AERO MODELLER

JUNE, 1953

SPECIAL ARTICLE ON CLASS "A" TEAM RACING WITH PLANS ● SID ALLEN ON COMPETITION R CONTROL MODELS ● SCALE DRAWINGS OF BRISTOL BRITANNIA ● GETTING THE BEST OUT OF POWER MODELS

1/6

Digital Edition Magazines.

This issue magazine after the initial original scanning, has been digitally processing for better results and lower capacity Pdf file from me.

The plans and the articles that exist within, you can find published at full dimensions to build a model at the following websites.

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

http://www.rcgroups.com/forums/member.php?u=107085

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

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Diligence Work by Hlsat.

Allbon SPITFIRE

1 c.c. DIESEL

Order from Your Local Model Shop

64/2 Inc. P.T.

Designed Especially for the Beginner

Developed primarily to give easy starting, the Spitfire also gives the highest power output yet produced in the 1 c.c. class. The special porting that produces such easy starting has also resulted in an engine that is flexible over the entire range of revs.

Engine Analysis this month states . . "all the hallmarks of a trouble-free engine which should give long and consistent performance."

Way out in front in POWER OUTPUT

·084 BHP at 11,000 Revs

BORE	·425 ins.
STROKE	·420 ins.
CAPACITY	·975 c. cms.
WEIGHT	3 ozs.
HEIGHT	1·875 ins.
WIDTH	1·3125 ins.

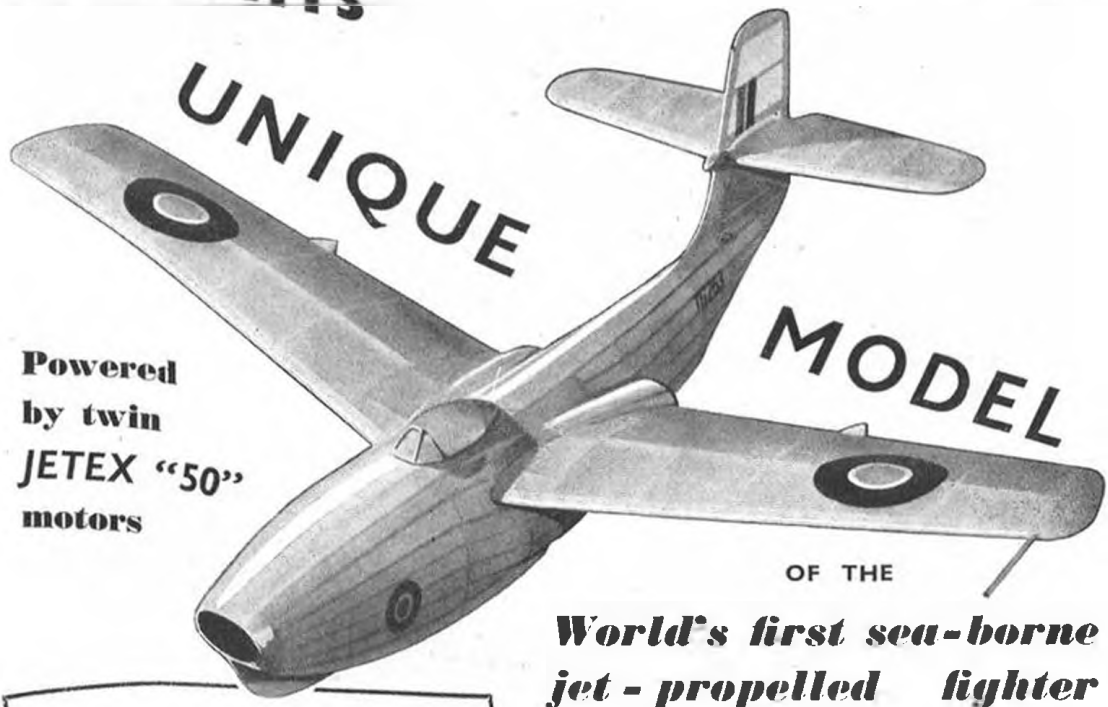
FAMOUS KEILKRAFT MODELS SUITABLE FOR THE NEW ALLBON SPITFIRE

44" BANDIT Cabin Duration
42" LADYBIRD Semi-Scale
42" SLICKER Contest Model
16" PHANTOM MITE C/L Trainer
21" PHANTOM C/L Trainer
20" SCOUT BIPLANE C/L Sport
26" SKYSTREAK C/L Stunt
24" RANGER Class A T/R

Turn to back cover for details of these fine kits

Manufactured by DAVIES CHARLTON LTD., BARNOLDSWICK, via COLNE, LANCASHIRE. Telephone Barnoldswick 3310

FLY THIS UNIQUE MODEL



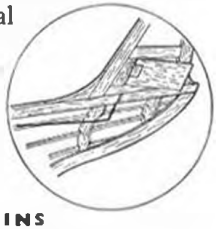
Powered by twin JETEX "50" motors

OF THE

World's first sea-borne jet-propelled fighter

JETEX SARO A/1

Here is a rare opportunity to be different. An unusual kit which builds into a superb flying scale model of the world's first sea-borne jet fighter, the Saunders Roe A.1. Fitted with special Auto Rudder designed to compensate for any slight differences in motors or fuel. Automatic action. Wing span 20 ins., Length 18½ ins., Weight 2¾ oz.



KIT CONTAINS

- *Full size detailed plan and step by step instructions*
- *Accurately printed balsa panels*
- *All necessary stripwood*
- *Formed cockpit cover*
- *Full insignia*
- *Cement, tissue, wire, asbestos and paper, etc.*

WIN £20 PLUS THE I.C.I. CHALLENGE TROPHY

Enter the Jetex Ratio-duration Contest at the ALL BRITAIN MODEL AIRCRAFT RALLY, Radlett Aerodrome, Herts. Sponsored by the St. Albans Model Aircraft Club. Finals to be held Sunday, 23rd August 1953. Write for competition form.

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WILMOT, MANSOUR & CO. LTD.
SALISBURY ROAD, TOTTON, HANTS

JETEX

SUCCESS! ···· SUCCESS! ···· SUCCESS!

VERON Sabre F.86E "IMP"

PAT. APPLIED FOR

THE "STAR TURN" OF THE SEASON

Incl. Pur. Tax **29/2**

The "IMP", a completely revolutionary method of propulsion introduced in the new VERON SABRE F.86E, the aircraft now in full production for N.A.T.O. countries. Kit, giving the nearest approach to modern jet flight yet attained, is now ready for you to build and fly.

Phil Smith, Veron's designer, "hits the target" once again with the North American SABRE, which, having been tried and tested, is acclaimed as the most advanced kit of its type on the market. The SABRE F.86E has an extra-ventral induction slot for 100 per cent. impeller efficiency and is a natural successor to the "IMP" (Pat. applied for) LA.17.

DATA
Span 34", Length 30½", designed for use with Diesel and Glow-plug motors up to ·9 c.c., such as the Allbon Dart ·5 c.c., Frog 50, Elfin 5 c.c., Mills ·75 c.c., and the Amco 87 c.c. Kit complete with easy-to-follow stage-by-stage plan and includes READY-MADE IMPELLER and STARTING PULLEY, graded strip and sheet, quality printed woods and all materials (moulded cockpit cover, etc.) are included. There is no undercarriage as the model is hand-launched.

LAVOCHKIN 17 scale replica of the Soviet fighter—also for "IMP" (Pat. applied for) propulsion—is ideal for ·5 to ·9 c.c. motors. Span 37"—kit complete with ready made impeller and starting pulley.
29/2 (inc. P.T.)

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SKY-SKOOTER
48" span cabin job for ultra-light R.K.61 Radio Control systems. For small Diesel and Glow-plug motors of 1·0 to 1·5 c.c. Will carry radio system weighing up to 12 ozs.
Kit (incl. P.T.) 29/2

MARTINET (36" span)
A combination kit suitable for both free and control-line flight. For Diesels of up to 1 c.c. capacity. **Kit (incl. P.T.) 24/6**

STREAKER (37" span)
Suitable for Allbon Dart ·5 c.c., E.D. Bee and all engines up to 1·49 c.c. **Kit (incl. P.T.) 23/-**

CARDINAL (37" span)
For those who wish to make a start in powered flight. Easy construction from shaped parts. **Kit (incl. P.T.) 16/11**

GLIDERS

VORTEX
Nordic A/2 sailplane. Span 66", Length 38". Total surface area 508·75 sq. ins. Kit contains details for auto rudder and "tip-up" tail dethermaliser. **Kit (incl. P.T.) 21/7**

VEROSONIC 46
A graceful-looking soaring sailplane. Swept wings and tailunit. Adaptable to "Jetex 200" power. **Kit (inc. P.T.) 12/3**

CORONETTE
"Companion" to the Verosonic Light weight and of simple design. Ideal for the newcomer to flight. Adaptable to "Jetex 50" power.
Kit (inc. P.T.) 4/1

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WYVERN (25½" span) The Navy's turbo-jet strike fighter. **Kit (inc. P.T.) 27/5**

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SPITFIRE. 27½" span. The famous British fighter which won respect from all opponents. **32/1** inc. P.T.

FOR JETEX 50

SEA-HAWK	6/5 inc. P.T.
THUNDERJET F.84	6/5 inc. P.T.
ATTACKER	6/5 inc. P.T.
SABRE	6/5 inc. P.T.

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This month the big news for home-buyers is the reduction in Purchase Tax, and we publish the new rates alongside actual prices in the way that I originated when P.T. was first introduced. For Overseas buyers my special service which has long served as a model for the rest of the trade, continues as efficiently as ever. Remember, NO P.T. Overseas. Packing guaranteed, correct exchange rates. Orders acknowledged by Air Mail and despatched immediately. As a Licensed Exporter, I invite trade enquiries from abroad.

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The "Am-Pull" marks the first serious departure for years in handles, and its advanced design is winning converts everywhere. Once you have experienced the extra degree of fine adjustment the "AM-Pull" offers, particularly in contest flight, you will never want to fly without it.

ARTHUR MULLETT'S
"AM-PULL" C/L HANDLE
5/6 P.Tax 11d.

RADIO CONTROL

E.D. COMPONENTS

		P.T.			P.T.
4-pin Plug and Socket	2/6		Potentiometer	5/6	—
2-pin ditto (polarised)	2/3		Mk. I Clockwork Escapement	47/6	7/11
2-pole Switch	3/0		Mk. III Escapement	18/6	3/1
On-off Single Pole Switch	3/0		Compact Escapement	18/6	3/1
On-off Double Pole Switch	3/9		Polarised Relay	30/0	—

E.D. TRANSMITTERS AND RECEIVERS

Mk. II.	Transmitter and Aerial	112/0	18/8
Mk. III.	Transmitter and Aerial	92/6	15/5
Mk. IV.	Transmitter, Control Box and Aerial	160/0	26/8
Mk. II.	Receiver	184/0	31/8
Mk. III.	Receiver complete	60/0	10/-
Mk. IV.	Three Channel Receiver	240/0	40/-
Mk. II.	3-valve Outfit, complete	£14.15.6	£2.9.3
Mk. III.	Miniature Outfit, complete	£7.19.6	£1.6.7
Mk. IV.	Tuned Reed, Three Channel Outfit, Complete	£20.0.0	£3.6.8

VERON

Control Line		P.T.	Rubber Powered		P.T.
Bee Bug	12/0	2/0	Rascal, 24"	5/6	11d.
Midget Mustang	22/6	3/9	Sentinal, 34"	10/6	1/9
Sea Fury	23/6	3/11	Hi Climber, 38"	25/0	4/2
Wyvern	23/6	3/11	Fledgeling, 24"	7/6	1/3
Philibuster	23/6	3/11			
Spitfire	27/6	4/7			
Focke Wulf	21/0	3/6			
Minibuster	15/0	2/6	Free Flight Power		
Panther	25/0	4/2	Sabre Ducted Fan	25/0	4/2
Gliders			Streaker, 32"	19/9	3/4
Verosonic, 46"	10/6	1/9	Skyskooter, 48"	25/0	4/2
Vortex, 66"	18/6	3/1	Cardinal, 37"	14/6	2/5
			Lavochkin, 37"	25/0	4/2

KEILKRAFT

Gliders			Flying Scale Power		
Topper, 40"	8/6	1/5	Piper Super Cruiser	18/6	3/1
Cadet, 30"	4/0	8d.	Cessna 170, 36"	18/6	3/1
Soarer Baby, 36"	5/0	10d.	Luscombe, 40"	18/6	3/1
Soarer Minor, 48"	8/0	1/4	Control Line		
Soarer Major, 60"	11/6	1/11	Phantom Mite, 16"	11/6	1/11
Invader, 40"	6/6	1/1	Phantom, 21"	18/6	3/1
Minimoa, 50"	7/0	1/2	Scout Bipe, 20"	22/6	3/9
Chief, 64"	18/6	3/1	Ranger, 24"	10/6	1/9
Dolphin, 30"	4/0	8d.	Pacer, 30"	15/0	2/6
Free Flight Power			Skystreak 26	9/6	1/7
Slicker Mite, 32"	9/6	1/7	Skystreak 40	10/6	1/7
Southerner Mite, 32"	10/6	1/9	Stunt Queen	21/0	3/6
Skylon, 38"	10/6	1/9	Rubber Powered		
Pirate, 34"	12/0	2/0	Achilles, 24"	4/0	8d.
Slicker, 42"	17/6	2/11	Eaglet, 24"	4/6	9d.
Slicker, 50"	25/0	4/2	Ace, 30"	5/0	10d.
Slicker, 60"	35/0	5/10	Senator, 32"	5/6	11d.
Southerner, 60"	40/0	6/8	Ajax, 30"	6/0	1/0
Junior, 60"	39/6	6/7	Competitor, 32"	7/0	1/2
Bandit, 44"	18/6	3/1	Gipsy, 40" (W)	10/6	1/9
Outlaw, 50"	22/6	3/9	Contestor, 45" (W)	23/6	3/11
Ladybird, 41"	18/6	3/1	Flying Scale Series	3/0	6d.

BRISTOL FREIGHTER Type 170 PLANS

EXCLUSIVE LIMITED DESIGN (Copyright)

For twin E.D. Bee engines. 65 in. span. Scale 3/5 in. to 1 ft. Designed, built and flown by H. J. Towner. The perfect R/C job. Instructions and list of parts with plan. *All parts in stock for building this masterpiece. Recommended only for specialists.* Price **2 gns.**

SKYLEADA

Gliders		P.T.
Three Footer	5/0	10d.
Flying Scale		
Auster, 26"	3/0	6d.
Grasshopper	3/0	6d.
Tiger Moth	3/0	6d.
Avro 707	3/0	6d.
M.I.G.15	3/0	6d.
Vulcan	3/0	6d.
Control Line		
Auster	7/5	1/2
Curtiss Hawk	15/6	2/7
Hornet	8/11	1/6
Free Flight		
Point Five	7/9	1/4
S.E.5a	14/5	2/3

JETEX

Jetex 50 motor	7/6	1/3
Jetex 50 Outfit	10/11	1/10
Jetex 100 Outfit	22/5	3/9
Jetmaster	24/0	4/0
Jetex 200 Outfit	31/8	5/3
Jetex 350 Outfit	43/2	7/4
Augmenter Tube	5/0	10d.
Hawker Hunter, with Jetmaster, Augmenter, complete	44/6	7/5

Fuels and Spares in stock.
Jetex Kits as advertised by the leading makers

ENGINES

All leading makes stocked, including full E.D. range as advertised.

		P.T.
Allbon Dart "S" Mk. II	54/0	9/0
Allbon Mk. II Javelin 1·49 c.c.	55/0	9/2
Allbon Dart Mk. I, 0·5 c.c.	52/1	8/8
E.D. Baby ·46 c.c.	45/0	8/4
Elfin ·5 c.c.	54/0	9/0
Frog ·5 c.c.	36/9	6/1
Mills 0·75 c.c.	50/0	8/4
Mills 0·75 c.c., with cut-out	55/0	9/2
E.D. Bee 1 c.c.	47/6	8/8
Mills 1·3 c.c.	75/0	12/6
E.D. 1·46 c.c.	52/6	9/0
Javelin 1·49 c.c.	55/0	9/2
Frog 150 1·5 c.c.	40/6	6/9
E.D. Comp. 2 c.c.	57/6	9/7
E.D. 2·46 c.c. Racer	72/6	12/5
E.D. Mk. IV 3·46 c.c.	72/6	12/5
D.C. 350 3·5 c.c.	66/2	11/0
Amco 3·5 B.B.	91/0	17/3
Glo Plug		
Frog 500	61/8	10/3
Frog 500 Spark	69/9	11/7
D.C. 350 (G)	66/2	11/0
Fuel Cut-off Valve	3/6	7d.

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Vandiver II	12/3 + 2/1
Keilkraft	
Ranger	10/6 + 1/9
Pacer	15/0 + 2/6
Stunt Queen	21/0 + 3/10
Skystreak, 26"	9/6 + 1/7
Phantom	18/6 + 3/1
Phantom Mite	11/6 + 1/11
Veron	
Beebug	12/0 + 2/0
Panther	25/0 + 4/2
Minibuster	15/0 + 2/6
Phillbuster	23/6 + 3/11
Midget Mustang	22/6 + 3/9
Focke Wulfe 190	21/0 + 3/6
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Spitfire Mk. XXII	27/6 + 4/7
Wyvern	23/6 + 3/11
Doughty	
Ambassador	21/0
Skyleada	
Hornet	9/0 + 1/6
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Curtiss Hawk	15/7 + 2/7

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POSTAL INSTRUCTIONS. All orders under 10/- add 9d., 25/- add 1/1, 40/- add 1/6, over 40/- post free. For overseas according to postal service requested and destination. Postal information concerning dispatch to any country given on request.

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Customers resident outside United Kingdom, including H.M. Forces, buy free of Purchase Tax.

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E.D. Boomerang equipment.

Complete outfit including transmitter, aerial, receiver and escapement which are wired ready to install **£10.0.0 + £1.15.9 P.T.**

Receiver pack ready as above in hard or soft valves types ... ... **£5.9.6 + 17/2 P.T.**

Receiving set only ... ... **£4.9.0 + 13/5 P.T.**

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E.D. Mk. II, 3-valve unit. Complete transmitter and receiver only. **296/0 + 55/6 P.T.**

E.D. Mk. IV Tuned Reed. 3 channels unit. Including control box. Complete **400/0 + 75/0 P.T.**

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E.D. III and aerial **92/6 + 16/5 P.T.**

E.D. II and aerial **112/0 + 18/6 P.T.**

E.D. IV, control box and aerial **160/0 + 30/- P.T.**

E.C.C. Transmitter Unit **50/0 + 9/4½ P.T.**

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	P.T.
Veron	
Streaker, 37"	19/9 + 3/3½
Cardinal, 35"	14/6 + 2/5
Lavochkin	25/0 + 4/2
Sabre	25/0 + 4/2
Frog	
Cirrus, 48"	21/0 + 3/6
Fox, 40"	17/2 + 2/10
Firefly, 36"	18/5 + 3/1
Janus, 44"	14/4 + 2/4½
Vixen, 36"	12/4 + 2/1
Powavan, 48"	22/1 + 3/10
Zephyr, 33"	10/3 + 1/8½
Keilkraft	
Skylon	10/3 + 1/9
Slicker 42	17/6 + 2/11
Outlaw	22/6 + 3/11
Bandit	18/6 + 3/1
Ladybird	18/6 + 3/1
Pirate	12/0 + 2/0
Cessna 170	18/6 + 3/1
Luscombe Silvaire	18/6 + 3/1
Piper Super Cruiser	18/6 + 3/1
Southerner Mite, 32"	10/6 + 1/9
Skyleada	
Point Five	7/10 + 1/3
S.E.5A	14/4 + 2/4½
Doughty	
Eliminator	19/6

RECEIVERS

E.D. II	184/0 + 34/6 P.T.
E.D. IV	240/0 + 45/0 P.T.
E.C.C. 951A	70/0 + 13/2 P.T.

COMPONENTS

E.D. escapement, compact and normal type	18/6 + 3/6 P.T.
E.D. polarized relay.	30/0
E.C.C. 5A relay.	25/0
E.D. Standard relay	22/6
E.D. Reed Unit (high or low frequency, state which).	60/0
Hivac Valve.	15/0 + 2/6 P.T.
Milliameter, 0-5 M/A	15/0
E.D. IV Control Box.	44/0 + 8/3 P.T.

BOAT KITS

	P.T.
• Wavemaster, 2·7 c.c.	60/0 + 10/0
• Spraymaster, 1·3 c.c.	31/0 + 5/2

Above are all hardwood construction.

	P.T.
• Veron Police Launch 1-1·5 c.c.	36/0 + 6/0
Veron Seagull	16/6 + 2/9
Electrotor for above	8/6 + 1/5
Veron Dolphin	30/0 + 5/0
Taycol Electric Motor for above	15/2 + 2/6

• Suitabe for radio.

Flywheels, marine units, universal couplings for E.D. engines.

Your E.D. Comp., Mk. III or IV can be converted to watercooling. Prices on application.

GLIDERS

	P.T.
Frog Fortuna, 48"	12/3 + 2/0½
Veron Vortex A.2	18/6 + 3/1
K.K. Topper	8/7 + 1/5
K.K. Soarer Minor, 48"	8/0 + 1/4
K.K. Soarer Baby, 36"	5/0 + 10d.
K.K. Soarer Major, 60"	11/6 + 1/11
K.K. Minimoa, 50"	7/0 + 1/2
K.K. Invader, 40"	6/6 + 1/1
K.K. Cadet, 30"	4/0 + 8d
Veron Coronette, 26"	3/6 + 7½d.
Veron Verosonic, 46"	10/6 + 1/9
Frog Prince	20/6 + 3/5
Frog Diana, 36"	7/5 + 1/3
Frog Vespa, 30"	5/9 + 11½d.
K.K. Chief, 64"	18/6 + 3/1

WINCHES

Glider winches, wooden pistol grip fitted with free running metal drum and line guide, drum measures, 5" diameter, ¾" wide, having ample line capacity. Finished in a glossy red and black. **5,9 + 1/0 P.T.**

ENGINES

The supply position varies from day to day, and apart from E.D. and Allbon products it is impossible to forecast stocks at publication date.

	P.T.
Amco B.B. 3·5	92/0 + 17/3
Allbon Dart, 1·5 c.c. II	54/0 + 10/2
Allbon Javelin	55/0 + 10/4
D.C. 350	66/0 + 12/5
E.D. ·46	45/0 + 7/3
E.D. Bee I c.c.	47/6 + 7/2
E.D. 2·46 Racer	72/6 + 5/11
E.D. Mk. IV 3·46 c.c.	72/6 + 5/11
E.D. 1·46	52/6 + 4/6
E.D. 2·46 Watercooled	98/6 + 10/9
E.D. 3·46 Watercooled	98/6 + 10/9
Frog 50, ·5 c.c.	36/9 + 6/2
Frog 150 Diesel	40/6 + 6/9
Frog 5·0 Red Glow	61/8 + 10/3
Frog 500 Petrol	69/9 + 11/8
Mills P.75	50/0 + 8/4
Mills S.75	55/0 + 9/2
Mills 1·3	75/0 + 12/6
Elfin ·5 c.c.	54/0 + 10/2
Elfin 1·49 c.c.	47/6 + 8/8
Elfin 2·49 c.c.	56/0 + 10/6

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ALLBON SPITFIRE

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54/0 + 10/2 P.T.

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Rubber Powered SPORTS MODELS

A new sports series, a power model and a team racer! All brand new, " out-of-the-rut " designs and kitted to the standards that only FROG can achieve. The " Seniors " feature the construction methods made famous in the FROG " Juniors " but with built-up wings tissue covered.

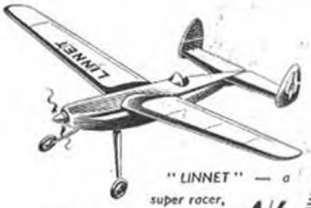
All these Kits include the FROG precision-cut wood parts, all accessories—including plastic airscrews (special 3-blade type for the " Tarquin " and " Mirage ")—and fully detailed drawings and instructions. See them all at your local FROG stockist!

" RAVEN "—a low-wing speedster, 18" span and a pleasure to build. **4/6**

"REDWING"—a trainer type, but quite aerobatic! 18" span and a FROG super kit. **4/6**

Power Models for the FROG "50"

"TARQUIN"—36" span power duration model. Absolutely first-class kit with precision-cut wood parts, 3-blade airscrew, wheel, etc. The " Tarquin " may also be flown as a sailplane, minus power "egg". **12/0**



" LINNET " — a super racer, 18" span, with twin rudders. **4/6**

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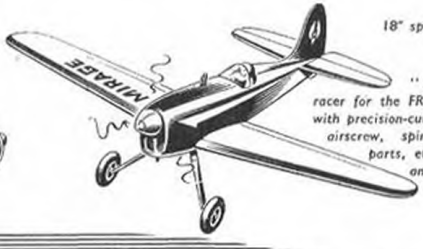
The best buy in 0·5 c.c. diesels! The FROG " 50 " is the ideal motor for the "Tarquin" and "Mirage". Up to 15,000 r.p.m. plus "First-time" starting. **42/9**



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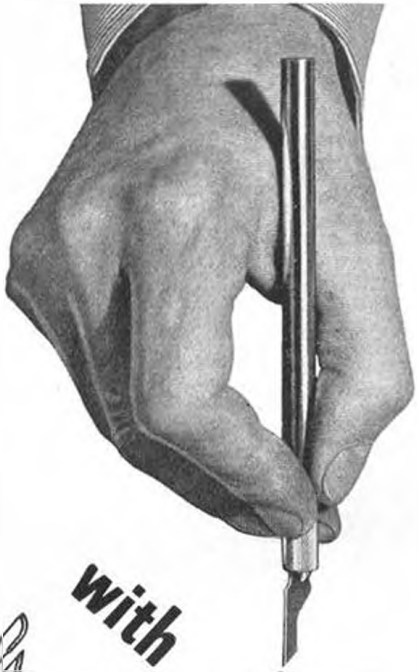

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See your model shop about this remarkable set, simplicity itself to install and the most economical in use.

Price: Transmitter, Receiver and Escapement (soft or hard valves), completely wired £11.19.6

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AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

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Editorial and Advertisement Offices : 38, CLARENDON ROAD, —WATFORD, HERTS. Tel. : 5445

A new 1 c.c. PAA Load Class

EVER since those halcyon pre-war days when the Editorial "Mayfly" won a hotly contested payload event carrying an odd assortment of lead weights, penknives, and coins, we have been keenly interested in any form of competition where factors other than sheer duration have provided novelty in the actual designing and flying of model aircraft.

We are, therefore, keen armchair critics of the PAA Load type of contest initiated in the United States under the sponsorship of Pan American Airways, and have watched its rapidly increasing popularity with each succeeding year. As is usual with any new class of competition, loopholes have been found in the rules—and speedily closed!—until this year no less than four Pan American events will be staged at the American Nationals alone. (It is worthy of note that more than half the total entry at the 1952 Nationals registered for the PAA Load events).

Attention in this country started in 1951, when the Bowden Trophy event held at Radlett Aerodrome was conducted on parallel rules to the standard PAA Load regulations, but only attracted 22 entries. Lack of publicity, plus confusion over the venue of the contests, probably accounted for this rather surprising lack of interest. Last year saw even fewer contestants when the same rules were applied to the Short Cup, but the award of magnificent watches to the few stalwarts who battled with almost impossible weather on that occasion has brought about a sudden quickening of interest, particularly among those who realised they had woken up too late!

1953 sees the PAA Load contest elevated to British Nationals prestige, and once again Pan American have donated a stupendous prize list, which we are sure will be really hotly competed for by both expert and novice alike.

It is with the latter class of modeller we are mainly exercised, and with our July issue we shall be presenting a FULL SIZE PLAN SUPPLEMENT, similar to our Xmas presentation, featuring a handy-sized 1 c.c. Power Model especially designed by Vic Smeed to the PAA Load rules. This design inaugurates a completely *new* PAA Load class, and is presented in an endeavour to bring to all readers the characteristics of the special type of machine required, and to form a basis on which would-be designers can learn the rudiments of PAA Load flying.

In addition to this free plan, full particulars will be announced relative to a splendid DESIGN CONTEST devised in conjunction with Pan American Airways, who have donated a prize list that will surely attract even the most blasé of modellers. Requirements are simple, and a Special Junior Award will be made in addition to the standard prize list, in order to encourage the many junior modellers who may feel they do not stand a fair chance against their more experienced senior contemporaries.

Remember, our next issue will be a special "bumper" number—usual 68 pages, special full size Free Plan, and all at the normal cost of 1s. 0d. Make sure of your copy now, and be certain of full information of the biggest Design Contest yet staged in the annals of British aeromodelling.

Cover Picture . . . .

A project of which we are likely to hear more in the future, is Sid Allen's long duration radio control model, seen in the capable hands of assistant Roger Clark. Model has an E.D. .8-40 "Hunter" diesel E.D. Mk. IV transmitter and 3 channel receiver, with new E.D. proportional actuator for elevator trim. Sid is holding the "Beep" Control box which is part of the new E.D. Mk. IV outfit.

Heard at the Hangar Doors

PAAgeboy

We have long felt that the average PAAload model was far removed in the way of looks from the type of model Pan American World Airways envisaged when promoting the PAAload contests. With this in mind we saw to it that the first task of Vic Smeed, when recently joining our editorial staff, was to design a good-looking PAAload model with a performance as good as its looks.

The result was " PAAgeboy ", depicted in our heading illustration above and shown in the full-size aircraft park at the aerodrome we used for flying tests. As readers will see, Vic has produced as neat a job as ever came out of the Smeed stable, with what we will modestly describe as a " highly satisfactory performance ". " PAAgeboy " conforms with the design contest we shall be running in our July issue and is also eligible for the flying competitions we shall be running next season in conjunction with Pan American World Airways.

The decision to restrict the motor capacity to 1 c.c. and to carry a " pilot " of 4 ozs. was made so as to line up with the American ½A class ; to permit the use of the model in restricted flying fields ; to appeal to the sports fliers who do not like the larger competition motors ; and lastly, and most important, to enable the younger modeller with his restricted pocket to " have a go ".

Look out for " PAAgeboy " in the July AERO-MODELLER where he will be featured as a full-size free plan included in every copy of your favourite journal.

R.Ae.C. Design Competition

Among the prize winners in the recent *Full-size* aircraft design competition organized by the Royal Aero Club, we were happy to recognize among the list of famous racing pilots and professional aerodynamicists, two aeromodellers of our acquaintance. Grahame Gates, well known for his double win of the Pilcher Cup in 1951 and 1952, and a prominent member of the Southern Cross A.C., was awarded a £10 special consolation for this collaborative effort with R. J. B. Woodhams in the two-seater light aeroplane class. Another consolation went to Peter Jaffray and his aeromodelling associates for their light aircraft. Peter has unfortunately had to forgo his interest in competitive modelling due to pressure of study for his Grad : R.Ae.S., but we especially remember his very successful lightweights which he built whilst a member of the West Essex Aeromodellers. To substantiate their entry, the Jaffray group actually made a 1/24 scale model of their project and submitted photographs in support of the specification and drawings.

Congratulations to these aeromodellers of repute. We are certain that the experience of their hobby has played a great part in enabling them to gain recognition in this important contest from a large entry of 104 designs, many of which came from professional drawing boards. We especially take pride in Peter Jaffray's own statement that : " My interest in Aviation was first awakened by the Xmas 1946 Dorland Hall AEROMODELLER Exhibition ".

A good 40 Dinars worth

The most refreshing bout of modelling journalism we have enjoyed recently was when first issue of the Yugoslavian " Aero Modelar " arrived in the editorial post a day or two back.

Both Editor Vladmir Pracek and Technical Editor Dragan Prohaska are well known to us as keen aeromodelling enthusiasts, and have in fact participated in International events in this country. The magazine is well illustrated, features some first rate plans, and has a lively editorial content that bodes well for its future.

We have always been impressed by the enthusiasm and sound technical knowledge possessed by the Yugoslav modellers encountered since the war ; above all we have been deeply impressed with their friendliness and sportsmanship on the competition field. If, as we feel, they are the true ambassadors of the new Yugoslavia, then at least here is one international picture where the future is bright.

The Bowden Trophy

The Bowden Trophy this year reverts to its original form, as a " precision " power event in which points are awarded for design, engine handling, take-off, stability in flight (both under power and in the glide), landing, etc. The contest, together with the Super Scale Trophy, will be flown at the R.A.F. Aerodrome at Halton, Bucks, on July 5th. Cols. Bowden and Binnie will have the co-operation of Mr. C. A. Rippon in judging. It will be interesting to see how many competitors the event attracts, in view of the changing attitude of the model world to pure duration flying. The last two entries in 1949 and 1950, were only 21 and 25 respectively.

Proxies Wanted

Following the precedent set up last year, your Editor has agreed to act as Team Manager for the New Zealand entries in the A/2 Glider Championships, due to take place at Lesce Bled, Yugoslavia, from the 21st to 23rd August inclusive.

Being desirous of providing experienced British fliers to handle these much-travelled machines, applications will be considered from anyone willing to pay their own travelling expenses and enjoy the experience of participating in a World Championship, with the added knowledge that they are also helping our New Zealand friends in their efforts to take their proper place in International competition. Applications, giving full details of A/2 experience, should be addressed to our Watford offices *immediately*.

S.M.A.E. Membership

In view of changes in the character of membership of the Society, the Council has under active consideration a number of modifications to the Constitution. These would permit the introduction of an Associate Membership, at reduced fees, for club members who do not wish to participate in the Society's competitions.

At a later stage, these proposals will be submitted to a General Meeting for formal adoption.

Pinwheel Promotion

A new helicopter event, sponsored by the Hiller Helicopter firm, will be a feature of this year's U.S. Nationals. International scope is planned if the comp. catches on. The first news omits rules but suggests that horizontal flight will be the point scorer; rubber, jet or i.c. motors are permitted. American trophy is three feet high, surmounted by a model of Da Vinci's forefather of rotary wing aircraft. A lead of this nature—not necessarily including so ambitious a trophy—would do much to encourage helicopter activities in this country.

Bouquet Dept.

The only British engine firm with an after-sales information service is the J. A. Oliver concern making the famous " Tigers ". They produce a regular news-sheet detailing modifications and experiences of other owners which provides most interesting and helpful reading. A recent bulletin recommends the following fuel for home-brew addicts: Esso blue paraffin (" kerosene " overseas) 45%, ether 35%, castor oil 20%, plus 2–4% amyl nitrate and up to 5% REDeX.

S.B.A.C. to S.M.A.E. — £500

We are pleased to announce that the Society of British Aircraft Constructors has donated the sum of £500 to the S.M.A.E. as a contribution towards the expenses of staging the International Championship Meeting at Cranfield next August.

One result of this munificent gesture is the lowering of individual entry fees, an important consideration to competitors who have to find travelling expenses from so many parts of the world, and we look forward to an even bigger entry to this year's Wakefield and Power Championships than ever before.

On behalf of our readers, and in fact aeromodellers all over the world who will benefit, we offer sincere thanks to the S.B.A.C. for supporting the modelling movement in so practical a manner.

Federation Support

No less important is the award of 50 guineas to the British Nationals prize fund by the Federation of Model Aeronautical Manufacturers and Wholesalers. This solid support enables the S.M.A.E. to publish a prize list worthy of such a meeting, and we trust the competitors will appreciate the action of the Federation in making a cash donation in preference to the somewhat haphazard merchandise awards as in the past.

The S.M.A.E. is in turn alloting up to £25 from general funds to complete the prize list.

Tidy Model Shops ! !

Those model shop proprietors who suffer from " dog eared Dans " (the customer who thoroughly thumbs the magazine counter stock and goes away leaving it looking like Epsom Downs the day after the Derby), will be interested to know that handsome magazine dispensers, stoutly built in metal and attractively decorated in a black crackle finish, capable of holding one dozen "AERO-MODELLER" and a like quantity of "MODEL MAKER", are available from our distributors free of charge subject to a certain minimum order. Significant too is the increase in sales experienced by those shops already using these attractive displays. Full information can be had from the Circulation Director, The Argus Press, 44, Hopton Street, London, S.E.1.

STOP PRESS

BRITISH A/2 TEAM

G. C. M. BYRD (Loughborough College) M. L. HANSON (Solihull)
G. LINFORD (Loughborough College) A. J. BROOKS (Grange)

OPERATING

CLASS "A" TEAM RACERS

by Mick Smith, Pete Johnson, Dick Edmonds and Norman Butcher

THE rapid growth of interest in Class A team racing since its introduction in 1950 has been fostered by the attractive selection of up to 2·5 c.c. diesels made available to the British modeller. An average entry at the larger 1952 organised Team Race Contests amounted to fifty models. Multiply this by three to get the actual number of entrants and it will be found that this comparatively new branch of the hobby is already as popular as any of the more established events.

The High Wycombe Club were one of the first of these specialist groups and their record is tabulated below to show you just how successful they have been since their first entry in 1951.

1951

Event	Models Entered	Place(s)	Remarks
Northern Heights Gala Day	1	1st	First Comp. entered
Festival Champs., Wembley	1	1st	
All Herts Rally, Radlett	1	1st	
South Midland Area Rally, Halton	1	1st	
Davies Trophy Finals, Fairlop	2	3rd	Motor needed decoke due to using poor lubricant

1952

Event	Models Entered	Place(s)	Remarks
Battersea T/R, Fairlop	1	4th	Model pranged when leading
West Essex Gala, Fairlop	5	1st, 2nd, 3rd	Winner timed at 79 m.p.h.
Northern Heights Gala Day, Langley	2	1st	1st and 2nd place winners at Fairlop had lines break
All Herts Rally, Radlett	2	1st	
South Midland Area Rally, Halton	1	4th	Model broken just before finals
Davies Trophy Finals, Fairlop	2	2nd	Both models beaten by eventual winner
Eastbourne Trophy at Nationals, Gosport	3	1st, 4th	Faster model pranged when leading

All models were powered by E.D. 2·46 Racers

So that our readers can glean some assistance from the wide experiences of these boys, we offer their own viewpoint on the subject and hope that it will be of great benefit to those who are still learning the game . . . Over to High Wycombe :

High Wycombe Views

"The heart of a winning T/R model is the motor. Our successes have always been gained with standard motors, no polishing or fiddling with the timing, just carefully run in on fuel with extra oil and run slowly at first on a large prop. The average motor needs about one hour slow bench running plus a further half hour in the air on a larger airscrew than would normally be used. This careful running in gives the average motor a better chance of obtaining peak performance earlier in its life, and by giving the motor a well-finished cylinder and piston, lengthens the motor life.

A good tip if you are buying a new or second-hand diesel motor is to turn it over until the piston is at Top Dead Centre, and any good motor should hold compression like this for at least one minute. Most of ours hold compression indefinitely even after a season's racing, in fact we find that ball-races and disc-valves need replacement first.

Once your motor is run in, on no account disturb the cylinder head liner and piston. If, however,

Right to left : D. Langston, Dick Edmonds and Pete Johnson of High Wycombe finished 1, 2, 3, out of a large entry in the West Essex Gala race.

Pete Cameron and Norman Butcher of Croydon, after their victory at the Cambridge team races. This view of Norman's model shows its simple, robust lines developed for the rigours of top class team racing.

Wing design may vary as to plan layout but the section is important. A section of symmetrical type is favoured due to its greater stability in windy conditions, and the minimum depth at the most should be ⅝ in. on a Class ' A ' wing. If a thin wing is used the glide will suffer especially, due to the heavier wing loading used on Class ' A ' jobs. An important item if cross-wind take-offs are to be negotiated successfully is the use of wing-tip weight, which should be enough to make the outer wing drop when the model is held by the crankshaft.

½A Class for 1·5's

As the rules are at the moment, the 1·5 c.c. motors, which are extremely popular, stand no chance of winning against motors nearly twice their capacity in Class ' A ', and we suggest that a separate class should be established, to be called ½A.

The following specifications are suggested, and have been used for our ½A model for some months now :—

Max. engine capacity	**1·5 c.c.**	**Line length**	**37' 10" approx.**
Wing Area	**50 sq. ins.**	**Fuselage depth at cockpit**	**2½"**
Tank capacity	**12 c.c. max.**	**Pilot**	**½" deep**

Using lines of 37 ft. 10 ins. length, 5 miles works out at 110 laps, or 11 laps for half a mile. There are, we think, as many 1·5 c.c. motors around as any other class, and add to this fact that a good selection of 1·49 c.c. motors may be purchased for £3. 3s. 0d. or less and you have the necessary factors to make a new ½A even more popular than Class " A ", so how about it? Rally and Gala organisers, how about including ½A in your programme this season?

We hope that the information we have given will help to popularise T/Racing, for we and many others have already found a great attraction for this branch of highly competitive modelling."

From Norman Butcher . . .

Another successful group with high placings during 1952 in the Class A Team Races, was the team of Norman Butcher and Pete Cameron from Croydon. Norman has a number of viewpoints to express on the duties of the team members, and we give you his ideas in conjunction with the successful " Sorcerer's Apprentice " design.

" It was the Northern Heights Gala which really rekindled my enthusiasm for Team Racing. I had previously flown Pete Cameron's ' Blockbuster ' at the West Essex Gala so when he asked me to be his pilot at Langley I was only too glad to oblige. The outcome of all this was that Pete Cameron and myself decided to join forces and build a racer each. The ' A ' job for which I was responsible was flying two weeks after the Northern Heights, and hopes were very high for the Nationals when it was realised that the model was averaging 75 m.p.h. over a timed mile, and consistently doing 35 laps. Hopes were even higher when the Nationals final was reached, only to have, with victory within our grasp, both lines break and the model describe a graceful arc round the Control tent, to crash upwind of the flight circle and break the crankshaft.

Apart from a few superficial cuts and abrasions the model was undamaged, and this fact should convince even the most sceptical that the method of construction used on this model is STRONG.

The All Herts Gala provided a similar situation, the model being undamaged, a new set of lines reeled out, and we finished only twenty laps behind those consistent winners High Wycombe. At the *Yorkshire Evening News* Rally our motor was definitely off song and we couldn't make the final. This setback was more than atoned for at the Cambridge meeting, where we had a trouble-free run and romped home an easy winner.

To win races, fast pit work is a must, but, and this we have proved many times, a race cannot be won on the ground alone ; a fast model is essential. Even more essential is the mutual trust and understanding that exist in any first-class team. The pilot who sits in the middle and issues instructions left, right and centre on how to start a motor will never be flying the winning model, any more than the team who bind their pilot for his inefficiency will take pride of place at the Prizegiving.

Pete and myself were lucky when we decided to re-enter the Team Race battle. We already knew the ropes. To a newcomer, however, it must sometimes seem that the rope is round his neck and the others are doing their best to tighten it. This is not really so, however, and if you've got a good team and a good model everything else comes naturally. To enable novices to know what a good team is like, I have made a list of qualifications each member should have.

The Pilot must be ambidextrous ; the safety of three other teams depends on this. He must act

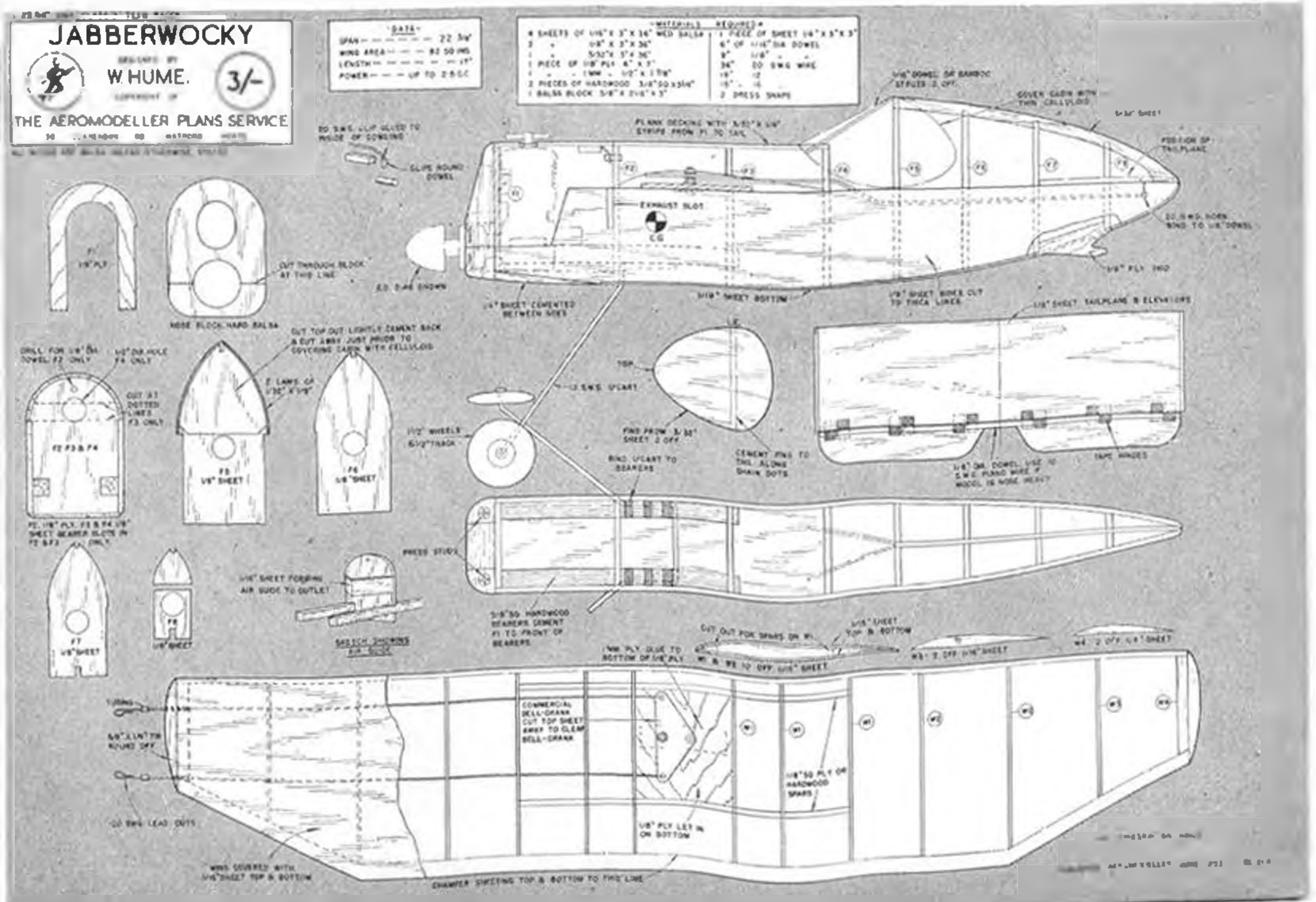
instinctively and correctly when another model is in his path, not yank on full up as so many do and loop round the other poor beggar's lines. The passing over the top rule is *not* inflexible; if safety demands it—go underneath. He must be able to fly a model by the feel of it; often during a race the model is out of sight for what seems hours. Finally he must be able to judge accurately the distance objects are behind the model, and the length of the model's glide (other crews may be refuelling; he may either stop before reaching them or glide over the top).

Team duties

1st Mechanic. Must know engines, i.e., tell instantly whether an engine has too much or too little fuel, is over or under-compressed. Whether increased engine heat during a long race will necessitate altered settings. These, together with the ability to start and restart any engine, whether he has handled it previously or not.

2nd Mechanic. His duties are not so arduous, consisting, usually, of releasing the model (having made sure no one else is landing or overtaking), keeping the lines flat on the ground, so as not to foul other models; in short, a general factotum. A good 2nd Mechanic, however, will be able to tell from where the motor has cut out, exactly

Pete Cameron and Dick Standing about to release the Apprentice for the final of the Eastbourne Trophy at the '52 British Nationals. Model finished third due to a line break. Full size copies of the 1/4th scale plan below can be obtained price 3/- post free from the Aeromodeller Plans Service.



Aircraftsman Bill Hume and a pair of his Jabberwocky racers, built whilst stationed at Fayid in the Canal Zone. Third model is seen in view at the bottom of page. All sheet construction makes this a robust job.

where the model will come to rest. He will also take occasional time checks and inform his team-mate whether performance is up to standard.

General. It is a good idea to have a system of ' tic-tac ' signals arranged between pilot and crew for the passing of essential information. Learn the rules, then you can always fly within them. If others break them, lodge a protest at once. You get nowhere suffering in silence.

The ' Apprentice ' is powered by a standard E.D. 2·46, not a specially selected one, and not a reworked one. In fact, Pete got it from a well-known Northern Mail Order House in exchange for a D.C. 350. Apart from a new crankshaft, rotor disc and piston/cylinder assembly, it has needed no attention since the Nationals !

Constructionally, there is no doubt that a sheet model is both easy to build and is rugged enough to withstand a full season's racing, which is no mean test of a model's durability. No detailed instructions are necessary for the ' Apprentice ', but the following brief notes should be of interest to prospective builders.

The whole basis of the airframe are the bearers ; these must be selected from either ash, oak or beech, and the motor, tank and undercarriage mounted on them. Working with this as a jig the fuselage sides can be cemented in place, having first cut out the slots for the wing. When the wing is ready, splurge plenty of cement over the bearers and adjacent woodwork, then slide the wing to position shown. The bellcrank assembly can now be added, followed by the tailplane, and fuselage top and bottom. Careful selection of the balsa wood is essential ; reference to the plan will give the correct grade.

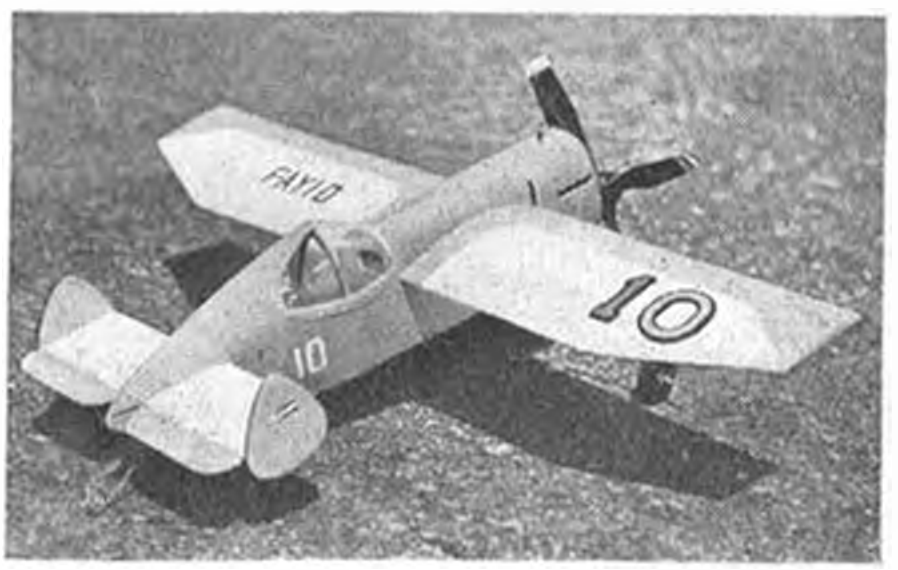
Much of the strength of this model lies in the fact that all joints are strengthened with silk, cemented on prior to the entire machine being covered with lightweight modelspan. Two coats of sanding sealer followed by six coats of 50-50 colour dope and thinners, well rubbed down, followed by a final coat of fuel proofer, will not only enhance the model but will prevent the infiltration of that arch enemy—oil.

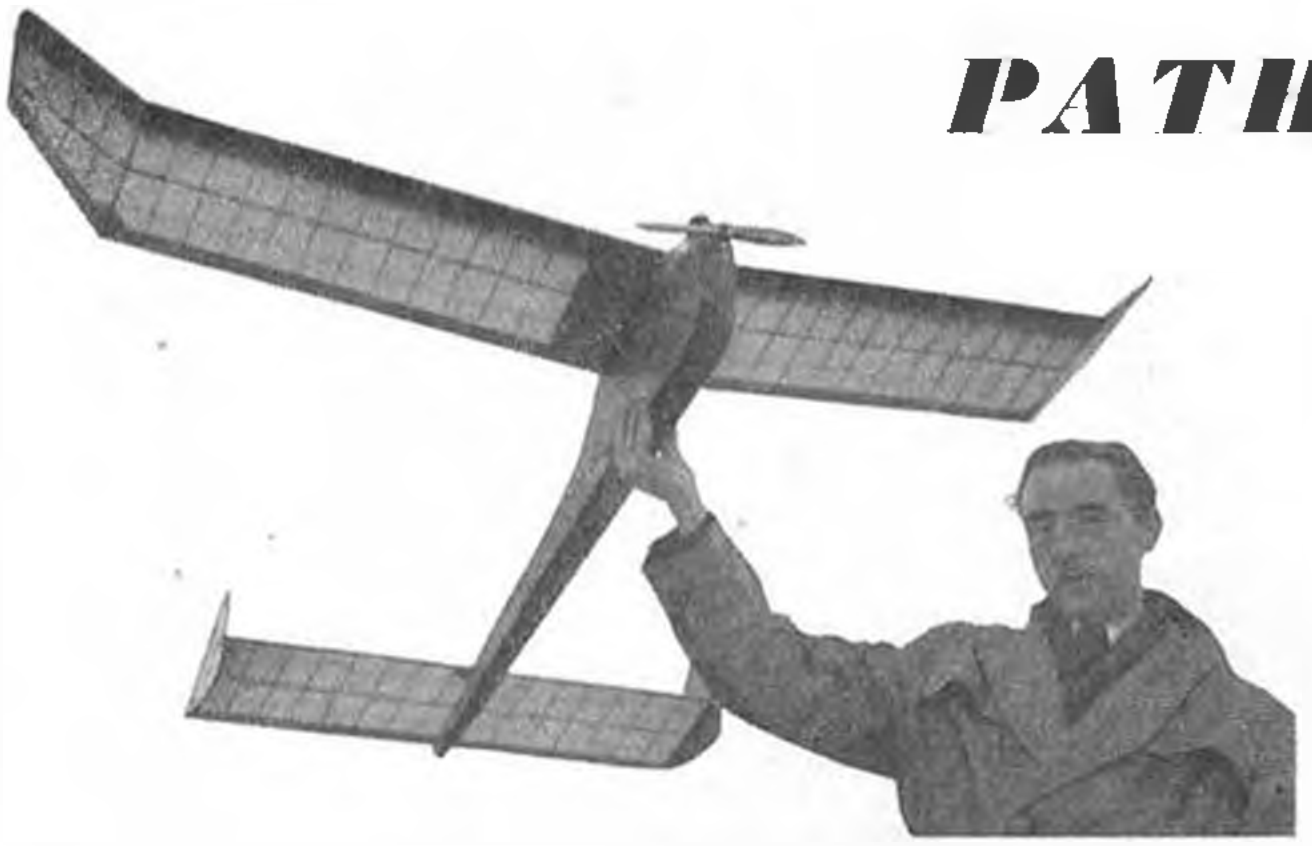
A former should be made of fairly hard wood round which the cowling may be beaten. 20 s.w.g. aluminium is easily worked ; just take your time and use a very light hammer.

If you can fly a control-liner you can fly the ' Apprentice ' ; if you can't fly a control-liner then you shouldn't be learning on a 75 m.p.h. ' A ' racer. Talking of flying, I think there ought to be a ' Golden Book of Team Race Don'ts ', and as a kick-off give you a list of some which should be included.

1. Never take off and climb steeply.
2. Never fly high with a slow model or baulky engine.
3. Never forget to duck your head when being overtaken ; remember shorty at the back.
4. Never fly holding the handle behind your head ; you might poke someone's eye out, and it's morally cheating.

There is one moment in Team Racing which is worth all the hours of work and testing, all the disappointments and ' if only's ', and that moment is when you are leading, the motor's going well, and the lap scorer signals the start of the last three laps. The sheer exhilaration of that moment has no comparison in any other branch of our hobby."





PATHFINDER

A 71 in. span, 88 sq. in.. low C.L.A. design for all-weather contest flying. suitable for 5 c.c.

By

R. O'Nions

Aged 28 . . . member West Bromwich Model Aircraft & Car Society . . . Tea Salesman by trade . . . married . . . interested in Power, Rubber, Glider and Scale Power, but has no other hobby than aeromodelling

INFLUENCED by the sight of a high thrustline model climbing on a perfectly stable flight path despite a fierce wind, R. O'Nions was so impressed that he decided to build a similar model for his old Forster 29. The result was the prototype of the " Pathfinder ".

Flight tests were perfect ; turns could be made to right or left without fear of a spiral dive, and times right up to contest standard with frequent 3¼–4 minute durations off 15-second power run. Later a second model was built for the Frog 500, and various refinements added to make this one of the toughest and safest-to-fly designs available for 5 c.c. In fact, the West Bromwich M.A.C.S. have adopted the layout as a standard contest model, and in over 20 months' operation, only one crash has occurred. That was due to a displaced tailplane knocked out of true during take-off.

Structurally, it is an easy model to build, and we feel that the wire brace wing fixing system will need no introduction to those who have used the same idea on the popular " Quickie " A/2 glider. The two-piece wing is also a great asset for transport, whilst the twin fins are detachable for easier packing. Another interesting feature made possible by the low C.L.A. design is the elimination of the normal undercarriage, replaced in this case by a pair of small 14 gauge wire skids.

Construction starts with the fuselage. ¼ sq. sides are made over the plan with 1/16 sheet inset between formers 1–6. Assembly follows the order of :—formers, spacers, engine bearers, gussets, wire parts, centre rib, then all of the 1/16 sheet, small soft blocks and 1 mm. centre rib facings with stub dowels.

Wing construction needs little explanation ; the mainspar should be added after the inner panels are lifted from the plan, then the leading edge sheeting, after the outer panels are attached at correct dihedral. Wire parts should be especially well bound and cemented in place, then the centre section sheeted and ply facing ribs added. Tailplane and fins are straightforward, and when completed, the whole model should be covered with heavyweight Modelspan, well doped, and the fuselage given a coat of fuel proofer.

Trimming begins with glide tests after balance has been checked at the mainspar position. All adjustment must be made with the tail incidence, rudder and downthrust, though this should not be necessary. Try first power flights with low engine revs., then gradually increase the power until a straight climb at 80° is attained. Slight right turn on power is desirable, then the " Pathfinder " rolls straight into the glide without loss of height when the motor cuts. Always use the d/t, even for test flights.

Full size copies of the 1/6th scale plan opposite can be obtained from the Aeromodeller Plans Service, price 6/- post free.

PATHFINDER

DESIGNED BY
R. O'NIONS
6/-

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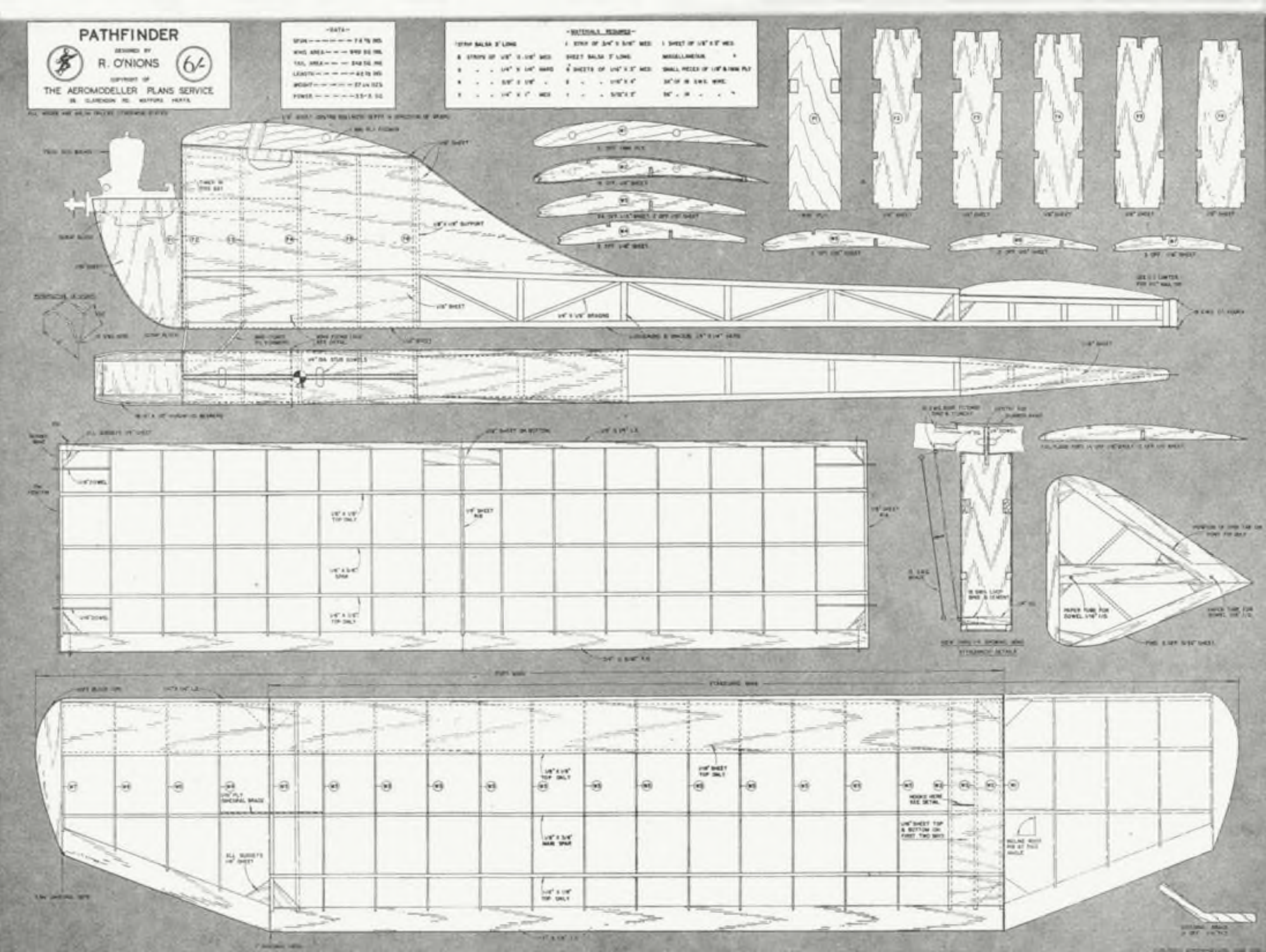
THE AEROMODELLER PLANS SERVICE
13, CLAREMONT RD., WATFORD, HERTS.

-DATA-

SPAN - - - - - - - - - - - 7 ft 7½ ins.
WING AREA - - - - - - - - 9½ sq. ins.
TAIL AREA - - - - - - - - 2½ sq. ins.
LENGTH - - - - - - - - - - 4 ft 7½ ins.
WEIGHT - - - - - - - - - - 27 ozs (12½ gms.)
POWER - - - - - - - - - - 3½-5 oz.

-MATERIALS REQUIRED-

12 ins. BALSA 3" LONG		1 STRIP OF 3/4" x 3/16" MED.	1 SHEET OF 1/16" x 3" MED.
8	STRIPS OF 1/8" x 1/16" MED.	SHEET BALSA 3" LONG	MISCELLANEOUS
6	" " 1/4" x 1/4" HARD	2 SHEETS OF 1/16" x 3" MED.	SMALL PIECES OF 1/8" & 1/16" PLY
4	" " 3/8" x 1/8" "	2 " " 1/16" x 4"	24" OF 18 S.W.G. WIRE
2	" " 1/4" x 1/2" MED.	1 " " 3/32" x 3"	36" " " "



A SIMPLE 48" A/2
FOR BEGINNERS

THE

CORSAIR

By

J. R. HOLT

Age 25 . . . Member Upton M.F.C. . . . wife is a keen aeromodeller . . . main interest is in Wakefields, Lightweights and Gliders . . . has no other hobby than aeromodelling.

CORSAIR was first designed as a simple, easy to build, glider for Mrs. Holt to fly in the 1951 Women's Cup contest. Low aspect ratio one-piece wing, large tailplane and generous material sizes make it an ideal project for any beginner, yet its performance rates high, as the following record shows.

MR. HOLT'S MODEL

2nd	1951 London Area Championships	7 : 54
1st	1951 Evans Cup (Club)	12 : 5
4th	1952 Croydon Gala	13 : 5
2nd	1952 London Area Championships	18 : 57

MRS. HOLT'S MODEL

2nd	1951 Women's Cup	8 : 39
4th	1952 Women's Cup	11 : 15

First model was built by Mr. Holt, and the second by his wife. Each has the same characteristic stable flight no matter how rough the weather,

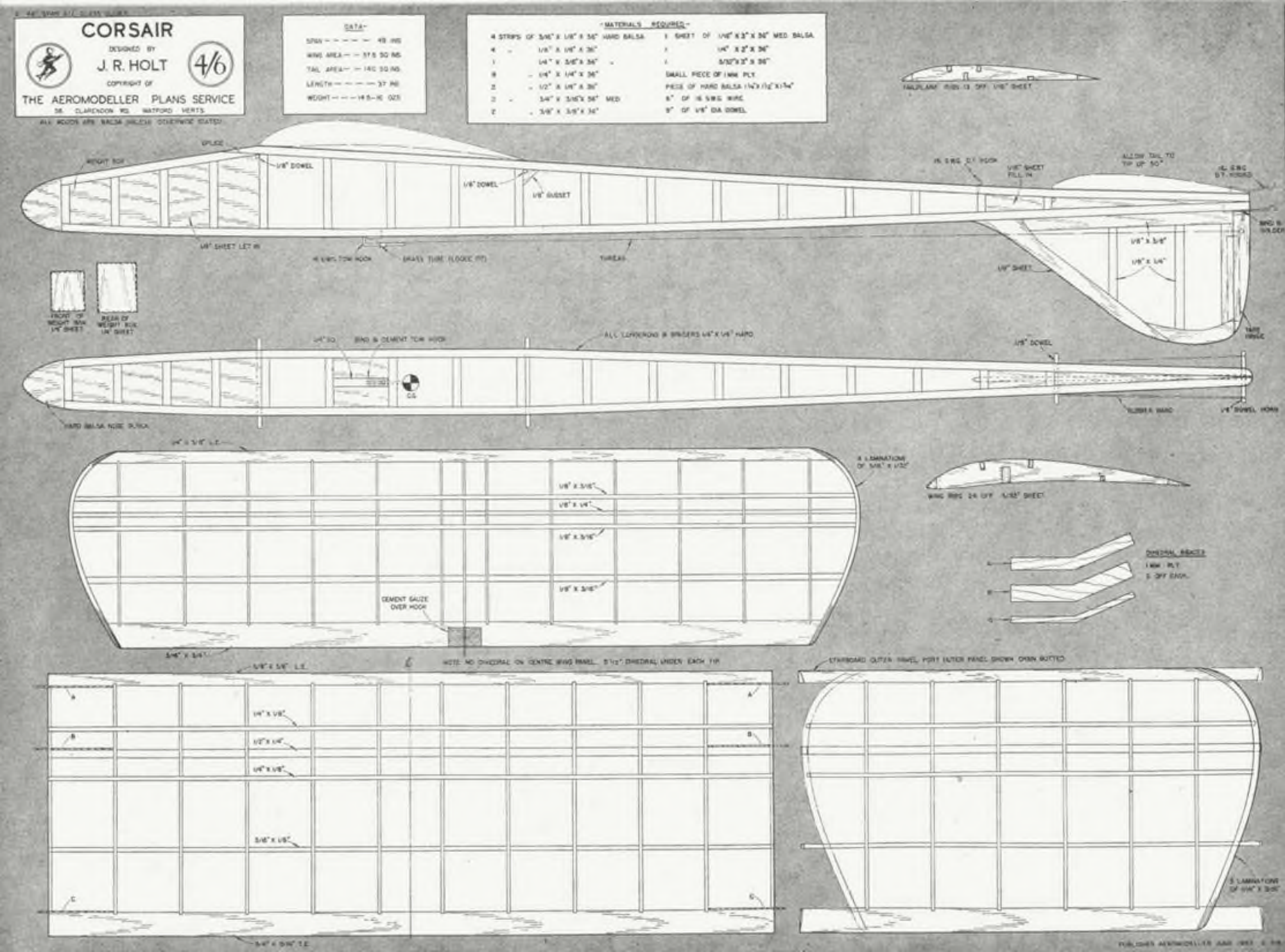
and each has withstood the general perils of beginner's tow-launching with flying colours. Quick recovery after a stalled launch is one of its finer points, whilst perfect overhead tows are possible, due to the relationship of the hook and C.G. positions.

Construction is really simple. Fuselage sides are made over the plan, then joined at the rear and by the weight box formers. Spacers and towhook assembly are then fitted, noseblock and sundry sheeting completing the job ready for covering. Ribs are best cut with the aid of a standard template, then the wing can be built, centre section first then the outer panels. Spars are fitted after all three sections have been joined with braces at leading and trailing edges, tips being raised 5½ inches. After adding dihedral braces and sanding edges to shape cover with heavyweight Modelspan for maximum strength.

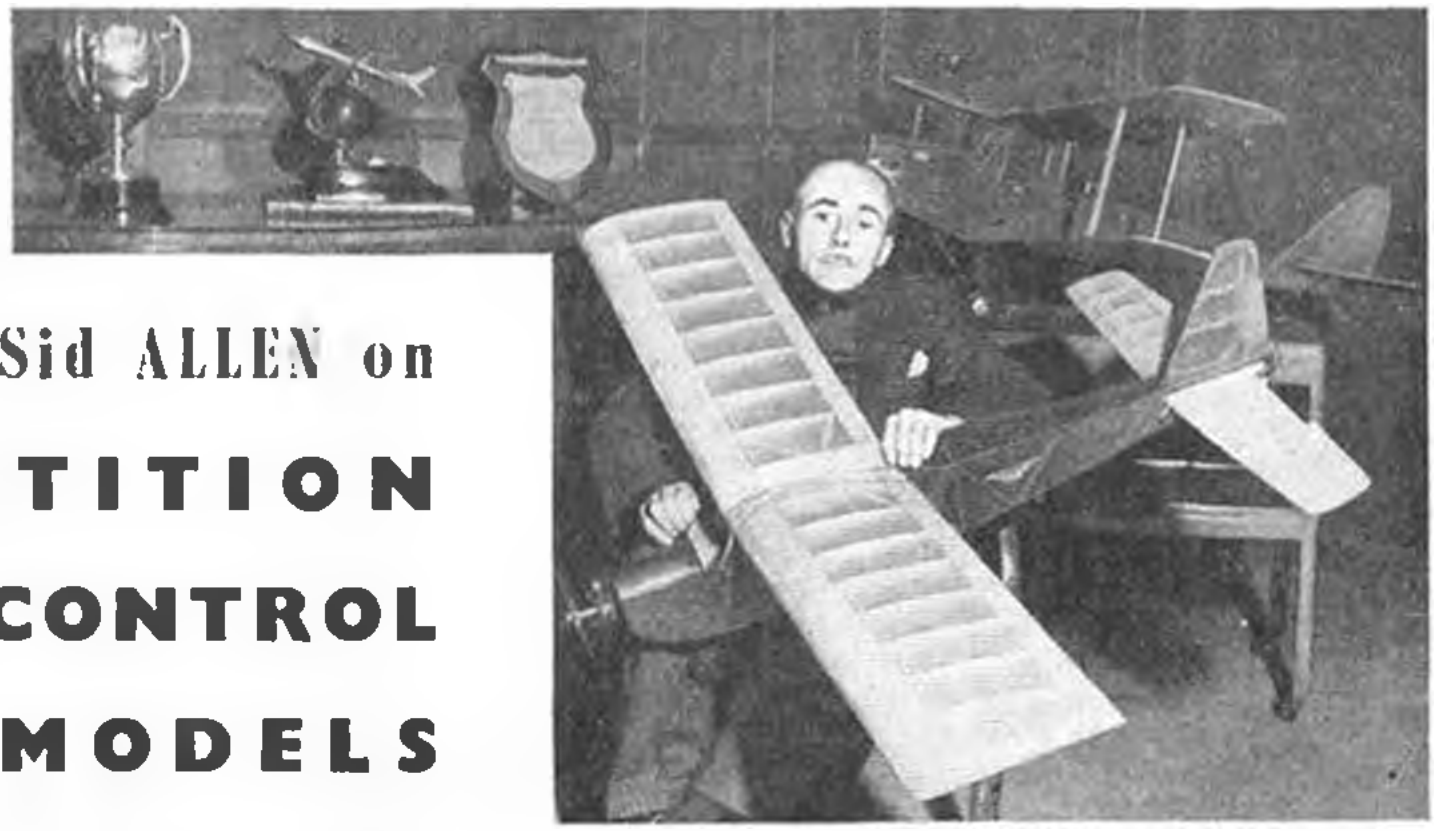
Tailplane and fin need no explanation, the underfin arrangement being employed for easy towing and simplified d/t fitting. Cover the tail with lightweight tissue. About 25° rudder offset will be suitable for initial trimming, the auto-rudder system being set so that on tow, the rudder is pulled neutral by the towing ring on the aluminium tube over the towhook. The de-thermaliser is the simplest form of tip-up tail, with fuse operation, one limiter cord is needed to restrict the tip to 55° maximum angle.

Balance with the aid of weight in the nose box, until the C.G. is at the indicated point. Then seal off the weight box, and use tail incidence only for all further trimming. Short towline (50 ft.) flights will soon find the best rudder and tail settings, then make a few full-length tows. If the C.G. is too far forward, or the hook is too far back, then towline stability will suffer . . . so keep to the plan and you'll have trouble free gliding.

Full size copies of the 1/4th scale plan opposite can be obtained from the Aeromodeller Plans Service, price 4/6 post free.


CORSAIR
DESIGNED BY
J. R. HOLT
4/6
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
DATA
SPAN — — — — 49 INS
WING AREA — — 37.5 SQ INS
TAIL AREA — — 140 SQ INS
LENGTH — — — — 37 INS
WEIGHT — — — 14.5–16 OZS
MATERIALS REQUIRED
4 STRIPS OF 3/16" X 1/8" X 36" HARD BALSA
4 " 1/8" X 1/8" X 36"
1 1/4" X 3/8" X 36"
8 " 1/4" X 1/4" X 36"
2 " 1/2" X 1/4" X 36"
2 " 3/4" X 3/16" X 36" MED
2 " 3/8" X 3/8" X 36"
1 SHEET OF 1/16" X 3" X 36" MED. BALSA
1 1/4" X 2" X 36"
1 5/32" X 2" X 36"
SMALL PIECE OF 1 MM PLY
PIECE OF HARD BALSA 1 1/4" X 1 1/2" X 1 3/4"
8" OF 16 S.W.G. WIRE
9" OF 1/8" DIA DOWEL
FAILPLANE RIBS 13 OFF 1/16" SHEET
SPLICE
WEIGHT BOX
1/8" DOWEL
1/8" DOWEL
1/8" GUSSET
1/8" SHEET LET IN
16 S.W.G. TOW HOOK
BRASS TUBE (LOOSE FIT)
THREAD
16 S.W.G. D.T. HOOK
1/16" SHEET FILL IN
ALLOW TAIL TO TIP UP 50°
16 S.W.G. D.T. HOOKS
BIND & SOLDER
1/8" X 3/8"
1/8" X 1/4"
1/8" SHEET
TAPE HINGE
FRONT OF WEIGHT BOX 1/8" SHEET
REAR OF WEIGHT BOX 1/8" SHEET
1/4" SQ.
BIND & CEMENT TOW HOOK
ALL LONGERONS & BRACERS 1/4" X 1/8" HARD
1/8" DOWEL
C.G.
HARD BALSA NOSE BLOCK
RUBBER HARD
1/8" DOWEL HORN
1/4" X 3/16" L.E.
4 LAMINATIONS OF 3/16" X 1/32"
1/8" X 3/16"
1/8" X 1/4"
1/8" X 3/16"
1/8" X 3/16"
CEMENT GAUZE OVER HOOK
3/16" X 3/16"
WING RIBS 24 OFF 1/32" SHEET
DIHEDRAL BRACES
1 MM PLY
5 OFF EACH
NOTE: NO DIHEDRAL ON CENTRE WING PANEL. 5 1/2" DIHEDRAL UNDER EACH TIP
3/8" X 3/8" L.E.
1/4" X 1/8"
1/2" X 1/4"
1/4" X 1/8"
3/16" X 1/8"
3/8" X 3/16" T.E.
STARBOARD OUTER PANEL, PORT OUTER PANEL SHOWN CHAIN BUTTED
3 LAMINATIONS OF 1/4" X 3/16"

THE 1952 Radio Control Champion



Sid ALLEN on

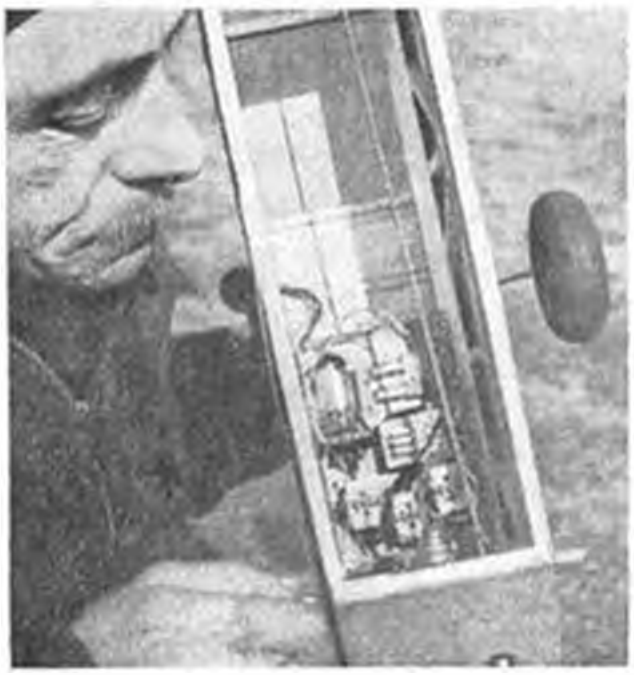
COMPETITION RADIO CONTROL MODELS

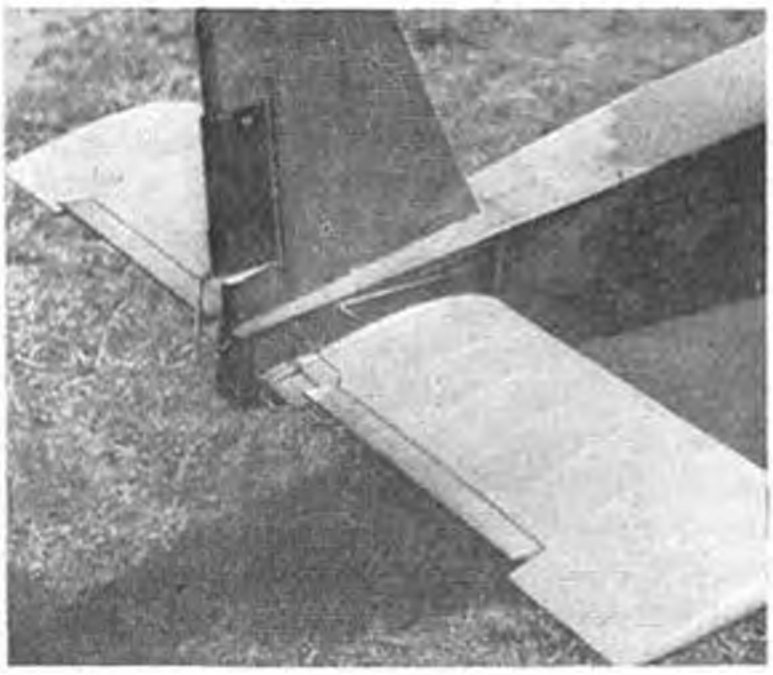
COMPETITION R/C models do not usually enjoy a long life, and it follows that a simple, strong and highly responsive aircraft is required. Simple, to give speed and ease of building. Strong, to enable you to get away with minor mishaps. Responsive, to provide maximum manœuvrability.

Assuming that the model is of simple construction, *i.e.* slabsider, it is suggested that the two sides and bottom of the inside of the fuselage be sheeted with 1/16 in. balsa, where the receiver is to be suspended. This not only strengthens the model but if the set does swing forward and to one side, the tendency will be for it to slide smoothly forward, without serious damage resulting. It has been my experience that, when the sides of a fuselage are filled in (say ⅛ in. sheet), and the set has swung and contacted a protruding upright or cross brace (say ¼ in. sq.), there has been a very strong tendency for the receiver to dig straight through the side of the fuselage, resulting in considerable damage.

To mount the receiver, I recommend four wire hooks, bound and cemented to each longeron at the rear, and two hooks similarly fixed approximately half the depth of the fuselage, at the front. If this procedure is adopted, the set is mounted very securely without being rigid enough to cause "chatter" on the relay points. It is advisable to make sure that leads from the receiver to the plug are sufficiently long to enable the set to swing either forward or backwards, without dislodging the plug. The same applies to the aerial. If the fin is fixed permanently to the fuselage it is not usual to find a change in directional trim, but if the fin and tail plane are built in one piece and are only secured by rubber bands, there is no guarantee of directional trim being the same two flights running. There is of course the alternative—the use of locating dowels—but as dowels are subject to wear, it is far safer to build the fin in as part of the fuselage.

In an endeavour to get the C.G. rightly placed, it is my practice to leave the engine bearers protruding further than required, and then to complete the fuselage, fin and tail plane and install all radio gear. Assuming of course that the C.G.





Left: Sid examines E.D. Mk. IV tuned reed 3 channel receiver installation in his latest model. Long rudder escapement rubber motor extends through from tail to Rx compartment. Right: Tail end reveals small but highly effective elevators, actuated proportionally by E.D. rudder mechanism (seen in Trade Notes, P. 370). These will be used to correct trim during consumption of 1 hour's fuel supply.

Heading opposite shows Sid with last year's trophies and his contest model. Right: Is his latest long range project, E.D. equipped, with Venner accumulators, and a voluminous fuel tank.

is not hopelessly out of position, final adjustment can be effected by the positioning of the engine on the bearers. It is taken for granted that the C.G. position on the original design is approximately correct, and I emphasise that this system should only be used for slight final adjustment.

I consider the efficiency of the present day actuator to be good, and following a careful check on a test rig (making any adjustments, if necessary) it is then installed without any provision for further adjustment. In competitions, points are usually awarded for take-off, and this calls for careful consideration of choice of undercarriages. The normal two-legged u/c, unless situated well back on the fuselage, usually results in ground loops. Greater success is obtained by using a tricycle u/c. If an airwheel is fitted as a nose wheel, it is a certainty that before many, if not one, flight is made, the wheel will be punctured and the obvious solution is to use a wheel of the solid rubber type. The type of wheel used on the rear legs is unimportant, as they do not take terrific punishment. The u/c should be built so that the model " sits " on the ground with a slight nose down attitude, and so that when the model lands, all three wheels touch the ground together. If the nose wheel is rather long, bouncing will take place on landing, often causing the relay to be thrown out of adjustment. However, if the torsion bar type u/c is used on the nose wheel and is fairly springy, then such difficulties do not arise to any great extent. It would also appear that the further the rear legs are behind the C.G. position the longer will be the take-off run.

Venner Accumulators

Now for a few particular remarks regarding Venner Accumulators. Highly efficient, light weight and small size, are qualities which make these accumulators admirably suitable for R/C models. I have used these cells in conjunction with commercially built actuators during the past two years and have found them to be more reliable than the ordinary type dry cell. I must say that in view of the flying hours put in by my models, the miniature accumulator has proved itself to be an economical proposition.

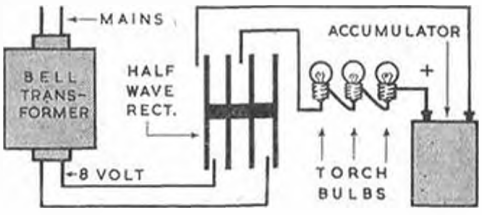
Occasionally, especially during the summer months, it is necessary to " top up " the cells with distilled water, and a pen filler is the tool for this job. Two 1½ volt cells, wired to give 3 volts, is ample to operate the normal actuator, provided of course that a reasonable amount of rubber is used on the escapement. I find that one loop of 3/32 in. sq. most satisfactory, but it is a common enough sight to see models with 2 or more strands of ¼ in. flat rubber being used on the actuator, and this invariably results in the rudder " skipping " or " sticking ".

Method of Fitting

As the accumulators are of the non-spillable type, no difficulty is encountered when installing in the model. In fact they can be installed in exactly the same manner as a dry cell, with the advantage that the sometimes inconvenient task of soldering leads to batteries is now dispensed with, the leads being secured to the accumulator terminals by nuts.

Charger

Bell transformer, half-wave rect. together with three or four torch bulbs (6·3) are the materials required to build a small charger for the accumulators, and are obtainable from practically every radio shop and from most ex-Government surplus stores, for a sum of a few shillings. Having constructed two or three of these units, I found that the transformers, although all of the bell type, did not have an identical output. Therefore, in order to keep the milliamps below 100, three or four bulbs were used according to the output available. Precise instructions for charging and discharging are supplied by the manufacturers with each accumulator sold. Below is a sketch of the wiring diagram for such a charger.



'54 NEW RULE WAKEFIELDS

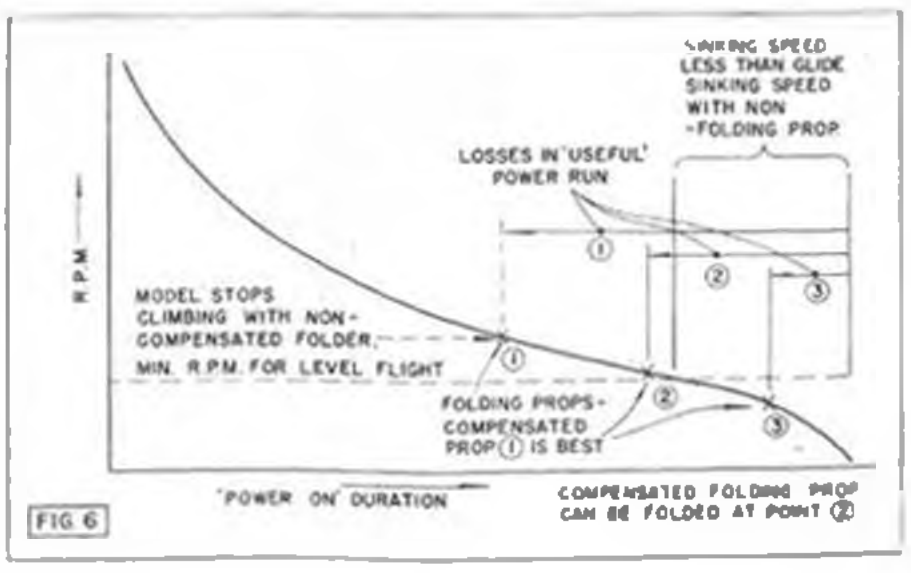
Concluding Ron Warring's viewpoint on the rule changes for next year

In the first part of this article, which was published last month, Ron Warring discussed the best methods of obtaining maximum use from the new restricted weight Wakefield rubber motor. Propeller efficiency, and the mention of variable pitch and limited speed props led up to this viewpoint on the folder . . .

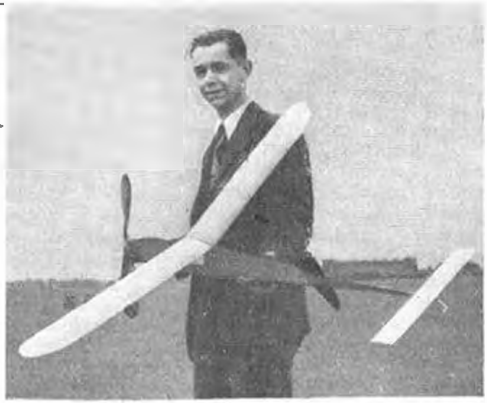
Before leaving the rubber motor there is one other subject worthy of discussion. In terms of getting the most out of the motor the conventional folding prop. design shows up badly in theoretical analysis, mainly because the trim required produces a most inefficient set-up towards the end of the power run. To overcome the change in trim as the motor stops, the propeller folds and the model goes into its glide, the conventional folder-design is generally losing height quite appreciably over the latter part of the power run—Fig. 6. The model becomes progressively more and more under-elevated as the end of the power run is approached so that it is, often appreciably, diving under power. A well trimmed model with a non-folding prop., on the other hand, will at least maintain height during this period, or even continue to climb slowly.

Cutting off the power run early to prevent this is a partial solution, but the non-folder still has the advantage in this respect. Even when the power output level has fallen below that necessary to maintain level flight, the model is descending *more slowly than it would on the glide.* Hence it has a longer effective power run. The other solution

Left: John Knight need not look quite so anxious about this snappy climb after take-off; but '54 rule models cannot be expected to get away as smartly as this.



Heading opposite shows Duncan Geddes admiring a smooth take-off by one of Bob Copland's streamliners. New rules will favour use of extra stringers, but Warring states there is no reason why streamliners should be superior. At right: Pod and boom by Sandy of Henley was a means to employ smaller tail and larger wing: has possibilities for short return gear motors, see fig. 9.



for folders—counteracting the under-elevation effect on the latter part of the power run by arranging for a swinging weight to move forwards and establish glide trim when the propeller folds (thus allowing the model to be trimmed out like a non-folding prop. job)—is not yet endorsed by practical results. It appears to work all right, but performance over the latter end of the power run is still suspect in many cases. The simplest ways of arranging the necessary trim change are an undercarriage, suitably weighted, folding forwards as the propeller folds back, or a propeller counterweight which folds forward as the blade(s) folds back. The latter is best suited to single blade folders but, on evidence, single blade propellers do not appear as efficient as two-bladers, so far as climb performance is concerned.

The freewheeling propeller is still widely favoured (first and second models in the 1952 contest averages used free-wheelers), but larger diameters and especially associated smaller pitches will rule these out for optimum performance. To take full advantage of the limited rubber, therefore, it appears that the large diameter, low pitch (1.1). ratio 1 : 1) propeller will have to be of the feathering type.

Finally come possible changes in model design to be considered. Referring to the original table of possible motor lengths under the new rules, both the return gear model and the long fuselage designs, as we know them now, are obviously ruled out. In fact we can establish a new standard for " long " fuselages right away—44 ins. between hooks, maximum, using a 12 strand motor taut between hooks. This would probably make a very good model, but to allow for experimentation with large diameter propellers we had better fix a minimum motor size of 14 strands, so that the new long fuselage model can be based around a hook distance of 38 ins.—Fig. 7. By comparison, a conventional fuselage length could quite nicely accommodate a 16 strand motor taut between hooks—Fig. 8.

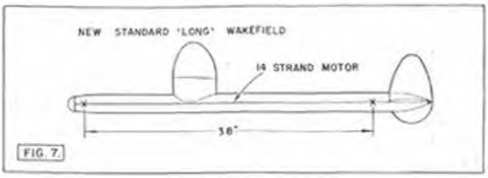


FIG. 7.

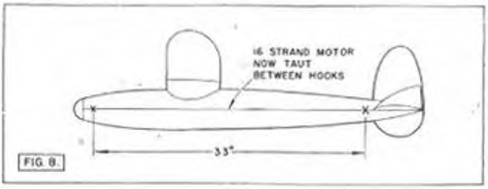


FIG. 8.

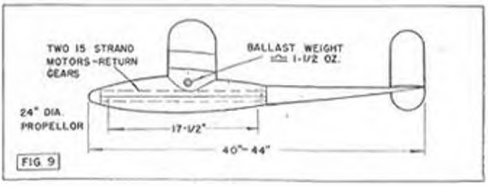


FIG. 9.

Photos from the West Coast of the U.S.A. show two types of unconventional model. Twin fuselage Wakefield by Warren Williams is novel approach to the '53 rules, whilst " Too-darn-long " by Jack Butler is an oversize caricature of the long fuselage Wakefield so popular in this part of the U.S.A. in 1952. Propeller is 28 inch diameter, and fuselage over 7 foot long: ¼ lb. of rubber is used !

Nice action shot from Ed Stoffel's camera is of Norman Marcus and his 1952 model taken immediately after release. The retracting support stick undercarriage is already in the "up" position. Prop is a single blade folder in true Marcus tradition.

The advantages of using taut motors are several. Bunching is virtually eliminated, making for more consistent performance and there is, again, the thought that you are using all the turns available from the motor (not wasting some through cording or using a mechanical tensioner). Dismiss this as useless power if you will, but there is still the possiblity of turning the " end zone " of the power run to use with a non-folding propeller (ref. Fig. 6). Actually, however, with the range of motor lengths available, and considering the present proportions of Wakefields, very little cording turns would be needed to accommodate any motor in any conventional fuselage. In other words, the amount of slack is small, so bunching will not be a problem. Given the choice in a new design the one additional factor favourable to the taut motor is its relative simplicity. It needs no cording and uncording between contests.

The conclusions to be drawn as regards the effect of the new rules on designs, therefore, is that outline proportions will most probably stay like the conventional models of the present time. In fact the new rules will probably have the effect of stagnating outline design, rather than encouraging further developments. What has previously produced radical changes in outline design has been alternative solutions adopted to utilise a greater and still greater proportion of rubber weight. Remove that approach to increased performance and we are back with conventional layouts.

A.G.M. Minutes: " Sunday flying has been banned . . . "

About the only non-conventional layout which can be visualised is the '54 design employing return gears—to produce a favourable modification of the power output curve as mentioned earlier in this article and also to concentrate the weights of the model around the C.G. and produce a generally more stable flying machine—Fig. 9. The pity of this is that to take full advantage of such a layout, all weights need concentrating around the C.G., calling for a light tail boom, tail assembly, wings, etc. In other words, a light airframe which, with less than 3 ounces of rubber, will call for ballast to bring up to the required minimum weight and, quite possibly, result in a rather more vulnerable design than one using a conventional fuselage layout.

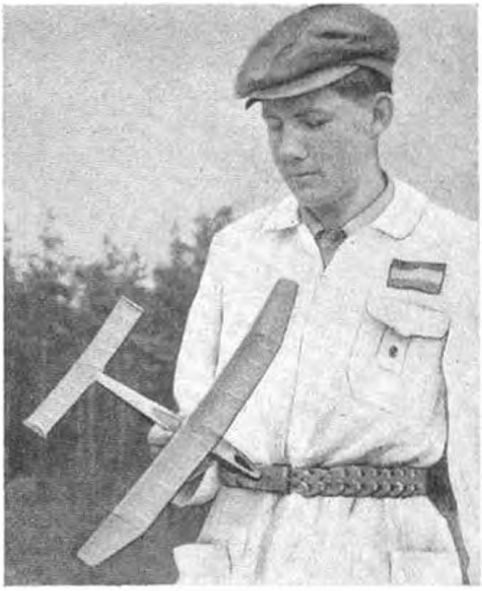
If I may be permitted to conclude with some comments on the new rules, as such, the pity of the new specification is that it penalises the people who have worked hardest over the past few years in improving Wakefield performance. Far from stagnating, Wakefield design under the old rules was continually productive of new ideas in construction (to reduce airframe weight) and in outline design (to utilise more power for enhanced performance) The same incentive must be lacking with rubber weight limited, particularly when it cannot fail to be appreciated that an " old " Wakefield will outfly its new counterpart. Where any type of contest is concerned, sheer performance is far more attractive than getting the best out of a " restrict-ed " specification where, inevitably, the luck element must assume greater proportions. Against this must be weighed the fact that the modern Wakefield was outgrowing the available flying fields and the new rules will, undoubtedly, make it more easy for the less experienced modeller to take part with more hope of success. But imagine, say, how the attraction of England-Australia test matches would be dimmed if Lindwall, Miller and Trueman were restricted to a bowling run of five paces—or to the use of a soft ball !

★ *Aptly-named (it means "Infant" or "little one") is this midget Jetex 50 model*

UKKIE

by well-known Dutch Wakefield flier C. R. de Vries

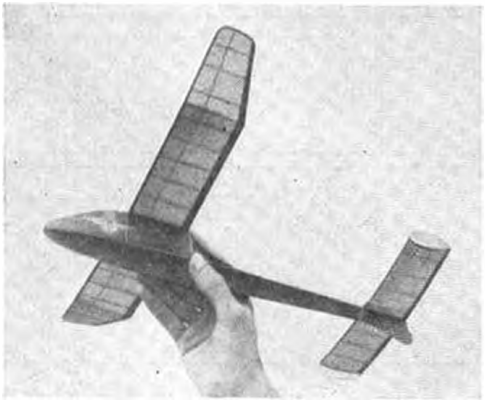
FULL-SIZE PLANS OVERLEAF



"Ukkie," held by designer de Vries (above) features a nose intake orifice and very simple construction. View at bottom left shows general neat lines.

AT the 1952 Swedish Wakefield Trials the Editor's eye was taken by the nifty flying of a little Jetex 50 model, belonging to top Dutch team member, C. R. de Vries. Negotiations were entered into for the design and in due course a detailed drawing arrived at our offices. This drawing we have "translated" into English by substituting usual British sizes for the metric ones of the original, and the full-size result will be found overleaf.

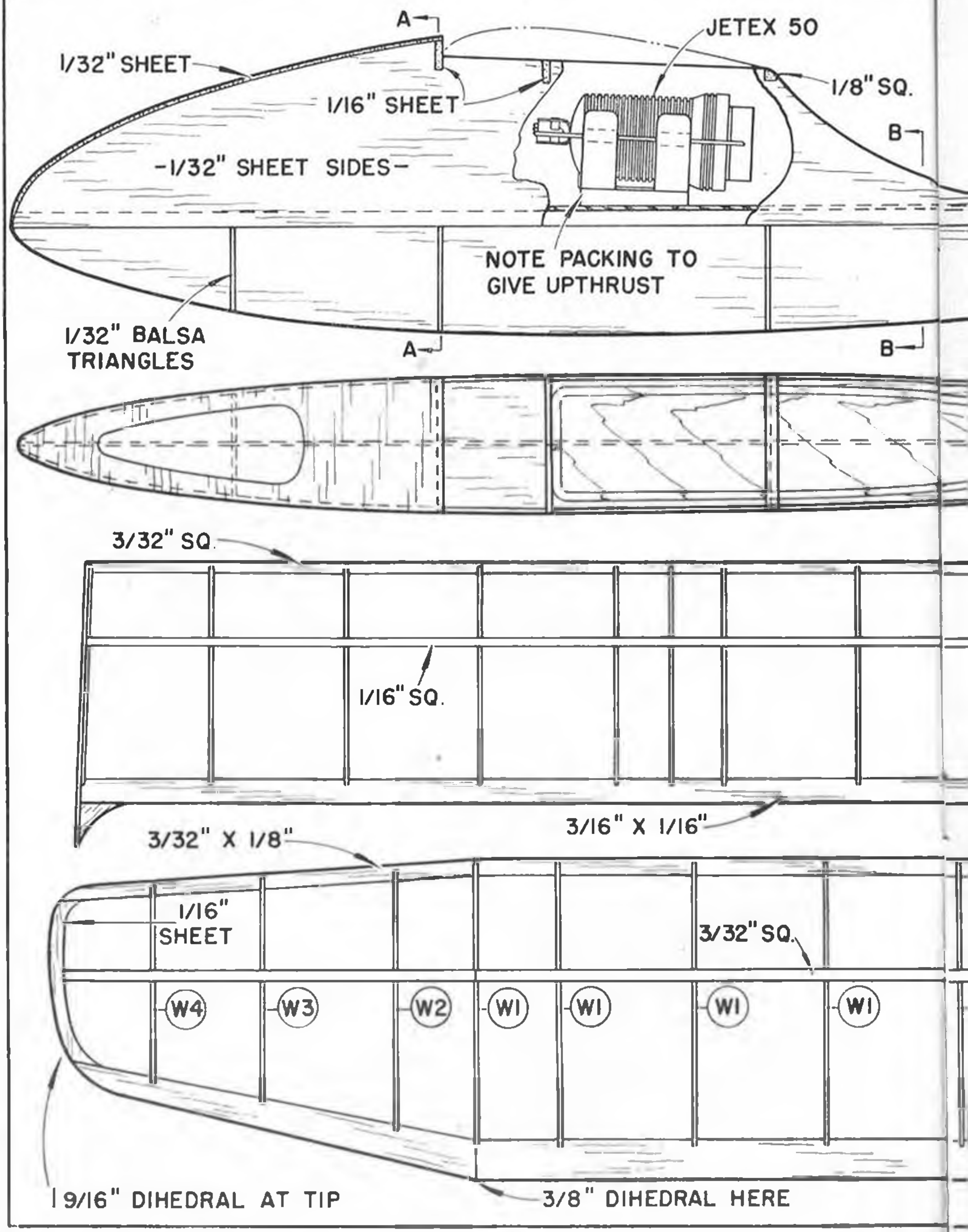
Construction of the fuselage centres around a soft ¼ in. sheet horizontal former. Upon this is erected a keel of 1/32 in. med. sheet stiffened with triangular formers of the same material. The keel also includes the fin. Turning the crutch over, the 1/32 in. sides can be added, together with the wing mount stiffeners, top sheeting with intake orifice, and the Jetex clip which should be packed to tilt the motor at the angle shown. Note that the wing mount stiffeners must be slightly angled to accept the dihedralled centre-section of the wing. A ply or mica panel strengthens the crutch and holds the clip firm.



The wing may be constructed flat on the plan, omitting the mainspar until after the dihedral had been inserted, by cracking and cementing the leading and trailing edges. The tailplane is built flat on the plan—note the toe-in of the tip ribs. Fins are cut from 1/32 in. sheet, grain vertical.

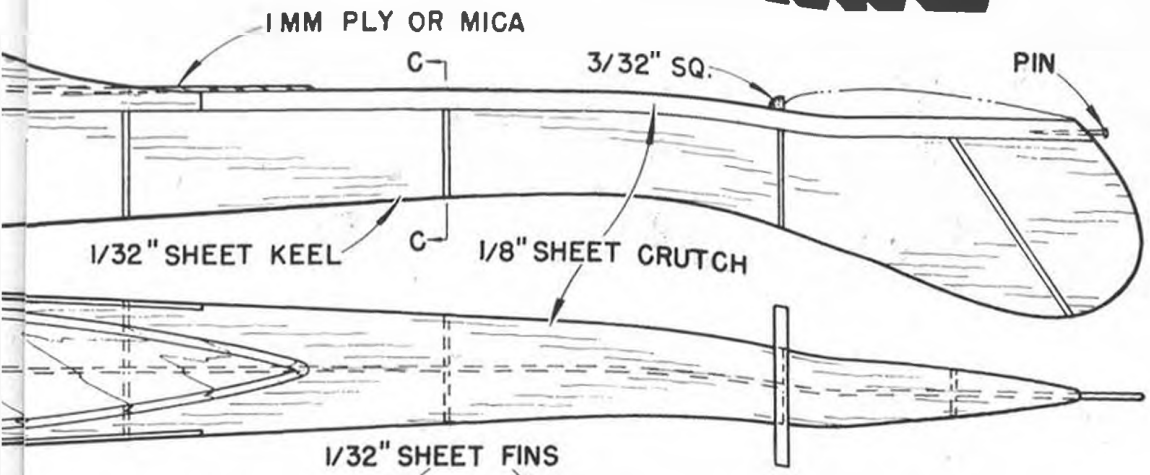
Cover the whole model with the lightest (Swedish "hard") tissue available, after a careful going over with fine glasspaper. Steam-shrink gently and apply one or two coats of 50-50 clear dope and thinners to which has been added a drop or two of castor oil. Pin down on waxed paper and allow a full 24 hours to thoroughly dry. Cement fins to tailplane and add fillets, and cement an inch-long piece of 3/32 in. sq. to the crutch as a tailplane stop. Add asbestos paper insulation beneath and to the rear of the jet unit, if desired.

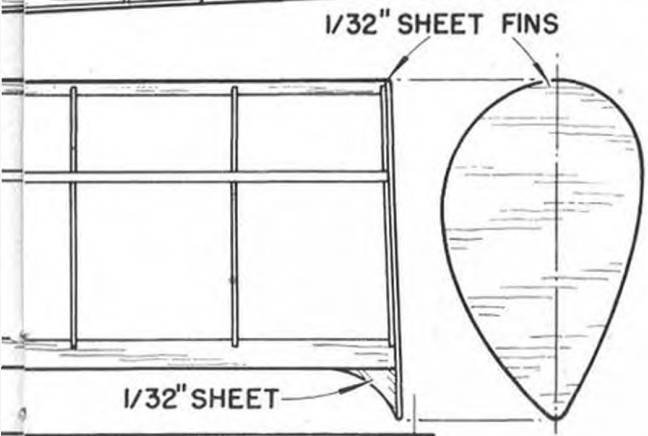
Using the empty motor, balance the model at approximately mid-chord and try a hand-glide. Movement of motor or small bits of plasticine may be used to achieve a perfect glide. Test under power with half-charges until thrust line is just right, then always put the motor in the *same way up*.

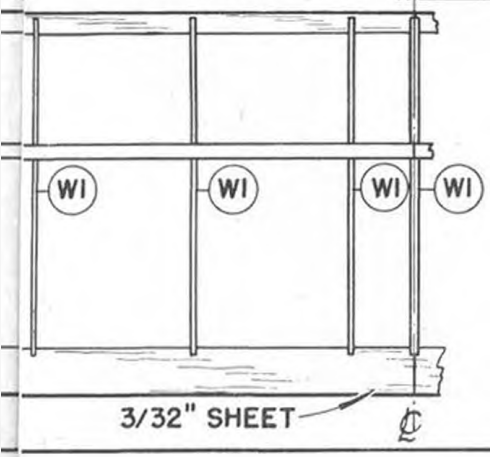

A
1/32" SHEET
JETEX 50
1/8" SQ.
1/16" SHEET
B
-1/32" SHEET SIDES-
NOTE PACKING TO
GIVE UPTHRUST
1/32" BALSA
TRIANGLES
A
B
3/32" SQ.
1/16" SQ.
3/16" X 1/16"
3/32" X 1/8"
1/16"
SHEET
3/32" SQ.
W4
W3
W2
W1
W1
W1
W1
19/16" DIHEDRAL AT TIP
3/8" DIHEDRAL HERE

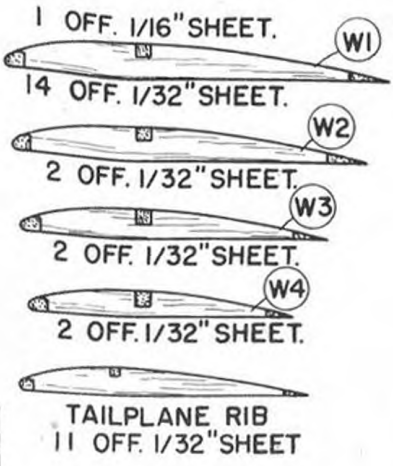
SPAN - 18" LENGTH - 13 3/4"
WING AREA - 39 SQ. INS.

UKKIE

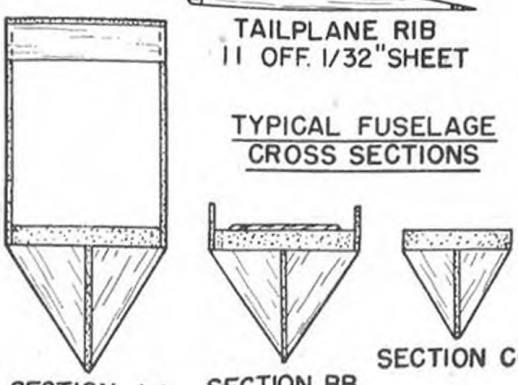








TYPICAL FUSELAGE CROSS SECTIONS



AEROPLANES IN OUTLINE

ONE of the three top-line British airliners to be awarded super-priority in production, the Bristol Britannia is our contestant for civil traffic on the world's largest routes, and like its team-mate, the Comet, promises to be a winner.

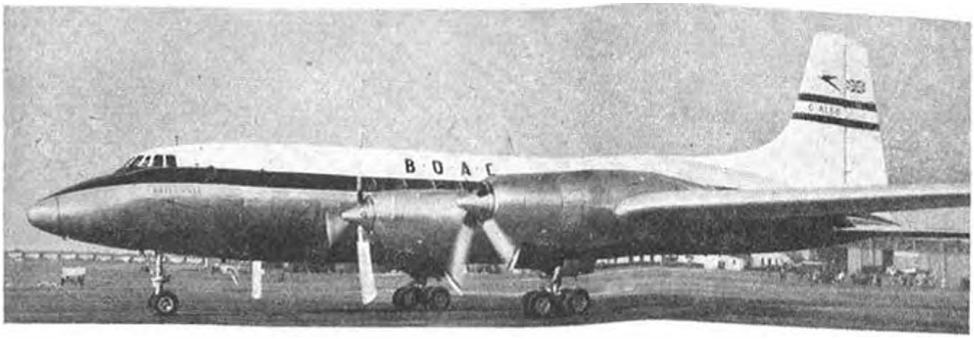
The issue of M.O.S. specification C.2/47 was the origin of the Type 175, and at first it seemed that this new airliner would be a rather ordinary addition to the fleets of long range airliners already operating. Initially it was intended to fit Bristol Centaurus piston engines pending the development of the Bristol Proteus propeller-turbines, but good progress was made with these and enabled the first flight to be made by the power of the turbo-prop. power units. On August 16th, 1952, chief test pilot A. J. Pegg, with a test crew of five, took the first prototype Britannia, G-ALBO, on its first flight, which lasted for 30 mins., from Filton.

A number of seating layouts are possible up to a maximum of 104, but B.O.A.C. machines will seat 92 tourist passengers or 63 first class. A movable bulkhead will enable the forward part of the cabin to be used for freight as required in addition to the large standard stowages beneath the cabin floor. Of the Britannia's many excellent points, three are most outstanding. The Proteus turbo-prop. engines set a new standard in all-important operating economy, and it is claimed that the Britannia is cheaper to operate than any other comparable type, and this holds good even on stage lengths as short as 500 miles. At the Britannia's first public appearance at Farnborough last year, the new airliner's extreme quietness was widely noted, and this low noise level has since further been improved by the production jet tail-pipes. The take-off performance is unusually good and the Britannia will be able to operate from high altitude tropical aerodromes with very little reduction in take-off weight, whereas other machines can only operate with a drastically curtailed payload. This point, among others, largely accounts for the demand for the Britannia from a Mexican airline. In order to operate at maximum economy, which occurs at altitudes around 35,000 ft., the cabin is pressurised equivalent to 6,000 ft. conditions.

Unlike other large aircraft of today, the weight and complication of a powered control system is avoided in the Britannia by a simple means. The control surfaces all have full length trailing edge tabs, and only these are operated manually by the pilot's normal controls, and so in turn move the main controls in the usual way without undue exertion by the pilot. Early tests showed the elevator to be over-sensitive, but this was easily corrected by relegating one section of the tab to the conventional duty of a trim tab and decreasing horn balance area. Control locks are hydraulically operated, as are the double slotted flaps and the Messier undercarriage. The two main four-wheel bogies fold forwards to lie parallel to the main legs, which retract backwards, while the nosewheel folds forwards, and the main fairing doors close when the undercarriage is down in all three cases.

Plans have been made for various versions of the Britannia, and the R.C.A.F. is interested in a maritime patrol version which will possibly be produced in Canada together with freighter versions by Canadair. In addition to the Britannia 100 as exemplified by the first prototype G-ALBO, there is to be the 200 freighter with a fuselage lengthened by 10 ft. 3 ins., the similar 300 for passengers, and the 310, which will be the 300 with tip tanks for extra range. A future possibility is the fitting of the Napier Nomad engine to the Britannia and, like the Proteus, this engine's strongest point is its great economy compared with present day piston engines and pure jets. Britannia deliveries are expected to commence next year, and the two machines per month from Filton will probably be augmented elsewhere.

The first prototype is fitted with Proteus 2 Series 625 turbines which deliver 3,200 h.p. and 800 lbs. thrust and, as first flown, had jet outlets flush with the top of the engine nacelles, so inclining the efflux upwards. G-ALBO is now flying with the long production-type tail pipes, which result in thrust increase of 200 lbs. per



No. 9 By G. A. CULL

engine. Due to fly in July, the second machine, which is registered G-ALRX, has Proteus 3 Series 705 engines which on test have delivered 3,350 h.p. plus 1,190 lbs. thrust, and these will power production machines. For the Proteus engines, De Havillands have developed 16-ft. diameter propellers, which are the first with hollow steel blades to go into production in this country. The second Britannia will undergo full type C. of A. trials this year at the full all-up weight of 140,000 lbs. and with tankage for 6,800 gallons. With the even more efficient Proteus 3's this machine is virtually a production machine, and will be eventually taken over by B.O.A.C. in addition to the twenty-five on order. B.O.A.C. is also to have five freighters, which are expected to be a most paying proposition with a payload of 43,000 lbs. Of this fleet the first two are almost complete and work has started on the seventh.

Having now made so promising a start by equalling and exceeding expectations on flight trials, the Britannia is capable of extensive development, and with an all-up weight of 150,000 lbs. confidently foreseen, seems destined to make a great impression in economic air transport.

Construction. The fuselage is a conventional semi-monocoque with widely spaced frames and close spaced stringers. Wing has two main spars with webs between extruded angle booms forming front and rear of torsion box. 6,800 galls. of fuel is stowed in bags in eighteen cells. De-icing is by air taken in at leading edge, heated by engines and ducted along leading edges. Tail unit of conventional structure with two spars. Part of outer nacelles hinges down integral with flap. Double slotted flaps are employed.

Specification. Span 140 ft. 0 ins. Length 114 ft. 3 ins. Height 36 ft. 8½ ins. Gross wing area 2,055 sq. ft. Empty weight 80,425 lbs. Loaded weight 140,000 lbs. Max. payload 25,000 lbs. Take-off run 3,700 ft. Landing run 2,800 ft. Economical cruising speed 360 m.p.h. at 36,000 ft. Max. still-air range 5,600 miles. Typical range, 3,200 miles at 355 m.p.h. at 27-37,500 ft. with 25,000 lbs. payload.

Colour. Fuselage roof, fin and rudder are white. Blue band down fuselage side and around windscreen, two bands across fin and rudder have registration between them. Above top band is Union Jack on rudder and "Speedbird" on fin. "B.O.A.C." above windows. Registration above starboard, below port wing tips. All bands in B.O.A.C. blue (deep royal blue). Rest of airframe is left bright alloy finish except for green anti-dazzle on nose separated from blue by thin white line. Prop blades have black roots with yellow band at tip and adjacent black band.

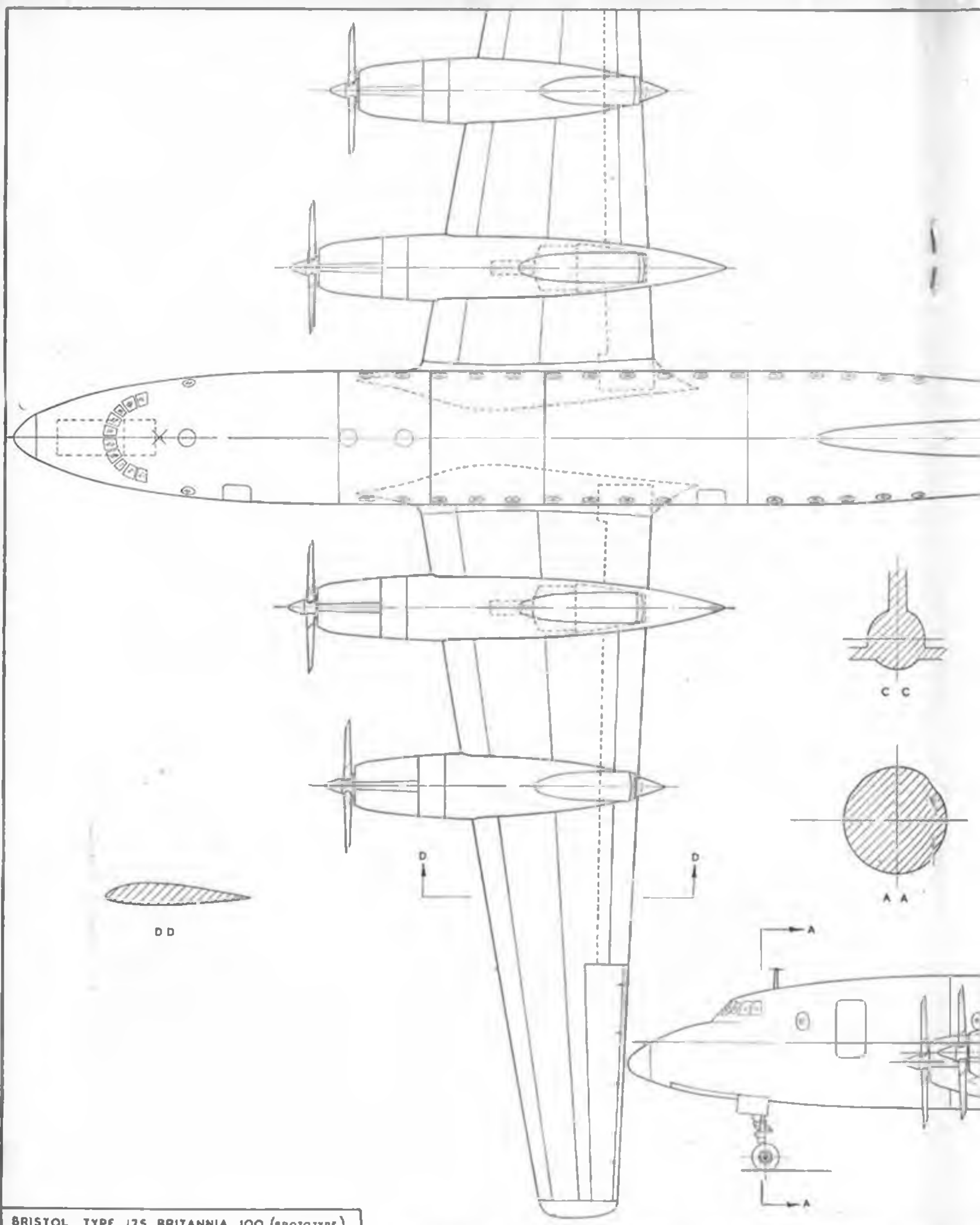
Notes for Modellers. Fuselage is circular section except nose forward of rear of cockpit. Note shape of nose cap in front view. Windscreen sits on raised platform which does not vary in depth along its extent but just blends in at fuselage sides. Unusual fairing at wing root leading edge with concave camber in elevation.

The

BRISTOL BRITANNIA

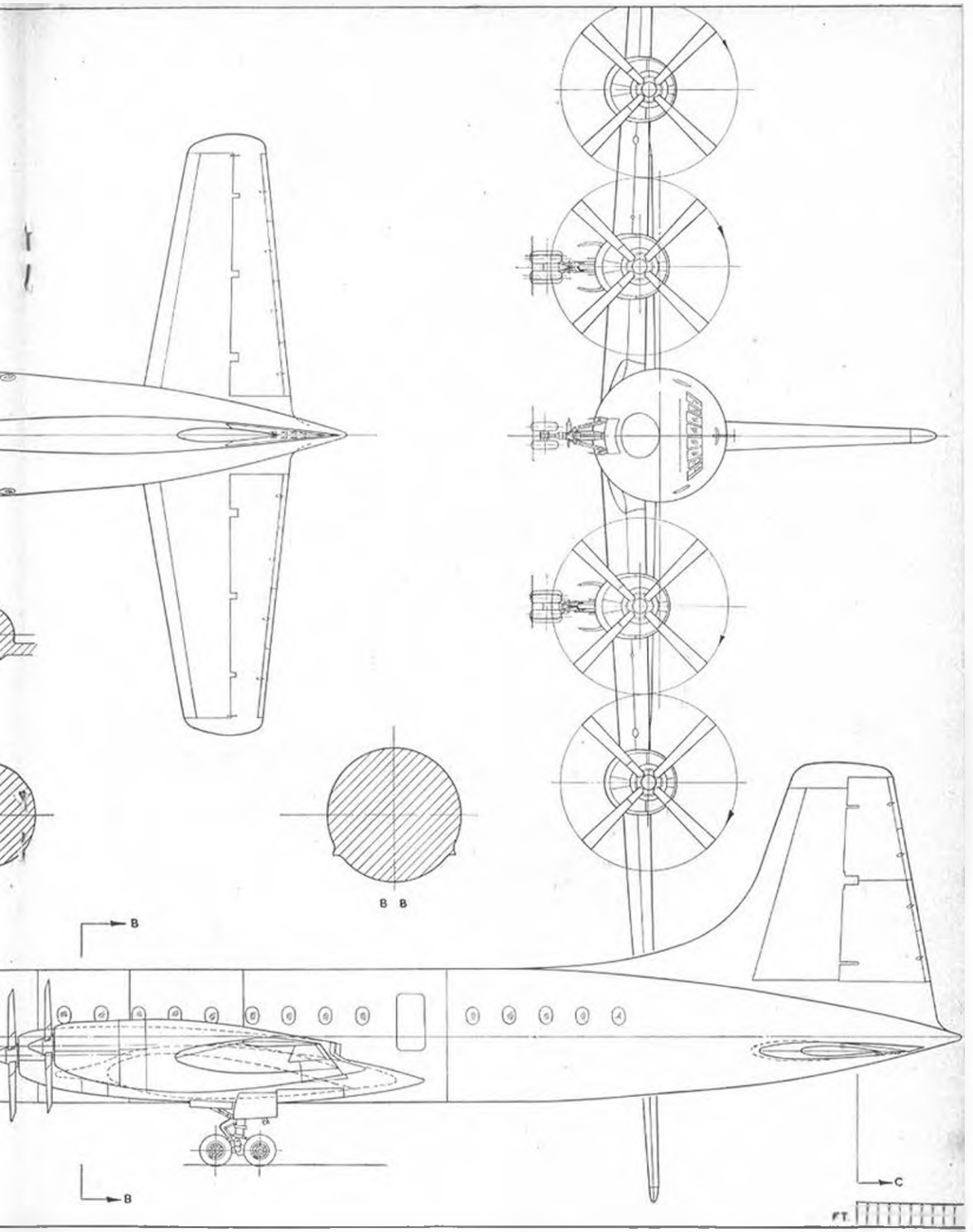
The Britannia taking off on its maiden flight makes a very impressive picture (opposite). Unusually clean lines (above) are helped by the closing of the main undercarriage doors for taxying. Increased thrust and reduced noise come from the new production-type tailpipes shown below, while the figures at the foot of the crew-ladder give some idea of the aircraft's immense size.

Photos by courtesy of Bristol Aeroplane Co. Ltd.

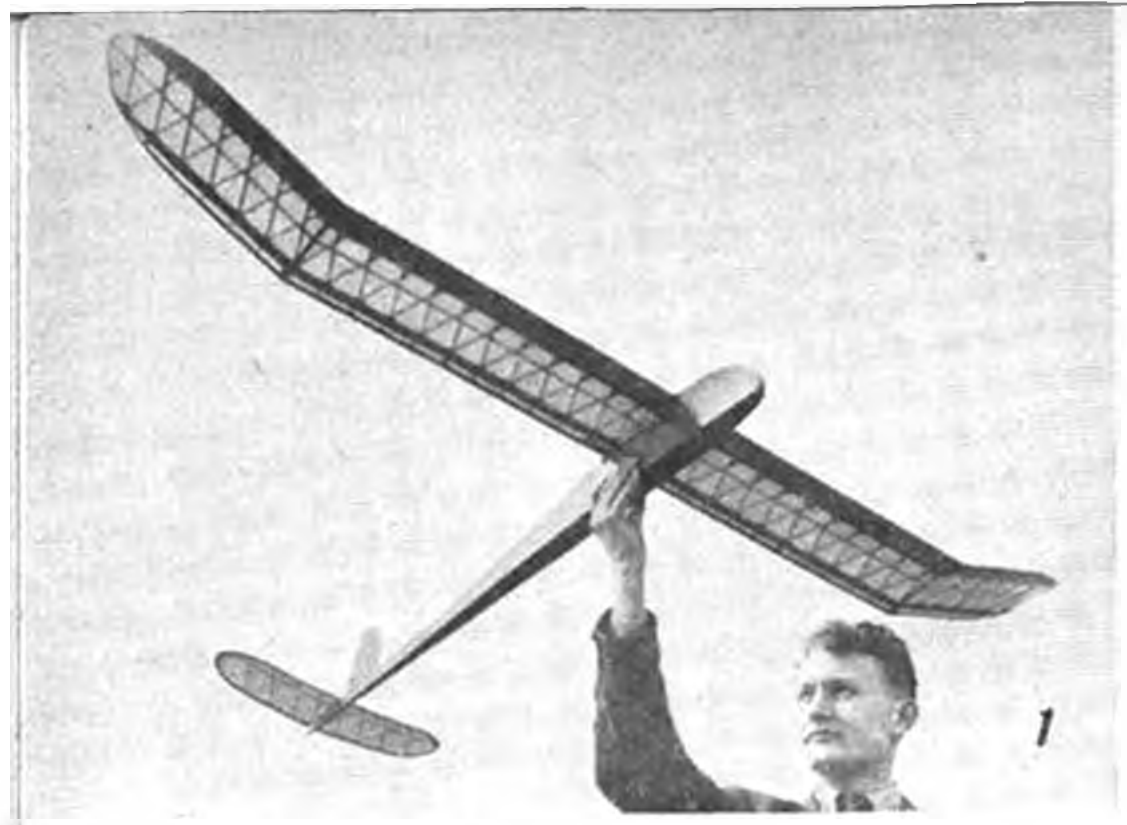


BRISTOL TYPE 175 BRITANNIA 100 (PROTOTYPE)

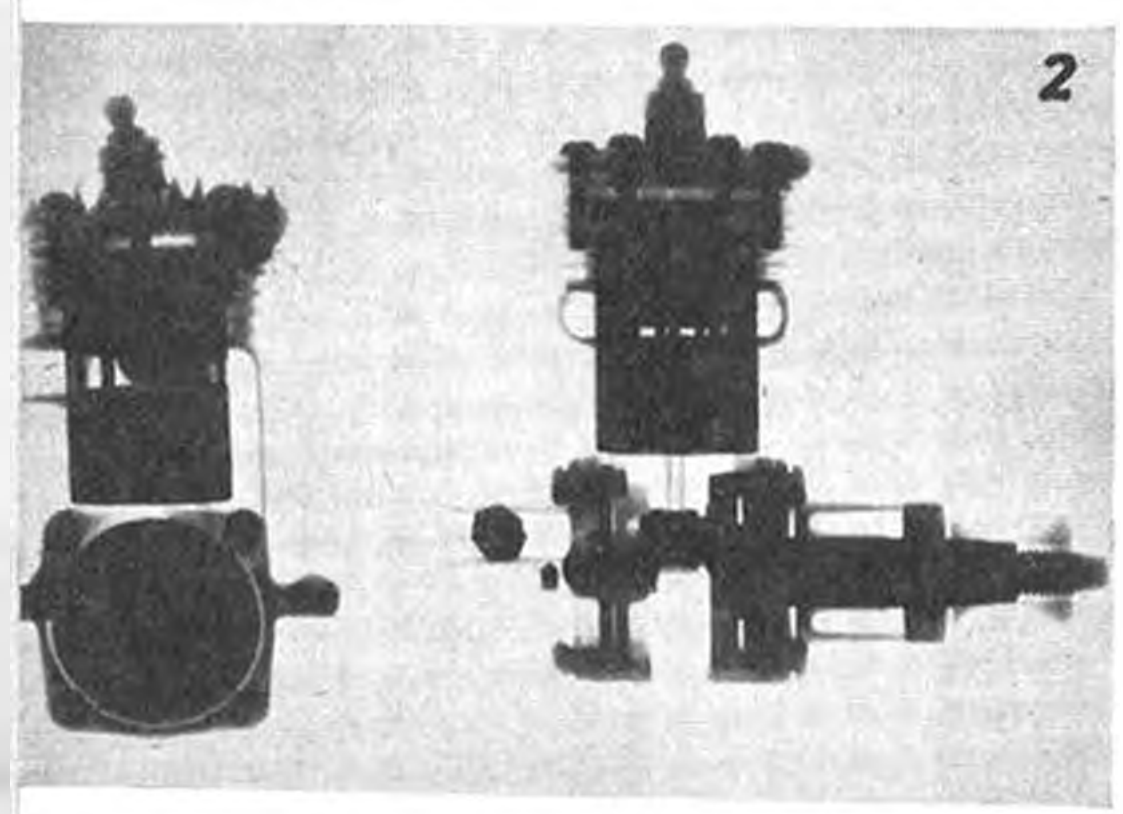
1/144th scale "N" type reprints and 1/72nd scale "M" type blueprints of this drawing are avail

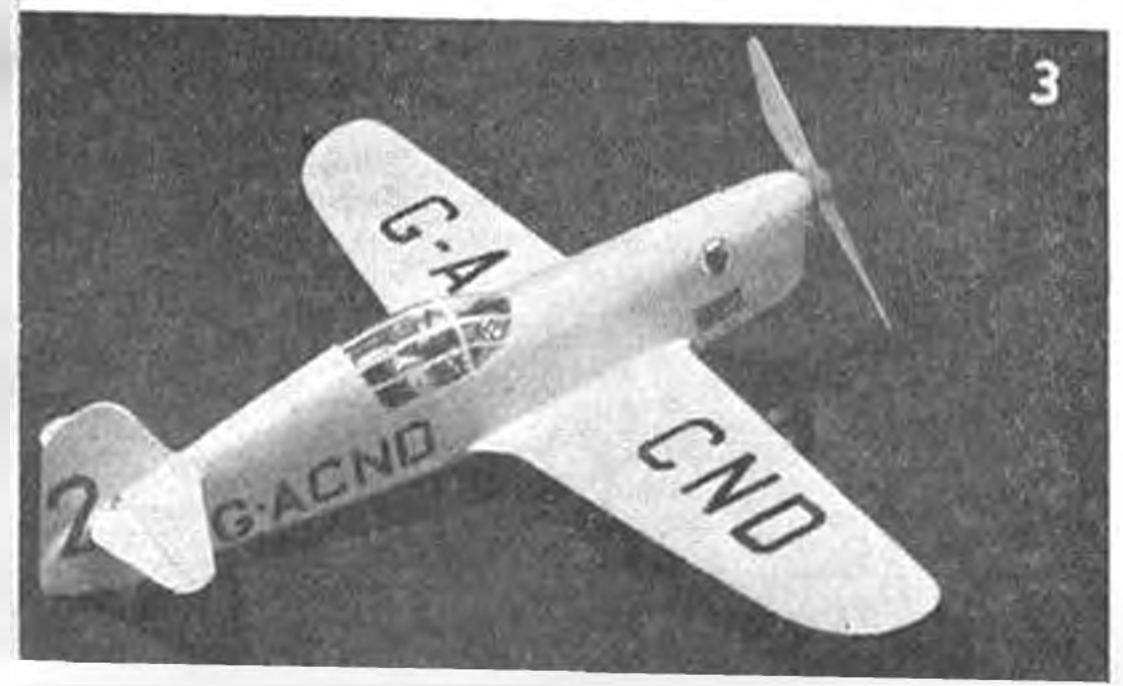


g are available price 2/- and 3/- respectively, post free, from the Aeromodeller Plans Service.



MODEL NEWS





WE had heard that those wizards of the towline, the Hansen's of Denmark, have been using an entirely new form of Glider trimming device on their A/2 models, so the picture (**1**) taken at Chobham Common makes quite a pleasant surprise. It shows our own ace, Roy Yeabsley, and his flapped A/2, the same system as used by the Danes, and we gather that Roy is in close contact with our friends across the North Sea—hence the coincidence in ideas. Briefly, the system is that a normal wing is built; but with a false spar at 75% chord, and then full span adjustable flaps are added on. For flight tests to find the finest L/D ratio, flaps are drooped at various angles to alter the actual section, and then when the best glide setting is discovered, the flaps are cemented firm forever. On Roy's model, a beautiful job, we noted about 3/32 in. downward deflection on the flap—from the normal MVA type of airfoil.

Already mentioned in last month's Hangar Doors feature, the Fokker E.111 monoplane by F. D. Ward of the Ashton Club was paramount model at the 1953 Northern Models Exhibition, Manchester. Shown as " Model of the Month ", a title which it justly deserves, the model is complete to the last wheel spoke, and hair in the pilot's moustache!

Picture **2**, is not a puzzle photo, but an X-ray of an ETA 29 engine. Taken by D. G. A. Bridgewell of Thornton Heath, who makes a habit of taking X-rays of his engines to find flaws, we feel there is a distinct usefulness in this type of examination.

From Holland we have a fine scale team racer in Number **3**. Built and photographed by Hans Janssen of Zwolle, this Mew Gull is a class B racer and is fitted with a Frog 500. Coloured Piper Cub yellow, with black lettering and red racing number, the Mew Gull would show up a number of our own unrealistic racers, what about it modellers? Why not more of these scale jobs?

Heave-ho and away you go, says Bob Linn in California, as he launches his Veron Lavochkin in Number **4**. First flights were with a Wasp ·049 installed, they were beautiful to watch Bob tells us, but lacked enough power to get high. Then Bob fitted a K & B ·049 and got improved flights to make some of the first ducted fan demonstrations on the West Coast of the U.S.A.

Another rather unorthodox free-flighter is Peter Shepherd's crescent wing airliner in Number **5**. Based on first news photographs of the Handley Page Victor, this model has an E.D. 2·46 diesel, and an almighty wing loading, judging by the launch it needed when we saw it at Chobham Common.

The Russians have used light aircraft to follow models for records, and in Israel a Piper Cub has been employed to locate flyaways; but we believe that credit for the first air-to-air radio control should go to George Honnest-Redlich and pilot M. Coudsnon of Chateau Thierry, in France. In No. **6** we see these pioneers in the cockpit of M. Coudsnon's self-made light plane, and at right is M. J. Prieur, French R/C model enthusiast who

helped to make the tests possible. Model in the foreground is an E.D. 2·46 64 ins. " Knockabout " with standard 3-valve modulated Rx. All-up weight is 3 lbs., and a larger version is now ready and capable of carrying a payload of 20 ounces of fuel, the purpose of which is open to speculation.

Three-dimensional radio control is far from simple. George carried the E.D. Tx. on his knees, with 10 feet of aerial flex through the window to a strut. Because of the speed differences the controlling craft must continually yaw and sideslip, remaining above the white model for best visibility. Those who have air experience will recognize the problem created when the model *appears* to circle, when in fact it is flying straight and the controlling 'plane is circling. Again, the lack of height appreciation makes it impossible to control landings from the air. Doubtless when George and his F/O Kite friend are fully practised we shall be hearing great things of this combination.

The Sabre in Number **7** is no ordinary model. This one is powered by Dynajet, has retracting undercarriage that comes down again for landing, brake flaps, "flying tail" and is realistically covered in wallpaper. Yes . . . you read that correctly . . . real wallpaper, 12s. 6d. per roll metal faced paper, as light as equivalent silver doped tissue and with the genuine surface. Peter Donavour-Hickie, whose superb model this is, tells us that if required, one can cover a model in silver, gold or bronze . . . shades of a gold plated entry in the Bowden this year, that *would* be something.

From Israel, N. Kadmon sends the view of his smart " Bubinchen " sport model for the E.D. 3·46 Hunter seen in Number **8**. Only 50 in. span, this should be a fast flier, and is covered with the builder's silk pyjamas, so it also ought to be tough! Inscription in Hebrew on the nose and musical theme on the port wing refer to Bach's Italian Concerto, the Kadmon family tune.

And so to last but by no means least, an excellent photo of a nice subject for a pusher scale model, the Swedish S.A.A.B. fighter in No. **9**. Scale is 1 in. = 1 ft., and the engine an Allbon 1·49 diesel which pushes her along at 30–40 m.p.h. Built by Ken Reay who specialises in scale models and lives in the Newcastle-upon-Tyne area, we can imagine that this job causes quite a stir on the flying field.

9

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Getting the best out of . . .
POWER MODELS

ABOUT sixteen years ago when power model flying was in its infancy in this country we were actively concerned with the initial flights of a " Blue Dragon " model powered by the then new Brown Junior 10 c.c. motor. Each flight was an adventure and, despite the rugged, hardwood construction, damage was quite frequent. But it was a real thrill each time to see this seven-foot span monster in the air.

All that, of course, was before the days of the pylon model and the compression ignition motor. The motors that were available were all spark ignition. Most of the British ones which were obtainable were far from reliable—and heavy. The lighter, more powerful American motors which started to come into this country before the war were generally too costly for the average modeller. Most of the power model accessories, too, were dear. That is one reason why we carved hardwood propellers instead of buying replacements.

For the present day power modeller, all that has changed. His models, comparatively speaking, are of lightweight design, which reverses the vicious circle, as it were. The rugged, heavy model is generally more prone to damage than its lightweight counterpart, simply on account of its greater wing loading and flying speed. Lighter loadings and slower landing speeds mean simpler undercarriages, so that now cantilever wire legs are all that are needed on the average power model, again resulting in a saving of weight. Smaller, lighter engines also meant that smaller, more portable models could be produced.

One of the main reasons why power models are crashed is that engine powers have increased enormously. The modern 2·5 c.c. diesel may well out-perform its 10 c.c. pre-war spark ignition counterpart. That pre-war engine flew a 7-ft. model weighing several pounds. The modern " 2·5 " may well be fitted in a model scarcely half the size weighing less than a pound. As a result we again get that trouble-making factor—excess speed—this time under power. The faster the model flies, the smaller the margin of stability and the more the effects of warps or bad trimming show up. The trend of design, too, has been towards high-performance models which can be quite critical on trim and may even become progressively *more* unstable during flight.

Getting the best out of power model flying means, primarily, getting consistency. Crash landings can

Jim Lewis, of Northern Heights M.F.C., launches his ETA 29 powered entry in the 1952 Northern Heights Gala.

be expensive—resulting in possible damage to both the airframe and the engine. Consistency involves a large number of different factors, but once you have mastered these, and only then, is the time to start worrying about performance.

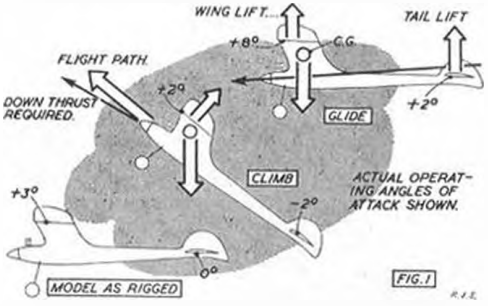
Power model design has advanced tremendously within the last decade. The pylon layout, properly used, is undoubtedly a most stable and efficient arrangement for power flying. Pylon models have been criticised as being tricky to trim or possessing marginal stability in that they are just as likely to develop a spiral dive as a circling climb—but the reason is not so much lack of stability in the design layout as the tendency to cram more and more power into such models. Pylon models are the first choice for contest flying—and power model contests call for maximum performance from a limited power run. In other words, such models must possess a very high rate of climb which, in turn, calls for a lot of power and a fast flying speed, since maximum rate of climb is realised with wings at a low angle of attack and high flying speed.

It is this excess flying speed which causes the trouble. It reduces all the stability margins so that what may be, essentially, a very stable layout, has its stability margin reduced (or even overcome, if the trim is not right) if the model is forced to adopt

such a high flying speed. If you have any doubts on this score, try flying a pylon model with a much smaller engine. Completely underpower the pylon model, in other words. You will then have, if the basic design is sound, one of the most stable flying models you could wish for.

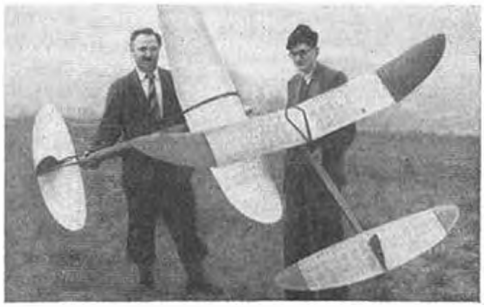
Of course, in the search for more and more performance, and in seeking ways of overcoming stability problems associated with high power (high speed) flight, some models have been developed which are, virtually, "asking for trouble". For example, rigging the model with the centre of gravity way back (on the trailing edge, or even further aft) may be all right for some of the experts, but the average modeller is likely to come unstuck following this practice. This trim, which uses the tailplane lift, as a powerful nose-up corrective force, is quite capable of handling high powers as long as the wing continues to develop sufficient lift. If the model is forced into a nose-down attitude, however, and the wing loses lift, excessive tailplane lift may now force the nose down into a dive from which there is no recovery.

The effect of tailplane rigging on trim and stability is worth studying, for here lies the answer to many of the problems associated with consistency. If we rig the model with, say, 3 degrees difference in rigging angles between wing and tail as in Fig. 1, and adjust the C.G. position for a nice



floating, slow glide, flight attitude on the glide will be nose up so that the wing has an operating or actual angle of attack of about 8 degrees. The tailplane has a corresponding attitude, relative to the *model*, of 5 degrees, but this is not the actual *operating* angle of attack of the tailplane. The direction of the actual airflow over the tailplane is influenced by the airflow over the wings, which is deflected downwards, tending to *reduce* the *effective* angle of attack of the tail, which may now be a matter of 2 degrees. The corresponding centre of gravity position for balance will now be only a little way behind the centre of pressure of the wing.

Under power, however, the model speeds up, which means, in effect, that the trim has to be adjusted so that the operating angle of attack of the wing is quite small—say, 2 degrees. The more powerful the motor, the lower this wing operating angle of attack may have to be.



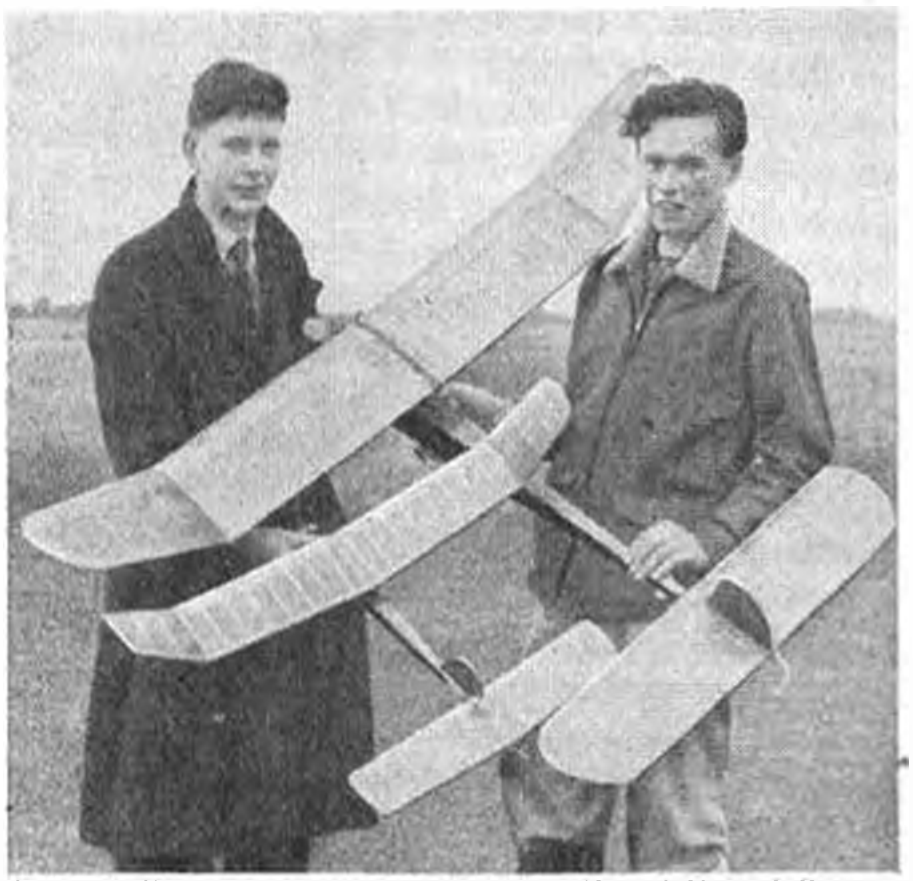
Big Stuff! Chas. Chester and M. Gaster at Chobham Common with their Anderson Spitfire and Hornet powered monsters.

Now the rigging set-up under power is quite different. Geometrically (relative to the flight path) the wing is at plus 2 degrees and the tailplane at minus 1 degree. Add the effect of downwash from the wings and the *operating* angle of attack of the tailplane is more like minus 2 degrees. In other words, the model is now no longer balanced and is tending to nose up strongly. To offset this the thrust line would have to be tilted downwards to produce a nose-down power-on force.

With a powerful motor, the amount of downthrust needed may be very large (downthrust required increasing progressively with increasing power, as a rough rule). The downthrust effect, however, is two-fold, for not only does it produce a nose-down force by virtue of its relative position to the other forces, but the airflow or slipstream from the propeller now meets the tailplane at a positive angle and modifies the effect of downwash from the wings—Fig. 2. The problem becomes too complicated to analyse satisfactorily on paper, so trial and error methods are used in trimming, i.e., adjusting the downthrust angle until a stable set-up is produced.

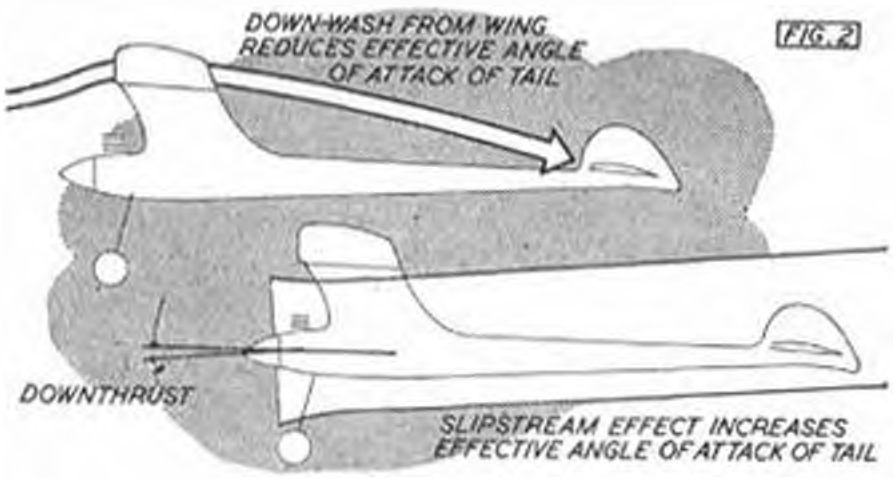
There is one way of duplicating such a set-up without apparently using downthrust, provided you can guess the relative angles required (based on

J. Rogers of Streatham believes in Downthrust with a vengeance. This Yulon Eagle contest model also features an underslung fin.



East Anglian power men, Peter Wyatt (Ipswich) and George Peek (Chelmsford) compare their Dart (144 sq. ins. wing) and Elfin 2·49 Jaded Maid (475 sq. ins. wing) contest models.

experience with similar design layouts). That is to set the wing at a relatively high rigging angle and the tailplane also at a relatively high angle, as in Fig. 3. The overall effect is basically the same as in the first example, except that the model will now tend to glide with the fuselage parallel to the flight path, and fly in a nose-down attitude (relative to the flight path) on the climb. It must be clearly understood that it is the attitude of the model *relative to its own flight path* which matters—not the attitude of the model relative to the ground or the horizontal. The only feature of the model which has any relation to the horizontal is the weight, which always acts vertically downwards.



Now the set-up so far described—a generous longitudinal dihedral angle (3 degrees difference in rigging angles between wing and tail) can be quite satisfactory for high-performance power flying, and reasonably safe and consistent. Under climb, however, the full thrust is not developed along the flight path, resulting in some loss of possible power (or rate of climb). If, for example, 15 degrees of downthrust are required, *relative to* the wing incidence (and that is by no means an excessive amount for controlling a powerful motor), the thrust line is actually inclined 13 degrees away from the true flight path—Fig. 4. If the thrust line could be made to approximate more closely to the flight path, the model would be that much more efficient on the climb.

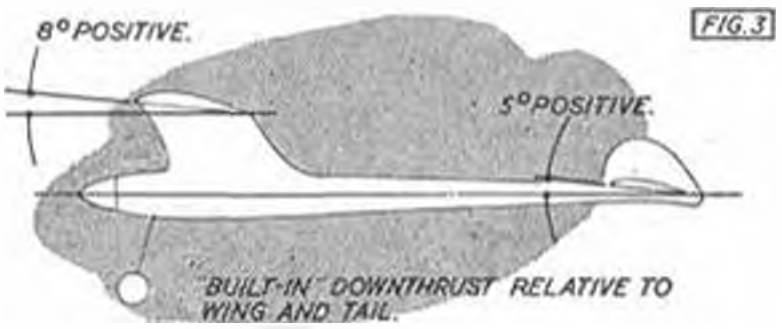
The pylon layout enables this to be done by making it possible to use the tailplane to provide a corrective nose-down moment under power, whilst any excessive diving tendency produced by tailplane lift under power is largely offset by the nose-up moment produced by the high-mounted wing—Fig. 5. Also note, too, that the tailplane being rigged positive to the thrust line, downwash effects from the wing will tend to be neutralised.

The main difference in rigging is that the centre of gravity is moved back and the difference in rigging incidence between the wing and tail is decreased. Some downthrust may still be needed to trim out satisfactorily, but the farther aft the centre of gravity (and, correspondingly, the smaller the difference between the wing and tailplane rigging angles) the less the need for downthrust, until eventually no downthrust at all is required.

The point at which this occurs will depend on the design layout of the model (aerofoil proportions, sections, pylon height, etc.) It will vary with different models. If the three trimming factors concerned could be plotted on a graph they would take the form of Fig. 6. The crossing point of the downthrust curve can only be determined truly for any design by practical experiment. It should, normally, come before the (geometric) longitudinal dihedral also reaches zero.

However, corresponding to a reduction in downthrust required, the longitudinal stability margin of the arrangement also decreases. Hence although we may find a satisfactory trim for "no downthrust", the stability remaining at this particular rigging point may be unsatisfactory for consistent flying. Largely, where to stop is a matter of personal preference, experience and general flying ability. Some modellers can get consistency with far less stability margin than others.

One way of displacing the longitudinal dihedral curve to the right of the diagram is to increase the tailplane area. This means, simply, that the tailplane is made to develop more lift at the same angles of attack by giving it more area. Large tailplanes have become almost standard practice on high-performance power models within the last two or three years—often approaching 50 per cent. of the wing area. Another method of giving the tailplane greater effect is to reduce the wing



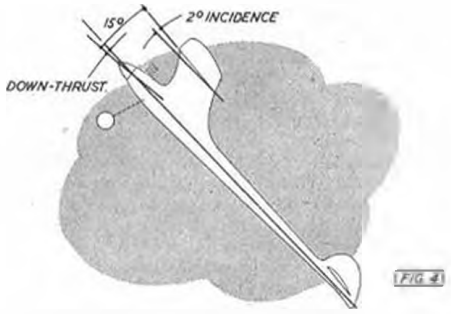


FIG. 4

lift by making the model circle sharply, e.g., trimming with sidethrust rather than downthrust, or combined with downthrust. It is easy, however, to overdo this type of trim and make the tailplane too powerful in circling flight under power so that the model winds itself up into a spiral dive.

If the above can be summarised in terms of simple trimming technique, it would be this. The more forward the C.G. position the safer the model is likely to be. Moving the centre of gravity aft and altering the tailplane rigging angle accordingly allows us to decrease the amount of downthrust required, at the expense of making the model progressively more critical on trim. If the C.G. is moved far enough aft we can produce a most *efficient* set-up, with the thrust line parallel to the flight path or even inclined upwards relative to the flight path, but stability may well be marginal and the slightest upset could lead to disaster.

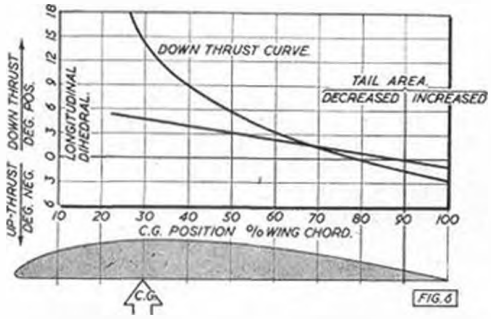


FIG. 6

If we assume that the best rigging is some midway C.G. position, this will vary with the design layout. For cabin type models, a maximum aft C.G. position of about 50 per cent. of the wing chord appears desirable. For pylon models we can usually move the C.G. a little farther back without running into serious trouble—say, 75 per cent. chord as maximum. Approaching either of these limiting points we should be able to find an efficient and safe trim, which will also give us the efficiency we need. Note how, in Fig. 7, these rigging positions modify the approximate downthrust required, assuming similar power in each.

If sidethrust is used in trimming, this should never exceed about 1½ to 2 degrees as a maximum, otherwise spiral stability may be effected. The use of sidethrust also means that the downthrust required can, generally, be reduced slightly. High-power trimming trends have, however, altered somewhat during the past few years. Not so long ago the ideal climb trim for a power model was considered to be a tight upward spiral. Now a good many experts prefer a substantially straight power-on climb. Also the old generalisation that "pylon models should always circle right under power" has been proved something of a fallacy. Pylon models, generally, tend to have one stable circling direction and the other direction of circle an unstable one (tending to wind up into a spiral dive). The "stable" circle for any particular model may be either right or left.

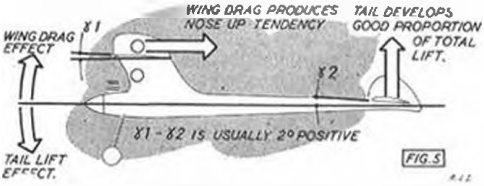


FIG. 5

Actually one of the best criteria for controlling the power-on circle of a model for fine trimming is the propeller pitch. Using a propeller with a higher pitch tends to promote a left hand circle under power; a fine pitch propeller, a right hand circle. You can select a pitch to turn a model in the direction required or, alternatively, to take off a little of the turn if it appears too vicious with the first propeller used. Engine speed can be adjusted by trimming the propeller diameters accordingly.

Having the same engine power with different pitch propellers (i.e., the same r.p.m.) does not, however, produce the same thrust. Theoretically, optimum performance should come from the use of a low pitch propeller with modern high-speed motors. Higher pitches became commonplace with the introduction of compression-ignition engines, and all the plastic propellers manufactured come within this range of moderate to high pitch diameter ratios. A return to pitch diameter ratios of the order of 1 : 3 or even 1 : 4 might be a fruitful field for experiment.

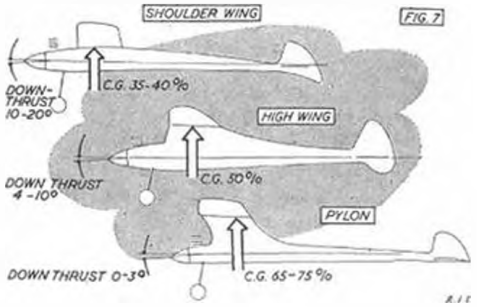


FIG. 7

GADGET REVIEW

HOW many modellers, we wonder, have admired the intriguing flight characteristics of D. Bryant's Fokker D VII? This 1/9th scale free flight scale model flew right through last season without mishap—thanks to that grand prang-saver, the pendulum control. Mr. Bryant's system is somewhat different to the normal pendulum control arrangement, and is shown in figure **A**. It will be seen that both rudder *and* elevator can be actuated by the single swinging weight, and in certain attitudes, both controls come into operation to save the day. Only one point needs a careful eye if you are considering using this system in your next scale model, and that is the size of the loop in the rudder lever. Make this too short, and the elevator travel is limited—too long, and you may have too much rudder at the wrong time.

For a glider with circular section fuselage, what could be better for the nosepiece than an ordinary spinner? T. Menzies of Troon in Ayrshire suggests the KeilKraft plastic moulded type shown as **B**, then the rear half can be firmly cemented in place, and the front portion unscrewed so that lead shot weight can easily be adjusted. The same gadgeteer submits idea **D**, where a hacksaw blade is employed as a shock absorbing nose skid for larger type gliders. Used on a Sunspot, Mr. Menzies' original is very effective: but we suggest elongating those holes to allow a little extra " give ".

Back to simple yet useful thought **C**, from J. Corless of Penrith, we have a spring steel tailskid made for us in the ordinary safety pin, complete with looped end, a feature that prevents the odd accidental tissue tear when carrying the fuselage and wings in the same box.

P. Lumsden of Chesham Bois, Bucks., has idea **E**, a wing fixing method he says will save the wings on a heavy d/t landing or turn-over. Two hooks are bound to the upper mainspars, and a hook and eye on the lower spars. The latter must be carefully placed to just allow perfect facing of the root ribs, whilst dihedral is held by elastic bands across the upper hooks, and by the wing seating on the fuselage.

A cowling clip used by K. Hale of Garston, Herts., on his scale control-line Boeing P.26 for a 10 c.c. Contestor engine, is shown as **F**. Spring-loaded so that the wire fastener is pulled against the cowl, this is an unobtrusive scheme, and could even be made to look like a scale version of the full size lever type engine cowl clip. Just a pull and a twist is sufficient to either lock, or undo this gadget. Another scale model benefit idea is shown in **G** and comes from Quentin Wilson at Maybole in Ayrshire (Canny lads, these Scots, they provide almost 33⅓% of these Gadget Review ideas!). This one eliminates the often unsightly and very unrealistic tommy bar compression adjustment screw which so often spoils a good job by protruding through the cowling. The compression screw is replaced by an Allen screw, obtainable at any reasonable tool shop, and after shortening to the required length, the Allen screw is arranged to come flush with the cowl when at the working setting. A special Allen key, from the same reasonable tool shop, is used to alter compression before each flight.

Now to the old favourite gadget subject, the fuel tank. In **H** there is a scheme for seeing exactly how much fuel is left in a tinplate tank, and it comes all the way from Jim Fullarton in Australia. We lay no claim that this is entirely original; but for the boys who are short of a brainwave in this direction, the sketch will provide a timely reminder for this contest season. The sight tube is simply a piece of clear neoprene.

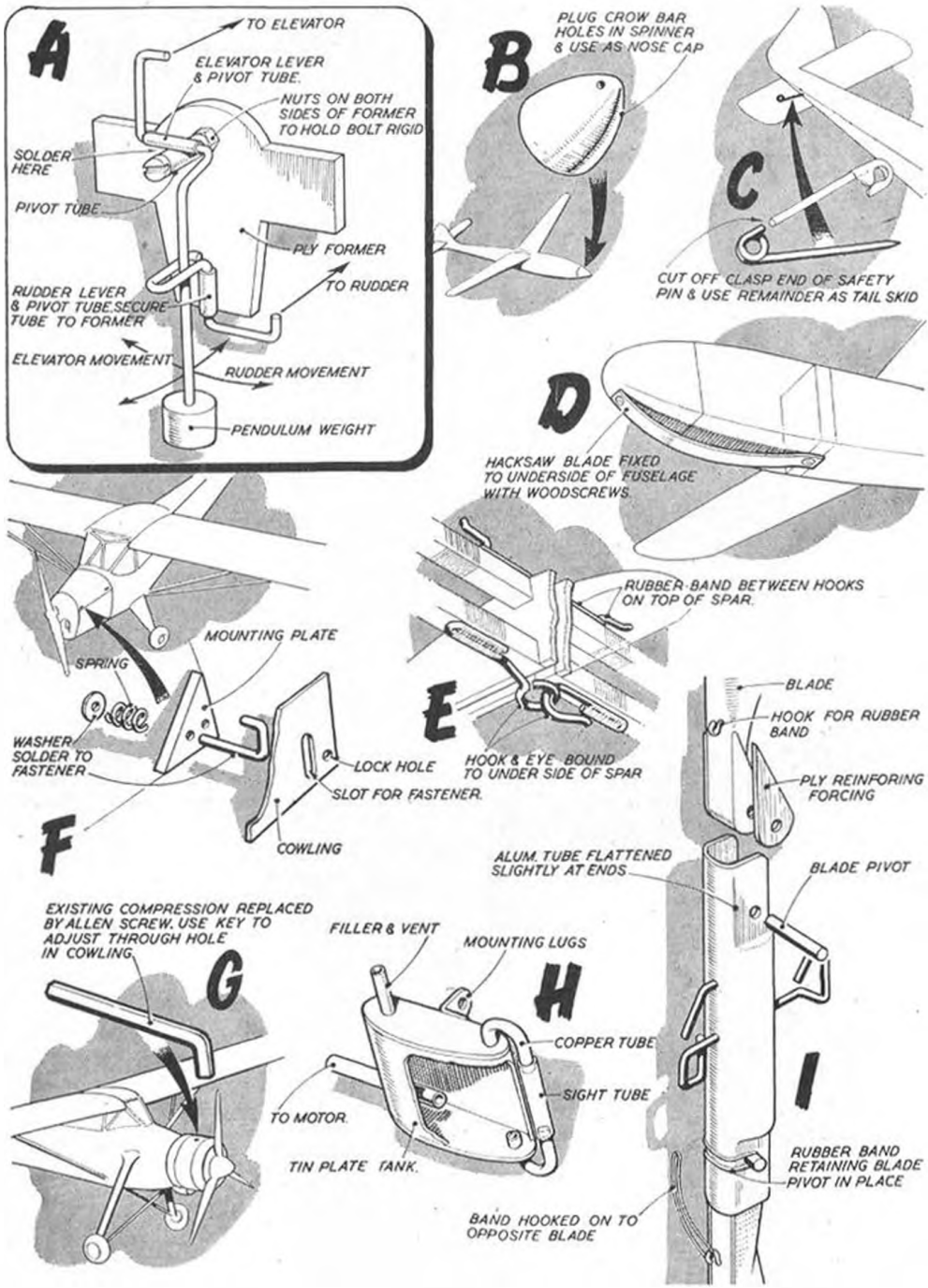
Not forgetting the rubber fans (unintentional pun!), gadget **I** hails from A. Longstaffe of the up and coming Beavers M.A.C., the De Havilland model club. This is a lightweight, crashproof prop. assembly. The hub is made from aluminium tubing with slightly flattened ends and is cut away as shown. Holes bored through the aluminium do not require the extra weight of bushes, and prop. blades are easily removed for alteration or replacement. As illustrated, the prop. is a straight free-wheeler with blades retained by rubber band. The same idea can be adapted for an orthodox two or single blade folder, again with a weight saving over the normal hub.

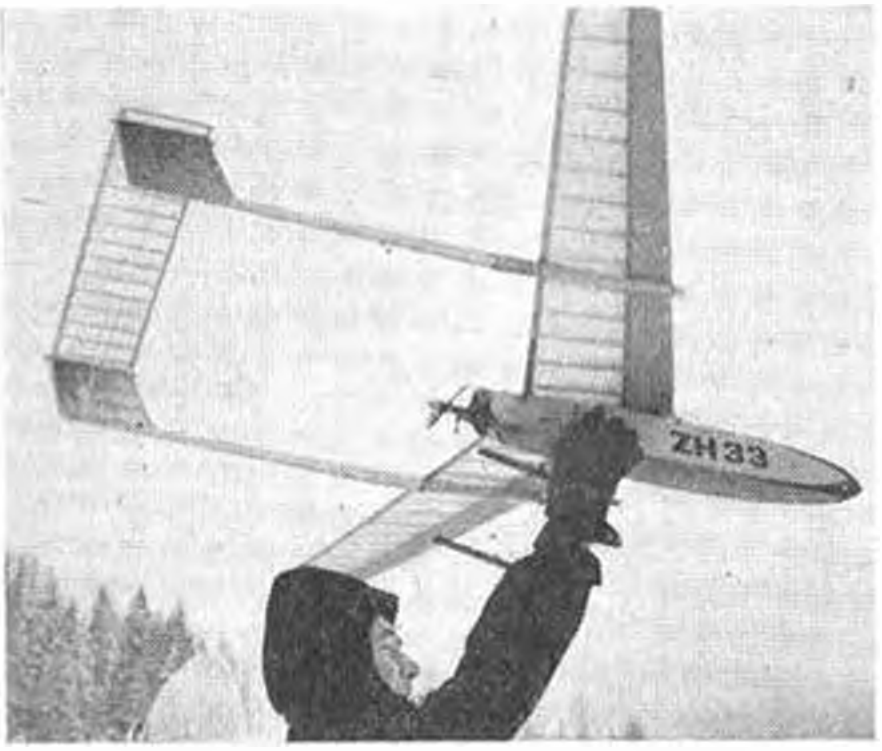
Helpful Hints

25% more power from a FROG 100 by removing exhaust ports, then rotating cylinder so exhaust are fore and aft . . . from J. Winter, Kingston.

Rag soaked in liquid paraffin, rubbed over covering makes the surface more pliable and moreover, removes milky white blushing . . . from W. Moule, Lanark, Scotland.

A pastry wheel or linen marker roughens ply or plastic surfaces for a good gluing joint . . . Scrap rag tissue strains fuel without straining your pocket . . . Mills 2·4 spinner fits a Frog 500—and looks good . . . A punched hole in a tank is better than drilling. No swarth to fall inside, and a better soldering joint . . . Screwed ends of bike spokes can be made into " J " bolts, trim nipples as nuts . . . from I. Stowe of Doonside, N.S.W., Australia.


A
TO ELEVATOR
ELEVATOR LEVER & PIVOT TUBE.
NUTS ON BOTH SIDES OF FORMER TO HOLD BOLT RIGID
SOLDER HERE
PIVOT TUBE
PLY FORMER
TO RUDDER
RUDDER LEVER & PIVOT TUBE SECURE TUBE TO FORMER
ELEVATOR MOVEMENT
RUDDER MOVEMENT
PENDULUM WEIGHT
B
PLUG CROW BAR HOLES IN SPINNER & USE AS NOSE CAP
C
CUT OFF CLASP END OF SAFETY PIN & USE REMAINDER AS TAIL SKID
D
HACKSAW BLADE FIXED TO UNDERSIDE OF FUSELAGE WITH WOODSCREWS.
E
RUBBER BAND BETWEEN HOOKS ON TOP OF SPAR.
HOOK & EYE BOUND TO UNDER SIDE OF SPAR
F
SPRING
MOUNTING PLATE
WASHER SOLDER TO FASTENER
LOCK HOLE
SLOT FOR FASTENER.
COWLING
G
EXISTING COMPRESSION REPLACED BY ALLEN SCREW. USE KEY TO ADJUST THROUGH HOLE IN COWLING.
H
FILLER & VENT
MOUNTING LUGS
COPPER TUBE
SIGHT TUBE
TO MOTOR
TIN PLATE TANK.
I
BLADE
HOOK FOR RUBBER BAND
PLY REINFORING FORCING
ALUM. TUBE FLATTENED SLIGHTLY AT ENDS
BLADE PIVOT
RUBBER BAND RETAINING BLADE PIVOT IN PLACE
BAND HOOKED ON TO OPPOSITE BLADE

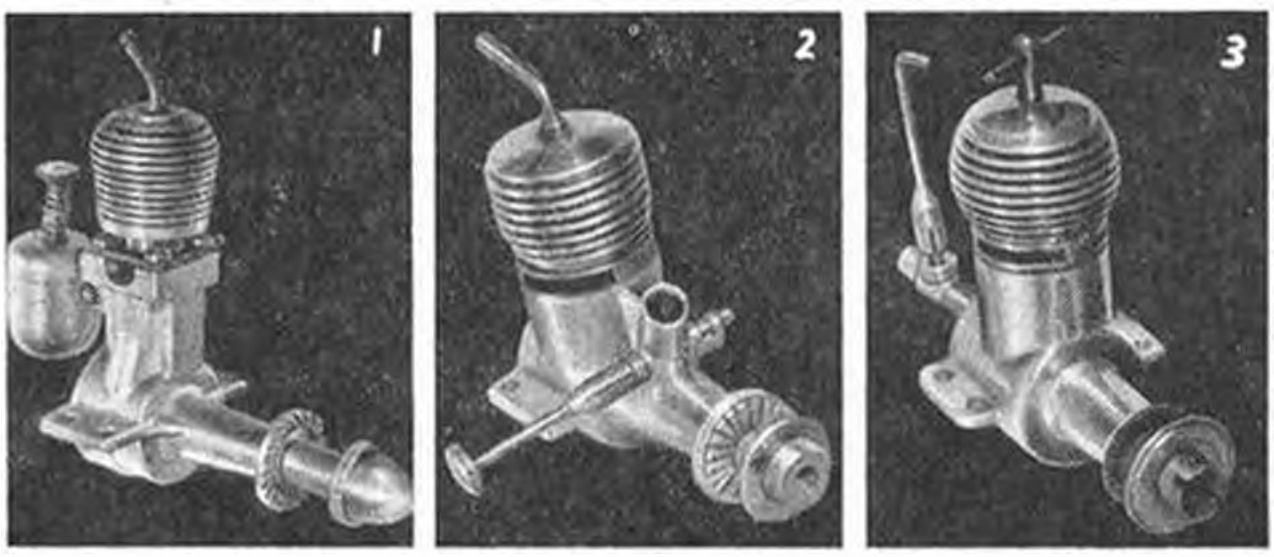


WORLD NEWS

BEGINNING with Eastern Europe, we have quite interesting news this month from **CZECHOSLOVAKIA**, when we learn that their first Wakefield trials took place on April 26th. There is every hope that both power and rubber teams will be visiting Cranfield in person this year, last participation in the Wakefield by this country being 1949, when two proxy flown models were sent. The Czechs have a powerful handmade 2·5 c.c. diesel known as the A.M.A. and made by motor-cycle racer Antonin Machacek in Prague, which should enable them to put up a very good showing in the International Power. It's been a long time since the last Czech visit to Eaton Bray, and judging by the high times recorded in intermediate contests, we can expect to see a high standard of flying by these boys. Unfortunately, the Milan Control-line Internationals is considered too early in the season, leaving insufficient time for a team to be planned for this event, and full participation at Knocke will not be possible due to inexperience with Team Racing and Stunt—so we shall not see the high-speed world record holders in action after all. (*Latest* absolute world speed record is Russian Michail Vassilchenko's 164·5 m.p.h., with jet control-line tailless, by the way !)

Immediately after the Czech Nationals which take place at Brno on July 23rd-25th, Czechoslovakia will be host to Russian, Polish, Rumanian and Hungarian control-line teams for an International rally. All F.A.I. classes will be flown, so we presume there will be a spate of fresh record claims at F.A.I. ,headquarters soon afterwards. One International has already taken place in Eastern Europe, and that was the slope-soaring (over snow) and team-race (over ice) at Zakopane, Poland. The Czech team was particularly successful, winning both events, see photos opposite.

Another country with International Eliminators on April 26th was **SWITZERLAND**, holding their second A/2 and Power team selection events at



***Top Left:** Doubtless influenced by D.H. Venom or 110, entry by Alfred Bickel in Swiss Ski contest is distinctly unique. **Below, Left:** Swiss E.D. 2·46 speed model by Ernst Weissinger of Davos; and **Right,** fastest Swiss 10 c.c. by Hans Frei (McCoy 60). Saunders Roe A1 jet fighter with twin Jetex is from the Wilmot Mansour kit and built by D. Hillhouse of Berea, Johannesburg — the first we've seen on water. **Bottom:** Yugoslav engines 1. TAM 2·5, an early production, 2. the new AERO 150, a promising contest job, and 3. the popular OSKAR 150.*

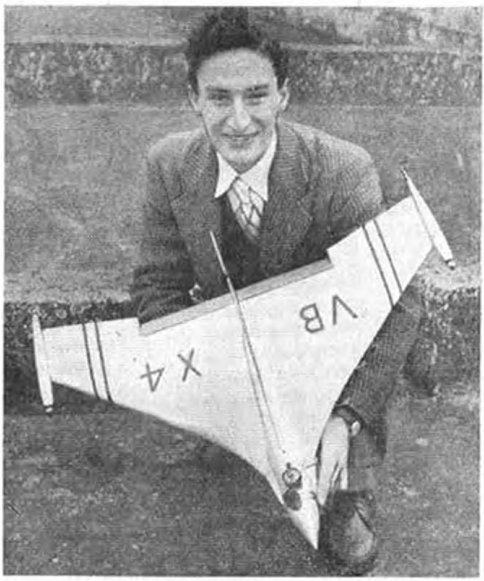
Czechoslovaks Cimburu and Kratina and their Cizek designed Neptune A.2s, placed 1st and 3rd at International slope event in Poland, snowbound site is seen at right.

Bienne. Wakefield interest is on the wane, and there appears to be some doubt whether a team will be raised for Cranfield. For International control-line, the Swiss National C/L contests were held early in the season on April 11th-12th and the results list strangely omits all of the more famous French-Swiss C/L specialists from Geneva. Apparently they did not compete, but nevertheless, speeds were creditably high, with fastest time of the day by Hans Frei at 123·25 m.p.h.

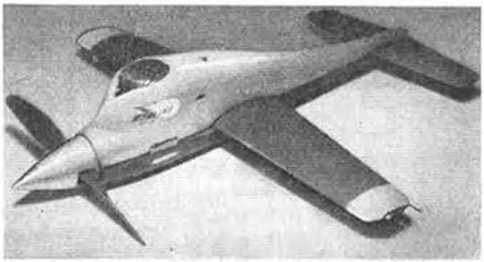
FINLAND held A/2 and Power contest in bright sun; but over snow at Heinola on March 15th. A 50 metre line was used for gliders, best time being Hamalainen's total of 10 : 03, whilst in power, J. Jarvi (an entrant—not the '50-'51 Wakefield site!) collected triple maximums to knock up 15 minutes. And who said there were no thermals over snow? We would certainly like to see that model at Cranfield.

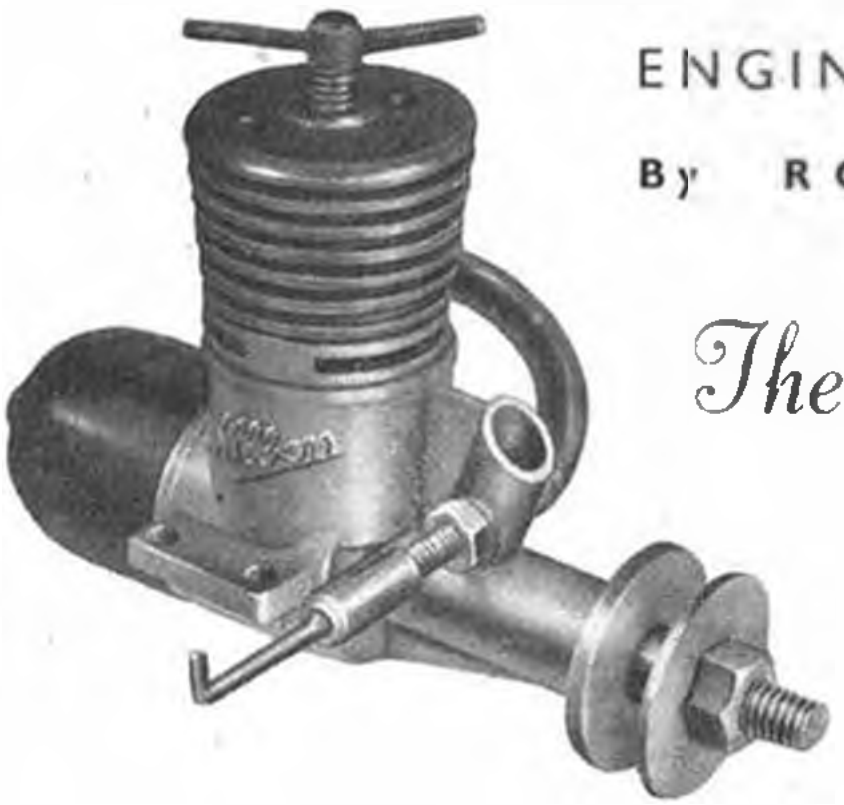
Wakefield Eliminators for St. Lawrence zone modellers in **CANADA** take place on May 17th at St. Jeans Airport, Quebec, and note this:—entry fee is $2 (15/-), part of this going to defray the high cost of sending over a team. Makes one think, does it not?

Details of three very interesting diesels have been sent from **YUGOSLAVIA** and photos can be seen on opposite page. The TAM 2·5 was the first Yugoslav product to go into mass production during 1951, but inferior power/weight ratio restricted its use to boat fans. Working r.p.m. is 5-6,000. The Aero 150 is a 1·49, about 100 have been made and it promises to be comparable to the Allbon Javelin in power output. An easy starter, it has larger bore than stroke and should be a very popular engine. Already established on the Yugoslav market is the Oscar or FSP 150, which we first saw in action at the '52 Power Finals in Switzerland. With rear disc induction, the Oscar is now being made as a Mark II, with manufacturing improvements to ensure consistent performance.



From Malta, G.C., John Vella displays his 60 m.p.h. delta with Amco 3·5. Span is 30 inches. Below: Dooling 61 speed model by Jiri Gurtler of Prague has a top recorded speed of 143·75 m.p.h, but will not, unfortunately, be competing at Milan and Knocke.





ENGINE ANALYSIS No. 11 (new series)

By RON WARRING

The ALLBON SPITFIRE

1 c.c. DIESEL

THIS extremely attractive addition to the Allbon range of engines was received with a comment from the Editor—" this engine has been specially designed for easy starting ability and is intended as a beginner's engine "—and, wittingly or otherwise, the instruction sheet was omitted ! (Guilty ! *Ed.*)

As mentioned in previous reviews, usual practice *is* to start each test engine without prior reference to starting instructions—and then check back to see how our own findings compare with maker's recommended instructions. Not having this data to check back on in this particular instance we cannot make such specific reference, but we can say that the Allbon Spitfire *is* most easy to start and provided the settings are near enough to those corresponding to the best running position, little or no trouble should be experienced in this respect. Probably more impressive than the actual starting characteristics, however, was the smooth, consistent power run achieved under all the test conditions of loading. All the hallmarks, in fact, of a trouble-free engine which should give long and consistent performance.

To get the record right, we started the Allbon Spitfire in less than twenty seconds, merely by " guessing " the control settings in the first place and then adjusting the compression by the " feel " of the motor as it was turned over. Re-starting from hot or cold gave no particular trouble throughout all the other test runs, during which time something like a bottle and a half of fuel was consumed. The Spitfire certainly has a great deal of flexibility as regards the amount of fuel inducted prior to starting, which should be a help to the beginner. In other words, it is less easy to flood and " hydraulic " than some other engines and can also be started on a lean mixture.

The size of the exhaust ports is not conducive to priming directly into the cylinder. For starting, therefore, two or three choked turns are preferred. You can leave your finger choking the intake and flip the propeller over until the motor " pops ", if you wish. This is an indication that ample fuel has been drawn in for starting. Then a smart flip of the propeller and the Spitfire should burst into life.

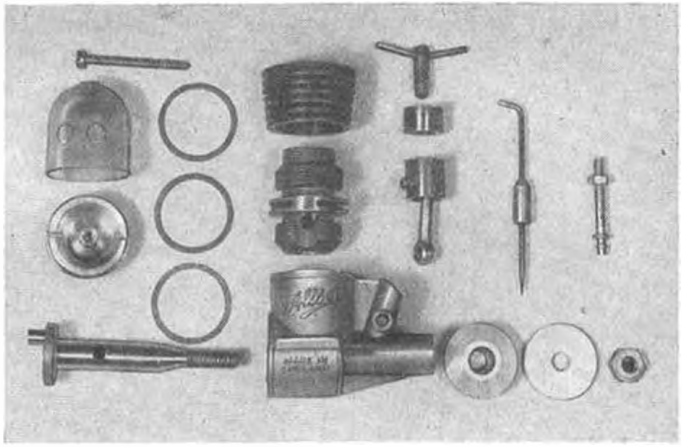
Actually we found that the *easiest* starting technique was to choke and increase the compression by about one-fifth of a turn As soon as the motor starts to run the compression is slackened off to the best running position. The needle valve can be left strictly alone in the " optimum " running position (one turn open on the test model).

Starting with excess compression demands that the compression be slackened off immediately the engine is running. Otherwise it will run rough and stop. Response to compression adjustment is quite positive. Slackened off too much the engine misses badly. Too much compression and the engine starts to labour and slow. You can almost see and certainly hear the piston beating its way up the cylinder against excessive head pressure ! Thus even the novice should have little difficulty in deciding which is the optimum compression setting for his Spitfire.

The full range of compression adjustment over which the motor still keeps running (from " missing " to " labouring ") is one-quarter turn. The compression adjustment tommy bar is of sensible proportions and upswept for easy grip. Movement is not too stiff and adjustment is easy with the engine running, hot or cold.

The needle valve control is not particularly critical over a range of one full turn. The motor slows and stops in rather a similar manner when excessively rich or excessively lean (*i.e.*, needle valve open too much or closed down too much), but the actual setting of the needle valve should be a guide to the novice here. A minimum of one turn open is desirable for good running.

Tests were started initially with a 9 × 6 propeller, which held the speed well down to between 5,500



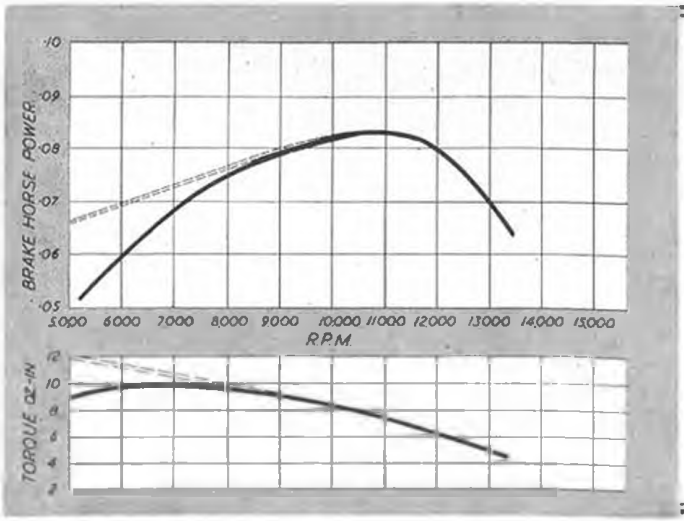
The Spitfire unscrews to reveal itself as a robust job. The barrel must surely be the burliest in current production, and should be positively free from all heat distortion. An annular ring collects the gases in transfer ports before entering the combustion chamber —one of several special features to make for very easy starting.

and 6,000 r.p.m. The Spitfire ran consistently and smoothly with never a miss. This same smooth running was maintained throughout the speed range, right up to 13,000 r.p.m. plus. About the only difference, apart from engine note, was the fact that compression had steadily to be increased as higher and higher speeds were obtained (using progressively smaller propellers), until the 10,000 plus r.p.m. compression setting was nearly one quarter of a turn more than the corresponding setting for optimum low speed running. The needle valve did not make a great deal of difference at any speed, adjusted through a quarter of a turn either way from the supposedly optimum setting.

The only difficulty in handling came when we tried high speed runs on 5 in. diameter propellers. Hand starting was, quite frankly, extremely difficult—mainly because there was just not enough propeller to flip over fast enough! On six inch diameter propellers, however, hand starting was just as easy—without that sudden rap on the fingers accompanying a solitary firing stroke. We found it easier to start the Spitfire for high speed runs without first increasing the compression and could, in fact, safely leave the controls alone until the engine was running, after finger choking.

Torque output is good for an engine of this capacity, and there is no doubt that, it certainly has a great appeal from the point of view of consistency, with a tendency to fall off slightly when the motor got really hot. We noticed, too, that after prolonged runs the fuel had a tendency to bubble and boil in the tank, due to the heat absorbed from the crankcase.

This, however, did not affect the running. We tried several times to stop the engine by introducing air bubble into the fuel line (creating an air lock in the line by withdrawing it from the tank as the engine was running and then replacing it). But the Spitfire ignored such tricks and kept on running



ALLBON SPITFIRE

Displacement : 0·975 c.c. (·060 cu. in.).
Bore : ·425 in.
Stroke : ·420 in.
Bore/Stroke ratio : 1·013.
Bare Weight : 3 ounces.
Mounting : Beam (upright, inverted or sidewinder).

Material Specification

Crankcase : LAC–112A silicon alloy, pressure die cast.
Cylinder: BSS–90. Hardened, ground and lapped.
Piston : Mechanite. Ground and honed.
Connecting rod : High duty forging alloy. RR-56.
Crankshaft : BSS–90. Hardened and ground.

Manufacturers

Davies Charlton & Co., 13, Rainhall Road, Barnoldswick, via Colne, Lancs.
Retail price : £3. 4s. 2d. (including purchase tax).

just the same. We even tried an out-of-balance propeller to shake the contents of the tank up into a frothy mixture, but that, too, sucked through the fuel line and was just as uncomplainingly absorbed.

Fuel consumption is very modest. The exhaust is relatively clean, showing that the mixture is well burnt. Running on just the contents of the fuel line (the other end being withdrawn from the tank) it seems almost that the Spitfire will never stop. At least, it takes some fifteen seconds to do so!

As to points of criticism, there are several, but all minor ones. The holes for the fixing screws in the mounting lugs, for example, are annoyingly just under 6 B.A. clearance and have to be reamed or drilled out. If the eager novice tries this with the end of a file, he may find that he has broken a vital part of the fixing lug off. Correspondingly, the fixing holes are much too slack for 8 B.A. fitting, and in any case, a motor of this size really needs 6 B.A. fixing screws.

The propeller backplate fitting, with no knurled "grip" seems a little plain and ordinary, but if the propeller is tightened right down properly there is little danger of propeller slip. The plain bush extension, fitting the hole in the propeller, is just too long to accommodate a 3 inch pitch propeller. If a 3 inch pitch propeller is used, therefore, either the length of this bushing can be reduced slightly by filing, or a thin washer mounted behind the propeller. At the other extreme the shaft is long enough to take an 8 inch pitch propeller.

Workmanship, inside and out, leaves little to criticise, except for perhaps for the rather disturbing fact that the needle valve only threads part way onto its respective threaded tube in the fully closed position—leaving a gap of something like ⅛ inch. This is a "peculiarity" rather than a "fault".

If there is anything we would alter, it would be the diameter of the tank. This is *slightly* larger than the diameter of the crankcase which means that the insides of the mounting beams cannot be brought flush with the inner edges of the lugs. Of course, a touch with the file at the appropriate spots on the plastic tank and this can be done, without unduly weakening anything.

On the basis of our tests we would recommend a 7 inch diameter propeller for sports flying, with a pitch of 4 or 5 inches. This will hold the revs. down to a comfortable figure. The Spitfire is quite happy handling relatively high pitch propellers of medium to small diameter. For that little extra free flight performance, perhaps a 7×3, or 7×4 plastic propeller, although an operating speed in excess of 10,000 (static) r.p.m. is not advisable owing to the fall off in power output past the peak, at about 11,000 r.p.m.

Altogether, the Allbon Spitfire is a likeable little engine, which will certainly prove a trusty servant for the sports flier, and in view of its performance, may even achieve honours on the contest field.

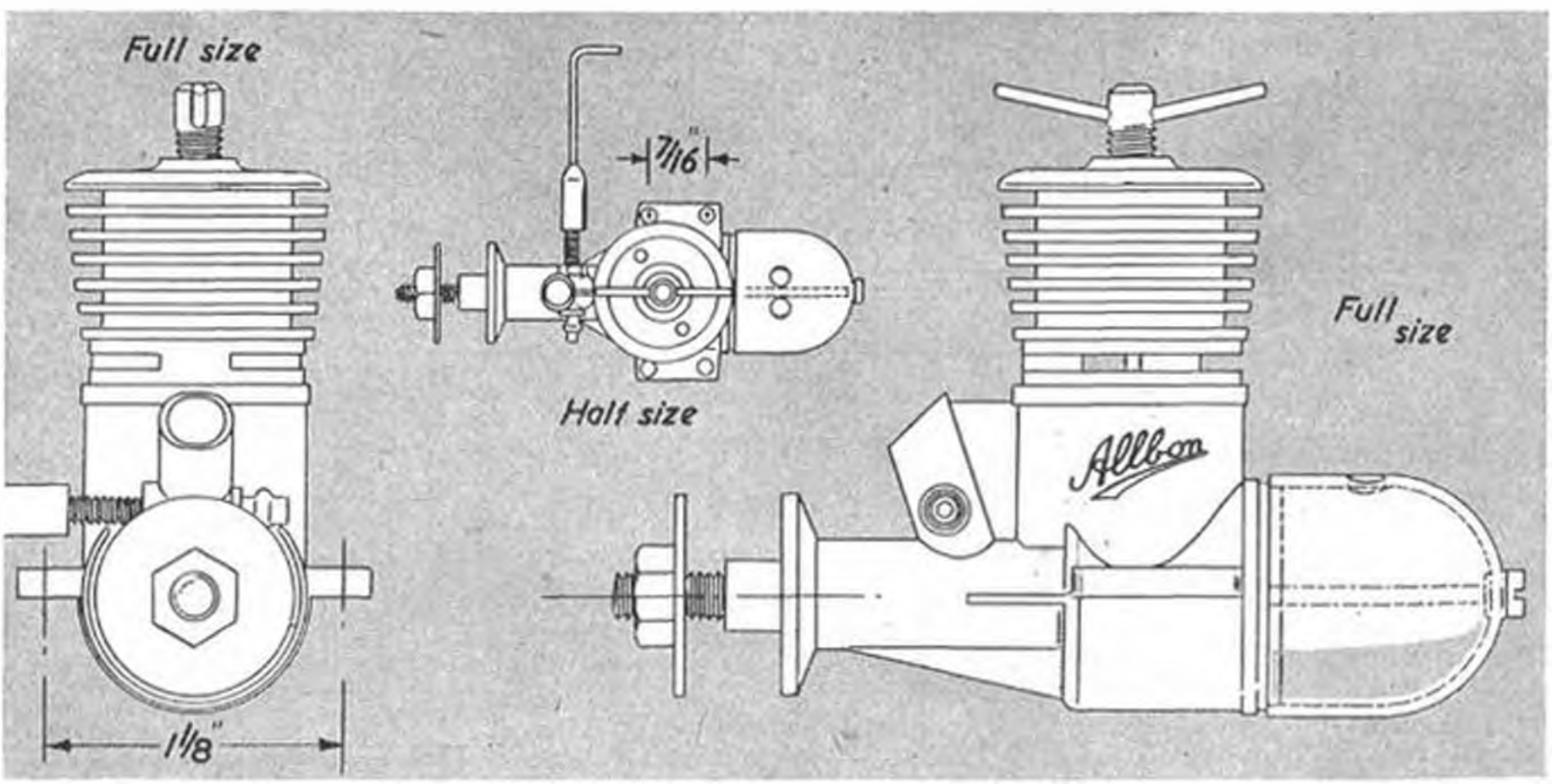
Fuel: Mercury No. 8

NOTE.—For the benefit of overseas readers, Mercury No. 8 fuel equivalent formula is:—

PARAFFIN	40%
CASTOR OIL	25%
ETHER	32·5%
AMYL NITRATE	2·5%

Propeller Tests

Propeller Dia.		Pitch	R.P.M.
9	×	6	5,650
9	×	4	6,750
8	×	6	5,900
8	×	5	7,760
8	×	4	8,200
8	×	3	8,500
7	×	6	6 850
7	×	5	8,050
7	×	4	9,450
7	×	3	10,800
6	×	5	11,250
6	×	4	12,000
6	×	3	13,150



Radio Control Notes

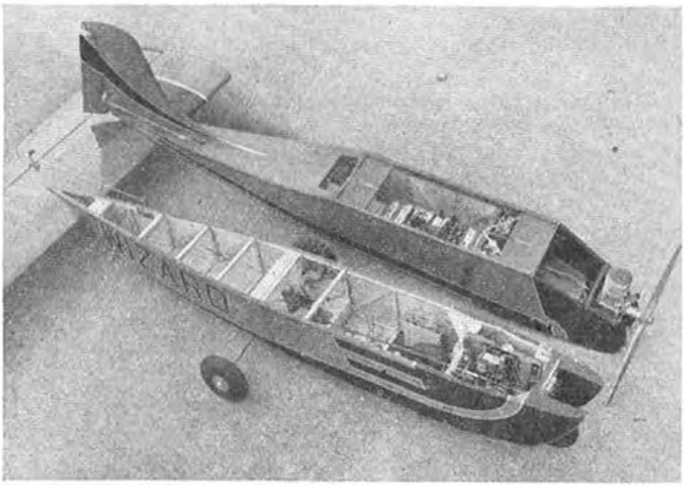
By HOWARD BOYS

IT is nearly four years since the writer gave up escapements in favour of direct electrical actuation, with a mechanical switch to pulse the signal on and off to give proportional control to the rudder. In view of the advantages offered by this system it is surprising that more people have not taken it up. Those who do, generally stick to it, and often add another feature. One highly successful system has been described in two most interesting letters from America, by Claude McCullough, and it is fitted in his model the " Wizard ", shown in the photograph. Here are some extracts from his letters.

" I have enjoyed reading the many helpful hints and circuits pertaining to pulse control, and as a confirmed pulse addict it is my belief that more R/C builders should try out this method, and I do my best to convert escapement fliers at every opportunity.

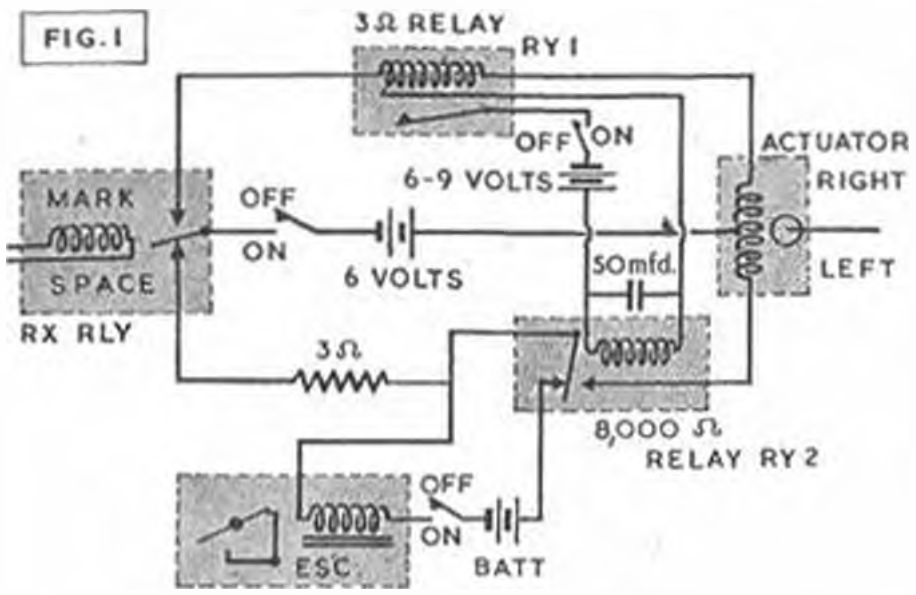
" I have been wrestling with the problem of secondary controls in conjunction with pulse for some time, to provide a simple and sure method. The basic system I used during the 1952 season is shown in Fig. 1. Its main aid is not the secondary control system alone, but the fail safe feature which releases the rudder and prevents that fatal spiral dive that anti-pulsers never fail to mention.

" Curiously, after installing this fail safe system we had no loss of control to test the device. Finally we turned off the transmitter to see what would happen. The motor cut and the ship went into a straight glide. Control was easily picked up again by turning on the transmitter.



Heading photograph and close-up right are of Claude McCullough's ambitious radio project " Wizard ". Power unit is an Anderson " Spitfire " and the multi-wheel undercarriage an unusual feature which did not work out too successfully, being installed a little too far back. As will be seen the fuselage is in two halves for easy access, the top half holding the receiver and actuator, the lower half secondary controls, etc. The pulse proportional system of control is used for both rudder and elevators. The elevator linkage can be seen quite clearly in the photograph on the right.

FIG. 1



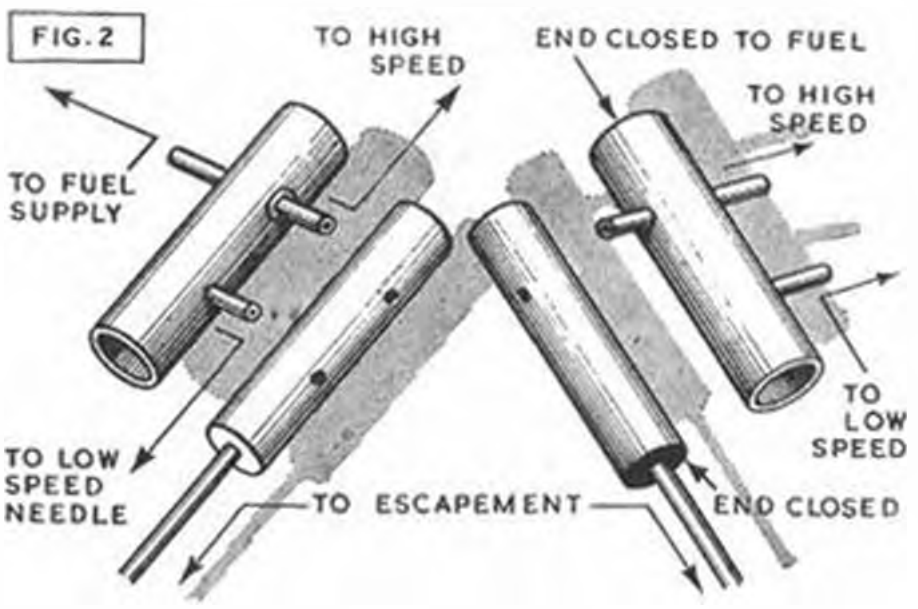
"While this control worked well, I have been experimenting with several methods to give simultaneous operation of two secondary controls over the pulse and hope to have the bugs out of one of these shortly. More and more fliers are turning in aerobatic work of a standard to make absolutely imperative the use of elevator control as well as motor speed and shut off, if any competition success is to be had.

"After trying to do adjustments by feel in the innards of an R/C, I determined that I would have at least one plane where work could be done without a knowledge of Braille. The fuselage was slit from end to end, the top half carrying the receiver and actuator, and the bottom half the secondary circuits, motor control, and elevator drive. The two halves are held together with rubber bands.

"The multi-wheel landing gear proved to have been installed too far rearward for good operation, and while I believe it would be acceptable if moved up, I have decided to use instead a two-wheel gear behind the wing leading edge. Your analysis of l.g. position some months ago is quite correct and the S.F. Mustangs made many scale type take-offs at the Nationals this year using near c.g. positioned gear.

"The plane is now powered with an Anderson Spitfire ·65 and has special tanking for inverted flying—which I haven't yet attempted, but certainly intend to try during the coming season".

FIG. 2



Here then is a description of Mr. McCullough's control system of Fig. 1.

RY.1 closes on every pulse from the transmitter, which at the same time pulls the rudder to right. This closes RY.2 which then takes one or two seconds to open due to the 50 mfd. condenser. This completes the left turn circuit so that the actuator is pulled left with Tx signal off. If no further signal is received for about two seconds, RY.2 will open and release the rudder. Also the escapement is energised while RY.2 is open. This escapement operates a fuel valve to give high and low engine speed, and fuel cut-off while the escapement is energised. While pulses are being received at the rate of 2½ or more per second, RY.2 will remain closed, and the actuator will flap right and left according to the mark-space ratio (signal on-off). If the pulses stop for any reason such as transmitter failing, or flying out of range, RY.2 will open stopping the engine, and releasing the rudder to be blown neutral. If the pulses are stopped for no more than half a second or so, the escapement will move half a turn to change the engine speed. When changing engine speed, it was found that the fuel cut off was so complete with the escapement energised, that it was difficult to skip the position and so a small balloon tank was fitted with a Tee connection in the high speed fuel line. This holds enough fuel to keep the engine running for about two seconds, giving time to get through the cut-off position. The fuel valve used is shown in Fig. 2, and is made from two pieces of brass tube, one a sliding fit inside the other. It is fitted so that high and low speeds are obtained in the de-energised positions, and fuel cut-off in both energised positions. The escapement is a two position, self neutralising type.

RY.1 is a specially wound E.C.C. 5a type, and RY.2 a Sigma 4F. The 3 ohm resistance balances the 3 ohm relay. The actuator is the double-acting "Birden" type (AM June, 1951) or could be Orton type (AM Sept., 1951) or Midget Motor type (AM July, 1951).

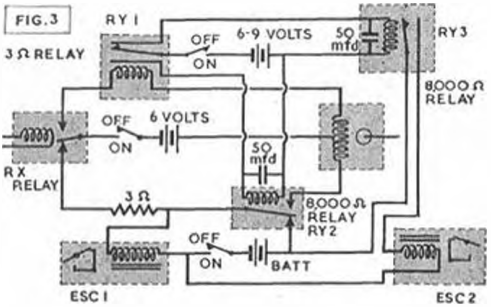
Mr. McCullough goes on—"During 1952 I used this set-up for motor control and elevator, both using either one or other on a flight, with motor shut-off always available in the energised position of the escapement, whether or not I was also using motor speed. I am now working up a revised and refined version of this type of control which will give simultaneous operation of motor control and elevator. This is done by making use of a full on signal as well as a full off, and having the pulse box limited on both sides. The original pulse box was fitted with a limiting stop so that on the left or off signal side, the pulses do not quite cease. A normally closed push button is used to cut the signal completely. When this is held on for half a second, RY.2 opens and kicks the motor control escapement one step, then pulsing is resumed".

Mr. McCullough did not send details of his latest system for operating two escapements in addition to the proportional rudder, but it does not seem a very difficult matter to add it to the first system. H.B. has drawn out a suggestion on these lines in Fig. 3. The back contacts of RY.1 are used, and will open with every pulse from the transmitter, and close with Tx off. If the signal is held on for a second or so, RY.3 will release energising the second escapement. This could be used for two positions of the elevator, say up and neutral. If up, down, and neutral were required, it would mean using a four-position escapement. Using a two-position escapement, self neutralising, it would be a simple matter to fit another fuel valve in the main supply to cut-off in the energised position. This would then stop the engine after about two seconds in the case of the receiver being jammed by another transmitter, and in fact any fault developing, other than in the escapement battery circuit, would result in a stopped engine.

A diagram of a suitable control box is shown in Fig. 4. Here the motor drives a pulse proportioner commutator which consists of a piece of brass tube, cut at an angle and mounted on a piece of insulation. The L.R. control lever slides across the cut edge of the brass tube, and makes contact for more or less of a revolution. The two stops prevent the lever going fully off or fully on. This operates the rudder. The push off button operates escapement 1 and the push on operates escapement 2.

Some time ago the writer thought up another scheme for use with a mark/space proportional rudder actuator. This is shown in Fig. 5 and uses a difference in pulsing speed. It was devised at the time experiments were being carried out in connection with Mr. Mahoney's scheme (AM Nov., 1952), RY.1 is the receiver relay and operates the rudder actuator A1. RY.2 is a low resistance relay that follows the pulses in the actuator circuit. RY.3 is a 2,000 ohm relay, VR.1 a variable resistance of 5,000 ohms and C.1, 10 mfd. B.2 can be 7½ to 10 volts. RY.3 will follow pulses as low as two per second, but not as fast as five per second. RY.4 is a 5,000 ohm relay and C.2 100 mfd., B.3 6 to 9 volts. With RY.3 pulsing, RY.4 will remain closed, which in this case holds the back contacts open. These contacts will close at high control pulse rates and energise the actuator A.2 which is shown as a governor type to hold the engine throttle open, when energised. The original idea was to use the contacts of RY.4 to change over the contacts of a two-speed contact breaker on an electric ignition engine. In this scheme then, low pulse rates give low engine speed, and high pulse rates gives high engine speed. It does not use an escapement, which the writer is rather averse to, since it would need to be wound, and these things usually seem to give trouble if either over or under wound.

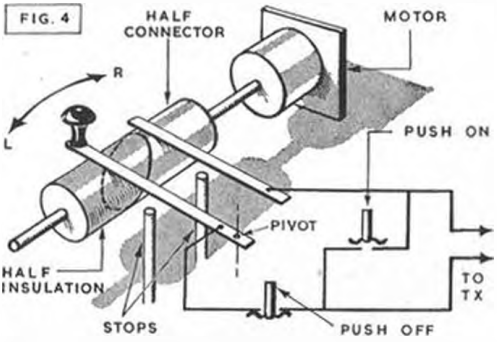
It might be possible to obtain something of a proportional engine speed control with pulsing speed, though it would mean experimenting with



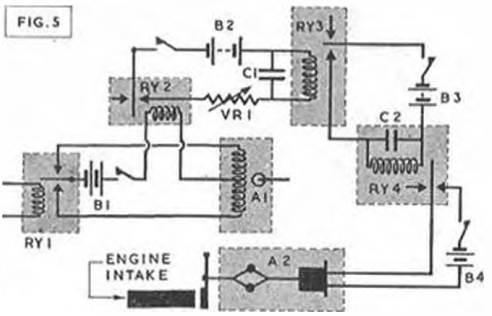
values for C.2 and B.3. The actuator could operate a throttle or needle valve.

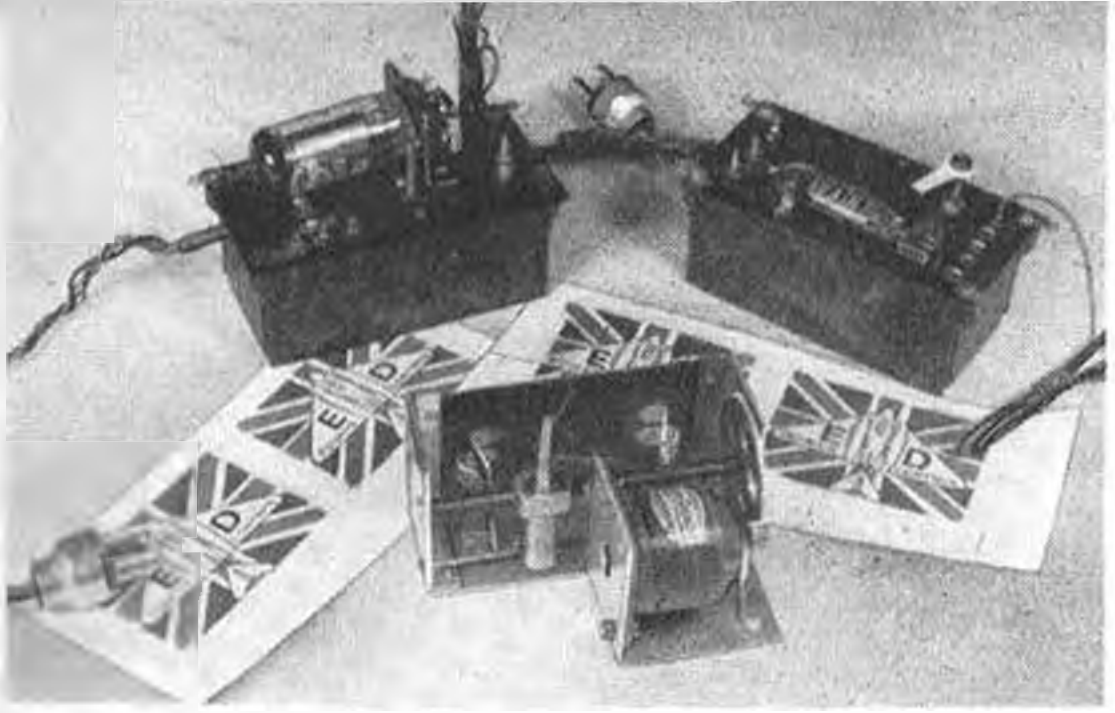
There are other schemes for operating a second control by means of different pulse rates, for instance a tuned reed could be used, but perhaps this is already enough for one month.

One last paragraph from Mr. McCullough—" I note in your January column that Mr. E. C. Sills



places a weight in the nose instead of increasing stab. incidence for flying in a wind. I have used this method also, and feel that it is the best way to meet the problem. My toolbox always has several sizes of lead weights for the wind contests—which seem all too frequent. At times I have flown an upwind cross country when no one else was able to."





Trade Notes

Purchase Tax

THE recent purchase tax changes have probably caused many modellers to wonder exactly what difference will be made to model supplies. Prices will, of course, go down, but only by a very small amount. An expensive radio outfit will show a noticeable reduction—the E.D. Mk. IV outfit drops by 25s. 0d.—but small kits will show little difference. The KeilKraft Eaglet, for example, will be reduced by 3d. Nevertheless, a few coppers saved here and there mean more models per £, and it is a hopeful thought that once reductions are commenced, the end of this iniquitous tax is brought considerably nearer.

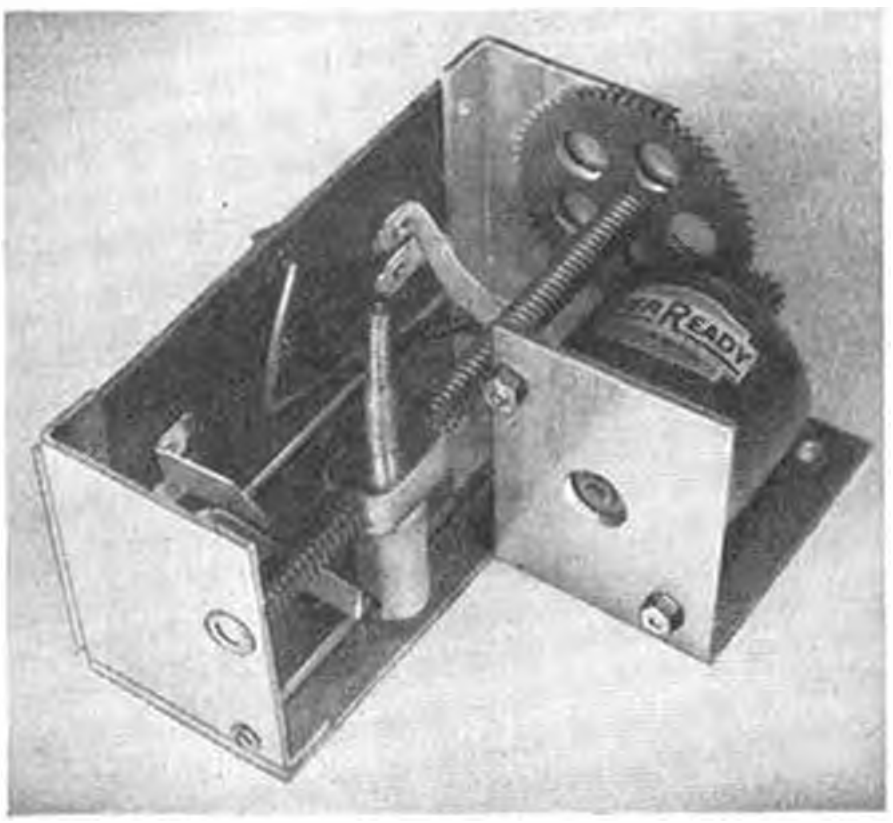
A rough guide to the new prices can be obtained by knocking 5 per cent. off the old tax-included figures.

New Radio Control Gear

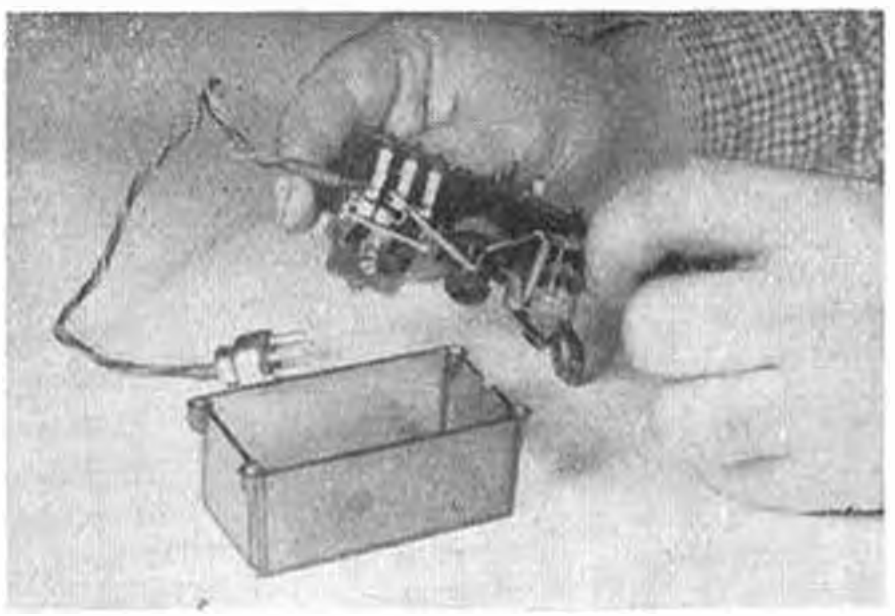
The name **ELECTRONIC DEVELOPMENTS (SURREY) LTD.**, usually abbreviated to E.D., needs no introduction to the average modeller. The latest products of this firm are up to the high standard we have come to expect, and are of particular interest to the radio neophyte. Pride of place is taken by the "Boomerang" radio control outfit, which is the answer to the novice's prayer in that it is purchased completely wired up, needing only connection to batteries. The receiver/escapement unit just has to be lifted out of the box, positioned in the model, and hooked up to the battery installation. The battery compartment in the box is put there solely for the benefit of the dealer selling you the outfit; all he has to do is connect up a set of test batteries to show you the set working before you actually buy it. A further interesting point is that the receiver is available with either "hard" or "soft" valves, and, in the latter case, five different aerial tappings are provided so that the aerial load can be changed to match the gradually decreasing sensitivity which is a characteristic of the gas-filled thyratron valve. E.D.'s are to be complimented on being the first firm to give the modeller a choice in this matter, and at a very reasonable price at that. The complete outfit (transmitter, receiver and escapement) costs just £11. 19s. 6d., or, without the transmitter, but with receiver and escapement all wired up, £6. 6s. 8d. Very detailed instructions ensure a successful "works first time" job.

Also introduced by the same firm is the E.D. Rudder Mechanism, a reliable proportional control unit intended for boats but also useful for larger aircraft. A jockey moves along a threaded bar which rotates when current is switched on; rotation is in either direction, which calls for reed selectors or a simple pulse system. Limit switches break the circuit at full rudder positions. Rudder movement is thus non-sequential and infinitely variable. Price is £2. 17s. 0d.

Good news for fuel fans is that E.D. Competition Diesel Fuel is in more plentiful supply. This brew



Heading shows "Boomerang" hard and soft valve receivers with E.D. transfers and new rudder mechanism. Left: Close-up of rudder mechanism shows principle of operation. Below: receiver comes in a neat translucent plastic case.



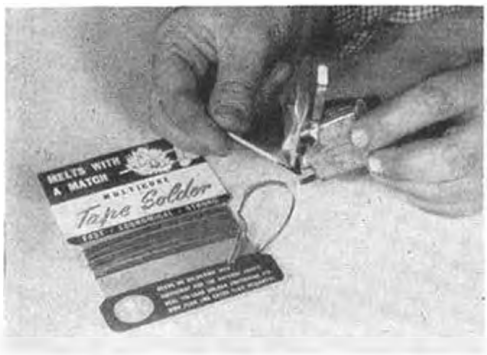
has for some time been a favourite among those who like to know their ether-content, and it remains one of the few commercial fuels requiring the addition of ether before use. It is unlikely, therefore, to go stale. Cost is 3s. 3d. per 8 oz. bottle. Another innovation by E.D.'s is a 2½d. Union Jack transfer overprinted with a futuristic aircraft and the words " E.D. Power Control ".

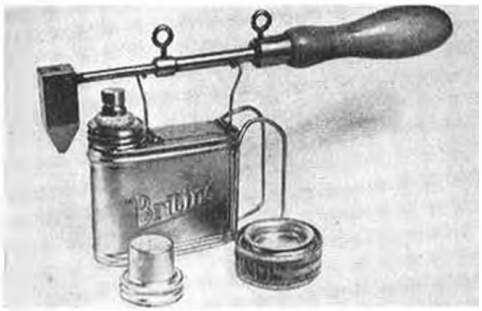
Big Wheels

Other eyes on long-felt wants are those of the **MODEL SHOP**, 3, Ridley Place, Newcastle-on-Tyne. That isn't a scale model Mills ·75 in the picture, merely a *large* pair of M.S. airwheels. Many big-model devotees have searched in vain for suitable wheels, and these 6 in. beauties should certainly fill the bill. Tyre diameter is 2½ ins., hub width 2¼ ins., drilled 8 s.w.g., but with allowance for reaming for larger axles if required. An inflation valve is sited in the wall of the tyre. 14¼ ozs. the pair may sound heavy, but after handling these wheels it seems a very reasonable figure and one which can well be afforded on models of 8 ft. or so span. For the cost of £3. 10s. 0d. the pair, plus an Anderson Spitfire and a few bits of tube—anyone want to buy a motor scooter ?

Towards Neat Soldering

Turning to construction and repair work, we first have an example of aeromodelling's contribution to general progress. The new tape solder produced by **MULTICORE SOLDERS LTD.**, originated when a member of the firm saw an unknown aeromodeller hammering cored solder flat in order to carry out a field repair. It melts in a match flame that way—easy, isn't it ? Tape solder is virtually the same as the aeromodeller was using—cored solder rolled flat—and is invaluable for field and radio repairs, as well as being extremely handy to use on the normal workbench. Just wrap it round the joint and apply heat. A card for 100 normal wiring joints costs 1s. 0d. only.





For heavier soldering jobs, a nifty gadget is marketed by **BI-METALS (BRITINOL) LTD.**, 1, Balfour Mews, Bridge Road, London, N.9. This is a midget pocket blowlamp which uses methylated spirit and throws a 5 in. flame. Ideal for bigger field jobs, the blowlamp has an accessory in the shape of a telescopic soldering iron which opens from 5 in. to 12 in. and which can be heated on the special folding rests attached to the lamp body. To round out the picture, " Britinol " solder paste is available ; this paste combines flux and solder and is simply smeared on the joint and heated. Prices are : blowlamp 7s. 0d., telescopic iron 6s. 6d.

Getting a Grip

Something for the C/L fan is offered in the form of a new one-piece handle cast in aluminium. Manufactured for wholesale distribution by **A. A. HALES LTD.**, and moderately priced at 4s. 1d. including P.T., the handle has a very nice finish and is simply but sensibly designed. One useful feature is the increased length of the lower horn, which brings the line attachment holes vertical when held in a normal manner.

Top right: The flame from the " Britinol " blowlamp plays directly on to the head of the soldering iron when in operation. Leak-proof screw cap for lamp is seen in foreground.
Left : Soldering the filler pipe in a stunt tank, using Multicore Tape Solder. The solder is already beginning to run in the heat from an ordinary match-flame.
Right: The handy size and convenience of the Hales control-line handle will appeal to many C/L fliers.

Readers' Letters

Bowden Replies

I was disappointed to find that my article on slots and related devices merely drew two thoughtless and destructive letters in the March issue of the AEROMODELLER. I had hoped that we would hear of constructive practical tests, and conclusions drawn, by modellers who had really delved into the subject in a practical manner, from which we might learn something to stimulate us to further efforts, which is the heart and soul of model flying. Instead I find two scribes falling over themselves in eagerness to prove that everything I wrote was nonsense. This unseemly eagerness evidently prevented them from reading my article properly, and led them into the trap of making a lot of wild assumptions upon which they based their attack.

Space is limited, but let us examine a few of the more glaring indiscretions.

(1) Mr. Barker produces a thinly veiled sneer at my quoting certain " full-sized " designers of note. If he had read my article correctly, he would have grasped that these men of great experience in the aircraft industry (inestimably greater than anything Mr. Barker has achieved as far as I am aware), started their slot experience, and measured results, on *model wings of 3 ft. 6 ins. to 5 ft. span*. I quoted these factors. Such astounding conceit as evidenced by Mr. Barker, would give the aeromodelling movement a poor name, if it were not for the fact that such utterances are confined to a very small minority of very raw and young aeromodellers in most cases. Mr. Barker goes on to assume that I have, to use his own words, " tried like many writers before him to apply full-sized aircraft design to models ". In actual fact, quite apart from the interesting full size comparisons, which mate up with model work, that I remarked upon, I started using slots on model aircraft around 1935 or 1936. Since then I have built several hundred models of every form, including circular wings, tailless deltas, etc. for waterplanes and landplanes, *and on most of these models I have used slots in some form or other*. I have flown these models control line, free flight, and by radio. I have tried comparative tests by sealing the slots, by over-elevating, under-elevating, and flying at different angles of attack, and with a number of varying wing sections. I have also observed smoke flowing over varying arrangements of slotted wings in my little Lippisch wind tunnel. All this sounds rather tedious, but surely it shows that full sized aircraft have had little to do with the matter as far as I am concerned, except that I used to pilot the things, and still retain sufficient sense, Mr. Barker, to take an interest in what full-size designers do, because I happen to appreciate that they often use models (particularly in America) and that they know their job far better than most young modellers do ! For one thing they have resources that aeromodellers can scarcely command.

The wings that I have tried with slots have had wingspans from 32 ins. to 10 ft.—all have reacted to slots, the larger the wing the more effective, presumably due to " scale effect ". And of course I have used washout tips, different section tips, and end plates. Mr. Barker should know, if he follows model aeronautics with intelligence, that a number of really well known British aeromodellers have used slots on landplanes, flying boats, and soaring sailplanes with success, and also that such well known American names, like Mr. Charles Hampson Grant the writer, and Mr. Gene Foxworthy the radio king have found slots give great stability on power model aircraft.

(2) In spite of the Barker tirade, I certainly do think it is bad designing to let one wing on a model inadvertently drop by stalling, followed by a spiral path to earth, so often seen during duration competitions, and most modellers of experience clearly recognize the difference between a wing dropping when stalled, and one dropping under control in a properly banked turn.

(3) Mr. Barker sneers at the mention of a boat. But a sailing boat has an allied interest in airflow. If our minds adhere rigidly to the narrow confines of one subject all our lives, we lay the foundation stone of becoming a crashing bore to ourselves and others. If Juan de la Cierva had not observed the windmill in action, it is probable that the autogyro's development would have taken longer and the progress of the helicopter would be less advanced today. It is because of the kindred interest in aerodynamics that the modern streamlined cars are discovering that steering loads caused by an angle of attack to a cross wind are necessitating a change in side areas, to control shifts of centre of pressure. This winglike lift on a streamlined car

"Ghoul III", the crescent-wing tailless model which carried for designer M. M. Gates, the lightweight tailless record in 1951. On the opposite page is shown the large delta model referred to in Colonel Bowden's letter.

section will change the future shape of swift cars.

(4) Turning to Mr. Gates, who has made exactly the same erroneous assumption, in this eagerness to make his leading points. I note he says that my "Misconceptions, and conclusions are all a result of full-scale tests without making any comparative tests of wings with and without slots, washout, etc." Well, well, we need not say any more on this, nor about the only method of wingtip control advocated by him, in the form of washout, other than to remark that every modeller, including myself, has used washout, and understands its virtues and limitations. But some of us also like the fun and variety of escaping from the Gates rut, for we recognise there are other methods of wingtip control worth trying, and I am always much struck by the variety of model aircraft shown by modellers in the pages of the AEROMODELLER.

(5) Regarding drag at high angles of attack and slotted wings. Once again Mr. Gates, do please read my article, and you will find this matter carefully laid out and summarised. *There is a decrease of drag at large angles of attack with slots open!*

(6) How foolish to denounce delta forms for tails or for any other purpose *without actually trying them in practice.* It happens to be one of the shapes of the future. Even Mr. Gates will learn something, I feel sure, if he will obtain and look at the published photographs of MODEL DELTA WINGS of differing form being tested at varying angles of attack in the wind tunnel, with their interesting flowing tufts of wool. We have a lot to learn about delta shapes for varying purposes including, dare I mention the fact, sailing boat wingsails! I am finding that to be true on my large delta model aircraft, photo attached.

(7) In conclusion, once again Mr. Gates is wrong. I have not given up elliptical wings. The bulk of my models sport this form. but I selected two photographs of rectangular surfaces for that much bated article, to illustrate endplated wings and tails!

Bournemouth. C. E. BOWDEN.

The Dear Dead Daze

DEAR SIR,

The outbreak of "Bowden baiting" in the March number is interesting, because it shows how much we aeromodellers have changed during recent years.

Time was when the Colonel's article on slots would have caused the "Readers' Letters" page to buzz with accusations, equations, denials and formulæ to prove the lot—shades of 1947, when the Colonel "did not even attempt the labour of reading Mr. Chandler's figures!"

Messrs. Barker and Gates reveal the new attitude in their calm, well-reasoned letters, devoid of all mathematics. They do, however, like many Bowden correctors before them, fail to appreciate the fact that Colonel Bowden is one of those old fashioned people who actually enjoy flying model planes—in other words, a sometimes reactionary, but nevertheless very enthusiastic modeller with vast practical experience. This, surely, is obvious from all his writing.

When did the formulæ craze finish? The last peppery letter I can trace is in the April 1948 issue, where a Mr. Elliott goes to town in no uncertain manner over an article by the slide rule king of the day, J. Halifax.

My own explorations in the field of mathematical theory ended in 1946 when I learnt from a well-known aeromodelling textbook, now considered heretical, that the mass density of air was ·002378 slug per cubic foot, and that the kinematic viscosity of same was ·00016.

Perhaps the sight of post-war small boys casting screaming power models aloft with reckless abandon made us realise that we were taking ourselves too seriously.

York. ANTHONY M. FINUCANE.

High Finance

DEAR SIR,

I view with some disturbance a recent editorial paragraph in your contemporary, "Model Aircraft", which states that that magazine has "*supported the Society (S.M.A.E.) financially to the extent of nearly £3,000 since the end of the war*". I feel that this is misleading since, if my information is correct, this sum is very largely composed of the actual purchase price of the magazine when it was sold to the present owners by the S.M.A.E., and can hardly be considered as an unencumbered donation.

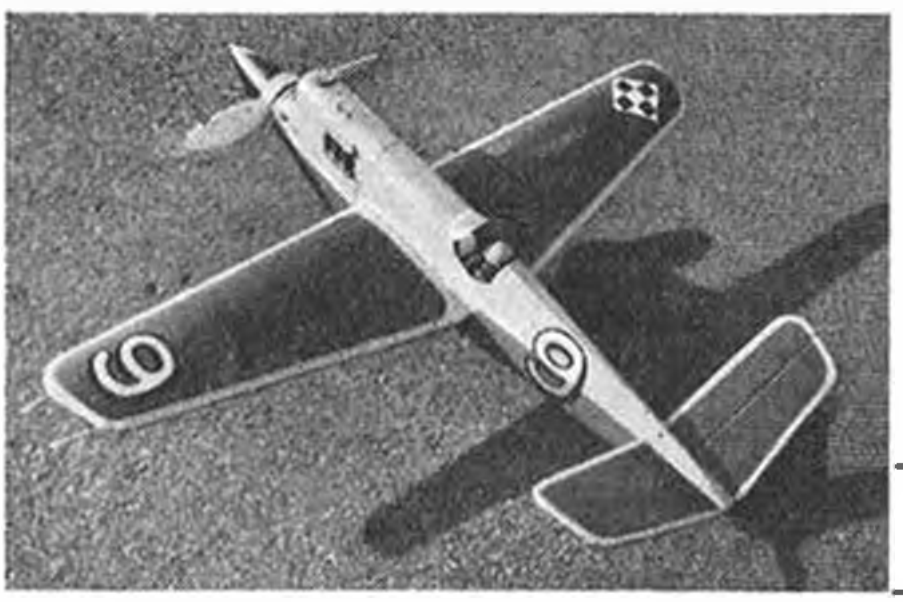
If this is the case, your magazine would be doing a service to modellers by correcting any false impression created by this misleading statement.

Whitstable. E. BURCHETT.

(Correct! It may be of interest to readers to learn that the AEROMODELLER supported the S.M.A.E. financially for a considerable period during the war by actually paying for the printing of MODEL AIRCRAFT *at that time the domestic publication of the Society. Since the war, we have made substantial cash contributions to funds raised for various S.M.A.E. purposes.—ED.)*

SCOTTISH PAGE

IT looks like aeromodelling is literally spreading from Land's End to John o' Groats. Scotland is keeping its end up, anyway, as we have word of a new club at **WICK**, in Caithness. They seem to be contest-minded too, as the West of Scotland Area has had an enquiry from them regarding S.M.A.E. affiliation. Here's wishing the best of luck to what must be the most northerly club in the U.K. Now here's some news from **GLASGOW M.A.C.** on the club's competition for Concours d'Elegance. There were quite a number of fine machines on show, but the three judges all awarded highest marks to Joe McMaster for his superb scale "Chipmunk". This McMasterpiece was very carefully built, and had a great deal of intricate detail, and so Joe collected the Colquhoun Cup to add to his accumulation of silverware. On March 8th the club Glider Championships were run off in conjunction with the Pilcher and Gamage entries. As Abbotsinch, the club's home flying pitch, is out for free flight, competitors had to travel to Lanark, and this was partly responsible for the low entry. The club Glider Championship was flown to the 50 metre line and 3 minute max. rule. The results were: W. McConachie, first; R. Taylor, second; and W. Meechan, third. Other news from G.M.A.C. is that they are losing several valuable members to H.M. Forces. **LANARK M.F.C.**, the **BARNSTORMERS**, and **G.M.A.C.** have been holding fairly regular slugging matches on Lanark Golf Course, with the G.M.A.C. fairly regularly winning them. Here we have the results of the latest conflict: Glasgow Model Aero Club, first; Glasgow Barnstormers, second; Lanark M.F.C., third. Barnstormer Alec Clark won the power event, with a total of 6 : 34, R. Taylor led in the rubber with 7 : 13 for G.M.A.C., and Bill Meechan, G.M.A.C. again, won the glider event, scoring 8 : 47. The Ayrshire Aeromodellers Association team races are to be held at Heathfield on June 28th, so roll up you Ayrshire bods.

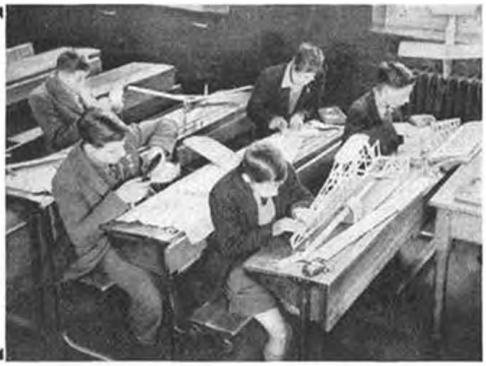


The first S.M.A.E. Area "do" had a great attendance at Heathfield, the **WEST OF SCOTLAND AREA** venue for the S.M.A.E. Cup, the Farrow Shield and the Women's Cup. Sixty entries was the grand total, a fairly large proportion being entries for the Area's eliminators for the U.K. Challenge Trophy. These were flown in Glider and Rubber, with the Irvine Club shooting into the top glider placings, and G.M.A.C. sharing honours with Prestwick in the rubber. In the S.M.A.E. Cup, Irvine again led, Dave Brown's "Jader" clocking 10 : 28, but T. Menzies wasn't far behind with 9 : 54. Brian Harris of Prestwick M.A.C. had the Area's top time in the Farrow; R. Sleight, also Prestwick, was second. The most commendable model in the rubber event was W. N. Cliff's "Dreadnought". Fully geodetic, this O.D. Wakefield was beautifully constructed, but unfortunately out of flying trim owing to some fault developing in the prop assembly. Mrs. Bob Dunlop struggled valiantly in the Women's Cup with her glider. The model has as good a glide as any other on the field, but wasn't getting much initial height on the tow-line, apparently being more used to breezier flying conditions than the flat calm which prevailed at the contest. The too-perfect flying weather brought out scores of flyers from near and far, and models of all classes, usually cached in boxes or under buses for protection against our usual gales 'n rain, were littering Heathfield's runways. Some fine examples of workmanship were seen from the bevy of flyers who turned up for a day's flying fun, ranging from a beautiful "Junior 60" belonging to the Ballochmyle Club to a nice line in control-line stunt by Alan Muir of Galston M.A.C. Gordon Richmond of Prestwick M.A.C. also turned up with a selection of his natty scale and semi-scale control-liners. Getting back to the contest area, though, something definitely worthwhile mentioning was Comp. Secretary Bill Meechan's portable score sheets. As results came into the contest control point, competitors could check their round-by-round positions during the contest. Though simple in operation, the system must have taken a considerable amount of thought to develop, and is certainly a credit to Bill and his colleagues who worked it out.

MAC.

Team racer by W. B. Bremner of Wick M.A.C. (most northerly club in the British Isles) has an Elfin 1·48 and would fit into ½A class rules suggested on page 334

CLUB NEWS



Taste of things to come? Pupils of the Peter Webster Sec. School, Chesterfield, make models partly in school time, a system which should be adopted at all schools.

ONE or two news sheets from northerly regions are again plugging the "They get better weather in the South" angle. We've often wondered how much truth there is in this, so we consulted an ex-Air Ministry Staff Officer whose job entailed, as an incidental, a study of the weather in various parts of the country. This R.A.F. bod., a keen modeller, says that in his experience, the average of flyable days in the North far exceeds that in the South, and, though chances of rain are slightly more up North, wind is more likely to pop up down South. This bears out our own experience, the best season's flying weather we recall being in Northumberland, and the next in Yorkshire. Worst were in South Wales and Kent. Further evidence is offered by full-size gliding clubs, which actually *want* wind; these are notorious for their inaccessibility, yet roughly 60% are in the southern half of the country.

The astonishing (and universal) weather conditions experienced for the early comps. this year carried on till Easter, so that the "Farrow Shield", "S.M.A.E. Cup" and "Women's Cup" were held under tolerable conditions. Came Easter Sunday, however, and down it came—the "Flight Cup" and "Hamley Trophy" were very nearly rained out, except in the North! Such, we suppose, is life.

Midland Area

Superb conditions obtained at Long Marston for the "Farrow Shield" and A/2 Eliminator on March 22nd. Lift was patchy, and **SOLIHULL M.F.C.** managed 22 mins. aggregate for their four-man team, a disappointing time since the first flight had seemed an easy maximum. What happens when towlines cross and a fouled model returns a max.? Timers recorded a no-flight, but it seems rough luck that E. Hanson, the entrant to whom this happened, didn't have an option in the A/2 Eliminator.

Final winners in **LEICESTER M.A.C.'s** "Mentor" competition proved to be D. Hall (sen.) and J. Wakeling (jun.). Brewin lost his o.d. sailplane at Rearsby, when it D.T'd in front of a taxying Auster and, not surprisingly, was written off.

WEST COVENTRY M.A.C. members are keeping an eye on junior D. Humphries, whose fully detailed Luscombe "Silvaire" walked off with the "Victor Ludorum Trophy" at the recent club concours. D. Dudley, H. E. Moore and H. Hopkins kept the senior flag flying by taking firsts in Power, Glider and C/L, respectively.

Allen's Cross Sports Ground is quite a Sunday morning centre, when **SOUTH BIRMINGHAM M.F.C.** act as hosts to nearby clubs. This season is to be devoted to coaching juniors, and a scheme to supply plans and adequate materials to impecunious youngsters is in operation. Well done—juniors can be a nuisance if not bludgeoned now and then, but they are, after all, the source of future club members, though it takes a far-sighted club to see it.

A concert party within the membership of **COVENTRY D.M.A.C.** helped the recent social evening, which everyone thoroughly enjoyed. J. Coplin placed 4th in the Area A/2 results (3 maxs. and 2 mins. plus) and Brian Roberts was 2nd in the individual "Farrow" results, flying a "Supa Dupa", which helped the club team to aggregate 26 : 06.

Southern Area

McPhee of Reading club returned best A/2 time of just over 13 mins. at Andover on March 22nd. A. Brooks and P. Hall, both of Grange, tied for second with 12 : 58. Few maxs. were returned in the "Farrow Shield", and Grange's total of 26 : 00 proved highest.

WEST HANTS. A.A. continue to publish their extremely good club magazine which includes art work despite the fact that it is produced on typed stencils. The trend at the moment is towards R/C, and several members are already flying under radio (or at least, Mr. Squires, with radio on board?). A "Falcon", an "Eros" and two "Electras" are on the way. Cliff Edwards established a new club glider record recently, losing the model ("Bitsa") at 13 : 37 o.o.s. The model was returned, to fly away again in the club open comp., which was won by Jean Wheatley with 4 : 17.

The **BOURNEMOUTH M.A.S.**, near neighbours of the West Hants., are also maintaining a first-class monthly journal, which includes very informative and clearly written articles by aerodynamicist Dick Hirdes. The club is well pleased with progress, every type of model being extensively covered, with the sole exception of rubber jobs.

Wednesday evenings sees the **FARNBOROUGH M.A.C.** meeting in the Scout Hut behind the North Camp 'bus shelter, and new members will be welcomed. Fine progress is being made in this recently formed club.

Western Area

George Woolls reports that **BRISTOL & WEST M.A.C.** is beginning to regain its pre-war status. Half the total entry in the Area A/2 Eliminator was made by this club, and J. Viner's "Satu" led the field.

***DON'T YOU DARE!** Dennis Lees looks quite worried when his Wakefield drops a wing during launch at Rufforth. Fortunately the wing didn't drop too far, and model got well away in the first round of the Weston.*

London Area

Chobham Common saw great activity on the 22nd, although mist cut down visibility and persisted all day despite a moderate breeze. **CROYDON D.M.A.C.** members put in some good flying, J. North heading the A/2 list with 13 : 00 from his three year old model. E. Bennet tried the new max. idea for size when he did three threes, a five, and 3 : 40 with his 300 sq. in. job in the "Farrow". Messrs. Albone, Palmer and Marcus each approached treble-maxs. to give Croydon a score of 35 : 25.

The **CRUSADERS M.A.C.** (Gravesend A.C. that was) have finally found a reasonable ground—across the Thames! Bad weather napoo'd the "Hamley" etc., but March 29th saw M. Keary win the club power comp., ratioing 6·6 average.

ENFIELD D.M.A.C. had an idea which may interest other clubs. The local Gas Council arranged for their Mobile Film Unit to give a show (90% aeronautical, from the Shell Film Library), the only string being that an audience of at least thirty should attend. Fifty saw the 2½ hour Enfield programme.

A handicap glider event is being tried by the **HORNCHURCH M.A.C.**, up to 200 sq. ins. total area receiving a 60 secs. bonus, 200–300 40 secs., 300–400 20 secs., 400 to A/2 starting scratch. Should prove interesting.

Hounslow and Chobham retrieving comes as a blow to **NORTHERN HEIGHTS M.F.C.** members grown used to bowling down Fairlop's runways in a "car". A club glider design for quick building is stimulating a lot of discussion. latest figures arrived at are 50 × 6½ in. wing, 36 ins. 25% tail and 5 oz. weight.

A "ferocious" wind upset the first Area inter-club events; **BYPASS MODELLERS (Sutton)** won from **PARK M.A.C.** by 10 : 00 against 0 : 26, but most models were unable to finish their flights. K. Smith's 50-50, 6½ oz. 200 sq. in. 2 min. motor run rubber job D.T.'d at 3 : 15 for the day's best flight.

Northern Area

Rufforth featured excellent conditions for the Area meet, and 68 entries flew in the S.M.A.E. Cup. R. Adshead of Halifax returned 16 : 42 for best time, and Leeds aggregated 29 : 51 in the "Farrow Shield".

J. Pannett of **BRADFORD M.A.C.** had timer trouble with his "Mallard", which spiralled upwards for 2¼ mins. It D.T.'d almost immediately, but a five-hour search (this character has patience!) failed to locate it. Within minutes of giving up, a R.A.F. pilot rolled up with it, having spotted it from the air, landed, and collected it in his car! In the "Hamley Trophy", S. Lanfranchi's "Hogan" turned in 7 : 56 despite a cold and gusty wind, while C. P. Miller raised 6 : 50 with a Wakefield in the "Flight Cup".

Interesting models at the recent **WORKSOP CLUB's** exhibition included a twin Jetmaster powered GA/5 by J. Saunders, a huge Amco-engined Superfort by H. Clegg, and the concours winner by P. Russell, a twin E.D. 3 : 46 Siebel 204D with full internal detail, electric retracting u/c, and so forth.

North Western Area

June 14th is the date of the Woodford ("Daily Dispatch") Rally, and two-flight contests under the new flight rules will be the order of the day. Events will otherwise be unrestricted. The "Eddie Riding" Trophy (F/F Scale) and T.R. Comps. will be as usual and combat on 50 ft. lines may be introduced.

"Farrow" entrants from this Area found lots of lift, no fewer than 22 maximums being recorded. Harrison (folder) and O'Donnell (featherer) both had treble-maxs., the former producing a further 3 : 54 to top the individual list. Confusion over line length resulted in A/2 fliers using 164 ft. lines while the rest of the country used 328 ft.

MILLOM M.A.C. got together with the **HAVERIGG** club for a Cumberland field day on Easter Monday. A full programme is lined up for the season, and nearby modellers and clubs are cordially invited to get in touch in order for some get-together meets to be held.

News of progress comes from the recently formed **HYDE M.A.C.** Two interesting models are a 5cc powered o.d. Aeronca "Sedan" with R.C. and a pendulum-controlled "Junior 60", by "Professor" Shorter and R. Wilson. A public show is to be given in the local park during Coronation Week, when any C/L fliers willing to lend a hand would be most welcome.

T. Smith of **BLACKPOOL & FYLDE M.A.S.** scored a nifty treble-max. and a 5 : 27 fly-off in the "Hamley". Reasonable success is reported by this club at Tilstock in the A/2, two members placing in the Area's top six; only one man showed up with a rubber job for the team rubber, however.

WALLASEY M.A.C. have a heavy session of C/L displays at Coronation fêtes this year, first of which is on June 6th at the New Brighton Rugby Ground. Rockets and radio are receiving attention in this club.

Folding wings have plagued Wakefield fans in the **SALFORD M.A.C.** but the glider boys seem to be

CONTEST CALENDAR

May	23-24	**BRITISH NATIONALS.** Centralised, R.A.F. Waterbeach, Nr. Cambridge.
June	7	**WAKEFIELD & POWER TRIALS.** Centralised, R.A.F. Digby, Lincs.
	13-14	**World C/L Championships.** Milan, Italy.
	14	**North Western Area Rally.** Woodford.
	21	**Kell Trophy, Frog Junior Cup.** D/C.
	28	**Slope Soaring Contest.** Clwyd Hills, N. Wales.
July	3-6	**International C/L Stunt, Speed, Knocke,** Belgium.
	5	**SUPER SCALE TROPHY, BOWDEN TROPHY.** Centralised, Halton, Bucks.
	12	**Northern Heights Gala Day.** Langley.
	19	**C.M.A. Cup, Frog Senior Cup.** D/C.

holding their end (nose end ?) up. L. Batty's consistent "Odin" placing 4th at Tilstock. A 9 ft. version of this model is on A. Harding's bench, and should provide interesting comparisons.

A 5 sec. motor-run and a large bump produced a 17 min. o.o.s., 37 min. total, flight for R. Shaw of **URMSTON D.M.A.C.** Another record flight was 10 : 11 by A. Batley's glider, beating the month old record set up with the same design by Miss E. Whiston. This young lady beat twelve other entries in a 15 min. scramble event by aggregating 7 : 14 with her glider, 43 secs. better than G. Gamble's second place.

Yet another club in the Manchester region is the **SHARSTON D.M.A.S.**, members of which favour either A/2s or 36 in. lightweight gliders. The club has exhibited recently in a large store and at the Northern Models show.

North Eastern Area

The **NOVOCASTRIA M.A.S.** meets weekly at 11, Loraine Place, Newcastle; membership stands at 40, and flying takes place regularly on Town Moor. Two power duration contests with the **TYNEMOUTH** club have resulted in a win for each, and more of these inter-club competitions are anticipated. A Coronation Rally will probably be held on Town Moor.

South Midland Area

The Area held its first 1953 meeting at Chobham Common on March 22nd, when slight mist upset timing. Leader of West Herts. Group returned best A/2 times out of 19 entrants, aggregating 10 : 27. Luton club raised 24 : 47 for top "Farrow" time in this Area.

A new club, the **REBELS M.A.C.**, has started off well with 28 members attending twice-weekly meetings. Flying takes place at Chobham Common (14 miles away) and modellers mentioned for consistent good flights are K. Young ("Debutante"), A. Clements ("Skylon"), J. Benson ("Hobo") and B. Wilson ("Senator").

East Anglian Area

The "S.M.A.E. Cup" saw a good attendance at Waterbeach, with 55 A/2 fans flying. Belfairs member M. Power headed the result sheet with 17 : 38. In the "Farrow", Belfairs again led with a 28 : 15 total, and the same club also produced the top Area time in the "Women's Cup" with Miss P. Healy's 7 : 55—37 secs. less than her flight time in the actual A/2 Eliminators.

Newly formed, the **WARE D.M.A.C.** covers most types of models with its nine keen members. Wednesday night is club night, meetings being held in a room opposite Ware Fire Station, anyone interested is welcome; a small exhibition and C/L demonstration is being arranged for the town's summer fête.

NORWICH M.A.C. have run a concours comp. for junior members, with a novel twist in that all models had to be accompanied by a carrying box. This to encourage juniors to make themselves boxes. An anonymously presented Yulon 29 was first prize, won by J. Rant with an o.d. Wakefield.

CAMBRIDGE M.A.C. are having their second team-race rally on August 9th, and the programme will include combat (r.o.g., 42 ft lines, no other restrictions), A and B racing, plus an event for ½A T.R.'s—35 sq. in., ·9 c.c. (which includes the "Bee"), 30 ft. lines, 7·5 c.c. tank, 2½ in. minimum fuselage depth at cockpit, minimum pilot's head height ½ in. Full details from A. Corill, 78 Eastfield, Chesterton, Cambridge.

Ireland

High winds and steady rain sabotaged the 1st Irish Open C/L Championship on April 11th, Begorrah. All events except "A" team racing were scrubbed, and will be held later in the year. "A" winner was J. Thompson of Dublin S.M.E.E. flying an o.d. "Jystin Time" averaging 35 m.p.h.; "Black Chiffons" placed second and third. 250 soaked spectators saw four streamer-cutters in one circle—until all four 'planes crossed lines . . .

The M.A.C.I. 8-page "Flying Times" is a well written and newsy little booklet well worth its price of 2d. per issue; extracts tell us that W. Redmond (Phoenix) has just completed his 11th "Jaded Maid", that £150 was made on the 2nd National Exhibition in Dublin's Mansion House, that A. Noonan (Shankill) has flown an Eta 29 job at 112·8 and that W. Brazier holds the National ratio record with 40 : 1. Dublin Club ran a 30 min. scramble recently, with astonishingly close results: J. Carroll (Dublin) 10 : 56·5, J. Thompson 10 : 56, M. O'Regan (Phoenix) 10 : 45. The last named later put up an unofficial 20 min. flight with his "Tomboy".

Clubs interested in talks and able to borrow a 35 mm. projector should investigate the illustrative filmstrips published by Educational Productions Ltd., 17, Denbigh Street, London, S.W.1, who will supply a free catalogue on request. The sample we have seen deals in 43 fascinating frames with the "Early History of Flight" (No. 5031) and is accompanied by a well-written booklet covering each illustration in detail.

Correspondents in this country are sought by 12 year old A. J. Prieve, Grammar School, Toowoomba, Queensland, Australia (aeromodelling and sport) and Richard Piccola, 233, First Avenue, New York 3, N.Y., U.S.A. (wants English diesels and R/C gear).

Finally, W. J. Boase, of 4, Bolitho Road, Heamoor, Penzance, Cornwall, is anxious to form a model club in that district. Interested parties please contact.

That's it for this month. Cheers.

The CLUBMAN.

SECRETARIAL CHANGES

WELLINGBOROUGH M.A.C.
G. Longstaff, 16, Link Road, Rushden, Northants.
NEWPORT PAGNELL M.F.C.
C. E. Read, 19, Union Street, Newport Pagnell, Bucks.
COWDENBEATH M.F.C.
J. Macari, 35, Kirktown Park, Ballingry, Fife.
CANTERBURY PILGRIMS M.F.C.
V. J. Mount, 115, Northgate Street, Canterbury, Kent.
NORTHERN HEIGHTS M.F.C.
A. T. Widgery, 19, Wellside Close, Barnet, Herts.
CHESTERFIELD SKYLINERS M.A.C.
K. C. Wigglesworth, 12, Swaddale Avenue, Tapton, Chesterfield, Derbyshire.
PONTEFRACT & CASTLEFORD M.F.C.
R. Marshall, 1, Wilson Street, Northgate, Pontefract.
WEST COVENTRY M.A.C.
C. G. Baker, 163, Broomfield Road, Coventry.
COVENTRY D.M.A.C.
A. J. Barr, 36, Stevenson Road, Radford, Coventry.
BATH M.A.C.
J. Dixon, 33, The Tyning, Widcombe Hill, Bath.

NEW CLUBS

SCOUSERS M.A.C.
H. W. Worthington, 10, Monk Road, Wallasey, Cheshire.
REBELS M.A.C.
J. A. Benson, 37, Furze Platt Road, Maidenhead, Berks.
WITNEY D.M.A.C.
A. H. Pitt-Pulford, 25, Market Square, Witney, Oxon.
NOVOCASTRIA M.A.S.
Major A. A. Valentine Cockle, 22, Cochrane Park Avenue, Heaton, Newcastle-on-Tyne, 7.
WARE & D.M.A.C.
E. D. Barks, 20, Post Wood Road, Ware, Herts.
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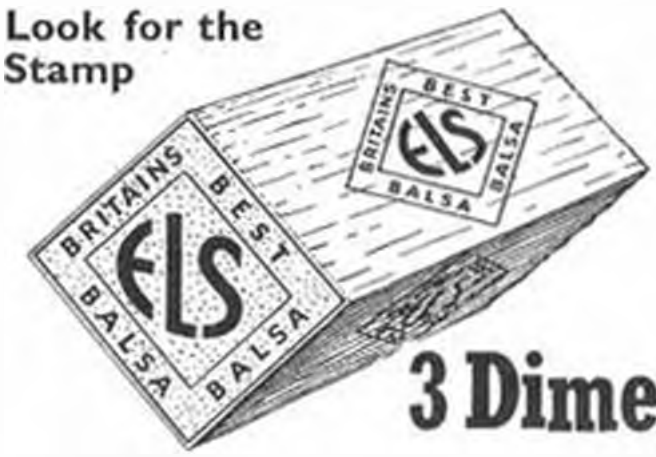

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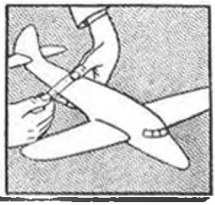

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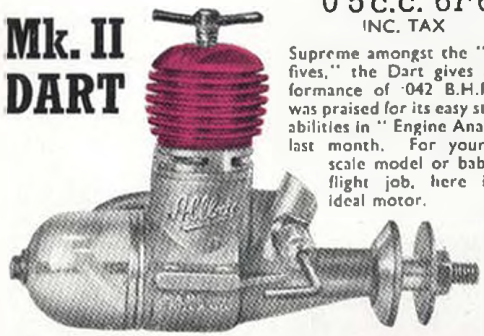

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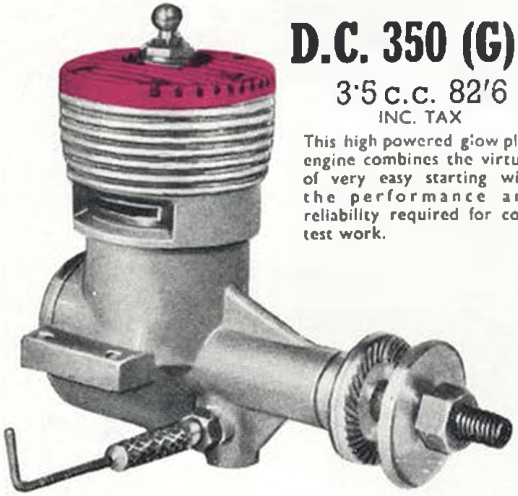

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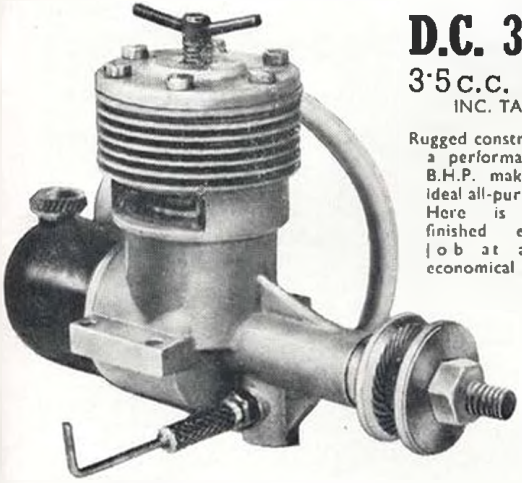

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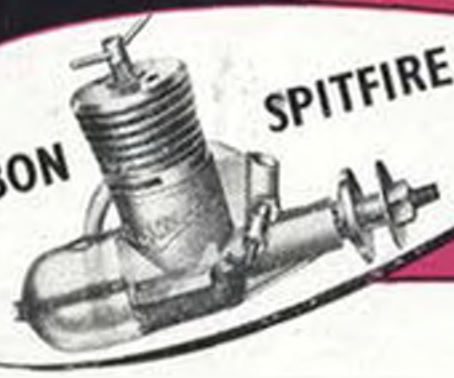

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