. 15
4	M. Stott	U.S.A.	<i>Meyers 145</i>	984	963.5	246.5	2194	(931)	(1236)	1578	3772	Ross Twin
5	A. Chaevsky	U.S.S.R.	<i>Antonov AN-2</i>	972	986	347	2305	(1268)	(1198)	1338	3643	Super Tigre 60
6	L. Barsukov	U.S.S.R.	<i>Ilyushin Il-2</i>	691	635.5	185	1511.5	(1703)	1886	—	3397	O.D. 61
7	M. Meador	U.S.A.	<i>Spitfire IIa</i>	844	874.5	260.5	1979	1314	(938)	(450)	3293	Veco 61
8	M. Reeves	U.K.	<i>Zlin 526</i>	933	894	310	2137	1036	—	—	3173	Merco 61
9	B. Krasnorutsky	U.S.S.R.	<i>Pe-2</i>	750	717	257.5	1724.5	(1408)	—	1430	3154	2 x Super Tigre 15
10	D. Goddard	U.K.	<i>D.H. Tiger Moth</i>	890	767.5	266	1923.5	1069	(1038)	(594)	2992.5	Merco 61
11	J. Matter	France	<i>D.H. Dragon Rapide</i>	828.5	773	376	1977.5	958	(524)	—	2935.5	2 x O.S. 15
12	A. Uminski	Poland	<i>Yak 18PS</i>	857	784.5	260.5	1902	899	—	(856)	2801	Super Tigre 60
13	R. Barboyon	France	<i>Brochet MB 110</i>	677	585.5	170	1432.5	1314	(1214)	(889)	2746.5	Super Tigre 40
14	H. Burnstine	U.S.A.	<i>Douglas A-20</i>	650.5	681.5	314.5	1646.5	—	—	602	2248.5	2 x Super Tigre 23
15	M. Staples	U.K.	<i>Miles Magister</i>	676	593	184	1453	(564)	628	(280)	2081	O.S. 19

Radio scale winners, the Simon brothers at left with the Messerschmitt Me 163B which was so spectacular. O.S. 60 in the nose foam wing, red finish as in Profile. Below: Terry Melleney prepares 2nd place Moth Minor, a complete contrast to the winner in every way. Opposite: the veteran Maxy Hester and his Ryan, a fine flyer and a great sportsman.

coaxed a slightly better flight from the *Magister*, Mike Stott who, in fact, improved on each of his subsequent flights, and Leonid Barsukov who topped the flying scores with his shiny green *Stormovik*. Matter came to grief when his *Rapide* lost power and hit hard, knocking off the nose section and splitting the wing covering. At the end of the day, Ostrowski's *Hornet* was leading comfortably with Faix in second place and Chaevsky third.

Third round

Sunday saw the arrival of comparatively windy conditions and very few competitors were able to improve their scores. Notable exceptions were Podgorski who put in a really good flight considering the conditions, to lift him from fourth to second in the final placings, then Mike Stott improved considerably on his third flight to make fourth place. Faix attempted to better his position, but the wind proved too much and the 'Chocolate Bomber' made a heavy landing before the flight had qualified. Chaevsky was ousted from his third place to fifth by Podgorski and Stott, the slight improvement which he made being insufficient to hold his position.

Jerzy Ostrowski remained supreme and was the worthy winner, Poland also taking the team prize, with U.S.S.R. second and France third. The meeting



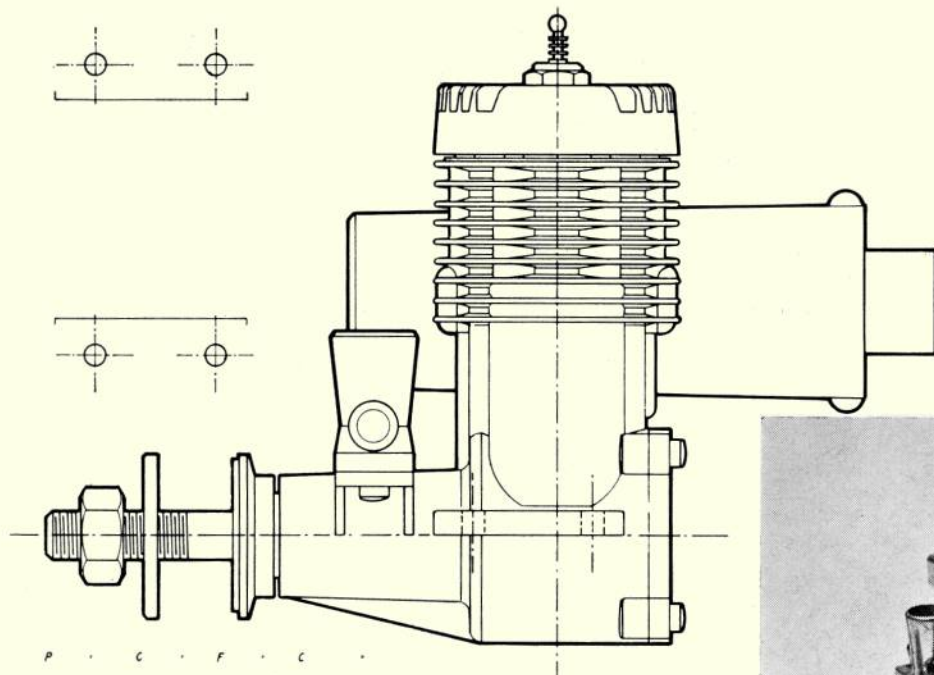
was notable for the very friendly atmosphere which existed between all participants, including even the judges(!) and it upheld that tradition of bonhomie which scale modellers have always shared.

TEAM RESULTS

Control Line	
1. Poland	10818.5 pts.
2. U.S.S.R.	10194 pts.
3. France	9510.5 pts.
4. U.S.A.	9313.5 pts.
5. U.K.	8246.5 pts.
Radio Control	
1. U.S.A.	16294.5 pts.
2. Germany	16103.5 pts.
3. U.K.	13330 pts.
4. Sweden	8979.5 pts.
5. Switzerland	8338.1 pts.
6. South Africa	3394.5 pts.
7. France	1581 pts.

WORLD R/C SCALE CHAMPIONSHIPS

	Name	Nation	Aircraft	Static Judging	Best Flight	Total	Engine/R/C
1	H. Simon	Germany	Me 163B	2112	3786	5898	OS 61/ Varioprop
2	T. Melleney	U.K.	DH Moth Minor	2380	3370	5750	HP 61/ Futaba
3	M. Hester	U.S.A.	Ryan STA	1983	3762	5745	Webra 61/ EK pro
4	B. Klupp	Germany	Piper Arrow	2183,5	3182	5365,5	Webra 61/ Simprop
5	H. Roth	U.S.A.	Evans VP	2376,5	2989	5365,5	Ross Twin/ Kraft
6	W. Ruegger	Switzerland	Po-2	2094,6	3230	5324,6	Enya 61/ Kraft
7	B. Wischer	U.S.A.	Pie/ Emeraude	2272	2912	5184	Ross Twin/ Royal
8	F. Ebermayr	Germany	NA T-28	1410	3430	4840	Super Tigre G 60/Rowan
9	M. Reeves	U.K.	Airmark Cassett	2032	2495	4527	H P 61/ Futaba
10	J. Levenstam	Sweden	S.E. 5a	1341	2345	3686	Veco 61/ Micronic
11	C. Jones	South Africa	Ryan STA	2260,5	1134	3394,5	Webra 61/ EK Pro
12	J. Stromqvist	Sweden	N.A. P-51 Mustang	1488	1862	3350	H P 61/ Logictrol
13	R. Yates	U.K.	Percival Proctor	1897,5	1156	3053	Merco 61/ Skyleader
14	J. Amman	Switzerland	Fairey Swordfish	1868,5	1145	3013,5	Webra 61/ Multiplex
15	J. Lyrsell	Sweden	BHT-1	1778,5	165	1943,5	H P 61/ Digiplex
16	R. Fouquereau	France	CAP-10	1366	215	1581	Super Tigre G 60

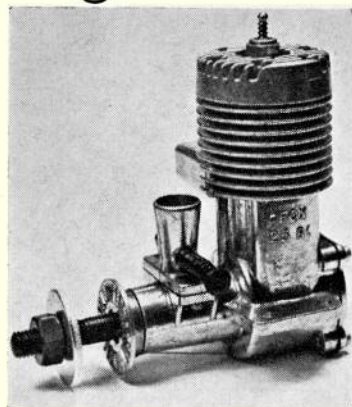
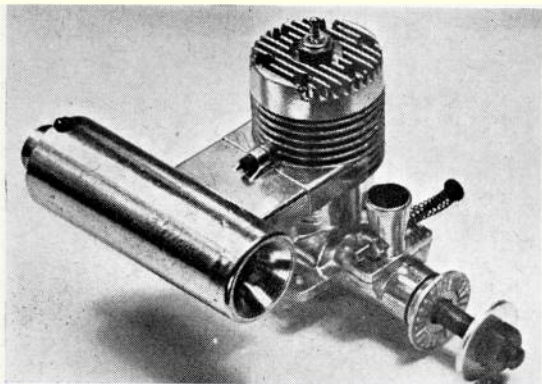


Peter Chinn's

ENGINE TEST: FOX 25

WITH THE RECENT establishment, by the American Fox Manufacturing Company, of their own sales and service headquarters in the U.K. (actual distribution remaining in the hands of **Irvine Engines**, plus **Model Aircraft (Bournemouth) Ltd.**), some substantial reductions in the prices of Fox engines have been made possible. However, one engine that has been very competitively priced ever since its introduction early this year, is the Fox 25.

This motor is interesting in that its overall size and weight are comparable with those of the average '19' class engine, yet it enjoys the advantage of a 25 per cent larger swept volume. Moreover, the advantage is fully exploited, as the Fox 25, if our test sample is representative, is a good 25 per cent more powerful than the average standard 19 engine on the same fuel.



Unlike most American engines, the latest Fox models have provision for the fitting of silencers especially made for them by the manufacturer. On the 25, as on certain other new Fox engines, this takes the form of tapped lugs above and below the exhaust duct to which the silencer is attached with a pair of Allen screws. There is a choice of two types of silencers. Both have a pressure diecast body with integral duct and in both types gases escape via radial slots in a full length inner machined tube, the only difference being that whereas with the open type, the tube is open at both ends to obtain an extractor effect, the alternative pattern has a closed front end to lower noise level.

In general, the Fox 25 is of conventional design and construction. It is of the popular front rotary-valve type with crossflow scavenging and a lapped cast-iron piston running in a drop-in steel cylinder liner. The main casting embraces the crankcase, cylinder casing and a bronze-bushed main bearing in a single unit. The only unorthodox feature of the 25 is its carburettor. This, following the style first used on the large Fox 60/74/78 series motors, has a vertical intake and is attached to the engine by means of a base flange. This is mounted on a rectangular saddle cast on to the crankcase nose and is secured from below by two screws.

The carburettor has a $\frac{3}{8}$ in. dia. choke which, after allowing for the spraybar diameter, gives an effective choke area of approximately 12.5 sq. mm. The rotary-valve is open for approximately 175 degrees of crank angle, closing at 50 deg. A.T.D.C.

The transfer ports open and close at 60 deg. each side of B.D.C. and the exhaust 67 deg. each side of B.D.C. These ports are of orthodox rectangular shape, unbridged and the cylinder liner is located

in the usual manner by a flange at the top where it is locked in position by the cylinder head. The head forms a wedge-shaped combustion chamber on the exhaust side of the piston baffle.

Fox engines in general are simple to dismantle, enabling the user to easily replace worn or damaged parts. No special tools are required for the 25. After removal of the prop driver, cylinder-head and backplate, the cylinder liner can be withdrawn, enabling the conrod to be lifted off the crankpin and the piston/rod assembly and the crankshaft to be taken out. Just one point needs to be noted regarding the removal of the piston from the connecting-rod. The solid gudgeon-pin is free to float in the front piston hole, but the rear hole is tapered for a light press fit. The gudgeon-pin must, therefore, always be withdrawn forward - i.e. carefully pressed out or lightly tapped out from the rear.

Performance

Two examples of the Fox 25 were submitted by the Fox factory for our examination and test. Both were quite free-running from new, neither showing any tendency to overheat or lose power but were, nevertheless, given our standard running-in treatment, using a straight methanol and castor-oil mixture for the first 30 minutes running.

It was quickly established, however, that a straight fuel is *not* suitable for the Fox 25. Both engines lost up to 600 r.p.m. on straight fuel when the plug lead was disconnected. A change to a mildly doped fuel (our standard 5 per cent pure nitromethane test mixture) corrected this completely and also gave a useful boost to power output.

Some prop r.p.m. figures recorded at this point included 8,200 r.p.m. on an 11 x 6 Power-Prop, 8,800 on an 11 x 5 Power-Prop, 9,200 on a 10 x 6 TopFlite maple, 9,600 on a 10 x 5 Punctilio, 9,800 on a 10 x 4 Punctilio, 10,500 on a 9 x 6 TopFlite maple, 12,000 on a 9 x 5 TopFlite wood, 12,200 on a 9 x 4 Punctilio, 12,600 on a 9 x 4 KeilKraft nylon and 13,700 r.p.m. on an 8 x 6 Power-Prop. The two engines were quite evenly matched as regards performance but one appeared to have a slightly better needle-valve response and this example was therefore set aside for the remainder of the tests.

The Fox silencer supplied with the two engines was of the open front type. This has an 11.1 mm i.d. extractor tube, open at both ends for a total area of 194 sq. mm and into which gases are drawn through

SPECIFICATION

Type: Single cylinder, air-cooled glowplug ignition two-stroke with crankshaft rotary-valve and bushed main bearing.

Bore: 0.680 in.

Stroke: 0.682 in.

Swept Volume: 0.2478 cu. in. (4.051 c.c.)

Stroke/Bore Ratio: 1.00:1

Checked Weights: 157 grammes - 5.54 oz.

(less silencer)

198 grammes - 6.99 oz.

(with Fox Type B extractor silencer)

GENERAL STRUCTURAL DATA

Pressure diecast aluminium alloy crankcase/cylinder casing/front-housing unit with bronze bushed main bearing and drop-in steel cylinder-liner. Pressure diecast aluminium alloy crankcase backplate secured with four screws. Case hardened steel counter-balanced crankshaft with 0.437 in. dia. journal, 0.315 in. bore gas passage and 0.156 in. dia. crankpin. Lapped Meehanite c.i. piston with straight baffle and 0.125 in. dia. solid gudgeon-pin pressed into rear piston hole only. Pressure diecast aluminium alloy connecting-rod with plain eyes. Pressure diecast aluminium alloy finned cylinder-head with .010 in. aluminium gasket and secured to cylinder casting with six screws. Pressure diecast aluminium alloy prop driver. Pressure diecast aluminium alloy flanged-based carburettor body secured to crankcase nose with two screws and reversible for left or right hand needle control. Brass spraybar. Beam mounting lugs.

OPTIONAL EXTRAS

- (i) Size B open-front silencer, P/N 90211
- (ii) Size B closed-front silencer, P/N 90212
- (iii) Aluminium propshaft extension $\frac{1}{2}$ in., P/N 90401
- (iv) Steel propshaft extension $\frac{1}{2}$ in., P/N 90402
- (v) Aluminium propshaft extension $\frac{3}{4}$ in., P/N 90403
- (vi) Steel propshaft extension $\frac{3}{4}$ in., P/N 90404

TEST CONDITIONS

Running time prior to test: Approx. 1 hour

Fuel used: 5 per cent pure nitromethane, 25 per cent

Duckhams Racing Castor-oil, 70 per cent methanol

Glowplug used: Fox standard platinum-rhodium filament long-reach, as supplied

Air Temperature: 14 deg. C. (57 deg. F.)

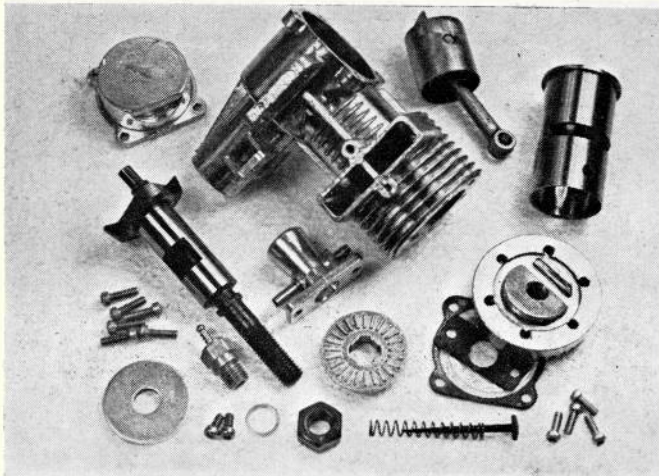
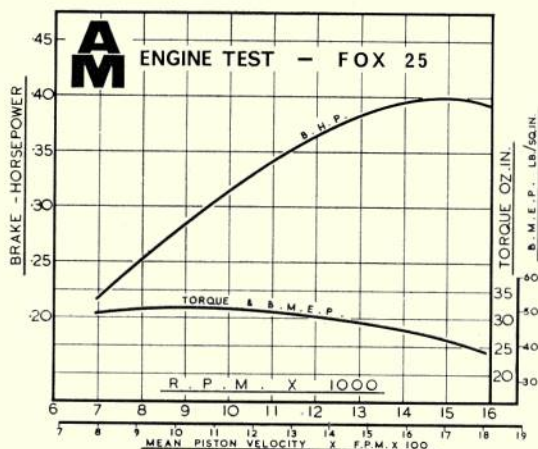
Barometric Pressure: 29.65 in. Hg.

Silencer: Fox Size B open-front type

seven slots totalling 100 sq. mm. Since these areas are larger than for many '60' size silencers, it is not surprising to find that the silencer does not 'silence' very much. On the other hand it does not have much effect on power either - in fact, our tests indicated virtually no measurable power loss at all.

Torque tests on the engine showed a maximum torque of 32 oz. in. at around 9,000 r.p.m. The

continued on page 588





YOUR TWO FULL-SIZE

A simple, sturdy
model for 1.5-2 c.c.
motors, designed to
teach the beginner
basics of aerobatics
by
RICHARD EVANS

SPIROGYRA was originally envisaged as a stunt trainer, for a school flying club, which would be capable of simple basic manoeuvres and able to bounce out of a hefty prang without any major damage. The prototype possessed both of these qualities and in actual fact could perform nearly all the aerobatics in the S.M.A.E. schedule with the exception of triangles. With a suitably balanced model, squares are quite easy – the only problem being that it nips round them rather fast, making quick reactions essential. Line tension is good at all times due to the asymmetric wing and large fins which are offset across the fuselage for this reason.

A variety of these models has been built powered by P.A.W. 1.49s, O.S. 10s and Fox 15s. My personal favourite, however, is still the original powered by an Enya 09 which seems to be the ideal power plant. The mustard tin tank detailed on the plan gives a very consistent 5-6 minute run with this motor, but I would not recommend its use with a diesel as the engine is mounted a little way from the tank and fuel surge seems to affect diesels more than glows, particularly with the smaller engines.

Construction should present no difficulties to those with even minimal experience, provided the following guidelines are followed. Firstly, the wing Cut out 16 ribs from $\frac{3}{16}$ in. sheet, slotting three for the bellcrank mount. Pin the $\frac{1}{4}$ in. sq. leading edge over the plan (leaving it square), then add the ribs with a sheet of $\frac{1}{16}$ in. balsa placed beneath in order to allow space for the cap strips which will be added later. When the rib/L.E. joints have thoroughly set, add the sheet trailing edge – this may be done with the framework lifted off the board if preferred, but take care to avoid warps. Next add the tip plates (noting that the starboard tip is from $\frac{1}{8}$ in. ply). Cut out the bellcrank mounts from $\frac{1}{16}$ in. ply, assemble the bellcrank assembly and install securely. Make the holes

for the leadouts in the port wing, then make up the leadouts from heavyweight Laystrate control-line wire bound and soldered to 20 s.w.g. piano wire. Attach the leadouts and pushrod to the bellcrank with cup washers, checking that they pivot freely. Epoxy the fuel tank in place, using soft balsa to pack it in position, then sheet in the centre section. Add the rib

Continued on page 573



The designer with a brace of Spirogyra – one powered by an Enya 09, the other by a P.A.W. 1.49. Models are rugged, being based on combat model techniques, yet are very good flyers. Ideal for learning how to fly aerobatics before progressing to larger, more expensive stunt jobs.

FREE PLANS!

Martin Dilly's Jedelsky-winged A/1 glider, ideal for small field flying

WEE KEE WEE was built in 1967, after the designer had proxy flown New Zealand A/2s with wings of Jedelsky structure at the Kauhava and Sazena World Championships. The models, built by Angus MacDonald and Noel Hewitson showed an impressive glide performance under British conditions, so careful female templates were made of the actual airfoils used, which were found to be very close to the Benedek 6407-e ordinates published in the June 1959 *Aeromodeller*.

These ordinates were scaled to a suitable chord for an A/1 glider and the end result was the model described here. Performance has been reasonably satisfactory in both calmish and turbulent conditions, and a number of placings in the top three of A/1 contests in Britain have been obtained during the past few years, the model winning the A/1 event at the 1971 Nationals with five two-minute maxes plus an admittedly fortuitous 8.14 in the fly-off.

An elliptical wing planform was chosen in order to reduce the tendency of wing flutter at high speeds, which had been observed (briefly, before the resulting impact) on an earlier A/2 with such a Jedelsky wing and parallel chord. While this A/1 has not shown such tendencies it is best to play safe and avoid towing at too high a speed, especially immediately before releasing the model into its glide turn.



WEE KEE WEE



Wood selection in solid wing structures is very important, the use of a stiff but light quarter grain wood of around 6 lb./cu. ft. density maximum being vital for the rear portion. Try also to use quarter grain for the leading edge half but, since the thickness is greater here, a low density wood is more important than the grain. An accurately made joint between the wing pieces is most important and the use of an epoxy adhesive is advised for this joint to minimise the risk of warps occurring as a result of heat and humidity changes.

Various details on the original model, while perhaps not thought essential, do either make life easier or else offer some slight advantage that may mean a few extra seconds and are, therefore, not to be sneezed at. Among these are the anti drop-off fitting on the tow-hook, which was 'borrowed' from New Zealander John Ensoll, who used it on his A/2 at Save in 1971, and consists of a U-shaped piece of stranded C/L wire epoxied to either side of the fuselage, just clearing the upper surface of the tow-hook. This offers some resistance to the tendency for the tow ring to slip off the tow-hook when the line is slack, a positive downward and rearward pull having to be applied to the line instead.

The removable centre section type of wing fixing allows the wing to skew in the event of striking an object on landing and at the same time permitting a plug-on wing attachment. Due perhaps to a slight amount of 'give' in the 2 B.A. nylon screw bolting the centre section to the fuselage, there is little or no tendency for the wing to skew accidentally, and no kind of friction surface at the fuselage/centre section interface has proved necessary in practice.

While a more or less conventional timer and auto-rudder release system was used on the original, in the light of later experience it is suggested that another system (yet again an Angus MacDonald idea) will prove more convenient. This consists of a new timer faceplate, on which are mounted the D/T release arm and also another wire arm which both tensions the auto-rudder into the tow position and also engages the waggler in the timer to hold it in

'Aw, shucks, it weren't nothing!' Martin Dilly modestly displays his neatly constructed model, which owes a lot to its New Zealand parentage - hence its name!

Aero Modeller

the stopped state until the towline is released. The employment of a thickish (approximately $\frac{3}{4}$ in. diameter) nylon monofilament, instead of a rigid wire pin, to hold the system in the towing mode, greatly reduces the chances of embarrassing hook-ups when pins jam under release tension.

Construction

Cut out the wing ribs, using a suitable ply or light alloy template.

Select a matched pair of $\frac{1}{4}$ in. sheets of balsa, not over 10 lb. density and preferably 8 lb. Quarter-grain is to be preferred here, but a slight straight-grained tendency is acceptable as the wood thickness is sufficient to resist most twisting in the forward part of the wing. After trueing up one edge of each sheet, glue a strip of hard straight-grained $\frac{1}{4}$ in. square to it, using either epoxy or a P.V.A. cement. When this has set, cut the rear edge of the sheet to give a total width of $2\frac{1}{2}$ in. Sand the lower surface smooth and give a coat of sanding sealer. Make sure that your building board is smooth and free of hard blobs of cement and other blemishes which will mar the finished surface while the upper one is being worked on. Sand and razor-plane the upper rear part of the sheets to give the appropriate bevel as shown on the plan; to avoid scoring the wood, the lines defining the limits of the wood to be removed should best be marked with a fibre-tip pen. When the rear edge is down to $\frac{1}{8}$ in. thick, sand in a slight amount of bevel, using garnet paper glued to a flat block, so that the rear edge is perpendicular to the upper, rather than the lower face of the wood, thus providing a good joint with the rear $\frac{1}{8}$ in. sheet part of the wing.

After trimming the edge of the $\frac{1}{8}$ in. sheet, which should be 6-8 lb. density and definitely quarter-grain, offer it up to the prepared edge of the front portion of the wing and tape together spanwise along the upper surface. Fold the two parts so that the joint is open, insert the glue (either using epoxy - preferably - or else P.V.A.), then close up the gap, weighting and packing the assembly while it sets upside down on a flat surface. Note that the tips should not be cut to plan shape until after the ribs are in place. When the mid-chord joint is set, trim the trailing edge and add the $\frac{1}{8}$ in. square spruce reinforcement. Should the joints require sanding and removal of excess glue, do it now, and not after the ribs are in place, as otherwise the sanding will cause local thinning of the wood above the ribs, bowing the wing.

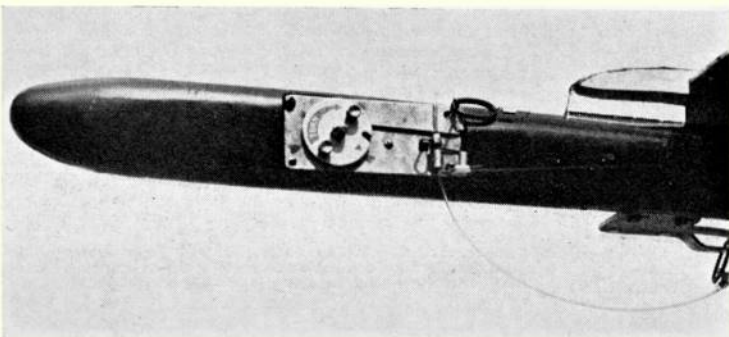
Mark the rib positions on the lower surface of the wing, and pin the front portion down to the board, again upside down; glue all ribs in position (epoxy), being careful to note that the leading edge half of each is straight and the trailing half slightly cambered. Pack up the trailing edge of the $\frac{1}{8}$ in. sheet to



match the camber of the ribs and weight down while curing. Meanwhile, roll the wing joiner tubes from brown paper gumstrip, using well-greased 14 s.w.g. wire as a mandrel; a good $\frac{3}{32}$ in. wall thickness should be achieved. When the wing halves are set, remove from the board and cut grooves to take the joiner tubes; epoxy these in place and replace a strip of balsa above each, then sand smooth. Cut the two $\frac{1}{8}$ in. ply trailing edge tongues, remove a corresponding piece out of the wing and cement in place. These tongues locate the trailing edge onto the fuselage and ensure that the incidence of each wing half stays constant. Make a female template for the upper wing camber and carve the top of the $\frac{1}{4}$ in. part of the wing to shape with a razor-plane and garnet paper; at this stage the tips may be cut to outline shape and the corners of the ribs rounded. Separate the wing halves at the double dihedral ribs, sand to give correct dihedral and cement at the proper angle. The completed wing can be covered with lightweight Modelspan or Japanese tissue, doped onto the wood after an initial coat of sealer.

Tailplane construction is straightforward, the basic ribs being trimmed and sanded to suit the elliptical tips before the addition of the upper spars. Cover with Japanese tissue and water shrink, following with sufficient thinned clear dope to prevent small drops appearing on the inside of the tissue when further coats are applied; this ensures that the pores in the tissue are sealed.

Start the fuselage construction by cutting the sides from medium straight-grained $\frac{1}{8}$ in. sheet and contact cementing the $\frac{3}{32}$ in. ply doublers to the inside of each; the nose area may be left a bit oversized to allow for final shaping after the approximate weight has been added when the model is finished. Add the triangular-sectioned longerons along the top and bottom inside edges of the sides, and the rolled gumstrip tubes for the D/T and auto-rudder lines. Cut,

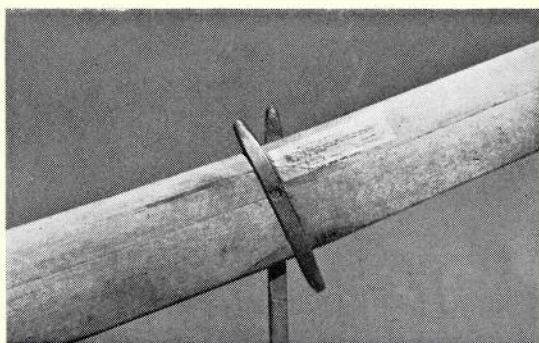


The suggested timer/auto-rudder mechanism as used on an A/2 and first seen on one of Angus McDonald's New Zealand A/2s. The monofilament release 'pin' is attached to the towline so that as the towline is cast off the auto-rudder kicks over and the D/T timer is started.

drill and tap the 16 s.w.g. dural tow-hook mount and epoxy it to the spruce bottom doubler, noting the tapering thickness to the rear of the latter; epoxy a 2 B.A. nut, preferably nylon, to the top doubler, again noting the thickness of this. Scarf joint the ply fuselage top to the $\frac{1}{8}$ in. balsa rear top and glue the spruce doubler, with its attached nut, to the ply top. Cut the fuselage core from soft $\frac{1}{8}$ in. balsa and contact cement to the sides; there will be a gaping hole at the front at this stage, which will later be filled with ballast and polyester putty. Add the rear block after epoxying into it the nylon nut for tailplane incidence adjustment and the curved aluminium tube for the D/T line. When bending this, first insert a suitable length of heavy nylon monofilament or plastic-insulated wire to prevent kinking of the tube, and bend either around a thumb or else with round-nosed pliers. Make sure that the sides are straight before the glue dries on the rear block, then add the top and bottom doublers, plus balsa top and bottom, after threading the nylon D/T and auto-rudder lines through the appropriate tubes.

Make the centre section from hard $\frac{1}{4}$ in. sheet balsa, add the rear tongue box, the $\frac{1}{8}$ in. ply screw support and the $\frac{1}{2}$ in. ply base. Epoxy the 14 s.w.g. wire joiner in place and finally add the ply sides, pushing the wings onto the joiners to ensure that everything lines up snugly before the glue dries. Now drill through the screw base to give clearance to the 2 B.A. nylon wing mounting screw; enlarge this hole above the support to allow the head to be recessed into the centre section, and let into it a suitable piece of rolled paper tube to prevent the wood from fraying round the screw.

Cut the fin from light quarter-grain balsa, hinge it, and add the torsion bars to give the glide bias to the rudder; make up the rudder horn, glue in place, then cement the fin into the fuselage. Add the tailplane mount. Cut out the timer hole, insert the timer, and assemble the semi-completed model; fill the nose cavity with lead until the centre of gravity is as shown on the plan, packing the lead into place with



The pod into which the wings plug is secured to the fuselage by means of a single nylon bolt. This is adequately strong yet allows the wing to skew in the event of a hard landing. No anti-skid device is needed.

Plastic Padding and leaving a good excess forward of the lead to form the extreme nose. The whole mess can now be carved and sanded to blend in with the centre section, which is left screwed in place for the operation; the use of a power tool and sanding disc makes life easier here, but do the work outside as the resulting dust from the plastic filler is surprisingly penetrating. Give the fuselage a couple of coats of sanding sealer, tissue cover and finish to choice, keeping the rear as light as possible.

Trimming is perfectly orthodox; adjust the tailplane incidence to give a flat glide and remove any final trace of over-elevation or stall with rudder to give a turn circle of roughly 200 feet diameter. Ensure that the glide with the auto-rudder in the tow position is very slightly to the right, and use as light a line for towing as will take the pull test; an A/2 line sags alarmingly and makes a top-of-the-line release quite an achievement. With the anti drop-off fitting you can allow the model to hang back on the line until there are signs of lift, when the model can be speeded up somewhat to bring it to the top of the line and into its glide turn.

SPIROGYRA

Continued from page 570

cap strips, followed by the $\frac{1}{8}$ in. sq. T.E. cap strip. The wing is now completed by adding the gussets to the tips and centre section, and by epoxying the aluminium leadout tubes to the inboard tip.

Now turn your attention to the fuselage. Cut out the $\frac{3}{8}$ in. sheet fuselage to the outline shown, but do not cut the slot for the wing at this stage. Epoxy the bearers in position then add the fins – noting the offset used. Carve and sand the rear of the fuselage to the sections shown – do not merely round off the corners as this could well produce a tail-heavy model. Next step is cut out the hole for the wing and to add the $\frac{3}{8}$ in. sheet doubler which should likewise be cut away to suit the wing. Cut these portions accurately for much of the strength of the model depends on these joints. Carefully slide the fuselage over the wing, check the joint for accuracy, then epoxy together, making sure that the two pieces are square to one another in all directions.

With a coarse grade of glass paper glued to a block of wood, carefully sand the leading edge to shape, finishing off with finer grades until a smooth rounded shape results. A razor plane is also useful here.

The tailplane simply slots into the fuselage and is

finished off with large gussets – make sure that the grain directions are as shown on the plan.

The model can be covered in heavyweight tissue or nylon. In fact, the use of nylon adds little weight and lengthens the life of a model enormously. The nose/wing joint must be covered in gauze bandage and given at least five coats of dope, lightly sanded between each one. This is most important to the strength of the model.

The last thing to do is to fit the engine. This is placed on the bearers, held in position with rubber bands and moved around until the correct C. of G. is found. If anything, it should be forward of that shown on the plan. However, if the wood is correctly chosen the C. of G. should cause no problem. If desperate, you can always add lead to the nose, but this is not really advisable.

The best prop to use will obviously vary from motor to motor, but I would suggest the use of a full-size nylon 7 x 6 on a 1.5 c.c. diesel and 2.00 c.c. glow. With 1.5 c.c. glow plug motors high revs are necessary to liberate the power and with the Enya 09 I find that a K.K. 7 x 6 cut down in 6 in. diameter is just about optimum.

Fly the model on 40 ft. lines or 45s on calm days and it should make you proficient at most basic manoeuvres. And if not, at least it should survive those bumps into the ground!



AIRCRAFT DESCRIBED No. 216

Poland's light bomber/reconnaissance aircraft, drawn by F. Pawlowicz

IN AUGUST 1934, the prototype *Karas* built at the *Panstwowe Zakłady Lotnicze* works (the Polish National Aircraft Establishment) took to the air, fitted with a Bristol Pegasus II M₂ power plant. These test flights were not too encouraging, both pilot's and observer's visibility being totally inadequate, while the cockpits were too cramped and the rear fuselage was suffering from vibration with subsequent tail flutter. Several months later the second prototype flew, having been extensively modified. The engine itself had been mounted lower, and enclosed in a new, low drag cowl to improve the pilot's field of vision. The bomb bay was dispensed with (bombs now being mounted below the wing) and this provided greater room for the crew members. Wings were also modified - leading edge slots were added at the centre section, flap efficiency improved and more effective slotted ailerons were employed. Further test flights revealed this machine had improvements over its predecessor, but forward visibility was still a little lacking. Before a raised pilot's

seat could be added, this machine was written off when it crashed on landing in bad weather. A third prototype, completed in mid '35, featured this raised seat, a revised canopy plus various minor improvements and went into production as the *Karas A*.

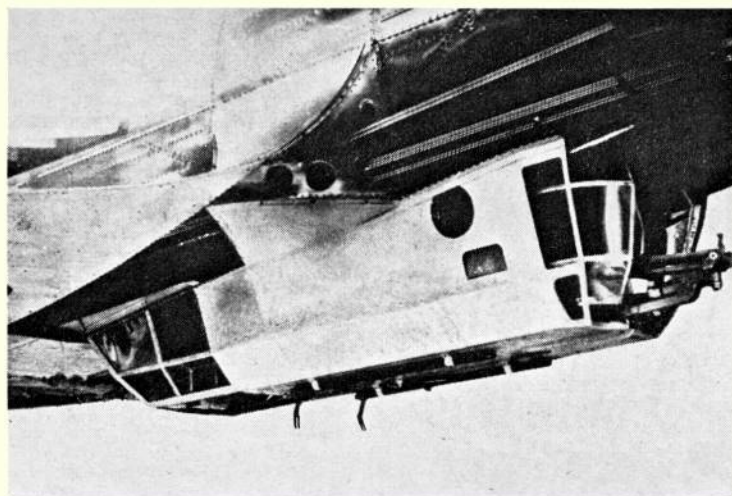
The PZL-built Pegasus II M motors fitted to production aircraft, however, proved to have shortcomings, not the least being insufficient power when the aircraft was fully laden, and consequently this 'A' series was relegated to a training role, with the operational ceiling restricted to 9,940 feet. The first of these production aircraft featured the slotted leading edge centre section of the second and third prototypes, but this was dispensed with on later machines. All the 'A' series were fitted with duplicated controls and served first with *Karas* conversion squadrons and later with air force training centres.

The more powerful P26-Bristol Pegasus VIII, rated at 680 h.p. was then fitted to form the 'B' series, differing externally only in respect of the compensated elevators, while none featured the wing flaps.

The *Karas* was certainly a distinctive looking aircraft and would make an interesting scale model. Note the undercarriage-mounted landing lights with the leather gaiters between the spats and the legs themselves. Constructionally, a very advanced aircraft for its time.

REPRINTS OF THIS 1/72ND SCALE FEATURE PLUS FULL-SIZE DYE-LINE PRINTS OF THE 1/36TH SCALE ORIGINAL ARE AVAILABLE AS PLAN PACK 2946, PRICE 40p PLUS 5p POSTAGE FROM AERO-MODELLER PLANS SERVICE, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

The *Karas*' unusual profile owes a lot to this gondola slung underneath the fuselage, which contains the bomb aiming device and/or camera at the front, machine gun position at rear. Gunner had good visibility with this layout which overcame the disadvantages of a low wing position which normally would have considerably reduced his arc of fire.



PZL P-23A & B 'Karaś'

POLISH RECONNAISSANCE AND LIGHT-BOMBER

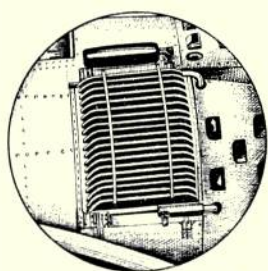
(MAIN 3-VIEW DRAWING SHOWS VERSION A)

DIMENSIONS P-23A & P-23B

SPAN 45 FT 9.5 IN
LENGTH 31 FT 9.5 IN
HEIGHT 10 FT 10.25 IN
WING AREA 287.9 SQ. FT

POWER PLANT: P-23A - PZL BRISTOL PEGASUS II M2 590 HP

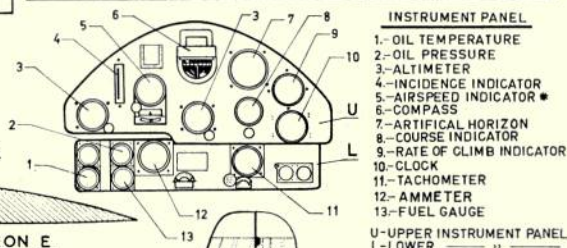
P-23B - PZL BRISTOL PEGASUS VIII 680 HP



OIL COOLER
SHOWN WITHOUT COVER



NATIONAL INSIGNIA
ON UNDERSIDE



SECTION E

INTEGRAL WITH THE FUSELAGE
TWO-SPAR CENTRE-SECTION
PART OF THE WING



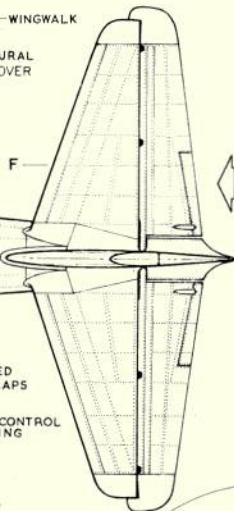
FIXED TAILPLANE

ELEVATOR
HINGE

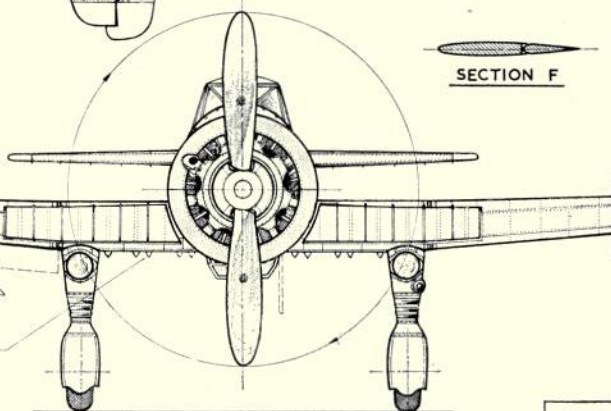
FIXED FILLET
CONFORMS TO ELEVATOR
IN CROSS SECTION

CONTROLLABLE
ELEVATOR TRIM TAB

ELEVATOR AND
LEADING EDGE
OF CENTRAL PART
OF THE WING P-23,
VERSION B



SECTION F



WING FLAP IN EXTENDED
POSITION
(MAX. DEFLECTION 45°)

BOMB RACK

THANKS TO HISTORICAL COMMISSION
OF THE POLISH NATIONAL AERoclub
IN WARSAW, AND MR. T. ZYCHIEWICZ
FOR USE OF PHOTOGRAPHS.

0 1 2 3 4 5 6 7 8 9 10 11 12
FT



These aircraft, of which 210 were ordered, were fully fitted for combat duties.

This all-metal cantilever monoplane was certainly an advanced aircraft for its time – particularly in regard to its wing construction, where the metal sandwich technique was employed. The wing itself was based around a wide central box girder, built up from two duralumin spars and corrugated duralumin sheet – the corrugations running spanwise. Smooth duralumin sheet was then added top and bottom of this corrugated core to produce the 'sandwich' effect. A duralumin D-shaped leading edge and stressed skin trailing edge were then attached to this central box.

A crew of three was carried. The pilot had the luxury of a fully enclosed cockpit, complete with

heating and ventilation, and this was shared with the observer who had a duplicated (and detachable) set of controls. The same observer also doubled as bomb aimer and gunner – reaching these positions by folding his seat and descending into a glazed gondola, slung underneath the fuselage to improve his vision and range of fire – always a problem with low-winged aircraft. The forward portion of the gondola carried the bomb-aiming equipment and camera, while at the rear a hinge-mounted gun was fitted with a 60° sideways and downwards firing angle. The rear gunner occupied a permanently open position, equipped with a semi-retractable gun on a P26-type hydraulic mounting. A fixed gun, firing through the airscrew, was also fitted. Under the wing centre section, racks were provided for carrying the bomb load – six 220 lb., eight 110 lb. bombs or forty-eight 55 lb., with electrical or mechanical release, were typical loads. A maximum of 1,540 lb. could be carried.

The *Karas* was also equipped for night or blind flying operations – landing lights being fitted to the undercarriage, while a signal light, operated from the cockpit, was mounted to the port undercarriage leg only. In addition, a landing flare holder was situated on the top of the starboard wing.

Specification ('B' series only)

Weight:

Unloaded but fully equipped	4,250 lb.
Loaded for long distance reconnaissance	6,918 lb.
Max. load for long range banking	7,773 lb.

Performance:

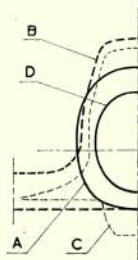
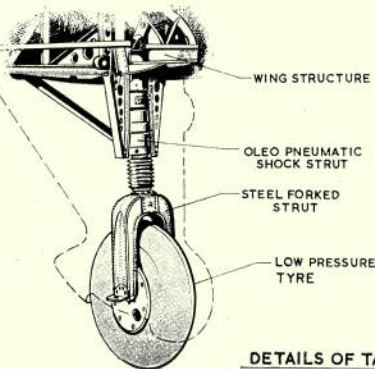
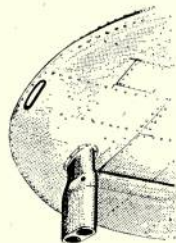
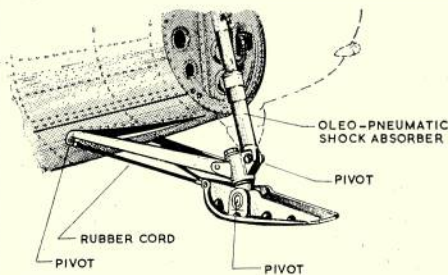
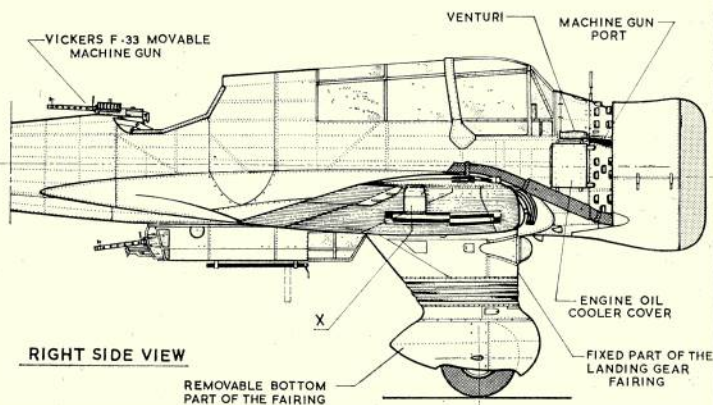
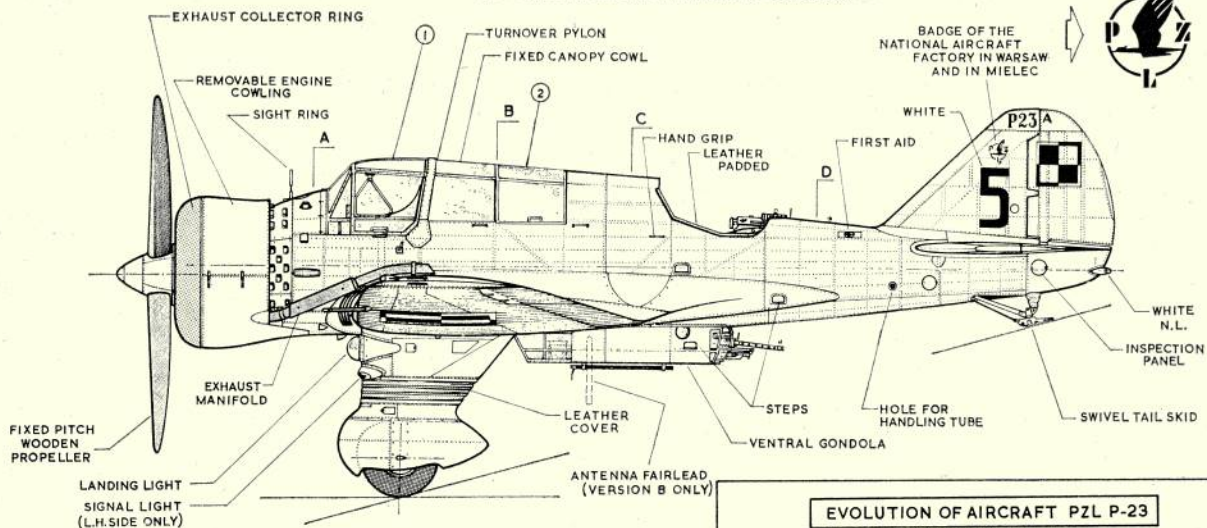
Max. speed at sea level	170 m.p.h.
Max. speed at 12,000 ft.	198 m.p.h.
Ceiling	24-26,250 ft. a.s.l.
Range (according to load)	410-930 miles

Although the PZL-23's were not outstanding from the performance point of view, all who flew the aircraft remember it with affection for its excellent handling and remarkable ability to absorb punishment, while it fostered the use of metal sandwich construction. Also, the *Karas's* design inspired the evolution of a series of other aircraft, namely the P42 (an experimental twin-finned aircraft with retractable gondola), the P43 which was basically a *Karas* modified to take a Gnome and Rhone 970 h.p. radial engine, and the P46 'Sum' powered by a 92.5 h.p. P2c Pegasus XX radial engine. Three hundred of this latter aircraft were ordered for the Polish Air Force, but they never reached production due to the outbreak of war, and the subsequent destruction of the PZL factory.



The low-slung engine was found necessary to provide sufficient forward visibility for the pilot. The observer was a busy man, doubling as bomb aimer and lower machine gun operator. Rear gunner was 'out in the breeze' behind the main cockpit.

BADGE OF THE
NATIONAL AIRCRAFT
FACTORY IN WARSAW
AND IN MIELEC



FUSELAGE SECTION

EVOLUTION OF AIRCRAFT PZL P-23

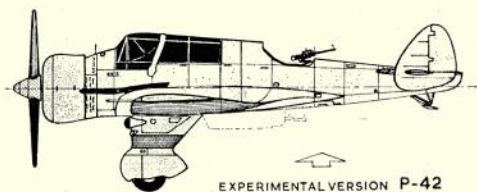
(NOT TO SCALE)



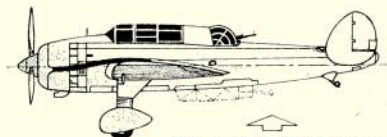
1-ST PROTOTYPE PZL P-23.
FIRST FLEW AUGUST 1934
POWER PLANT: BRISTOL-PEGASUS 590 HP.



VERSION P.43 BUILT FOR
BULGARIAN AIR FORCE.
POWER PLANT: Gnome & Rhône 970 HP.



EXPERIMENTAL VERSION P-42
WITH TWIN FIN AND RUDDER, AND
RETRACTABLE VENTRAL GONDOLA.



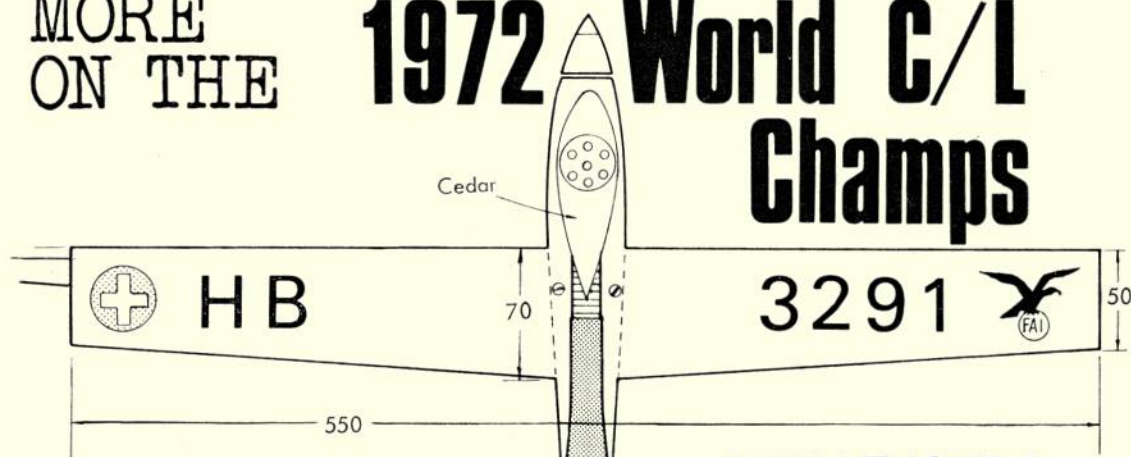
PZL P-46 'SUM', OF WHICH TWO
PROTOTYPES WERE BUILT WITH ENGINES PZL-PEGASUS XX 925 HP
AND Gnome & Rhône 14 NO21 980 HP. IT NEVER CAME TO THE
SERIAL PRODUCTION OF THIS AIRCRAFT BECAUSE OF THE WAR.

COLOUR SCHEME

ENTIRE AIRCRAFT—OLIVE GREEN.
LOWER SURFACES OF WINGS, TAILPLANE
VENTRAL GONDOLA—LIGHT BLUE GREY.
COLLECTOR RING, PROPELLER AND TYRES
—BLACK.

MORE
ON THE

1972 World C/L Champs



Wing and tail are Cedar covered with
0.2 mm Alumn. sheet
ALL DIMENSIONS IN
MILLIMETRES

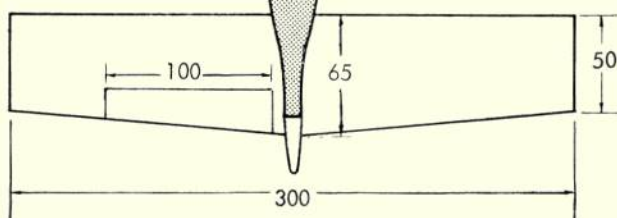
CHALLENGER I F.A.I. Speed model

by LOUIS BILAT

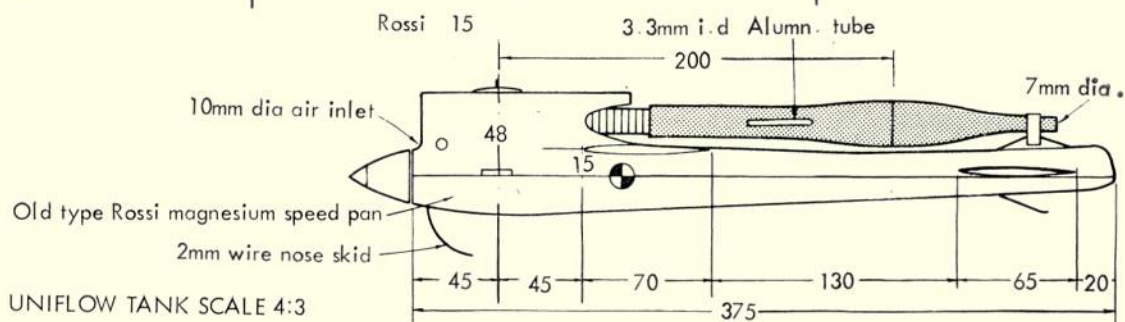
SCALE 1:4

IMPORTANT

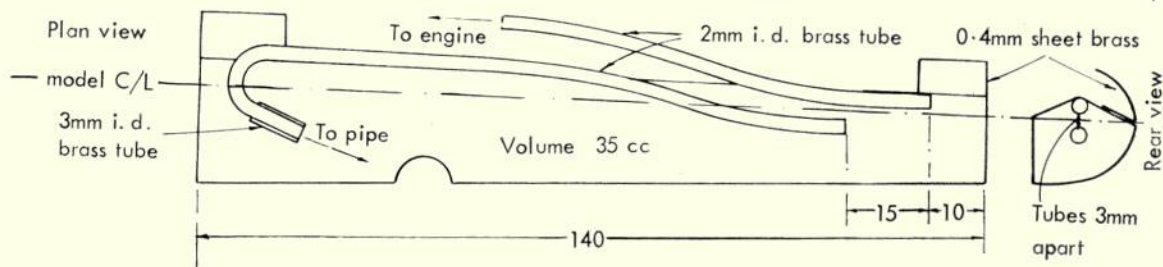
- 1 Epoxy 3.3 mm i.d. alum. tube to pipe.
- 2 Epoxy tank to pan.
- 3 When take off is difficult, use a dolly switch.

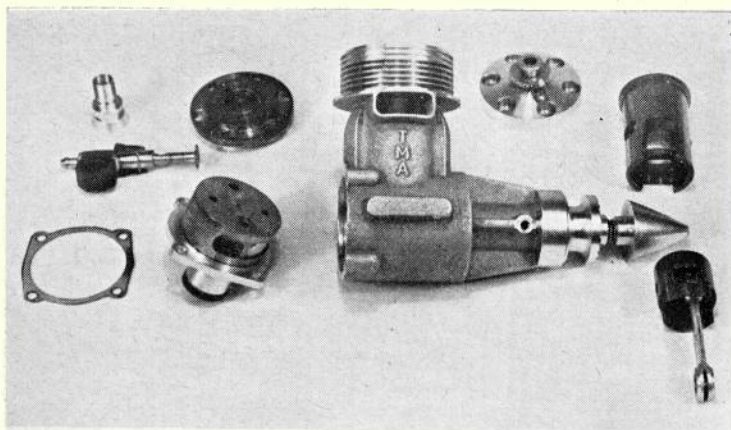


Total weight, 470
grammes. Best speed
obtained, 240 Km/hr.
using 7.7 mm dia.
venturi and TopFlite
5 1/4 in. x 7 1/2 in.
propeller.



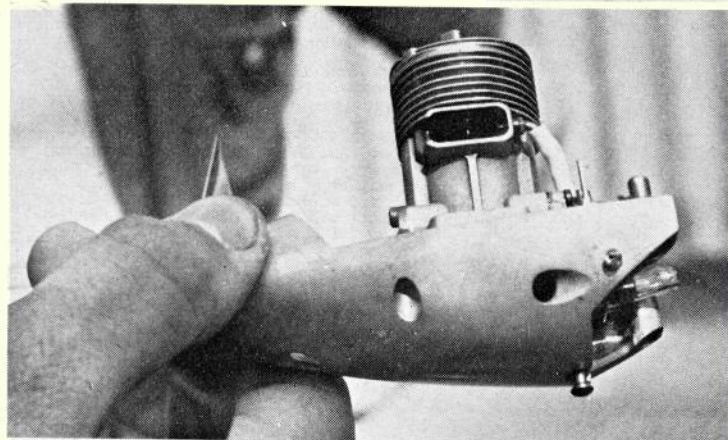
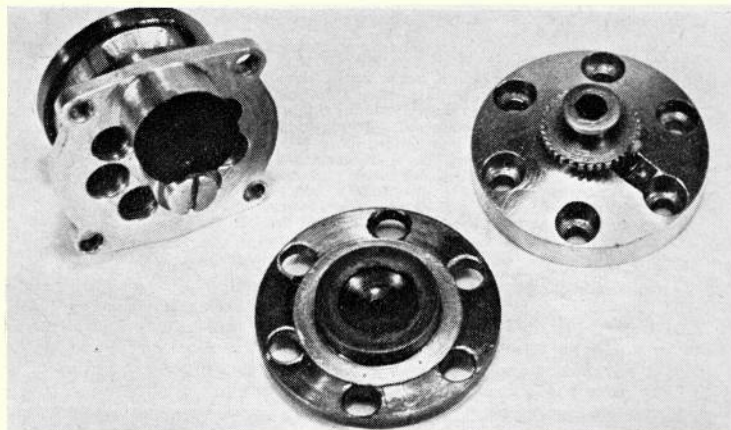
UNIFLOW TANK SCALE 4:3





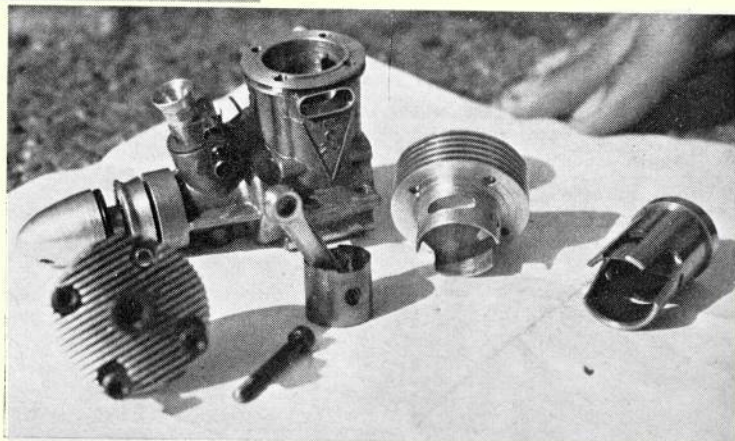
Dismantled Russian team-race motor at left shows some of its HP parentage. Casting is very neatly produced, certainly well up to normal manufacturing standards, yet these are hand-built motors – each Russian team uses these castings but they all differ slightly internally. Cox-type annular ring carburettor is made of plastic in order to prevent conduction of heat to the incoming fuel charge. Much attention appears to have been made to lubrication of the drum induction unit and con rod big end. These motors sound different to all others in current use, and have a deeper, most distinctive note. Standard of workmanship is good, but by no means the equal of Paul Bugl, who earned universal praise for his handiwork on the Bugl 15.

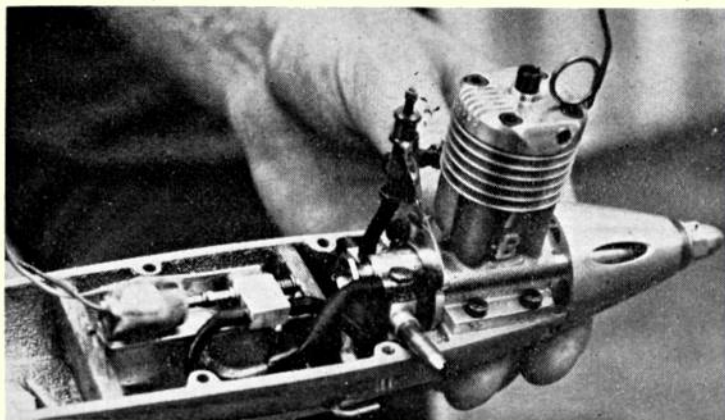
Close-up of some of the parts from the Russian motor at right shows HP-like lightening of the back plate (top left) and the very neat ratchet locking device for the compression screw (top right). The contra piston itself is in two parts, and is well cooled as the main body, made of beryllium, fits over the liner like a flange and extends to the same dimension as the finning. The small moving part of the contra piston provides more precise adjustment and maintains a better head shape. These motors are critical on the amount of amyl nitrate used – above 1½ per cent seems to produce problems, possibly due to lack of sufficient adjustment of the small area contra piston.



Krasnorutsky's motor (seen at left) is mounted in a very short crutch, to save weight, which has an all-enveloping front end. Note cooling duct in pan. Few competitors used pans, most preferred the more lightweight, though possibly less rigid, crutches. Note the forward edge of the exhaust stack has been cut away – all the Russian motors used featured this. Reasoning is that the airflow scavenges the burnt exhaust away more quickly, while at the same time cooling the piston. Before the final, each of the Russians de-lacquered their engines, using a fluid on cloth, finishing off with rather rough treatment from a scraper. All employed the exhaust port primer shown here.

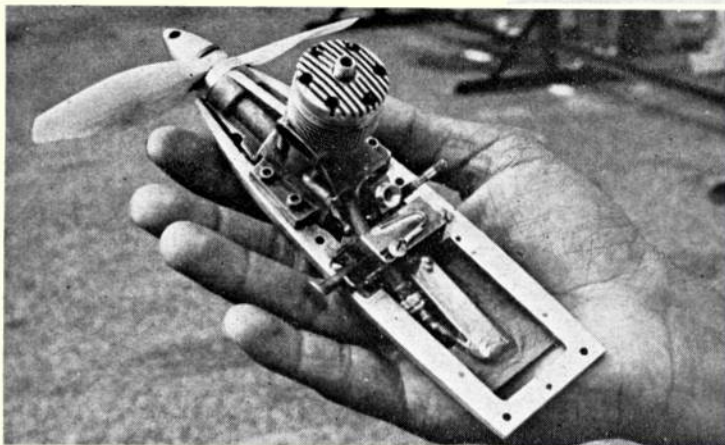
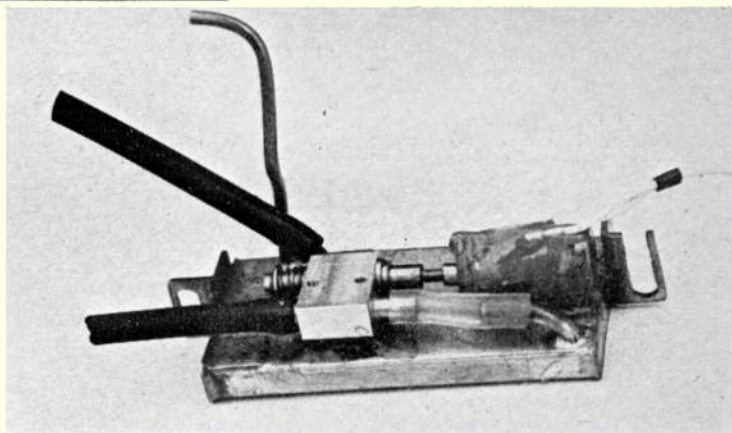
Not used in the contest, but nonetheless a most interesting experiment by Delhez/Dessourcy of Belgium was the five-port conversion of a Super Tigre G20, seen at right. Based around an HP, Delhez reduced the size of the exhaust port with epoxy, made a new cylinder jacket, cut additional ports in the liner and lightened the piston. A Cox carb is also fitted in aid of economy. Very little running has been performed but results are encouraging, with 10 laps being covered in 24.5 seconds with a range of 25 laps. Well worth developing, and a tribute to the Belgian's ingenuity and machining ability.





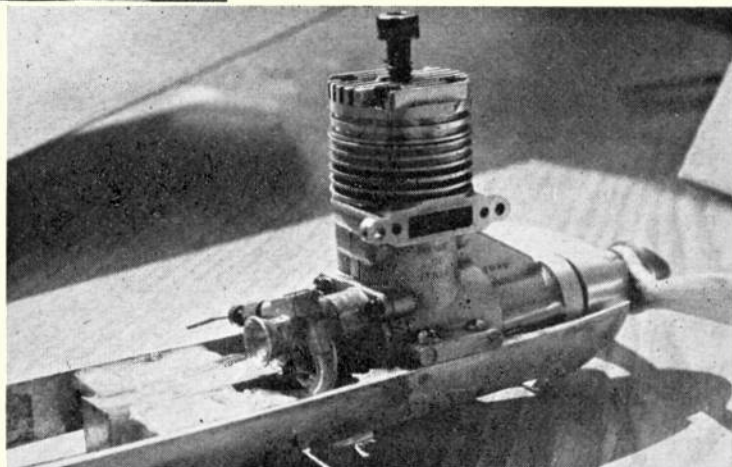
Left, the hardware package of Danes Bobjerg/Siggard is almost as unconventional as their team racer. The Bugl 15 is fitted into a pan and incorporates Bugl's nose fairing. The prop skid is clamped to the cylinder head, but they incorporate a single coil in order to save stress on this component - note how the base of the coil rests upon the head itself. A regulated exhaust port primer is fitted as is Bugl's carb incorporating a fuel cut-off, although this device is not used, they rely on Hasling's brain-wave of an electrically operated cut-out, as may be seen epoxied to the underside of the tank.

At right: Hasling's team race tank viewed from the underside reveals the electrically operated solenoid (at right) which operates the sprung-loaded fuel shut-off (sprung-loaded to 'on' for safety). The solenoid only has a 'throw' of about 2 mm, so machining work on the cut-out has to be extremely accurate. Motor can be stopped within half a second, and is operated by the pilot who carries batteries in his belt and has a switch built into the handle. The bellcrank is made of nylon as an 'insulator', and the two wires lead from these contacts to the solenoid. Quite what happens in the rain with binding lines remains to be seen!



Hodgkins and McCollum of the U.S.A. performed well in team race with this A.R.M. 15, mounted in the lightweight magnesium A.R.M. crutch. The fuel tank is mounted by epoxying in the middle of a piece of sheet balsa - an easy way of 'trimming' the tank position. Fuel shut-off is a simple tube-crusher and is reset separately from the fuel filter. Unusual these days is the use of a fuel filter in the feed line, most teams relying on a filter in the pressurised refuelling line. Bartels glass-fibre prop used as did the majority of the competitors. Tank is a simple single vent rectangular unit. Model averages around 90 m.p.h. in a race, up to 96 m.p.h. in practice or flying solo.

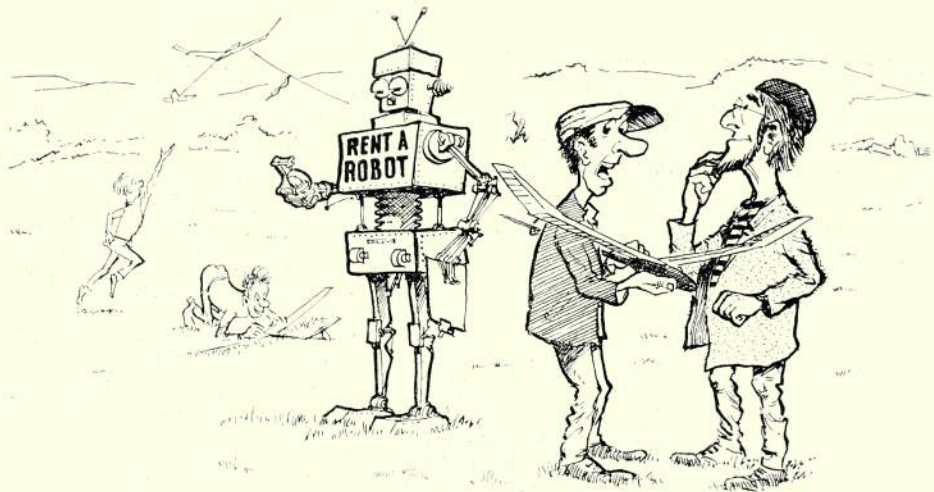
At right: the Rivold/Geschwendtner Super Tigre G15 RV, as prepared by Ole Hasling. The fuel they used (Ole's formula) was very black, due to the use of Molysslip additive, and consisted of 3 per cent Molysslip, 2 per cent Redex, 1½ per cent Benzole, 1½ per cent Amyl Nitrate, 3½ per cent Heptone, 19 per cent Castrol M, 26½ per cent Ether, 43 per cent paraffin. Quite some mix! Bartels 7 in. x 7½ in. Drazek Special prop used. Their model, built in just five days, was covered overall with two layers of 0.035 mm glass-fibre cloth and had aluminium tubing passing right around the wing tips to act as skids. Rearward wheels in conjunction with a nose skid were also used on the 'gadget free' racer.



topical twists

by 'Pylonius'

illustrated by 'Sherry'



Man at the Top

Model flyers are often not just single hobby men, they are often active, too, in fields other than those patrolled by vigilant farmers. Take, for instance, our foremost model flyer, without whose name no contest prize list would be complete. Having already confounded all space/time theory of there only being 24 hours in a day by modelling at six times the intensity of his mere mortal rivals, he has now given a few more hours per day for the computers to juggle with. While we all thought he was fully committed in personally supplying about a quarter of the model flying activity in the country and reporting on the remainder, he was, in fact, pretty actively involved in quite another hobby. And pretty is the operative word, since the models concerned in this hobby were not the balsa and tish ones, but the photographic kind, albeit just as lightly covered.

All this came to light when the gentleman in question, who has lifted more pots than a Victorian chambermaid, lifted the big prize in a national photographic competition. It seems to be all a question of having the golden touch. Congrats John, anyway! Now, when I take a photograph, it comes out like one of those Loch Ness monster pictures. In fact, I have often thought of applying for the job as official monster photographer. Many of the pictures I have taken of my models have a definite Loch Ness touch about them in another sense too, as the models have the same rapid sort of sinking speed as the monster.

Not their Cup of Nats

A most unnatural Nats – apart from the quite natural ghastly weather – would seem to be the general verdict on what up to this year has been our annual jamboree. What made it so unnatural was the separation of one half of the fraternity from t'other. All to do, of course, with the unnatural growth of that wonder brainchild of aeromodelling, Radio. It had so outgrown its place in the scheme of things that it demanded a separate existence; or at least the heavyweight part of it did, and so the one big happy family occasion of aeromodelling proved to be two rather miserable groups engaged in a series of somewhat frigid contests, made even more frigid by the coldness that develops between the judge and the judged.

What was sadly missing, apparently, was all the usual fun of the fair, but the sideshows were just not in evidence. What had happened to all the quaint craft, the hoppy helicopters, the flying frying pans and the billowing old-tyers? Possibly they didn't know at which pitch they would be welcome, if welcome at all. For the in-betweeners there was just no in-between.

'They couldn't get anyone else to run the meeting, apparently.'

A Matter of Judgement

A factor always to be taken into account in model affairs is the law of diminishing returns. This does not mean that, as you get older, you get your missing models back less and less, but that whatever you do, whether it be playing with a yo-yo or driving a Rolls Bentley, the novelty all too quickly wears off. Next thing you know you'll be looking round for a jet-powered yo-yo or stripping down the Bentley for stock car racing. The same applies to the modelling newcomer. At first his ambition is strictly limited to putting a few feet of atmosphere between his super new model and *terra firma*. But having achieved that he could hardly go on crying 'Eureka' for ever, particularly when the successive flights get tamer and tamer. If his bent is towards Radio he might well pawn the family heirlooms for the latest in multi equipment, while if he has free-flight tendencies he might well retreat from life in order to do unspeakable things to a noseblock.

All of which leads eventually to the next stage, the competitive urge, when he is so thoroughly jaded with the old neck-cricking routine that the only thing left is to prove that his style of model flying is better than that of the next man. Trouble is the next man, and the next man to him, have also got the competitive itch, thus leaving something of a shortage of personnel to officiate at the contesting clashes of ego with ego.

It wasn't so bad in the old days when Mann Monoplane Mk. I met Mann Monoplane Mk. II. It was simply a matter of clocking up how much longer Mk. II stayed up than Mk. I, with only that normal sort of vision required of the umpire that reads a parking meter at 25 yards, but in these complicated times you need at least one super-vision judge per model, each expert in more specialised ways than the mere turning of an egg timer. And whereas you needed only one man per automobile with a red flag, you need at least three per model at a modern pylon race.

But as there has been an electronic breakthrough in the control of model aircraft, we may well be on the threshold of a similar breakthrough in the controlling of the controlled models. The judges and timekeepers might well be replaced by some sort of all-seeing, all-knowing, highly officious robot. The Dalek-like creating would have a quick way of dealing with the 'I wuz robbed' competitor – one phut from his exterminator and the problem would be settled.



FLYING SCALE COLUMN

by Eric Coates

Swiss Scale team 'en masse', Ruegger with his Polikarpov Po-2 and Amman supporting his Fairey Swordfish with the cheerful mechanics and supporters in attendance.

THIS LAST MONTH has seen a lull in the U.K. Competition Calendar, unfortunately timed to coincide with the best flying weather of the season to date. However, it does give a travelling respite before the round of competitions which are traditionally held at the end of the season; when the winds are supposedly at their lowest ebb.

Midsummer though, is the time for displays at various public functions, which is a very necessary part of Public Relations work for the responsible aeromodeller, and there is no doubt that the radio controlled scale model is the prince of performers in this field. At one time the public was 'gaga' at any form of R/C but it has rapidly become very selective in its patronage, and now when the various types of R/C model are displaying their respective circus tricks, it is the model 'which looks like a real aeroplane' which commands nearly all the attention. The S.M.A.E. Council of course are well aware of this and, therefore, at the premier display given by the Society – the *Air Day and Golden Jubilee Kings Cup Air Race*, organised by the U.S. and R.Ae.C. (to which the S.M.A.E. is associated), held at Booker airfield on July 15th – scale models were used exclusively. As well as the flying display a magnificent static show of the best flying scale models in the country, representing all three classes, was presented in a tent. This was sited on the border between the Members and Public enclosures so that everyone could have a look. Despite the brilliant weather, a constant flow of people flocked through all day – the most honoured guest being H.R.H. the Duke of Edinburgh conducted by Scale Committee Chairman, Dennis Thumpston.

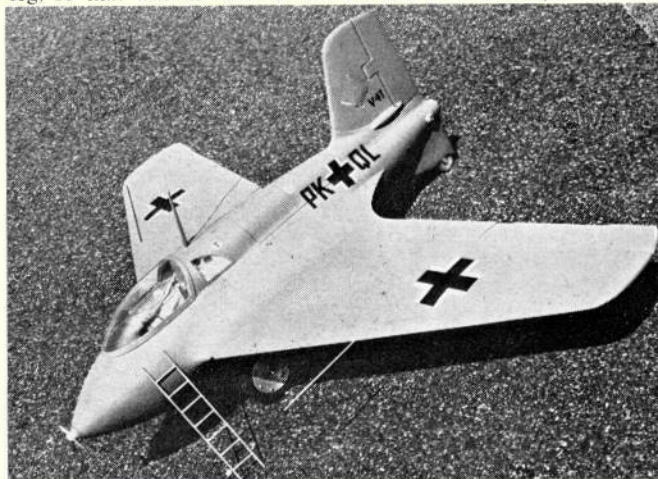
Two flying sessions were given, each of 20 minutes duration, accompanied by a P.A. commentary by H. J. Nichols. Up to six scale models, most of them biplanes, were airborne simultaneously keeping the vast crowds attention throughout.

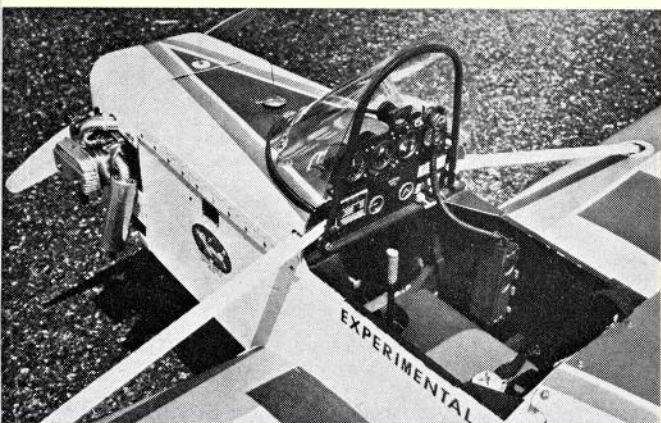
I was more closely involved in a second display. The *Royal Navy Air Day* held at my home flying field of Lee-on-Solent. Here the *Lee Bees* put on a mixed display of R/C aircraft only being able to muster two airworthy scale models. Unfortunately, fellow clubman Martin Rudgeley's gear went u/s in his *Chipmunk* immediately prior to the display – we think due to the excessive heat inside his car, for everything functioned perfectly again an hour later when it had cooled down. I was, therefore, left to

The Me 163 which won the R/C scale World Champs event was just as impressive in flight as in appearance. Towed to the take-off area behind a scale tractor, the engine was fired up and the machine leapt into the air, shedding its drop off 'dolly' undercarriage in scale fashion.

carry the scale side alone with my aged S.E.5a.

Conditions were well nigh perfect and I flew three sorties, within the 20-minute period, throwing the machine around the sky with gay abandon, despite its old creaking joints – the S.E. started life as a free-flight model five years ago. This nearly ended in disaster when, after about a 20-turn spin from 500 ft., the port lower wing was observed to have moved back on its dowels to give 15 deg. sweepback. A hurried landing, with about 20 deg. opposite rudder on, prevented a mid-air disaster. A few minutes afterwards I was putting the model back on our static display, in one of the hangars, when I was approached by an enthusiastic elderly gentleman wishing to know if I had piloted the S.E. through 'all those wonderfully-realistic manoeuvres'. Rather diffidently I admitted I was, whereupon he extended his hand in congratulation and announced himself as the ex-Commander of No. 41 Squadron when they flew S.E.5a's on the Western Front in 1918! He went on to tell me how he was 'bounced' by a Jasta of *Albatros D.V.'s* at 15,000 ft. whilst over the enemy lines in February 1918. A burst of gunfire shattered his instrument panel. When he regained control of his S.E.5a, he was down to 4,000 ft. with a 'dead' engine. Still surrounded by hordes of *Albatroses*, he saw an airfield below and was forced to land on it. This transpired to be Douai – home of the famous Jasta 11 (Richtofen). Only when he tried to get out of the cockpit did he realise he was wounded in the leg, so that was the end of the war for Mr. Powell.





for that was to whom I was talking. After several weeks in hospital he sat it out in a P.O.W. camp until the Armistice in November.

Talking to Mr. Powell like this made me wonder how many veteran pilots of both wars, who have no connection with, or little knowledge of, the aeromodelling world, see scale models of aircraft they once flew at model displays. If it provokes nostalgia, in the same manner as it had obviously done with Mr. Powell, then display flying is a darn sight more worthwhile than I had previously considered it to be!

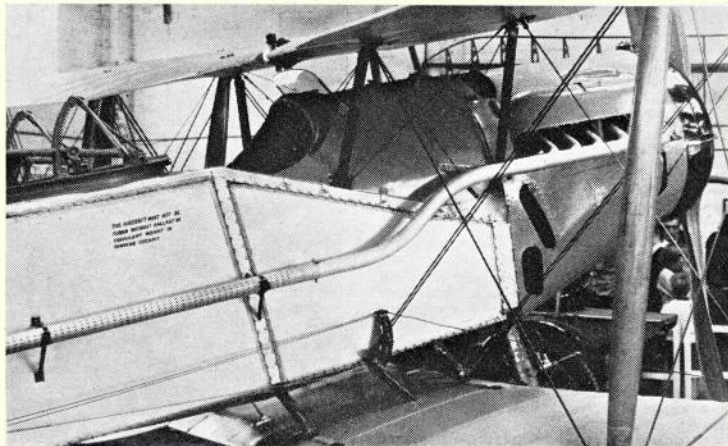
Now to a few constructional details. Earlier this year, I mentioned I had tried out one or two new ideas in the construction of my D.H.9A. Most aeroplanes of the first 30 years of this century had fuselages which were only slight variations of the box structure still in common use for most rubber duration jobs today – both structures consist of four longerons; spaced apart by vertical and horizontal cross braces. There is, however, one major difference – the way in which torsional loads are resolved within the structure. In the case of the model this is simply taken out in the tension of the covering; the tissue is stuck to all longerons and cross braces so that each panel is capable of resisting torsion by tension of the covering in a diagonal direction. Most builders of scale models of the early era, myself included, have tended to use the rubber model construction as a matter of course; it has almost been inbred into most of the older generation, before the

Cockpit of John Roth's $\frac{1}{4}$ scale Evans V.P. shows the excellent detail including the exposed instruments above the normal cowl line, inside the windshield, plus radio console. Note, also, the Volkswagen type cylinder heads, specially fabricated in three parts, bolted in place on the Ross twin.

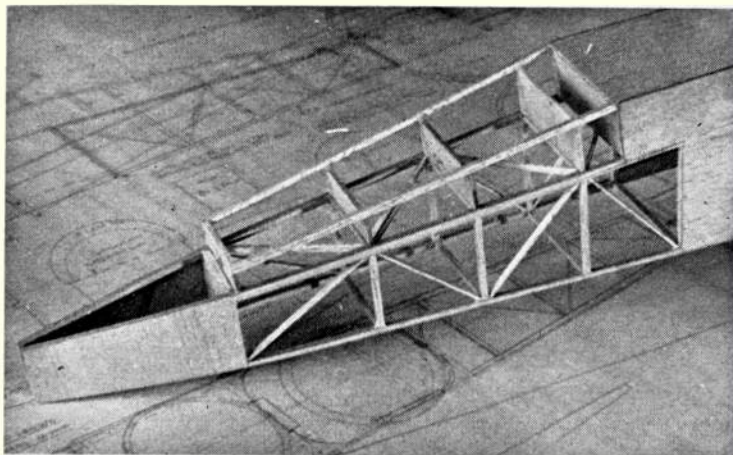
era of plastic film. Incidentally, ever noticed how weak a plastic structure is when this 'instant' covering is applied? No wonder so many radio models develop flutter problems and literally disintegrate in the mildest of prangs. To return to the subject: the tissue plus silk technique, doped directly onto the open framework is beautifully strong but not very scale-like. In full-size practice, when wooden structures were used, each bay was braced by a pair of diagonal tensile wires which were necessary as all joints were of the pin type. Later tubular steel structures had welded joints which could take bending; although bracing wires were still often used. If we look carefully at the covering of an aeroplane of W.W.I vintage we will see that it is attached only to the longerons, sometimes doped on and very often laced (the *Bristol Fighter* at Old Warden is a good example). The fabric is attached to very few cross members; unlike on the wings where it is sewn to every rib. Indeed, it is usually proud of the cross-members and only when viewed against strong light can the cross-members be seen through the covering. The covering on the fuselage in fact carries no loads whatever – it is only there to prevent the wind whistling through the drag-producing structure.

The over-prominence of fuselage cross braces has annoyed me for some time when looking at photographs of my models. Therefore, on the 9A, I capped all the exposed longerons with strips of $\frac{1}{8}$ in. x $\frac{1}{32}$ in. This quite naturally followed the contour of the $\frac{1}{32}$ in. sheeting on the forward and absolute rear parts of the fuselage. As the torsional rigidity of the fuselage would be seriously reduced by not sticking the covering to the cross-members, I compensated for this with $\frac{1}{16}$ in. x $\frac{1}{8}$ in. diagonal cross braces lying, of course, $\frac{1}{32}$ in. inset in the plane of the longerons. The dorsal structure is not of great structural importance and was produced with undersized formers and two 'proud' stringers at each corner.

The resulting structure is very stiff and would be quite capable of taking the torsional loads imparted by the tail surfaces, without the covering – just as on the prototype. As the diagonals are capable of taking both compressive as well as tensile (if you have glued them correctly) loads, a single member in each bay is sufficient. Twin diagonal wires are used in each bay in full-sized practice because a wire can



The Shuttleworth Collection's Bristol Fighter shows how the fuselage fabric is held clear of the cross members. When attempting a scale model, particularly if contests are in mind, it is considerably easier if one chooses a subject which is readily on view in a museum. So much simpler to study the actual machine rather than photographs or drawings which never seem to quite illustrate the point of detail which you are querying!



Rear fuselage of Eric's DH9a reveals the diagonal bracing used for extra torsional stability which was necessary when, in the interests of scale effect, he avoided sticking the covering to the cross members, as described in the text.

only take tensile loads.

Before covering, all cross-members and diagonals to which the covering is not required to adhere, are rubbed with a candle – **not** the longerons though. The covering is then doped to the longerons and the selected cross members and pulled as tight as possible. When the adhesive dope is dry I then, on this occasion, recommend water-shrinking the tissue. When this is dry, apply the shrinking dope sparingly. At all costs avoid a 'weld' of dope in the gap between the tissue and a cross-member. If this happens, tease the tissue away from the cross-member until the 'weld' breaks. Should you allow the weld to dry, you will have an indentation in the covering at this point. When the dope is dry the tissue should be taut and 1/32 in. clear of the cross braces. You can easily push the covering back to the brace but it will spring clear again. Dope on the silk now in the normal manner and apply the colour dope – when complete the cross-members are invisible beneath the khaki.

There is no point in performing this exercise if the model is to be left clear doped; I didn't bother on the lower face of the D.H.9A fuselage as can be seen in the accompanying photographs. The cross members can easily be seen beneath 1/32 in. of unpainted tissue and silk, and what is more, the diagonal bracing which shouldn't be there, can also be seen!

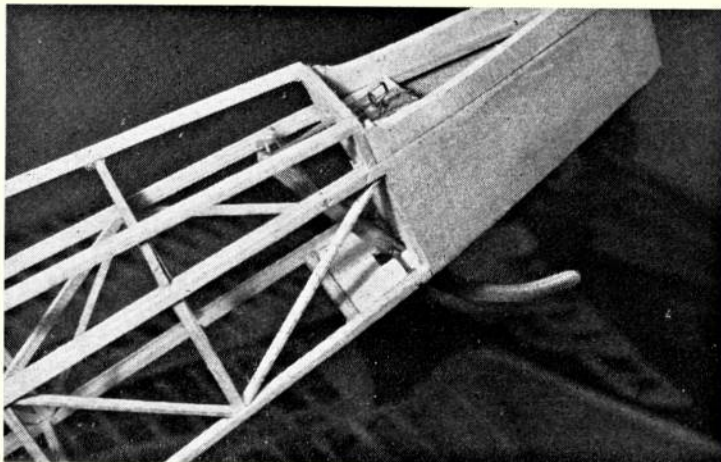
I mentioned that I was going to construct the fuselage of the *Ninack* in such a manner to Terry Manley early on in the year, when he was already well under way with his D.H.4. He thought it was a good idea

and modified his structure accordingly. The system also lends itself to the 'baggy' covering so often seen on photographs of tatty service aircraft at the front. Terry tried to simulate this effect too, but was only partially successful. As he said, *'It is amazing, when you try and do a rotten job of the covering, it shrinks perfectly!'* One can't help but wonder what law it is that allows this to happen, yet when you want a neat job, on a wing, wrinkles appear in profusion.

Coming back to Matt Dopes, which I wrote at length about a month or two ago, I have had a letter from Tim Rickard of Colchester who suggests that if matt colour is not available, then mixing talcum powder with gloss has the desired matting effect. I haven't tried this myself, but it sounds as if it should work, although be careful with the amount of talc put in, otherwise cracking may occur. This, I find, is the common problem with sanding sealers made from talc and dope.

One news item this month. After considerable negotiations with the R.A.F., that excellent airfield, Odiham, has been secured once again for the **S.M.A.E. Southern Gala**, and this will take place right at the end of the season on October 31st. As I announced earlier this year, it was intended to introduce scale competitions at this event for the first time – the events will be: Free Flight and R/C (Class 2). In view of the minimal entry at the North Luffenham meeting in July, there will not be a control-line event.

Close-up of the DH9a's rear fuselage reveals $\frac{1}{32}$ in. x $\frac{1}{16}$ in. capping on the longerons in order to lift the covering clear of the cross braces. Note how the diagonal braces are not employed on the underside of the fuselage – nor are capping strips used, the tissue being stuck directly to them. This is because the underside was left clear doped, and thus lifting the cover off the cross braces would have been a waste of time, and the diagonals visibly non-scale.





John O'Donnell's FREE FLIGHT COMMENT

John's latest Coupe d'Hiver model, held aloft by neighbour Jane Fairclough. Note how her left hand cleverly conceals John's latest secret weapon - a Hofsass style delayed prop release - details of which remain undisclosed until the opposition catches on. Meanwhile, John is making hay while the proverbial sun shines. Nice neighbours, too!

RECENT CONTESTS have been noteworthy on a number of counts. Some events have been affected by extremes of weather - giving rather surprising results. Others have seen the appearance of new ideas, both as regards model design and otherwise. I will endeavour to describe all these aspects in the context of the contests concerned.

The Midland Area Rally was held on 2nd July at R.A.F. Swindon - a venue not used since the World Control-line Championships in 1966. This year's meeting was successful - but it is difficult to say whether this was because of, or in spite of, the prevailing weather conditions - a dismal, drizzly morning was followed by an overcast afternoon. Compensation was provided, however, by the wind being light all day. In consequence, there was a fair amount of activity, even though the long uncut airfield grass made retrieving a very wet operation.

There was little in the way of real thermals, and this is reflected in the scores recorded and the relative numbers in the 'open' fly-offs. The Rubber event had nine trebles, out of barely double that number of entrants. Three-threes is just too easy in calm conditions! The fly-off was held in rather murky conditions that presented obvious visibility problems, and this provided an opportune moment for the debut of John Carter's new and enormous rubber model. Intended to win fly-offs on visibility rather than performance, this model is conventional in design if not in size. Justification for the concept came in the form of first place - but by a surprisingly small margin. Just two seconds separated Carter's giant from Lou Robert's model. The latter probably had the smallest wing area of any in the fly-off, but a fast high climb presumably made it easy to see. Third place went to Albert Fathers, newly launching out from flying only glider.

From the unbelieving looks and comments on the day, some factual details of John Carter's model should be of general interest.

With six-foot span and seven-inch chord the wing has around 500 sq. in. of area. This is bigger than an A/2 and is enough to dwarf any normal 'large' rubber model. Wing structure consists of a $\frac{1}{2}$ in. x $\frac{3}{16}$ in. L.E., four spars (largest being $\frac{1}{2}$ in. sq.), a $\frac{1}{2}$ in. x $\frac{1}{2}$ in. T.E., and straight ribs. The fuselage is 72 in. long, $3\frac{1}{2}$ in. square, and has but $\frac{1}{2}$ in. sq. longerons with smaller size warren girder spacers. The two-blade folding propeller is 28 in. dia. x 26 in. pitch and requires 7 oz. of 6 x 1 mm. Pirelli made up as 24 strands. Winding is a 3-man operation, and involves a long-handled winder and six foot of P.V.C. drainpipe (to act as a winding tube). With an all-up weight of 13 oz., the model has a slow climb, a two-minute motor run, and a very good glide. Hardly a windy-weather model but an approach of which we are likely to see a lot more!

The three-way glider was won by contest official Gerry Fener - again with a large model. In this case, however, he was virtually 'given' the contest. Mike Woodhouse towed so far that his model soon disappeared behind an upwind wood and Pete Whitehead's A/2 spiralled in from a stalled release. This left Gerry able to make an unhurried and uneventful two-minute-odd flight with his 98 in. span model. This is the same plane that he has flown for some years - but looks a little different with a newly-painted fuselage!

Power had four in the fly-off and surprisingly close scores. Winner was Dave Pymm, currently doing well with his G15-powered and Ray Monk's style Open model. Ray himself was second with an elliptical-tipped O.S. 29-powered design, whilst Mike Green and I were a little behind.

The $\frac{1}{2}$ A event was won rather more decisively by Mike Duce who found much better air than either Ray Monks or Russell Peers. Naturally enough, all were using TD 049

engines. Chuck glider saw Roy Clarke repeat his Nationals success - despite the efforts of S. Marriott and Barry Kershaw.

Tailless was advertised - but not contested, as there were no entries. This category is now showing the effects of losing its once - enthusiastic protagonists.

I had a good day in winning both the other 'minor' events - Coupe d'Hiver and A/1 glider. With both being run to the 5 x 2 rules, this kept me busy right up to the end of the contest! My new Cd'H caused much comment due to its Hofsass-style delayed prop. release - a device that is much too conspicuous to remain very long as a 'secret weapon'. Runners-up in 'Coupe' were Graham Jubb and Dave Tipper. All scores in A/1 were close - but low. Certainly my model will set no trends with its ex-Wakefield wing and 20-year-old box fuselage! Much more modern equipment was flown by K. Roper and Colin Morris - but for not quite long enough!

A very novel and intriguing idea appeared momentarily at Swindon. Trying to capitalise on rivalry between its own members, the Falcons club had devised a system of 'fines' for those who 'dropped' a flight below a max in Open events. A score of under three minutes in Open Rubber would cost the flier the sum of 50p. More difficult events were rather more modestly priced! A combination of re-entry and a very off-day by their 'star' member soon put paid to this wonderful incentive scheme!

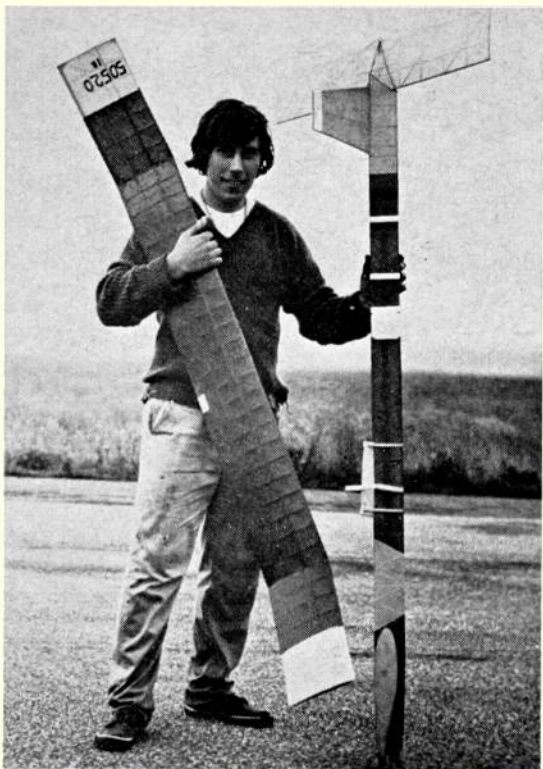
Practically all the country seems to have enjoyed very pleasant weather on 9th July for the Fourth S.M.A.E. Area-Centralised meeting. Consequently the various events had large entries and good scores.

Predictably, the event attracting most interest was the team glider contest for the M.E. Cup. Glider is the most popular category and the need to field full teams encourages a club to 'round-up' its less enthusiastic members. Clubs are not restricted to a single team of four members and several clubs had a full or part 'B' team. Only Norwich had the manpower to provide a third team - and their enthusiasm was also evident in other ways.

From Les Brambley's report on the East Anglian Area activities, it would seem that although they shared the use of R.A.F. Bassingbourn with the London Area, they flew as separate entities.

The weather was kind all day with a light wind, variable cloud, and patchy, but plentiful lift. Pilot flying played an important part in the proceedings and the whole Norwich club regarded the contest as a team affair. The approach succeeded in that their whole 'A' team max'd out. All in the E.A. had seven glider trebles out of 15 entrants. Conditions must have been ideal at fly-off time as three of the gliders got well away in a massive patch of lift. Steve Bowles and Bill Parker were eventually clocked off at 14:45 and 19:01 respectively. Even these scores were exceeded by Derek Roche of Anglia - probably through having a much larger model. His 'open glider' was 9ft. span, 8 inch chord, and 27ozs. a.u.w. Such a size model has obvious advantages over the usual A/2's when it comes to unlimited 'thermal' flights. Derek's glider was seen for 22:02 and was airborne for over half-an-hour.

One of the inherent characteristics of the area-centralised events is the effect of weather variations across the country. When I first heard of Messrs Parslow, Bowles, Halford and Woodhouse all flying off for a total of 36:00 plus 38:29 it sounded like a case of 'gilding the lily'. In fact this was not so. At Henlow, the Northampton team of Parry, Payne, Dowling and Evatt also managed four trebles - and what would normally be two very good fly-offs, N. Parry recorded



Yes, it is big, isn't it! John Cooper gives an impression of the size of his monster fly-off Open Rubber model. Maximum visibility rather than duration was the prime requisite, and already the design has proved successful. Total weight for the 500 square inch machine is 13 oz., so it is certainly a calm-weather device.

almost 10½ minutes, and Trevor Payne only a couple of minutes less. They must have been very disappointed in only managing second place in the Team results! All in all there were 33 individual trebles recorded out of 138 entrants – with all but six of those eligible to fly-off actually doing so.

The F.A.I. Power event for the *Astral Trophy* also had good scores. There were five perfect scores of seven maxs, and six more within half a minute. Surprisingly only the winner, Roy Collins, had thermal assistance on the eighth flight. Flying at Bassingbourn, this model climbed well on a 9.7 second run and was still good for another couple of minutes when he D/T'd down for a fly-off score of 7.02. Successive scores were down at the three minute level with Phil Ireland, John West and Dave Pymm all within a four second spread. Martin Dilly made up the quintet with his MVVS diesel-powered model.

The trophy-less contest for *Coupe d'Hiver* saw my new model notch up another first place! I flew with the Northern Area at Driffield where the weather was not quite as good as further south. The morning was nice enough, but the afternoon became overcast and breezy. Flying tactically, I managed five two-minute maxs before conditions got too difficult. The fly-off had uninspiring conditions throughout the 6 to 7 o'clock period. It was only through Tony Cordes' A/2 marking passable air that I was able to manage a 2:19 fly-off. In the event it was academic as no-one else max'd out. Ian Dowsett (flying one of the models he took to Paris in the spring) and Jim Wright each had one flight below a max, and were second and third. Incidentally I was using the 'wind and wait' technique and now know that you can hold a fully-wound motor for the best part of ¼ of an hour!

The Leeds club were fortunate in having an exceptional day for their rally at Topcliffe on 23rd July. The conditions remained calm all day, with bright sun and large strong thermals for much of the afternoon. Naturally enough there was plenty of flying – but the organisers must also have been pleased at attracting representatives from the 'deep South'. A well-publicised guarantee of substantial (for aeromodelling that is) cash prizes appears to be contributory –

and is surely a pointer for certain other meetings.

A single, or 'block', entry fee was charged to all contestants regardless of number of events flown. Whilst this is fine for the energetic (or greedy) all-rounders, I did hear mutterings that 40p. was a lot to pay for a single event. Re-entry was allowed, but discouraged, by making it expensive at 30p per event. These financial arrangements made it possible for the host club to boost their award list considerably by returning 'all – but the small change' in the form of prizes.

The big event from every aspect was A/2 Glider – run to the full quota of seven flights. Conditions were ideal for straightforward tactical flying – as can be seen from the fact that no less than ten contestants recorded the magic 21 minutes a piece! Perhaps surprisingly there were no near misses – the next three competitors all scored re-entry but recorded a string of maxs following poor initial flights.

The A/2 fly-off came as a complete contrast to the contest itself. Held in calm, overcast and 'dead' conditions there seemed little hope of lift. Practically everyone simply waited, hoping for someone else to go and show what the air was like. Eventually there was no longer any time to wait and everyone flew all-but simultaneously. Winner proved to be Brian Picken whose model seemed to find just a little help low down for a 2:44 score. It has *Humble-hound* surfaces on a glass-fibre rod fuselage, distinctive in having both an underslung pod and fins. There was a tie for second place between Tony Cordes and John Boon, both at 2:38. It would be unkind to leave glider without mention of one flier not in the fly-off. This was Pierre Chaussebourg – French pen-friend of Dave Goodwin – and including the contest as the climax to an English holiday. His high aspect ratio model attracted much interest by virtue of its 'circling tow'. Although the solid wing structure caused many to dub it as 'S.P.L.' it was actually a modification to a design by Bazillon. An awkward D/T landing shattered the wing, but gave Pierre the chance to demonstrate the 'instant' repair capabilities of cyanoacrylate adhesive – fantastically quick and equally expensive!

The Open Power fly-off had ten participants – far more than the number seen at a club gala for years. Russell Peers produced his K & B40 model for the fly-off (after using an ETA29 *Woodpecker* for the treble) and won by a very narrow margin over Dave Pymm's G15 model – both at around 5½ minute mark. Half a minute behind came Phil Ireland, all the way from Southampton, with a Rossi 15 sheet-surfaced F.A.I. model. Another long-distance entrant, Fred Chilton, was fourth.

Open rubber had almost half the entry reach the fly-off – only to record rather unimpressive fourth flights. Only Alan Jack cleared six minutes – despite an initial power stall – to register quite a clear-cut win. Both Alan and club-mate Ron Pollard (who was runner up) judged the moment to launch by the use of a long 'Melinex' streamer mounted on a 20 foot pole. The pole itself is interesting, being made up of a large number of *Ronytube* offcuts! Russell Peers was third with a rather small model of a design loosely based on that of Dave Wiseman.

Coupe d'Hiver, A/1 glider, and ½A power were all flown together in a single combined 'Mini comp'. Previous experience had convinced the Northern Area that the performances of the different categories was not sufficiently similar – so a correction factor was applied to the scores. Based on Dave Hambley's analysis of 1971 scores, the durations of C. d'H. models were multiplied by 1.3, those of A/1 by 1.1, while ½A power on six seconds run were taken 'as is'. A two-minute max was applied to the factored-up scores. This, in effect, meant that a flight of 1:33 with a *Coupe*, or one of 1:49 with an A/1, was worth a max.

The contest produced four perfect scores – and the realisations that no decision re the fly-off had been made in advance. Logically enough the 'K' factor was used on the extra flight as well. In practice this did not affect the placings at all. Dave Pymm over-ran with his ½A model, but did not do long enough in any case. Of the A/1s, Phil Ireland went first, but found no lift. Tony Cordes did a bit better and gave me the opportunity to launch my ready-wound *Coupe d'Hiver* underneath his A/1. My model climbed well and held weak lift for a flight of 4:29, that the factor increased to nearly six minutes.

One other event had a fly-off. Chuck glider results saw Roy Clarke make it three-in-a-row, just one second short of five one-minute maxs. Second place, just one second less, was tied between Mc Askie and Ewan Jones, and flown off in consequence to leave them in the order given.

There were two vintage competitions – a duration event on the rally schedule and a privately sponsored precision contest run by Jim Moseley. Ted Smales won both! For duration he flew an *Isis* Wakefield to three good flights and a minute lead over the pair of *Scram* lightweights flown by Dave Goodwin and myself. Precision involves trying to total five times the first flight and is usually attempted by making

Dave Goodwin (right) with French pen-friend Pierre Chaussebourg and solid wing A/2, seen at the Leeds rally while the latter was completing a holiday in this country. Not, in fact, an 'SPL' design, but based upon a Bazillon model.



shortish flights of around a minute. Both Ted and Jon Clements got within a couple of seconds or so of their target time - flying sports-type power models. Scores are converted to percentage error (so as to equalise the effects of different first flights) and came out at 0.71 and 1.0 per cent respectively.

Overdue for mention are two overseas contests - both held in April. Quoting all the various snippets that I have received (from Dave Anderson in Australia, and Ron Magill and Paul Lagan in New Zealand) about the **Trans-Tasman Free-Flight Challenge** would completely fill my total space allowance for the month! Although this year's contest was only the second one held, this bi-annual International seems to have 'caught-on' very successfully. Extension of the idea to C/L and R/C is already under way!

The event has been treated very seriously with both countries running Trials to select their teams. The New Zealanders travelled to Richmond in New South Wales, 40 miles south of Sydney to compete. In England there is a tendency to think of Australia and New Zealand as being next door to each other - but in fact they are more than 1,200 miles apart. The contest really is International.

The three World Championship categories were flown, with teams of three from each country, plus a number of 'individual' entrants. Overall winner was to be the nation with two wins out of three. As Easter Saturday's contests saw the Australians top F.A.I. Power, and the New Zealanders take Wakefield, the Sunday's event for A/2 was very keenly fought! Eventually the visitors recovered from a shaky start to win both the A/2 event and the overall contest.

Individually, Paul Lagan had a very good weekend with first place in both Wakefield and Power, whilst Australian John Borrill (flying as an individual) won the A/2 glider event. Scores and the like can be extracted from the results.

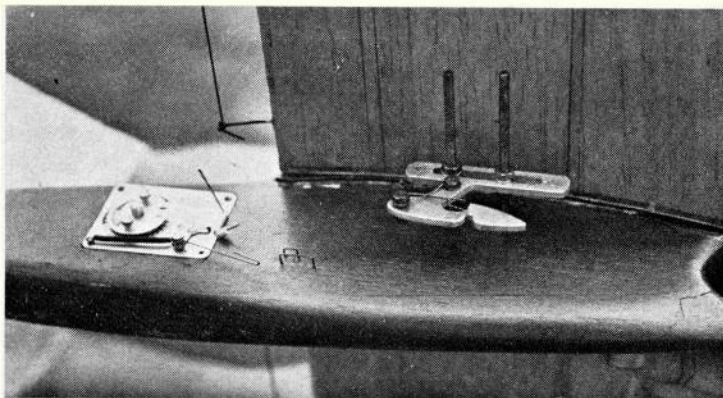
The other event was the annual **Spanish A/2 Postal Contest** - now in its sixth year. This is a very efficiently run postal event with full results and souvenir pennants being distributed to all participating clubs - a marked contrast to one or two other events that have disappeared without trace - or results!

April's weather was hardly conducive to much British participation, and our entries were limited to but four clubs - Norwich, Wigan, West Lancs and Whitefield. The East Anglians provided our 'best' team score, well down at 12th place in the Senior age group (over 21). The other two N.W. clubs flew at Chetwynd on the day of the second Area-centralised meeting. Norman Duncan's 11th place with 14.07 for five flights was quite an achievement in the windy conditions prevailing. My club decided to wait for better weather that didn't materialise. In consequence, we went out on the last eligible day of the month to make purely nominal flights in a good stiff gale. One quick D/T'd flight apiece of 40-50 seconds was our aim - just to demonstrate our interest and support - and to keep our pennant collection complete! Seriously though this postal is a well-organised affair and well worth supporting.

Predictably enough, top scores were very high, even if Rumania did not quite repeat its clean-up of 1971. Prasanta Banerjee of Calcutta topped the individual Senior results with 5 x 3 plus 4 minutes, 5 minutes, and 2:48. His club won the team event just in front of two Rumanian teams. T. Brewster of Toronto was first in the under-21 ('Juvenile') class with a 4 mins fly-off, whilst the Melinna group from Spain took the corresponding team award.

RESULTS:

MIDLAND AREA RALLY, R.A.F. Swinderby - 2nd July 1972
Open Rubber (19 entries) 1. J. Carter (Falcons) M+5:18; 2. L. Roberts (Lincoln) M+5:16; 3. A. Fathers (C/M) M+4:53; 4. P. Harris (Evesham) M+4:31. **Open Glider (32**



Close-up of Pierre Chaussebourg's high aspect ratio, solid balsa winged A/2 reveals the offset towhook for use with the circling tow technique, which he demonstrated most impressively. Note how the dural tow-hook assembly may be readily adjusted for the amount of offset, and the neat spring-loaded 'anti fall-off' attachment for the tow line. Turbulators are carried well forward of the leading edge.

entries) 1. G. Ferer (Leicester) M+2:11; 2. M. Woodhouse (Norwich) M+1:17; 3. P. Whitehead (York) M+0:07; 4. T. Dilkes (Falcons) 8:24. **Open Power** (16 entries) 1. D. Pymm (Walsall) M+3:45; 2. R. Monks (Birmingham) M+3:37; 3. M. Green (Grantham) M+3:26; 4. J. O'Donnell (Whitefield) M+3:18. **A/1 Glider** (9 entries) 1. J. O'Donnell (Whitefield) 8:43; 2. K. Roper 8:34; 3. C. Morris (St. Albans) 8:27; 4. A. Balding 8:19. **Coupe d'Hiver** (7 entries) 1. J. O'Donnell (Whitefield) 9:49; 2. G. Jubb (Liverpool) 7:17; 3. D. Tipper (St. Albans) 7:07; 4. P. Owens (Liverpool) 6:18. **JA Power** (7 entries) 1. M. Duce (Liverpool) M+4:13; 2. R. Monks (Birmingham) M+2:57; 3. R. Peers (Falcons) M+2:28; 4. D. Pymm 8:31. **Chuck Glider** (7 entries) 1. R. Clarke (C/M) 5:16; 2. S. Marriott 4:39; 3. B. Kershaw (Wigan) 4:16; 4. A. Crisp (FACCT) 4:12.

FOURTH S.M.A.E. CENTRALISED CONTESTS, 9th July, 1972

M.E. Cup - Team (Glider 44 entries) 1. Norwich A M+38:29; 2. Northampton M+24:53; 3. Brighton A 34:10; 4. Hayes 33:58; 5. Croydon A 33:53; 6. Birmingham 33:22. **M.E. Individual scores** (138 entries) 1. D. Roche (Anglia) M+22:02; 2. W. Parlow (Norwich) M+19:01; 3. S. Bowles (Norwich) M+14:45; 4. N. Parry (Northampton) M+10:28; 5. T. Payne (Northampton) M+8:35; 6. M. Fantham (Richmond) M+5:54. **Astral Trophy** (F.A.I. Power 30 entries) 1. R. Collins (Anglia) M+7:02; 2. P. Ireland (Southampton) M+3:01; 3. J. West (Brighton) M+3:00; 4. D. Pymm (Walsall) M+2:57; 5. M. Dilly (Croydon) M+2:00; 6. D. Welch and Child (Brighton) 20:49. **Coupe d'Hiver** (33 entries) 1. J. O'Donnell (Whitefield) M+2:19; 2. I. Dowsett (Northwood) 9:43; 3. J. Wright (St. Albans) 9:38; 4. J. Cooper (C.M.) 9:32; 5. B. Rowe (St. Albans) 9:29; 6. G. Jubb (Liverpool) 8:01.

LEEDS D.M.F.C. F/F RALLY - July 23rd, Topcliffe

Open Power (30 entries, 24 flew) 1. R. Peers (Falcons) M+5:35; 2. D. Pymm (Walsall) M+5:28; 3. P. Ireland (Southampton) M+4:58; 4. F. Chilton (Crookham) M+4:41. **Open Rubber** (25 entries, 23 flew) 1. A. Jack (Tynemouth) M+6:22; 2. R. Pollard (Tynemouth) M+5:15; 3. R. Peers (Falcons) M+5:07; 4. P. Gaunt (Leeds) M+4:45. **Hand Launch Glider** (14 entries, 12 flew) 1. R. Clark (C.M.) 4:59; 2. McAskie (C.M.) 4:58+51; 3. E. B. Jones (Sunderland) 4:58+37; 4. B. Kershaw (Wigan) 4:48. **A/2 Glider** (47 entries, 45 flew) 1. B. Picken (W. Lincs) M+2:44; 2. J. Boon (Falcons) M+2:38; 3. A. Cordes (Leeds) M+2:38; 4. J. O'Donnell (Whitefield) M+2:32. **Vintage Precision** (5 entries, all flew) 1. E. M. Smales (Blackburn Aircraft) .71% Error K.K. 'Bandit'; 2. J. Clements (Leeds) 1.00% Error Vernon 'Sentinel'; 3. J. Moseley (Leeds) 2.80% Error R.M. 'Hummingbird'; 4. A. Godden (Morley) 5.65% Error K.K. 'Gypsy'. **Mini Comp** (27 entries, 23 flew) 1. J. O'Donnell (Whitefield) M+5:51; 2. T. Cordes (Leeds) M+2:43; 3. P. Ireland (Southampton) M+2:14; 4. D. Pymm (Blackburn A/C) M+0:00. **Vintage Duration** (13 entries, 11 flew) 1. E. M. Smales (Blackburn A/C) 8:22 'Isis'; 2. D. Goodwin (N. Sheffield) 7:29 'Scram'; 3. J. O'Donnell (Whitefield) 7:23 'Scram'; 4. H. Tubbs (Leeds) 6:54 'G.H.20'.

6th SPANISH POSTAL A/2 CONTEST - April 1972

Junior Team (22 teams) 1. Escuela Provincial de Aeromodelismo de Melilla Spain 2,536; 2. Asociatia Sportiva 'Cimentul' Rumania 2,481; 3. Escuela Prov de Aeromodelismo de Pontevedra Spain 2,335. **Senior Team** (29 teams) 1. Calcutta Model Aero Club India 2,663; 2. Asociatia Sportiva 'Cimentul' Rumania 2,631; 3. Asociatia Sportiva 'Avia' Rumania 2,617; 12 Norwich M.A.C. G.B. 2,135. **Junior Individual** (Under 21 years old - 77 scores) 1. T. Brewster (Toronto F.A.I. Group Canada) M+240; 2. Jesus Iglesias (E.P. de A. de Melilla Spain) 900; 3. Joaquin Garcia (E.P. de Melilla Spain) 885. **Senior Individual** (Over 21 - 109 scores) 1. Prasanta Banerjee (Calcutta M.A.C. India) 900+300+168; 2. Barbu Gheorghe (A.S. 'Cimentul' Rumania) 900+240+289; 3. Paul Lagan (Wellington M.A.C.) 900+35; 11. Norman Duncan (West Lincs F.F.S. G.B.) 847.



Southampton club member Phil Ireland had a good day at the Leeds rally, taking two third places, using his F.A.I. power model in the Open event, and with his A/1 glider in the 'Mini Comp'. The Mini Comp was unique on this occasion in the use of a 'K' factor for the various classes to offset the differing standards of rubber glider and power.

1972 TRANS-TASMAN F/F CHALLENGE, 1st and 2nd April Wakefield 1. P. Lagan (N.Z.) 1,175; 2. A. Morrison (N.Z.) 1,163; 3. T. Prosser (Aust.) 1,120 (winning team New Zealand 3,313 seconds). **F.A.I. Power** 1. P. Lagan (N.Z.) 1,230; 2. J. Borrill (Aust.) 957; 3. R. Lloyd (Aust.) 874 (winning team Australia 2,657 seconds). **A/2 Glider** 1. J. Borrill (Aust.) 1,167; 2. A. Hill (N.Z.) 1,132; 3. M. Pettigrew (Aust.) 1,131 (winning team New Zealand 2,882 seconds).

ENGINE TEST *continued from page 569*

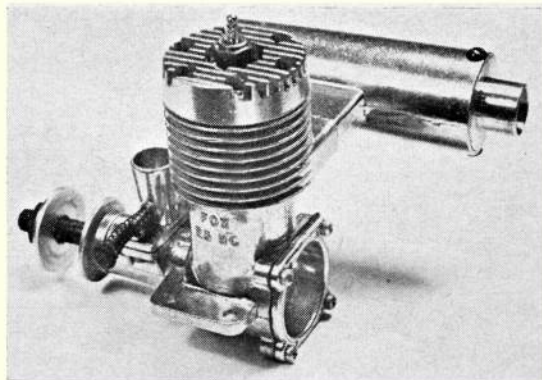
torque curve was remarkably flat and, as a result, a peak output of just on 0.40 b.h.p. was determined at a little short of 15,000 r.p.m., which is very good for an engine of this type.

Handling qualities in general were satisfactory. On mild fuels, such as the 5 per cent nitro test mixture, we found that, for starting, the 25 liked to have the needle-valve opened up slightly from the running setting.

As was indicated at the beginning of this report, the appeal of the Fox 25 lies in the performance it offers in relation to both price and overall size and weight. Incidentally, a throttle equipped version of the engine for R/C is now also marketed.

Power/Weight Ratio (as tested with Fox open-front silencer): 0.91 b.h.p./lb.

Specific Output (as tested): 99 b.h.p./litre.



CLUB NEWS

THE TWO BESETTING problems of model flying are airfield space and insurance. At one time we had only the airfield problem, but as the hobby has developed mechanically and electronically so has the insurance factor grown in proportion. Yet neither of these considerations need give cause for undue pessimism. It is true that many of the service fields upon which we have relied so long, particularly for major events, are being lost to us, but there do seem to be other options. As regards insurance, the number of accidents with model planes has always been small, but with the heavier, faster models now flown the incidents become more serious. Even so, there is good evidence that clubs are generally highly responsible in the disciplines they exercise over members, and personally I would like to see more and more authorities limiting flying sites to club members only on an organised basis.

These two problems of flying space and insurance crop up, perhaps inevitably, in the **North West Area's The Mesage**. First item we noticed was the cancellation of the NWA C/L and R/L Criterium due to the non-availability of Burtonwood. It was hoped to stage the event at Woodford, but this did not prove possible. However C/L flying still goes on at Burtonwood, with the Warrington M.C., flying R/C on the other side of the motorway. Moreover, the Area has been approached by the Lancashire Sports Federation with regard to a recreation centre near Ashton-in-Makerfield. Apparently there is space for four C/L circles and an R/C take off strip. Insurance wise the news is of new proposals from S.M.A.E., Chairman Ron Firth, which would do away with Associate membership and third party insurance and increase senior membership fees. However, the R.A.F., indemnity and premises policy would be maintained — essential for competition purposes if nothing else. Among other proposals there is one that would bring back a unified Nationals, but if split would favour F/F and C/L at one venue and R/C at another. The drawback here is the almost impossibility of the R/C schedule, already tight, taking in Thermal Soaring, or would this go to the wall? On the flying front the newsletter carries a report of the Area Centralised F/F event held in June at Flookburgh. Entry middling: best supported event was Open Glider with 15 competitors. Standard of flying high, but no floppy thermals at Flook in spite of favourable weather. Max's were none too plentiful, with fly-off's getting an unusually thin intake. Just to show how curious are the Flookburgh up and downers there were only 6 maxs recorded out of 45 flights in the Wakefield Weston Cup event. (In East Anglia the score was 33 out of 56!)

We have a letter from Mr. M. Finn giving us news of the **Billingham M.A.C.** The club hails from Teesside, and did have something of a reputation way back. Even so, something of the old flavour still remains, and it looks as if the club is making a come back. Still a long way to go it seems, although a couple of members are on the brink of competition flying. Control line is the main interest, with Combat a particular favourite. The flying field situation is in need of improvement. The availability site is suitable only for C/L, and is not always free. Mr. Finn is looking for a spot of competition from other clubs. He can be contacted at 34, Delaval Road, Billingham. The address holds good, too, for any prospective members who could also pop along to the club meeting at room 14, Billingham Community Centre, any Wednesday evening.

Them's my sentiments exactly. I refer to the opening homily of the **Sevenoaks and D.M.A.C.'s** newsletter, *Airmail '72*: 'I don't know how you are all fixed but at the moment I'm finding it hard to find any time to fly or build, it's all work and no play.' Particularly true when you have to sweat it out over a typewriter instead of getting that new wing pinned down. But some people find the time; witness the queues of applicants to the clubs with Radio flying facilities. Sevenoaks has its share of such applicants and is thinking of increasing its membership in order to accommodate something of the new blood. Wisely the committee reviews the position from time to time; consideration presumably given to the actual amount of flying that goes on rather than to the paper figures. Not that there isn't plenty of flying. Entries in the *Skyleader Challenge Cup* were some 15 pilots, all eager for the fray. The schedule was take-off, 2 consec loops, horizontal eight, double immelman, double stall turn, with the option of 3 spins, 3 rolls or 3 bunts with

rectangular approach and landing. L. Bailey leads in the first round with a 103 score. Second is P. Leach, who is also leading in the Pilot of the Year event. The club made a good showing at the Ashford event in July, winning some of the gold, but most important the visitors had a really enjoyable day.

Still in the same Area, we next have to hand *High Flying*, the magazine of the **Anglia M.F.C.** Not much hard news here, but a useful article on why your wings flex or, even crack in flight. Perhaps I should have read this piece before finding that I had to fit tougher steel dowels in my radio glider. Remember most wing failures occur near the fuselage, which means you must always provide adequate root strength. Now they tell me! And talking of strength, there is a tip here of mixing Devcon with Araldite. Personally I am a great 'adherent' of good old balsa cement. New fangled glues just don't work for me. I found this out when I optimistically took a five minute epoxy at its word. Two hours later and a ruined flying session it was still just tacky. But strength of quite another kind is needed to cement a club together, and certainly weakness lies in the attitude that demands of a club the convenience of a flying field without any involvement in club affairs. This very sore point is discussed in the newsletter, and must be a problem in many sports flying radio clubs. The whole question of the organising work of the model club, which has traditionally been on a gratis basis may well be in obeyance. We may well be coming to a situation where substantial honours could be the order of the day.

Mr. C. W. Draper, P.R.O., of the **Nottingham M.A.C.**, has sent us along a whole mass of information of this very active and progressive club — much more than we, unfortunately, have room for. However, let us begin by saying that the club strikes a fair balance between the main interests: 40 per cent C/L, 30 per cent F/F and 30 per cent R/C, and there appears to be a good intermix between the three, making for a cohesive atmosphere. R/C flying is Sport only, but F/F and C/L have their contest elements. Club flying fields are the well known Wymeswold airfield and a sports ground for small engine models only. Membership is around the 40 mark, but, unhappily, about to be depleted by the migration of members Don Pickin and Ken Whybrew, who are off to New Zealand, that far flung, but very active outpost of model flying. Club events are generally held at Wymeswold, though crop problems limit its use during the high summer. Quite a few events have already been held this year, including a perennial favourite for Gliders of not more than 40 inch wingspan. Since most contest gliders come outside this limit, some scope is given for the beginner with his smaller kit model. Even so the big guns are not immune to the attraction, and winner this year was Alan Kidby with a lopped wing A/1. As for other F/F events our windy summer took its toll. Crashes in the Open R/G/P events were all too numerous, with four out of the five Power models entered coming to grief. Rubber coped better, eclipsing the Power models in the two class contest. Gliders fared well, too, though tricky to tow up. A competent assortment of A/2's took the field, including Bill Draper's new all sheet model on its first time out. Wind brings with it retrieving problems, and Ken Oliver, the winner, was lucky to get his model back after it had hit a king size thermal. No retrieving problems in C/L, of course, unless you let go the handle. Here several of the F/F stalwarts showed their versatility in the circles. Bill Draper and John Hewitt took first and second place in Combat, and Bill Draper also featured in the A and B Rat Races, partnered by Barry Parkinson. In the A race the Lowe/Woodhead took off into a half loop and did a couple of laps inverted before crashing. In the B race the potent machinery common to that class gave the usual headaches. A Super Tigre overheated, a K & B developed tank trouble and a very fast ETA 29 lost compression. Won by Draper/Parkinson with a McCoy 29. More events yet to come, all yielding points towards the *Grain Trophy*. This is currently held by Bill Draper who looks as if he may keep possession.

The Nottingham Model Aircraft Club's insignia is boldly executed in black and white. Nice simple design, which also is cheap to produce as a transfer — a point well worth considering when choosing a club emblem.



After a somewhat depressing lull comes a veritable storm of activity, according to *Nitro*, the newsletter of the **Belfast M.F.C.** if the lack of a suitable site does put a damper on F/F then the C/L circles are there to provide a variant. All four were in operation during the first of the Wednesday evening flying sessions at Henry Jones flying field, and no less than four 35 powered stunters made an appearance in a club competition. Also symptomatic of the flying site restrictions was the emergence of R/C Thermal Soarers, which can give much of the flavour of F/F flying without the leg work. Results given here of the Uls.er C/L Champs held back in June. M. Doyle/C.Dickey won Goodyear with an Oliver Major powered Mirage. The K. Smeltzer/P. Watt team took the Rat Race. Combat was won by G. Dickson and Stunt by M. Doyle. A complete blow out was the fate of the June Bishopcourt Gala. It caught the full flavour of our glorious non-summer, and after Maurice Doyle's A/2 got blown a hopeless distance on a 2 min. max and Colin folded a wing on his A/2, discretion was considered etc. In July eight members of the Belfast club took themselves to Dublin's fair city for the Irish C/L Champs. The Belfast boys dominated the Race events but Phoenix made something of a comeback in Combat and Stunt.

Ron Landmore has reminded me that another get-together of old **Brentwood M.A.C.** members has been laid on for Saturday, the 11th November, at the Village Hall, Stock Road, Ingatstone. The proceedings which will include film shows and reminiscences, plus refreshments, is scheduled to commence at 4 p.m. Any of the old club members who may read this is more than welcome to attend. Incidentally, Ron is on the lookout for a plan of Bob Copelands's 1936 *Northern Star*, a very fine model of its day. His address is 6, Rochford Avenue, Shenfield, Essex.

Writing in the **Buckaneers M.C.'s Scimitar**, Pete Smoothy, the club's R/C Aerobatic expert, has found the way to put the go into glow. He has acquired a battery-powered engine starter, and apart from the joy of having all his fingers intact, found he could start up without the start leads—a phenomenon which only works with certain engines for reasons still being theoretically explored. Actually I saw a hand cranked starter in action some time ago, and this is certainly the sophisticated—and painless—way to get the revs revving. Another piece in the newsletter tells of the tribulations of the Nationals in the words of Derek Giles. His view was that the meeting could have been a very good one in spite of the absence of the traditional trimmings, but the wind was just too much. Pete Smoothy's name crops up again. This time as winner of a nominated time and spot landing event. The multi machines take this sort of thing in their stride; split seconds and inches—well almost—separating the top men. Second was Bill Burkinshaw, who elsewhere in the newsletter demonstrated that he could wield a handle as well as a bleep box. He joined Jim Mannall in a display at the Bletchley Week Fete. It was a case of fly and flee; flying until the uncontrolled crowd got too pressing then fleeing to safety. However, Jim managed to put his Nimrod through the F.A.I. Aerobatic Schedule—giving the crowd an enthralling exhibition.

Norman Chapman, writing in the **Three Kings Aeromodellers** newsletter, has compiled a list of available Control Line flying sites in and around the club district. The tally comes to six; all of which appear to have some time restrictions attached. Perhaps the best site, because of the tarmac area is the old Croydon Airport, although the rules here are stringent to say the least. To adhere to all the special conditions laid down you would need a memory like an elephant. These days, though, the demand is more for R/C sites. In fact many C/L options are never taken up. One in the district where I live has to my knowledge never been used as the only local interest is Radio. But plenty of local interest in the the South London domain of the Three Kings. The club has just acquired its 50th member, and now comprises 42 full S.M.A.E. members, 2 country members and 1 honorary member. And this gives it the highest voting strength of any purely C/L club. One thing the club is noted for is the high standard of its model output, and the latest Model of the Month keeps up the hard earned reputation. It is a *Hi-Fly Stunt* model by Mick Clanford based on a 1956 Model Aircraft plan. Big and heavy: it is 55 in. in span and weighs 57 ounces, but there is no doubt about these big jobs having the graceful, non-flit flying style. Some of the club eye catchers went on display at the Syracuse according to the newsletter, he was resplendent in silk dices take offs with the Scale jobs. Wal Cordwell had some bad luck with his *Gladiator*. It ground flipped. But Geoff Burkett's *Hampden* and Dave Morbin's *Chipmunk* circuted very nicely. Also on display was Bob Ivans, with four of his large scale models. I say 'also on display', because according to the newsletter, he was resplendent in silk neckerchief, flared trousers and a lace shirt.

From the *Flightmaster* California, comes the *Flying Scale News* and *Views* magazine. Covers the Flying Scale scene in depth, and appears to be directed at the chap who takes this branch of the hobby seriously.

And that about winds it up for this month.

Clubman.

Contest Calendar

- September 17 **STH. MIDLAND AREA GALA** - Cranfield, Beds. F/F: Open R/G/P, Cd'H, Wakefield (Ted Evans Memorial), Helicopter, Junior Kit Contest, Chuck Glider, Tail-less, C/L: F.A.I., Goodyear, Combat, Junior Stunt, Aerobatics, R/C: Aerobatics, Class 2 Scale, 1/4 A pylon race. Details and pre-entry (free) R/C events, R. Ruffy, 84 Swifts Green Road, Stopsley, Luton, Beds. Scale on Blue/Brown frequencies only. Other events Red, Orange, Yellow, Green frequencies only.
- September 24 **S.M.A.E. ALL-SCALE MEETING**. R/C, C/L, F/F. Venue: Little Rissington, Glos.
- September 24 **LIVERPOOL D.M.A.C. C/L FLY-IN**, Aerobatics, Fly for Fun (most entertaining flight wins), short grass surface. Silencers plus Insurance proof essential. Venue: Kirkby Gold Club, Kirkby, Lancs. Details: C/L Comp. Sec., G. Barnes, 80 Cartmel Road, Huyton, Lancs.
- September 24 **S. MIDLANDS C/L GOODYEAR MEET**. Cancelled.
- September 30 **2nd F/F WORLD CHAMPS TEAM TRIALS**
- October 1 1st day - F.A.I. Glider (10.00-18.30)
2nd day - F.A.I. Rubber (09.00-18.15)
F.A.I. Power, Fly-offs 18.30 onwards.
- October 1 **NORTHERN AREA GOODYEAR MARATHON**. R.A.F. Topcliff - S.M.A.E. members only, no spectators. Details: J. C. Horton, 10 Lawn Avenue, Burley-in-Wharfedale, Ilkley, Yorks LS29 7ET.
- October 1 **HARPOLE 4th ANNUAL STUNT COMP.** The competition with the built-in lunch. Full details: A. Grimbley, 11 Military Road, Northampton.
- October 1 **S.E. AREA R/C FLY FOR FUN**. F.A.I. Pylon, Scale, Spins, Touch & Go, Limbo, Bi-plane pylon race, Novelty Events at Golden Cross, near Hailsham, Sussex. 10 a.m. start.
- October 7 **NORTHERN GALA. 21 events** - F/F, C/L, R/C, Jnr. Stunt. (19 cu. in. max.) Venue: R.A.F. Rufforth, Yorks.
- October 8 **RICHMOND GALA**. F.A.I. R/G/P (3 'STAG' trophies) A/1, 1/4 A, Cd'H plus Chuck. Venue: Bassingborn (on A14 north of Royston, Herts.).
- October 8 **THREE KINGS CLUB C/L MEET**. Aerobatics & Class 2 Scale. Silencers compulsory, and proof of insurance essential. Venue: Croydon Airport Industrial Estate, all vehicles to park in Imperial Way.
- October 15 **LONDON AREA 3rd ROUND**. C/L F/F - F.A.I. R/G/P, Open P, A/1, Cd'H, Chuck. C/L - Combat, F.A.I. T/R, Goodyear, Stunt, Scale, Speed. Venue: U.S.A.F. Wethersfield, nr. Braintree, Essex.
- October 15 **SOUTHAMPTON F/F GALA**. Combined Open R/G/P plus Open G, 1/4 A Power, A/1 Cd'H. Venue: Beaulieu Airfield.
- October 22 **YORK M.A.S. RALLY**. A/2, Open R, P, Chuck, Cd'H. Venue: Elvington.
- October 22 **WHARFEDALE 13th RUFFORTH 1000**. S.M.A.E. - members only, no spectators. Venue: R.A.F. Rufforth, Yorks. Details: J. C. Horton, 10 Lawn Avenue, Burley-in-Wharfedale.
- October 22 **BRIGHTON D.M.A.C. HYDRO CONTEST**. Power & Rubber classes of hydro models. Non-hydro's not permitted - 10 a.m. start at Ashdown Forest. 25p pre-entry to J. West, 12 Northfield Way, Brighton.
- October 29 **SOUTHERN GALA**. Open R/G/P, 1/4 A, Chuck, C/L Stunt, F.A.I. T/R, Goodyear, Combat (first 32 entries only), Class 2 R/C scale F/F Scale, Junior Kit. S.M.A.E. (plus Jnr. Kit entrants) only. Venue: R.A.F. Odiham, nr. Basingstoke, Hants. Power flying from 12.15 to 18.00 hrs. only.
- November 26 **ST. ALBANS M.A.C. WINTER GALA**. Open R/G/P, 3rds from 10.30 a.m. plus Cd'H & A/1. Power for Simeons Trophy. Venue: Chobham Common.
- December 3 **FALCONS GALA**. Open R/G/P, Chuck Glider. Venue: R.A.F. Chetwynd. S.M.A.E. members only.



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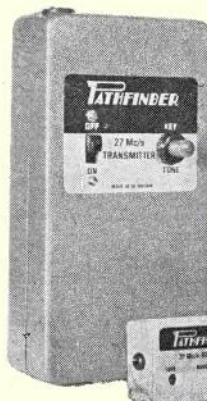
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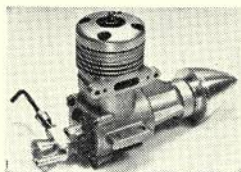
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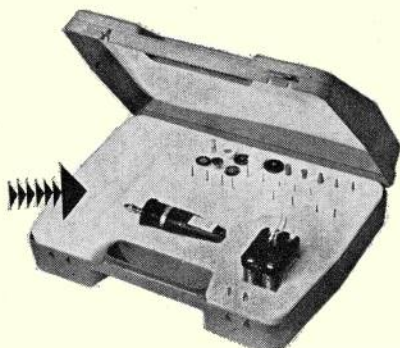
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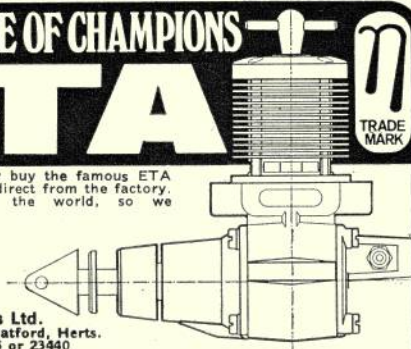
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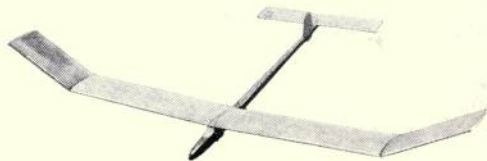
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