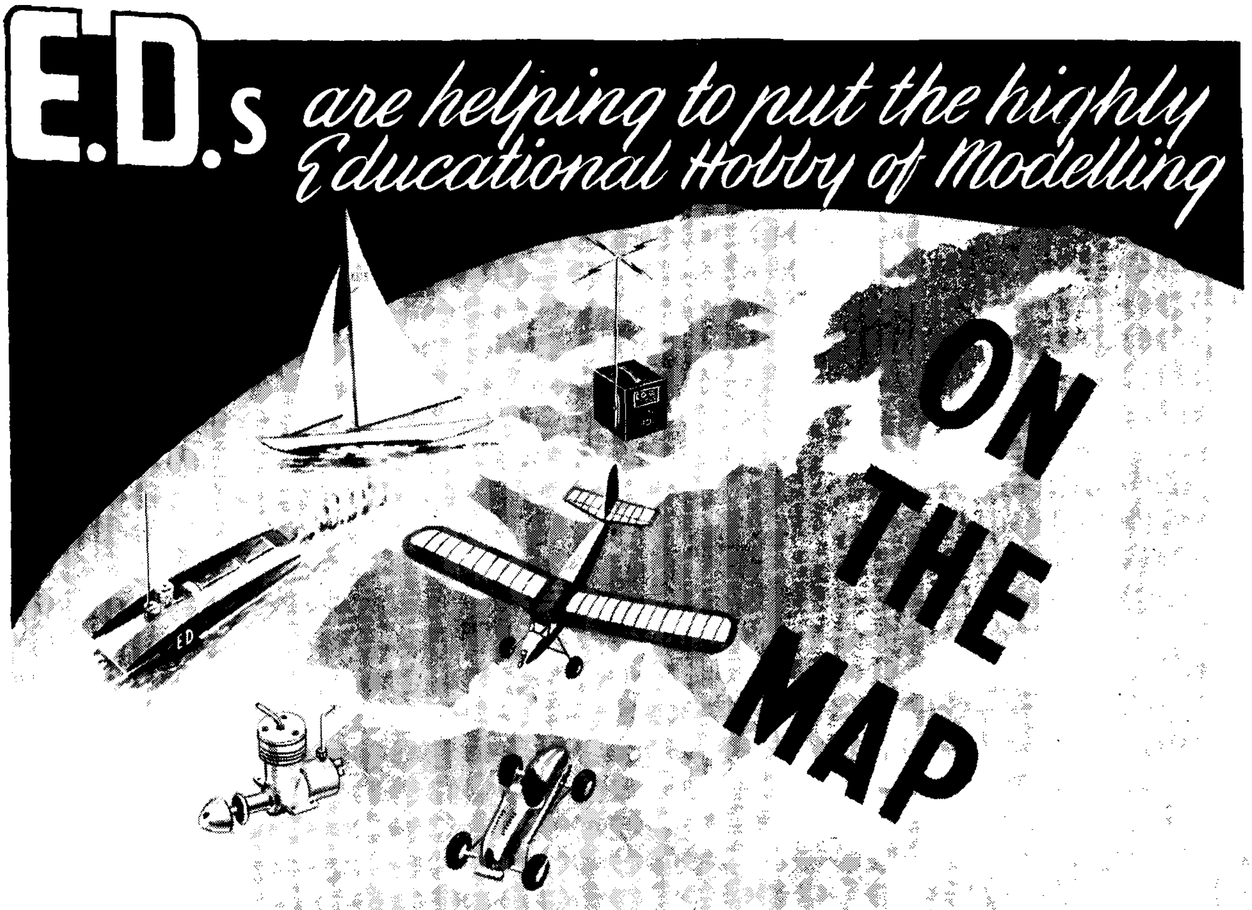
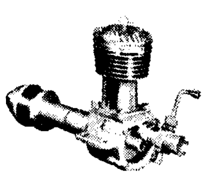
AEROMODELLER

CONTENTS

JANUARY 1951 1/6

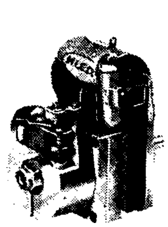


SOME NOTABLE E.D. PRODUCTS



E.D. Diesels.

The finest range of models on the market. 1 c.c. Mk. I. at £2 . 7 . 6 ; 2 c.c. Mk. II. at £2 15 . 0 : 2 c.c. Competition Special at £2 . 17 . 6 ; 2·49 c.c. Mk. III. at £3 .5 . 0 : 3·46 c.c. Mk. IV. at £3 . 12 .6. Prices include P.T.



M.I./E.D. Magnetos.

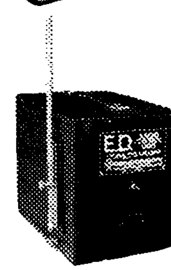
The ideal ignition system for two-stroke or four-stroke engines up to 30 c.c. Dispenses with the old coil and battery system. Price £4 . 10 . 0 In unit form, price £2 . 15 . 0

E.D. Plastic Propellers

Practically unbreakable. Do not flex in flight. Pitch can be altered by heating. From 2/3½ each. Inc. P.T.

E.D. Timers.

Under 1 oz. Total run 50-60 secs. 7 oz. pull. Price 12/6 Inc. P.T.



E.D. Radio Control Units

The thrill of complete and reliable control at long ranges. Standard Unit complete less batteries £14 . 10 . 0 Mk. III. Miniature Unit complete less batteries. £7 . 19 . 6

E.D. Fuels.

A balanced Fuel blended with the correct proportion of ether. Ready for use. Price 3/- E.D. Competition Diesel Fuel, for speed work. Price 3/6

Also Kit Sets including the "Radio Queen," "Aerocar" and "Challenger" Hydroplane, Clutch Units, Water Screws, and Marine Units, Complete Spares Service for Radio Control Units and Diesel Engines.

ORDER FROM YOUR NEAREST MODEL SHOP

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD

DEVELOPMENT ENGINEERS

KINGSTON ON THAMES 1223 18, VILLIERS ROAD, KINGSTON-ON-THAMES, SURREY, ENGLAND.

F M A M W UNITAS

1947 1948 1949 1950 1951

MERCURY CARRY ON!

Outstanding Mercury successes include—

Magbug
Monitor
Musketeer
Speed Wagons
Team Racer
Gili-Chopper
Mallard
Magpie
Monocoupe

PRICES of raw materials are rising. Deliveries of Balsa from overseas (and only the best suits Mercury) get held up and cause disappointment. Purchase Tax must now be reckoned with in certain cases. Yet genuine modelling enthusiasts aren't going to be put off with difficulties any more than we are. In fact we at Mercury are going to turn out better kits than ever in 1951 as well as better accessories, and we are keeping prices as low as possible consistent with quality. We feature two examples here—price reductions on our famous fuels and a new kit that spells economy in every way. ***It will pay you more than ever now to keep in touch with your Mercury dealer: He will have all the gen on the latest situation.***

MORE MERCURY FIRSTS

R.A.F. CHAMPIONSHIPS *Halton 3-9-50*
MALLARD 1st F/F DURATION—F/LT. Ware—273 secs.
NORSEMAN 1st—CONCOURS D'ELEGANCE (Gliders)—F/LT. Verney.
SUNDERLAND C/L CONTESTS—13-8-50.
MUSKETEER 1st, JUNIOR MONITOR 2nd, JUNIOR MUSKETEER 3rd.

Britain's Finest Fuels now Cost Less

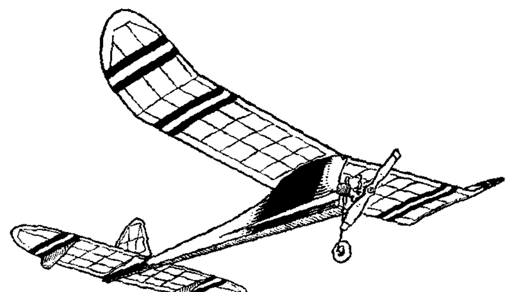
Nos. 2, 3, 5 and 8 **2/6** **PER 8 oz. BOTTLE**

No. 4. *New formula Economy G. Plug. 8 ozs. 2/-*
No. 6. *New formula Economy Diesel. Ready Mixed. Needs no ether. 8 ozs. 2/-*

Measured in terms of engine wear, there are no cheaper fuels than Mercury. Their quality and consistency remain as high as ever, and by being contained in glass bottles, their purity is assured.

No. 7. Special Racing Fuel 3/6 *No. 1.* 1/9

More Mercury Fuels are sold than all other brands together.



MEET THE ★ ★ ★ ★ ★

JUNIOR MALLARD

The very job for 0.5 to 0.87 Diesels

The Mallard is running true to Mercury form—winning important contests, and delighting all who fly it. So now there's a Junior Mallard that offers Mallard performance with real money saving. This newest Mercury Model is in standard kit form and includes pre-cut and printed Solarbo, full size plan, tissue and "hardware". *Span 33¾ ins.; Wing Area 190 sq. ins.; Total Area 275 sq. ins.* Mallard 48" for 1·5 *to* 2·5 *diesels.* 17/6

PRICE **10/6** SUBJECT

★MERCURY TEAM RACING TANKS

Designed and robustly made to exact S.M.A.E. specification.

30 c.c. **4/7** (incl. P.T.) 15 c.c. **4/3** (incl. P.T.)

No modeller can afford to be without the latest Mercury Catalogue these days. In cases where Purchase Tax affects the advertised price, your Mercury Dealer will be advised of such changes as may occur. The Mercury Catalogue 40 pages. costs 6d. and is on sale at your local Mercury stockists.

Make 1951 a MERCURY YEAR too

MERCURY *for Better Modelling*

MERCURY MODEL AIRCRAFT SUPPLIES LTD., LONDON, N.7.

AND NOW. . .

Jeticopters!

The amazing JETEX HELICOPTERS that fly so well !

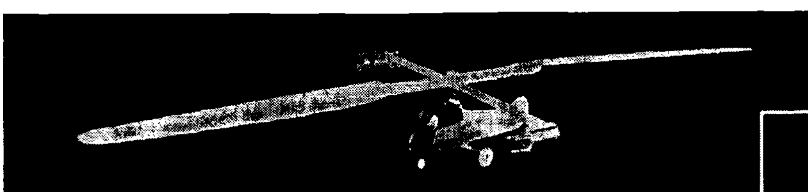
FIRST MODEL HELICOPTERS TO COMPLY WITH THE THEORY OF AUTO-ROTATION

These are undoubtedly the most successful model helicopters ever to be designed! The "50" will reach a height of approx. 100 ft. and the "100" even more than this. When the motors have stopped, the auto-rotation of the blades enables the Jeticopter to glide for a considerable distance. Jeticopters fly well in any weather, and both models will R.O.G. Just light the fuses and stand back!

JETICOPTER KITS CONTAIN –

READY FORMED ROTOR BLADE HINGES, ENGINE MOUNTING CLIPS, FULL SIZE PLAN, CEMENT, CELLULOID, WIRE, BALSA, PLYWOOD, ETC.

Important Reminder : *Cost of additional JETEX 50 MOTOR is only 6/6 plus P.T.*



JETICOPTER 100 . . . . Price of kit 7/6

PROPULSION :— 2 JETEX 100 MOTORS, BLADE SPAN 35 in.

JETICOPTER 50 . . . Price 5/-

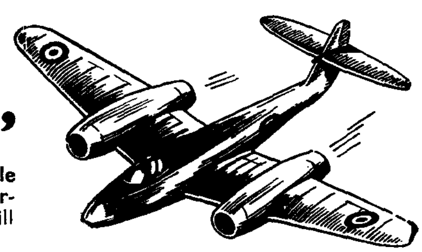
PROPULSION: 2 JETEX 50 BLADE SPAN 23 in.

NEW !

JETEX METEOR '50'

Second in the Jetex flying scale series, the Meteor is a fine performer. This is a kit you will enjoy building and flying.

WINGSPAN	20 in.
LENGTH	20 in.
WEIGHT (without motors)	1¾ oz.
PROPULSION	2 Jetex 50 motors



Kit includes :— All parts printed, cement, tissue, moulded cabin, full size plans, roundels. PRICE **7/6**

OTHER JETEX FAVOURITES

Plastic Racing Car complete with motor, fuel and accessories—ready to run .. **17/6**

Plastic Speed Boat complete—ready to run. Fastest boat in the world for its size ! **12/10**

Vampire "100" flying scale model .. **7/6**

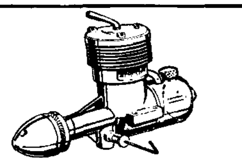
Vampire "50" flying scale model .. **5/-**

Hot Dog high performance model for Jetex 50 .. .. **3/-**

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

JETEX

RAEBURN MODEL SERVICE



D.C. 350. A certain 1951 Competition winner. Price 87/6.

Allbon Dart ·5 c.c. ...	65/2
Mills S ·75 c.c.... ...	67/3
Mills P ·75 c.c.	61/2
Amco ·87 c.c.	72/6
E.D. Bee I c.c.... ...	47/6
Mills 1·3 c.c.	91/8
Elfin 1·49 c.c.	59/6
Allbon Javelin 1·49 c.c.	68/3
Allbon Arrow 1·49 c.c. (G.P.)	68/3
"K" Kestrel 1·9 c.c. ...	45/–
"K" Tornado 1·9 c.c. (G.P.)	49/6
"K" Falcon 2 c.c. ...	59/6
E.D. Mk. II, 2 c.c. ...	55/–
E.D. Comp. Special 2 c.c.	7/6
Mills 2·4 c.c.	102/8
Elfin 2·49 c.c.	70/–
E.D. Mk. III, 2·5 c.c. ...	65/–
D.C. 350, 3·44 c.c. ...	121/–
Amco 3·5 c.c.	121/–
Amco 3·5 c.c. (G.P.) ...	97/6
E.D. Mk. IV, 3·46 c.c....	72/6
Yulon 29, 4·89 c.c. (G.P.)	99/5
Frog 500, 5 c.c. (G.P.)...	75/–
E.T.A. 29, 4·85 c.c. (G.P.) (A)	149/5
"K" Vult. Comp. Spec. 5 c.c....	59/6
Yulon 49, 8·2 c.c. (G.P.)	124/5
E.D. Mk. I ...	£14 10 0
E.D. Mk. III ...	£7 19 6

Frog "45," 45" ...	27/–
Frog Centurion 60" ...	63/6
Frog Strato. D., 42" ...	15/–
Frog Janus, 44" ...	15/–
Frog Vixen, 36" ...	12/6
Frog Powavan, 36" ...	25/–
K.K. Slicker Mite, 32"	9/6
K.K. Slicker, 42" ...	17/6
K.K. Slicker "50" 50"...	25/–
K.K. Super Slicker, 60"	35/–
K.K. Southerner Mite, 32"	10/–
K.K. Southerner, 60"...	40/6
K.K. Pirate, 34" ...	12/–
K.K. Bandit, 44" ...	18/6
K.K. Outlaw, 50" ...	22/6
K.K. Scorpion, 44" ...	32/–
K.K. Falcon, 96" ...	107/6
K.K. Cumulus, 54" ...	00/0
Mercury Mallard, 48"...	17/6
Veron Streaker, 37" ...	19/9

EASY TERMS

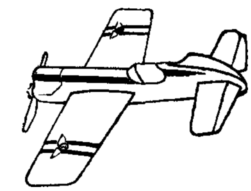
We have been assured by many customers that our easy payment service is the simplest and most reasonable yet devised. We can supply Engines, Engine and Kit Combinations and Accessories of total cash value of £2 and over under this scheme.

★

WRITE TO-DAY FOR FULL LIST AND HIRE PURCHASE FORM.

★

It's Easy to Buy, THE RAEBURN WAY



MERCURY MK I. Team Racer. Price 17/6

E.D. Radio Queen ...	78/6
Veron Skyskooter ...	25/–
K.K. Phantom Mite, 16"	11/6
K.K. Phantom, 21" ...	18/6
K.K. Scout Biplane, 20" (*Team racer*)	22/6
K.K. Stuntmaster, 30"...	19/6
K.K. Stunt King, 36" ...	18/6
K.K. Stunt Queen, 40"	21/–
K.K. Skystreak '26', 26"	9/6
K.K. Skystreak '40', 40"	10/6
Mercury Junior Monitor, 30"	14/6
Mercury Monitor, 39"...	27/6
Mercury Junior Musketeer, 28"	14/6
Mercury Musketeer, 40"	19/6
Mercury Mk. I ... ... (*Team racer*)	17/6
Mercury Speedwagon, 30"	14/6
Mercury Midge, 12" ...	5/6
Veron Sea Fury, 25½" ...	22/6
Veron Spitfire '22', 27½"	27/6
Veron Focke Wulf '190', 33¾"	19/6
Veron Midget Mustang, 24"	21/–
Veron Bee-Bug, 22" ...	11/6

Frog Prince, 60	25/–
Frog Dart, 16"	2/6
K.K. Vega	1/3
K.K. Speck	1/6
K.K. Polaris	2/6
K.K. Chief, 64"	18/6
K.K. Invader, 40"... ...	6/6
K.K. Minimoa, 60" ...	7/–
K.K. Soarer Baby, 36" ...	5/–
K.K. Soarer Minor, 48" ...	8/–
K.K. Soarer Major, 60" ...	11/6
K.K. Cadet, 30"	4/–
K.K. Cub, 20"	2/6
Mercury Gili Chopper, 42"	12/6
Mercury Magpie, 24" ...	3/9
Mercury Norseman, 58"...	17/6
Skyleada Midge	1/3
Skyleada Swift	2/6
Skyleada Wizard	3/–
Skyleada Jeep	3/–
Skyleada Skyrova, 16" ...	1/6
Skyleada Three Footer ...	5/–
Veron Swift	1/6
Veron Tomtit	1/9
Veron Wren	3/3
Veron Coronette, 26"	3/3

TO ORDER

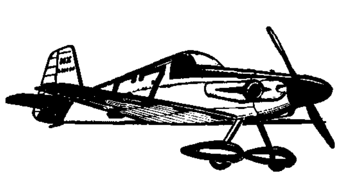
Send Postal Orders, or we can supply C.O.D.

All Orders over £1 post free.

Frog Venus, 38"	15/–
Frog Goblin, 24"	4/9
Frog Saturn, 30"	10/6
Frog Sprite, 24"	4/6
K.K..Ace, 30"	5/–
K.K. Achilles, 24"... ...	4/–
K.K. Ajax, 30"	6/–
K.K. Playboy, 20"... ...	3/3
K.K. Orion, 23"	3/6
K.K. Eaglet, 24"	4/–
K.K. Competitor, 32" ...	7/–
K.K. Senator, 32"... ...	5/6
K.K. Gypsy, 40"	10/6
K.K. Contestor, 45½" ...	23/6
Mercury Maybug, 32" ...	7/6
Veron Fledgling, 24" ...	6/9
Veron Goblin, 17" ...	3/3
Veron Rascal, 24"... ...	4/6
Veron Sentinel, 34" ...	10/–
Skyleada Hawk	4/6
Skyleada Falcon	3/6

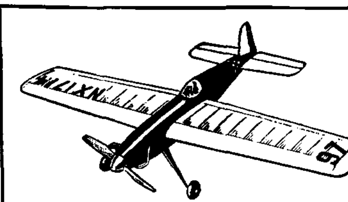
FLYING SCALE

Aeromodels Hawker Fury, 15" 5/6

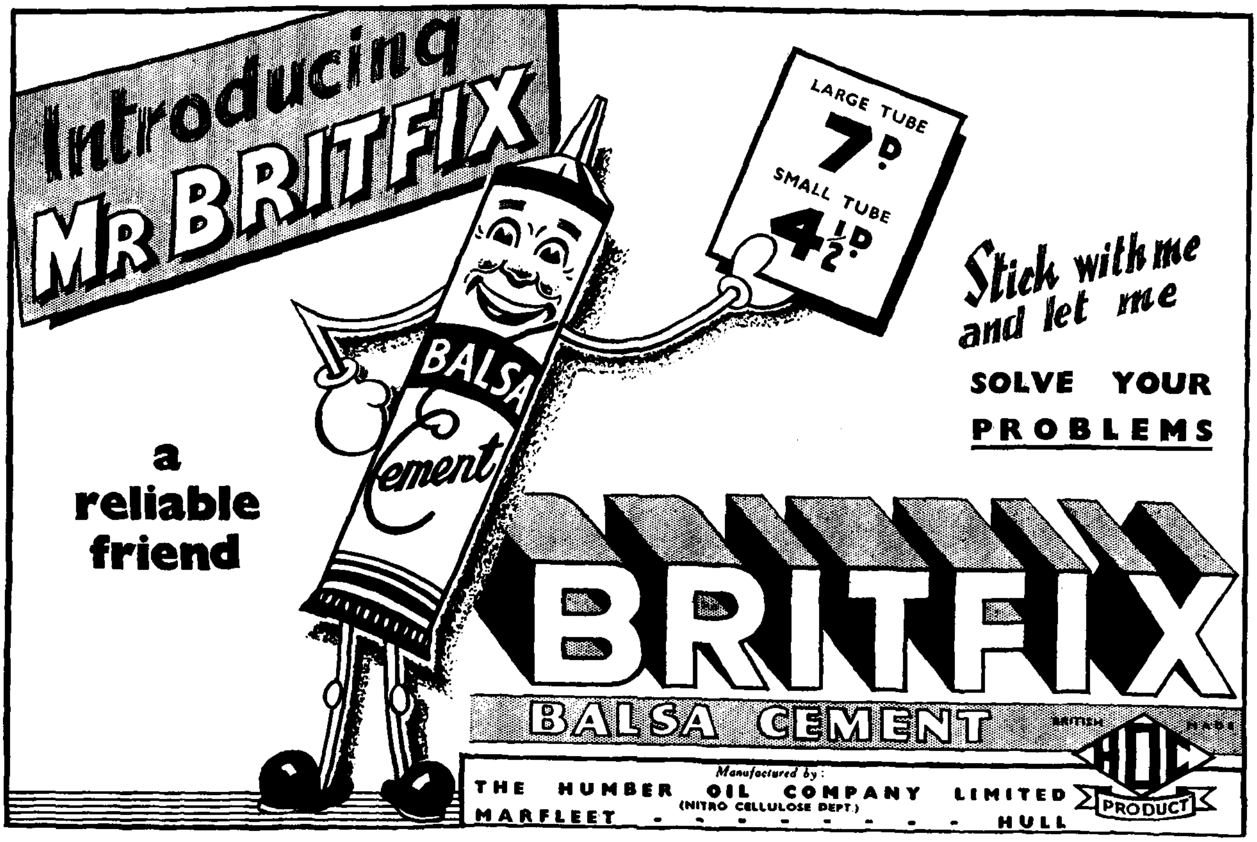


MIDGET MUSTANG Price 21/-

9 ARCADIA
COLNE
LANCS.



STUNT QUEEN Price 21/-



Rip Max Ltd.

EVERYMAN'S MODEL SHOP

Rip and Max wish you all a happy New Year and a successful 1951 flying season

SEND FOR OUR CATALOGUE 6d. POST FREE

● *TO ORDER—Send cash with order or goods sent C.O.D. Orders of £1 and over are post free. Under £1 add 1/6 to order to cover SAFE packing and postage. If less we refund.*

BUY NOW! Although we still hold large stocks of pre-tax items, our fresh deliveries are subject to Purchase Tax. As raw materials will not be taxed we earnestly advise all customers to purchase their requirements of kits and accessories as soon as possible thus ensuring pre-tax prices.

GLIDERS

Frog Fairy 30"	7/6
Frog Prince 60"	25/-
Frog Vanda 40"	9/6
Halfax Roma 40"	7/6
KK Cadet 30"	4/-
KK Cub 20" (also Jetex 50)	2/8
KK *Chief* 64" (A-2 Class)	18/6
KK Invader 40"	6/6
KK Minimoa 50"	7/-
KK Soarer Baby 36"	5/-
KK Soarer Minor 48"	8/-
KK Soarer Major 60"	11/6
Mercury G-Chopper 42"	12/6
Mercury Magpie 24"	3/9
Mercury Norseman 58"	17/6
Skyrova Glider 16"	1/6
Southern Sailer 24"	3/9
Southern Sloper 36"	6/6
Veron Coronette 26"	3/3
Veron Verosonic 46"	9/6

RUBBER

Frog Goblin 24"	4/9
Frog Saturn 30"	10/6
Frog Stardust 37"	10/6
Frog Stratosphere 62"	17/6
Halfax Minor 22"	3/3
Halfax Major 30"	5/6
Halfax Jaguar 44"	21/-
KK Ace 30"	3/-
KK Achilles 24"	4/-
KK Ajax 30"	6/-
KK Competitor 32"	7/-
KK Eaglet 24"	4/6
KK Gypsy 40"	10/6
KK Orion 23"	3/6
KK Playboy 20"	3/3
KK Senator 32"	5/6
Mercury Maybug 32"	7/6
Premier Cruiser Pup 30"	8/6
Skyrova Duration 16"	1/6
Veron Goblin 20"	3/3
Veron Rascal 24"	3/6
Veron Sentinel 34"	10/-

RUBBER SCALE

Airyda Hurricane 16"	2/6
Airyda Tipsy 16"	2/6
KK Piper Cub 26"	6/-
KK Pixie (semi-scale)	4/-
Royles Tiger Moth 31"	18/6
Skyrova Auster 12"	1/6
Skyrova Tiger Moth 12"	1/6
Skyleada Spitfire 16"	2/-
Skyleada Tempest 16"	2/-

and many more.

KITS FOR JETEX

Jetex Flying Wing (50)	3/-
Jetex Dorajet (200)	14/6
Jetex Vampire (scale) (50)	5/-
KK Skyjet 50 (50)	3/9
KK Skyjet 100 (100)	5/6
KK Skyjet 200 (200)	7/6
Veron Airojet (100)	7/6
Veron Cirrojet (200)	10/6
Veron Fouga Cyclone (50)	4/6
Veron Minojet (50)	3/-

POWER F/F

Frog Centurion 60"	63/-
Frog Janus 44"	15/-
Frog Janus 44"	15/-
Frog '45' 45"	27/6
Frog Strato-D 42"	15/-
Frog Vixen 36"	12/6
Halfax Hermes 41"	15/6
KK Bandit 44"	18/6
KK Cumulus 54"	
KK Outlaw 50"	22/6
KK Pirate 34"	12/-
KK Scorpion 44"	32/-
KK Slicker Mite 32"	9/6
KK Slicker 42"	17/6
KK Slicker "50" 50"	25/-
KK Southerner Mite 32"	10/6
KK Southerner 60"	40/-
KK Super Slicker 60"	35/-

Mercury Mallard 48"	17/6
Mercury Monocoupe 64" (semi-scale)	
Shaws Envoy 40"	14/9

FOR RADIO

ED Radio Queen 84"	92/6
Halfax Spartan 60"	38/6
KK Falcon 96"	107/6
KK Junior '60' 60"	39/6
Veron Skyskooter 48"	25/-
Veron Stentorian 72"	69/6

C/LINE STUNT

Frog Vandiver	13/-
Frog Radius	17/6
Halfax Millsbomb Mk II	18/6
J's Nancy	14/6
KK Phantom Mite	11/6
KK Phantom	18/6
KK Skystreak 26	9/6
KK Skystreak 40	10/6
KK Stuntmaster	19/6
KK Stunt King	18/6
KK Stunt Queen	
Mercury Junior Monitor	14/6
Mercury Monitor	27/6
Mercury Junior Musketeer	14/6
Mercury Musketeer	19/6
Shaws Dervish	19/6
Veron Nipper	9/6
Veron Bee Bug	11/6

C/LINE SCALE

Regent S.E.5A.	8/9
Regent Hawker Fury	8/9
Modelair Nieuport Scout	19/6
Modelair Bristol Bulldog	22/6
Royles Tempest	15/-
Royles Tiger Moth	21/-
Veron F.W.190.	19/6
Veron Sea Fury	22/6
Veron Seafire	27/6

TEAM RACERS

KK Scout (Biplane)	22/6
Mercury T.R.1	17/6
Veron Midget Mustang	21/-

C/LINE SPEED

Mercury Midge	5/6
Mercury Speed Wagon 20	12/6
Mercury Speed Wagon 30	14/6
Mercury Speed Wagon 60	29/6

ENGINES

Allbon Arrow 1·49 c.c.	GP	55/-
Allbon Dart ·5 c.c.	D	52/6
Allbon 2·8 c.c.	D	96/-
Allbon Javelin 1·49 c.c.	D	55/-
Amco ·87 c.c.	D	72/6
Amco 3·5 c.c.	D or GP	97/6
E.D. Bee 1 c.c.	D	45/-
E.D. Mk. II 2 c.c.	D	55/-
E.D. Comp/Special 2 c.c.	D	57/6
E.D. Mk. III 2·49 c.c.	D & GP	65/-
E.D. Mk. IV 3·46 c.c.	D	72/6
Elfin 1·49 c.c.	D	59/6
Elfin 1·8 c.c.	D	79/6
Elfin 2·49 c.c. 1950	D	69/6
Elfin 2·4 c.c.	D	89/6
ETA '19'	GP	124/5
ETA '29'	GP	149/6
Frog '250' 2·5 c.c.	D	72/6
Frog '500' 5 c.c.	GP	75/-
Mills ·75 c.c.	D	50/-
Mills ·75 c.c. (with cutout)	D	55/-
Mills 1·3 c.c.	D	75/-
Mills 2·4 c.c.	D	84/-
Nordec RG 10 10 c.c.	GP	200/-
Nordec R 10 10 c.c.	P	210/-
Nordec RG 10 Special 10 c.c.	GP	240/-
Nordec R 10 Special 10 c.c.	P	250/-
Wildcat 5 c.c.	D	77/6
Yulon '29' 5 c.c.	GP	79/6
Yulon '49' 8·2 c.c.	GP	99/6

JETEX UNITS

Jetex 50 Outfit	9/6
Jetex 100 Outfit	19/6
Jetex 200 Outfit	27/6
Jetex 350 Outfit	37/6

FUELS (per bot.)

Mercury No. 1	1/9
Mercury Nos. 2, 3, 4, 5, 6, 8	3/-
Mercury No. 7	4/6
E.D. Standard	3/-
E.D. Special	3/6
Frog Powermix Diesel	3/-
Frog Redglo	3/6
Roadways Mixed Diesel	2/6
Roadways Special Glo	2/6
Mills Blue Label	3/-
Ether, Mercury	2/6

DOPES AND PROOFERS

Clear, Glider, Banana Oil	2 oz.	1/-
" " "	8 oz.	3/-
All colours dopes	2 oz.	1/3
" "	8 oz.	3/8
Thinners for above	2 oz.	10d
" " "	8 oz.	2/4
Marjonas Proofer	small	2/-
" "	large	6/-
Titanine Proofer	small	1/6
" "	large	4/-
S.J.A. Clear F/proof dope		1/6
Aerolac, Black, Yellow, Red		1/6
Aerolac thinners		1/-

BALSA CEMENT

O'my long nozzle	small	6d.
O'my " "	medium	9d.
O'my " "	monster	1/3
Britfix " "	large	7d.

TISSUE PASTE

O'my small tube	6d.
O'my large tube	9d.
O'my 2 oz. jar	1/-

OTHER SUPPLIES

Durofix small tube	9d.
Durofix large tube	1/-
Casco casein glue per tin	1/6
Croid Universal Glue	1/-

BALSA WOOD. All sizes in stock
RUBBER. Dunlop ¼, 3/16, ¼ lb. 10/6
PIRELLI, ¼, 14 oz. skein 10/6
PIANO WIRE: in 3 ft. lengths.
22, 20, 18, 16, 14, 12, 10 SWG.
2d. 2d. 3d. 4d. 7d. 1/-d. 1/-
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ESTABLISHED 1935

AEROMODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

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"Covers the World of Aeromodelling."

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PURCHASE TAX

MOST of our readers will, by now, have become aware of the fact that, for some time past, the question of purchase tax applying to certain kits, engines and model aircraft accessories has been at issue.

The claims by H.M. Customs and Excise, originating in 1948, were challenged by the Federation of Model Aeronautical Manufacturers and Wholesalers and, by arrangement, a "test" case was brought against the well-known firm of Messrs. E. Keil & Co., Ltd. After considerable delay, the case was brought to Court and heard in the King's Bench Division before Mr. Justice Croom-Johnston, on October 23rd, 1950.

His Lordship gave judgment in favour of H.M. Customs and Excise, *i.e.*, in support of their claim that model aircraft kits, engines and accessories are taxable goods.

However, the position is not yet at all clear, as, under date of October 31st, 1950, H.M. Customs and Excise notified the Secretary of the Federation that "pending the issue of fresh directions pursuant to the recent decision of the High Court concerning liability to Purchase Tax of model aircraft kits, parts and accessories, traders may account for tax on these goods on the basis of the Press Notices issued by the Commissioners on 1st November, 1948, and 7th December, 1948 (Nos. 241 and 247). The Commissioners are not yet able to say when they will be able to issue fresh directions."

The difficulty now is, apparently, that there is some confusion as to exactly what products are affected by the press notices above referred to.

We cannot comment further on this matter as, at the time of writing, no firm decision has been reached by the Federation as to whether or not Mr. Justice Croom-Johnston's decision will be appealed against, but, for the time being, it seems that most manufacturers are adding tax to most of their products.

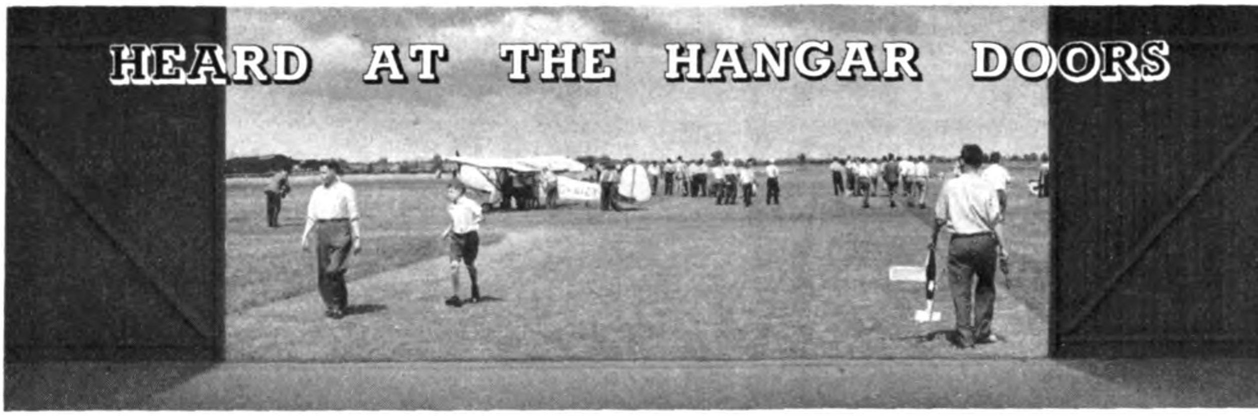
On the face of things this would seem to indicate price increases, against which at least one manufacturer has so arranged his discounts as to enable him to continue to sell his products at the same retail price and yet cover the amount of tax which may be payable on these goods.

Re material supplies such as balsa, wire, cement and tissue, etc., these do not appear to be chargeable, and it seems pretty clear that certain types of kits will not be considered chargeable. It may be some little while yet before the position is entirely clarified, and we are advised by the Council of the Federation that every step possible is being, and will be, taken to protect the interests of the model aircraft movement in this country, and, if possible, to obtain exemption of model aircraft kits, engines and accessories in the future.

Cover Photograph . . . . .

Features none other than Pete Cock, shown expending a deal of energy in launching his heavyweight radio control model. "Heavyweight" is the operative word, for this 58 in. span model weighs 7½ lbs., has a loading of 2 lbs. per sq. ft. and a flying speed in the sixties! Power unit is an E.D. Mk. IV diesel and the radio an E.D. Mk. I. Method of launch is to run at full speed and hurl the model skywards, hence Pete's somewhat determined expression.

HEARD AT THE HANGAR DOORS



IN sliding back the hangar doors, which formed so popular a feature of our pre-war issues, we would remind our newer readers that these pages are intended not only to provide a regular forum for editorial comment on matters of general interest and policy, but also to give due prominence to fact and hearsay both grave and gay which might otherwise be relegated to some obscure section of the issue, or even for lack of an appropriate section be omitted altogether. The hangar doors were last unlocked in January, 1939 : we hope to keep them open now for just so long as aeromodelling needs a candid commentary on items great and small.

Model Aircraft " Olympics ".

We had not intended making an editorial issue of this subject until such time as the matter had been submitted to the F.A.I. for International consideration, but in view of certain criticisms contained in a recent issue of our contemporary " Model Aircraft ", we feel bound to reply to some of the points raised, and at the same time place on record the full scheme as outlined to the S.M.A.E., and accepted by the Council for transmission to the F.A.I.

Briefly, the situation is as follows. With the current expansion and increased interest in International model aircraft competition, we came to the conclusion that logically the programme would finally include events for all the main categories of model aircraft. This surmise was endorsed by the recently stated policy of the F.A.I. to restrict International Championship events to a maximum of four per annum. Other International events may be organised, but will not receive Championship status.

In the rubber-driven field, the Wakefield Trophy was the natural selection, having met the Championship conditions for a number of years, and the introduction of the " Swedish Cup " for A/2 class sailplanes accommodated the appropriate class for gliders. The field is thus left open for Free-flight Power, Radio-control and Control Line (speed and stunt), and currently these categories are " open to tender ".

At an earlier date, the AEROMODELLER was pleased to offer to the S.M.A.E. a suitable trophy for International Radio Control competition. This offer was accepted, and awaits submission to the F.A.I. for acceptance under International status.

With a reasonable Championship group decided, it is our considered opinion that the logical procedure is to group these events into a grand meeting at a common venue, the contests being held over a given period. Our suggestion is a seven-day meeting, four days of which would be devoted to flying, with a day of rest-cum-sightseeing between each. It does not require much imagination on the part of our readers to visualise the attractions of a top scale World Championship meeting of the type proposed.

The Editor(s) of " Model Aircraft " quite rightly point out a number of snags inherent in such a scheme, the chief being the question of finance. Having some first hand experience of matters aeromodelling abroad we feel that the majority of the difficulties indicated would apply more to this country than overseas, and we answer on that basis. In our opinion in only one instance has proper sponsorship for an aeromodelling meeting been successfully negotiated in this country, this being the annual event organised by the North Western Area with the co-operation of the Manchester " Daily Dispatch ". What one group can do, surely the governing body of aeromodelling in this country should be able to better, and we have no qualms at all regarding the securing of adequate financial sponsorship in due time.

The vexed question of accommodation is a further point tabled against the scheme, but here again we feel it is purely a matter of the proper approach to the right quarters.

One criticism we cannot appreciate is that relative to the participation of nations some distance from the annual venue. Surely this does not hold water, else the Wakefield Contest would never have reached the prominence it holds to-day ? Proxy flying has always been available to participants in International Events, and though it is at best a poor substitute for the actual competitor handling his own machine, it does at least attract a number of entries who would be barred under other circumstances.

Chief criticism levelled against " our " scheme is to the effect that the Wakefield Trophy *may* lose its place as the premier event in International aeromodelling. In our opinion this is so much twaddle, for we have not the slightest doubt that the Wakefield Trophy contest can hold its own with any other event staged for other categories of model aircraft. If it does not, surely the answer must be that each trophy and/or contest must stand on its own merits?

We must make it clear that the " Wakefield " will always hold a high place in our affections, but International aeromodelling cannot restrict its laurels to one branch of the hobby. The glider, power, radio, and control-line enthusiasts are as much entitled to their share of International recognition as the rubber-driven enthusiasts, and no good will come of any attempt to further segregate the types. All categories of the hobby should be on an equal footing, but we are absolutely certain that the Wakefield as such will always be regarded with an affection that no other contest will ever receive.

Finally, in view of observations made to us from time to time, and particularly in regard to this affair, we should make it clear to our readers that observations made in " Model Aircraft " editorials are not necessarily the views of the S.M.A.E. Council. It is well known that the Editors of that journal are prominent members of Council, but we feel sure they will be the first to disclaim that the whole of their editorial comments are necessarily an official viewpoint as determined by the Council. We in turn make it clear that our editorial comments—unless otherwise stated—are purely statements of our own views and opinions on aeromodelling.

Top Dog.

Besides winning the 1950 Senior Championship for the whole of the country, J. A. Gorham of Ipswich becomes the first man to qualify for an International "C" Class Merit Certificate under the new rules.

Under the old system one had only to obtain three 3-minute flights to qualify for this top distinction, but present-day regulations require three flights of 3 minutes each on the *same* day, with each of three types of model—rubber driven, glide and power. The qualifying flights can be completed within the space of one year, but flying with each category of model must be completed on one day.

Gorham's feat is all the more remarkable in view of the fact that he only qualified for his "A" certificate on 12th May, 1950, gaining his "B" endorsement a month later. Details of his International qualifying flights are as follows :—

Rubber :	2nd July, 1950	186·6	219	226
Power :	13th July, 1950	240	204·8	257
Glider :	15th Oct., 1950	210	193	214

Congratulations are due to Gorham, and we trust the special badge under consideration by the F.A.I. will not be long in forthcoming. In our opinion it should be the highest honour to be qualified to wear one of these special international marks of efficiency.

New S.M.A.E. Officers.

Single nominations only being received for all but one of the vacant offices due for election this season, the postal ballot was only brought into action for the election of a Hon. Technical Secretary. Mr. M. A. (Max) Coote succeeded to the office with 639 votes against his "opponent" Mr. Norman Butcher, who polled 611, one of the closest ballots yet recorded.

Ken Brookes of the St. Albans club succeeds Mr. F. E. Wilson as Public Relations Officer, and with knowledge of his drive and experience in "putting over" the annual All Herts Rally, we have full confidence that he will bring to this extremely important duty a degree of initiative and news appreciation that has been somewhat lacking in his predecessors.

Capt. Taylor, for some time Competition Secretary to the London area, takes over from "Val" Turner what is (in our opinion) the most important office in the S.M.A.E. under present conditions. National competitions play an increasingly major part in S.M.A.E. affairs, and the proper conduct of such events is a matter by which the Society is largely judged by most present-day aeromodellers.

With the Treasurer and Records Officer being returned unopposed the full panel of Officers for the forthcoming season is as follows :—

Chairman	Mr. A. F. Houlberg	(S. Midland Area)
Vice-chairman	Mr. R. F. L. Gosling	(N. Western Area)
Secretary	Mr. D. A. Gordon	(London Area)
Treasurer	Mr. H. W. Barker	(E. Midland Area)
Comp. Secretary	Mr. E. D. Taylor	(London Area)
Tech. Secretary	Mr. M. A. Coote	(London Area)
Records Officer	Mr. C. S. Rushbrooke	(Midland Area)
P.R.O.	Mr. K. Brookes	(London Area)

"I Smell Strangers . . ."

This paraphrase of the well known Parliamentary expression might well be adopted by the S.M.A.E. as a safeguard against a disgraceful situation that continually makes itself apparent at its Annual General Meetings.

We refer to the small minority faction whose avowed policy is the sabotage of the now well established Area system of conducting the national Model Aeroplane Movement on a democratic basis, substituting in its stead their long rejected London-elected and London-based "Kremlin" methods that so nearly split the British aeromodelling movement a decade ago. Confining themselves to a not-so-subtle whispering campaign throughout the season, an Annual General Meeting is made the opportunity for a full scale attack on whatever elected Council is in office. As a well known official felt impelled to state, "These people come along with the express purpose of making a nuisance of themselves, and abuse the freedom of speech we all enjoy".

Speaking with experience as serving members of the Council, we know the vast amount of work accomplished each year by a committee of aeromodellers willing to devote their time and energies to the administrative side of the hobby, when their personal inclinations would prefer that time to be spent in active participation in competitions and other flying. No man yet born, or committee elected, can hope to please all the people all the time, but we claim the Council does at least satisfy the majority of those they represent, and this is amply borne out by the overwhelming vote usually cast in opposition to the above mentioned faction.

On November 5th their full venom was directed at the election of a Fellow, and as a result of their actions Mr. D. A. Gordon, hard working Secretary to the Society, was deprived of this honour—for this year at least. Constitutionally the election of a Fellow can only be accomplished on a unanimous vote, and this was vetoed by the raising of four hands in opposition. Never was a more dog-in-the-manger attitude demonstrated in public !

We sincerely trust that the advice given to Mr. Gordon—to stick in and fight such "types" — will be seriously considered by him, for—as we well know from personal experience—to allow such methods to get under the skin and bring about a resignation from office does nothing more than give the opposition just what they have angled for.

It is a great pity that the fair-minded majority of the members of a respected club should be brought into disrepute by a few reprobates, for their methods most definitely SMELL, and they are truly "STRANGERS" to the hobby and spirit of British aeromodelling.

Cover Pictures.

We invite those of our readers who include photography amongst their hobbies to submit suitable pictures for our new photographic cover. We can only consider outstanding photographs of topical or unique subjects, appertaining to aeromodelling. They need not necessarily be action pictures, but it is essential that they are first class photographs.

Where the negative is not available, we should require prints at least 8 ins. × 6 ins., and needless to say, any pictures used will be handsomely paid for.

A Great Loss.

It is with regret that we report the tragic death of Noel Groves in a motorcycle accident on the 13th November.

Noel was well known to us all in the aeromodelling world for his first class photographs, particularly his action photographs taken on the flying field. They set a standard few could equal. The 1949 Wakefield Contest Report contained much of his work, and readers will remember the first class set of pictures used for our "Caption Contest".

Noel was 23 years of age, a member of the Surbiton Club, and by profession a press photographer. He covered many assignments for the AEROMODELLER, where his practical knowledge of modelling combined with outstanding photographic abilities, served to produce the magnificent pictures we had come to expect from him.

Aeromodeller Annual, 1950.

While the recent trade dispute—now happily resolved—has made some delay in the publication of AEROMODELLER ANNUAL 1950 inevitable we trust by the time these lines appear that our principal trade orders will have been filled, and by Christmas Day all those readers who look forward to receiving their copy by this festive occasion will have been satisfied. To any small minority not so satisfied we would express our profound regret, and add, in extenuation, that phrase so frequently seen in these post-war days : ". . . it's worth waiting for ! "

P. E. NORMAN DESCRIBES HIS 36" SPAN F/F STUNT MODEL

GLOSTER GAMECOCK

IN 1925, came a development of the "Grebe" known as the "Gamecock", fitted with the Bristol Jupiter 420 h.p., later developing 490 h.p.

It was a single bay biplane, short and somewhat fat, having a smaller lower wing. A high lift upper wing was used with a thinner section lower wing, the chord of upper and lower being equal. Both wings had a pronounced dihedral angle and stagger, and the upper wing was carried on inverted W type centre section struts. The fuselage was faired to almost a circular section, tapering to a knife edge. The undercarriage was fitted with the then new Oleo shock absorbers.

The fuselage carried two machine guns concealed in troughs on each side of the pilot's cockpit, another smart innovation.

The aircraft was finished silver all over, with red, white and blue roundels, and the squadron markings were carried along the top plane and the sides of the fuselage. It had a top speed of 145 m.p.h.

The Gamecock II was similar to the I except the centre section was carried on the conventional splayed struts and the wings were attached to the centre section giving increased strength and a flat portion between the dihedraled wings. The power of the engine was also increased to give the machine a top speed of 155 m.p.h.

The Gamecock was highly manœuvrable and would fly "hands off" with no tendency to any vices. It marked the end of the all-wood fighter, as experiments were being made with the "Siskin" and "Bulldog" type of metal construction.

The single seater fighter had always appealed to me, and this model of the "Gamecock" is one of my series of the most famous fighters from 1916 to 1942, which I am building.

The Aerobatic Model.

Owing to its comparatively short fuselage, the machine is aerobatic, but its generous wing area, dihedral angle, large tail and rudder, make it a fairly safe model to fly.

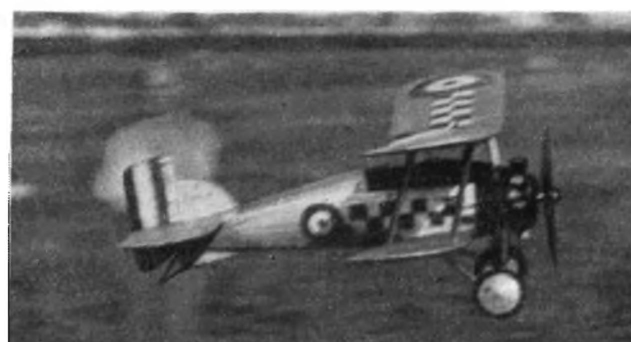
It has a pendulum controlled elevator, which I now fit as standard, on all my models, and a wing loading of 11·8 ozs./sq. ft. (light for me ! ! !).

The model turns to the left, and can execute beautiful stall turns, also loops, bunts and inverted flying. The machine does a diving roll out of the inverted position in a most realistic way.

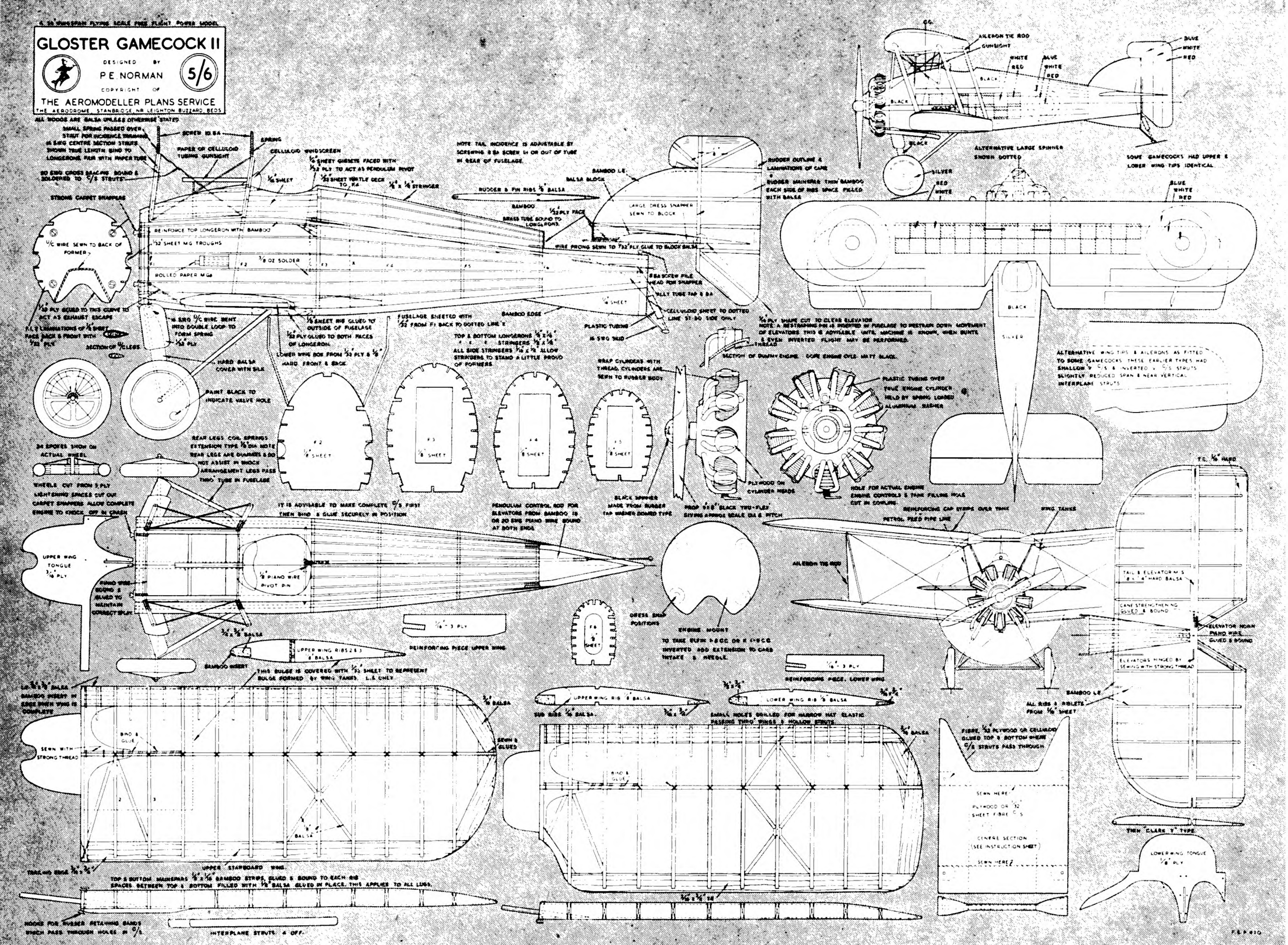
The inverted position is, I believe, brought about in the following way : The model is first of all given a little more right rudder and slightly more elevation on the adjustable tail, and it will go into loops. Quite often, when climbing up to the second or third loop, the machine loses a little forward speed, and being in a steep climbing angle, the pendulum weight falls back as far as possible; then, exerts itself and the machine reels over. The weight is then falling back, giving full down elevator, which, when the machine is upside down, becomes full "up". The model flies thus for perhaps 70 to 100 yards gradually carrying into a shallow dive : when at a certain point the weight suddenly falls foward, the machine dives at speed and then recovers to fly on its natural course.

I have detailed all of this performance, as it is most interesting to watch, and I would be pleased to know if this manœuvre has been performed by any other free flight scale enthusiast. (I have had this manœuvre performed by my large 4½ lbs. Sopwith Camel model, too). I would not advise anyone to attempt this until they have become perfectly familiar with the model, and are prepared to take some pretty fast and heavy crashes ! !

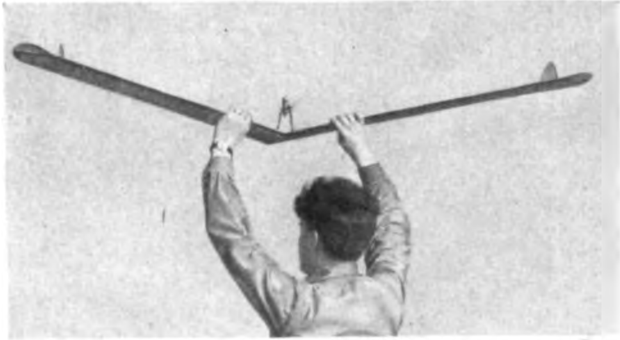
Complete building instructions for this model are issued with each copy of full size drawing (see 1/5 scale reproduction opposite), which is available from the Aeromodeller Plans Service.

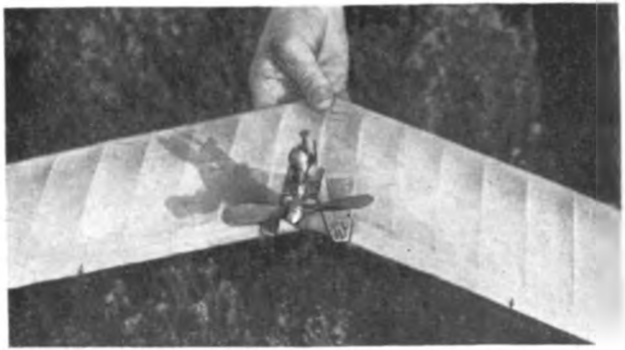


Above, the Gamecock is caught pulling out at the bottom of a loop. Below, the designer and a brace of models.



GLOSTER GAMECOCK II
DESIGNED BY
P.E. NORMAN
5/6
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD, BEDS
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
STRONG CARPET SNAPPERS
REINFORCE TOP LONGERON WITH BAMBOO
1/32" SHEET M.G. TROUGHS
3/8 OZ SOLDER
ROLLED PAPER M.G.s
CELLULOID WINDSCREEN
PAPER OR CELLULOID TUBING GUNSIGHT
SPRING
RUDDER & FIN RIBS 1/8" BALSA
BAMBOO L.E.
BALSA BLOCK
LARGE DRESS SNAPPER SEWN TO BLOCK
1/4" SHEET
BAMBOO EDGE
PLASTIC TUBING
16 SWG SKID
HARD BALSA COVER WITH SILK
PAINT BLACK TO INDICATE VALVE HOLE
24 SPOKES SHOW ON ACTUAL WHEEL
F2 1/8" SHEET
F3 1/8" SHEET
F4 1/8" SHEET
F5 1/8" SHEET
F6 1/8" SHEET
SECTION OF DUMMY ENGINE
PLASTIC TUBING OVER TRUE ENGINE CYLINDER
PLYWOOD ON CYLINDER HEADS
BLACK SPINNER
ALTERNATIVE LARGE SPINNER SHOWN DOTTED
SOME GAMECOCKS HAD UPPER & LOWER WING TIPS IDENTICAL
BLUE
WHITE
RED
BLACK
SILVER
AILERON TIE ROD
GUNSIGHT
WING TANKS
PETROL FEED PIPE LINE
UPPER WING TONGUE 3/16" PLY
1/8" PIANO WIRE PIVOT PIN
1/16" - 3 PLY
REINFORCING PIECE UPPER WING
UPPER WING RIBS 2 & 3 1/8" BALSA
BAMBOO INSERT
DRESS SNAP POSITIONS
ENGINE MOUNT
REINFORCING PIECE, LOWER WING
UPPER WING RIB 1/8" BALSA
LOWER WING RIB 1/8" BALSA
SUB RIBS 1/16" BALSA
TAIL & ELEVATOR M.S. 1/8" x 1/4" HARD BALSA
CANE STRENGTHENING GLUED & BOUND
ELEVATOR HORN PIANO WIRE GLUED & BOUND
ELEVATORS HINGED BY SEWING WITH STRONG THREAD
BAMBOO L.E.
ALL RIBS & RIBLETS FROM 1/16" SHEET
BIND & GLUE
SEWN WITH STRONG THREAD
SEWN & GLUED
UPPER STARBOARD WING
SEWN HERE
PLYWOOD OR 1/32" SHEET FIBRE C/S
CENTRE SECTION (SEE INSTRUCTION SHEET)
THIN "CLARK Y" TYPE
LOWER WING TONGUE 1/8" PLY
INTERPLANE STRUTS 4 OFF





Top photo shows correct method of launching model with the trailing edge gripped between thumb and forefingers at the balance points which are marked with arrows in the lower photograph. Above is a close-up of the engine mount which features a ·2 c.c. Kemp. The ·32 c.c. Kalper can also be used, and for experienced builders only the ·5 c.c. Dart.

HERE is a model, which, to say the least, is something not seen on every flying field.

The performance is quite surprising in that a diesel of only 0·2 c.c. capacity gives a swift, steady climb to a model of nearly 7 ft. 0 ins. span.

An added attraction is that, with the motor and mount removed, the machine becomes an excellent tow-launched sailplane. It is, of course, necessary to restore the longitudinal balance by adding lead shot to the nose. Good results have also been obtained hand-launched from a slope without fins.

Wing.

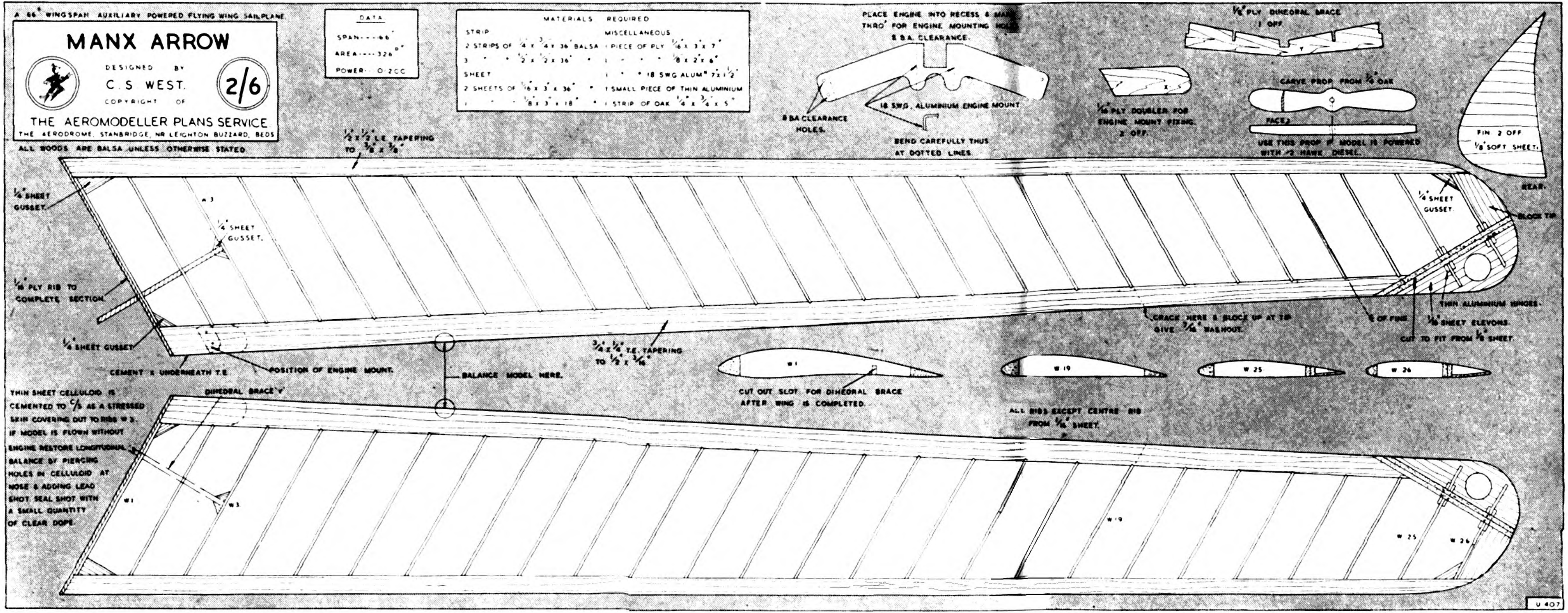
The ribs are cut first by means of the three templates shown on the drawing. These provide two stages of section graduation, i.e. from 1 to 19, under-camber to flat, and from 20 to 26, flat to reflex.

The method of making is well known ; the required number of 1/16 in. balsa pieces are threaded onto a " U " shaped piece of wire between the templates and carved off as a block, finishing with glass-paper. It is important to reverse the order of the templates for the other wing.

A firm grade of balsa is used for the leading and trailing edges which are first tapered to the sizes noted on the drawing and the trailing-edges notched as shown to receive the rear ends of the ribs.

Having pinned the edges in position on the plan, the ribs may be cemented in, working from rib 2 to rib 19 where the trailing-edge is cracked and blocked up at the tip to a height of 7/16 in. to give the required washout. The remainder of the ribs are then fixed in position.

A portion of the trailing edge is removed for the fitting of the elevons, which are cut from 1/16 in. sheet ; the rear ends of the last three ribs being suitably cut and fitted to keep a smooth rib profile. The tips are completed with soft block. Elevon hinges are easily made from thin sheet aluminium and cemented into the wood.


A 66" WINGSPAN AUXILIARY POWERED FLYING WING SAILPLANE.
MANX ARROW
DESIGNED BY
C. S. WEST.
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD, BEDS
2/6
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
DATA
SPAN----66"
AREA----326 □"
POWER-- 0·2CC
MATERIALS REQUIRED
STRIP
2 STRIPS OF 1/4" x 3/4" x 36" BALSA
3 " " 1/2" x 1/2" x 36" "
SHEET
2 SHEETS OF 1/16" x 3" x 36" "
1 " " 1/8" x 3" x 18" "
MISCELLANEOUS
1 PIECE OF PLY 1/16" x 3" x 7"
1 " " " 1/8" x 2" x 6"
1 " " 18 SWG ALUM^m 7" x 1 1/2"
1 SMALL PIECE OF THIN ALUMINIUM
1 STRIP OF OAK 1/4" x 3/4" x 5"
PLACE ENGINE INTO RECESS & MARK THRO' FOR ENGINE MOUNTING HOLES 8 B.A. CLEARANCE.
8 BA CLEARANCE HOLES.
18 SWG. ALUMINIUM ENGINE MOUNT
BEND CAREFULLY THUS AT DOTTED LINES.
1/8" PLY DIHEDRAL BRACE 1 OFF.
1/16" PLY DOUBLER FOR ENGINE MOUNT FIXING. 2 OFF.
CARVE PROP FROM 1/4" OAK
FACE
USE THIS PROP IF MODEL IS POWERED WITH ·2 HAWK DIESEL.
FIN 2 OFF. 1/8" SOFT SHEET.
REAR.
1/2" x 1/2" L.E. TAPERING TO 3/8" x 3/8"
1/4" SHEET GUSSET.
1/4" SHEET GUSSET.
1/8" PLY RIB TO COMPLETE SECTION.
1/4" SHEET GUSSET
CEMENT X UNDERNEATH T.E.
POSITION OF ENGINE MOUNT.
BALANCE MODEL HERE.
3/4" x 3/8" T.E. TAPERING TO 1/2" x 3/16"
CRACK HERE & BLOCK UP AT TIP GIVE 3/16" WASHOUT.
BLOCK TIP
THIN ALUMINIUM HINGES.
1/16" SHEET ELEVONS.
CUT TO FIT FROM 1/8" SHEET.
℄ OF FINS
W 1
W 3
W 19
W 25
W 26
CUT OUT SLOT FOR DIHEDRAL BRACE AFTER WING IS COMPLETED.
ALL RIBS EXCEPT CENTRE RIB FROM 1/16" SHEET.
DIHEDRAL BRACE 'Y'
THIN SHEET CELLULOID IS CEMENTED TO C/S AS A STRESSED SKIN COVERING OUT TO RIBS W 3. IF MODEL IS FLOWN WITHOUT ENGINE RESTORE LONGITUDINAL BALANCE BY PIERCING HOLES IN CELLULOID AT NOSE & ADDING LEAD SHOT SEAL SHOT WITH A SMALL QUANTITY OF CLEAR DOPE.
U 407

MANX ARROW

BY C · S · WEST

A 7' SPAN FLYING WING FOR ENGINES FROM ·2 c.c. TO ·5 c.c. CAPACITY.

THE DESIGNER . . . . . Age 30 . . . . married . . three small daughters . . . Secretary of Godalming Club . . . . . has built everything but R/C models . . . prefers own designs . . . other hobbies, music, figure skating, and cycling . . . . . by profession a textile artist.

Returning to the No. 1 ribs, these are sanded flat and cemented securely on each side of a centre rib of 1/16 in. 3-ply, remembering the four-inch dihedral on either side.

The slots on ribs 2 and 3 are cut by first marking their positions with the aid of the dihedral brace, which is afterwards cemented in place.

Thin sheet celluloid of the cabin window variety is next cemented to the centre-section as a stressed skin covering out to ribs 3 and the plywood strengtheners marked " X " fitted in position under the trailing-edges.

The covering is of good quality tissue with two coats of clear dope ; banana-oil or fuel-proofer being used in the vicinity of the engine mount.

To make the model more portable, rib 6 can be duplicated and strengthened, dowels and tubes inserted and the L.E. and T.E. cut through. However, it is best to build the wing whole first for greater accuracy.

The next operation is to fit the fins, which are cut from soft $\frac{1}{8}$ in. sheet balsa and sanded to a semi-streamline. It will be noticed on the drawing that they are fixed at a slight angle to rib 23, i.e., with the T.E.'s pointing slightly away from the centre of the machine.

The Engine Mount.

This is cut from 18 G. sheet aluminium ; this may be managed by careful use of a fine fretsaw, finishing with a file. The holes are drilled 8 B.A. clearance size and the bending carried out slowly and carefully. A quick bend with a sharp corner will soon crack aluminium.

Washers should be used where the bolts come through the trailing edge to prevent the heads sinking into the wood. The mount should give the correct thrust line.

Airscrew.

This is of special design, arrived at by experiment, and is carved from oak or similar heavy hardwood to the shape shown on the drawing.

Easier hand starting, greater flexibility of engine control and more thrust have been experienced with this prop. The engine manufacturer's airscrew, while being satisfactory for normal work, gives inferior performance on this machine and greater difficulty in control and starting in either case.

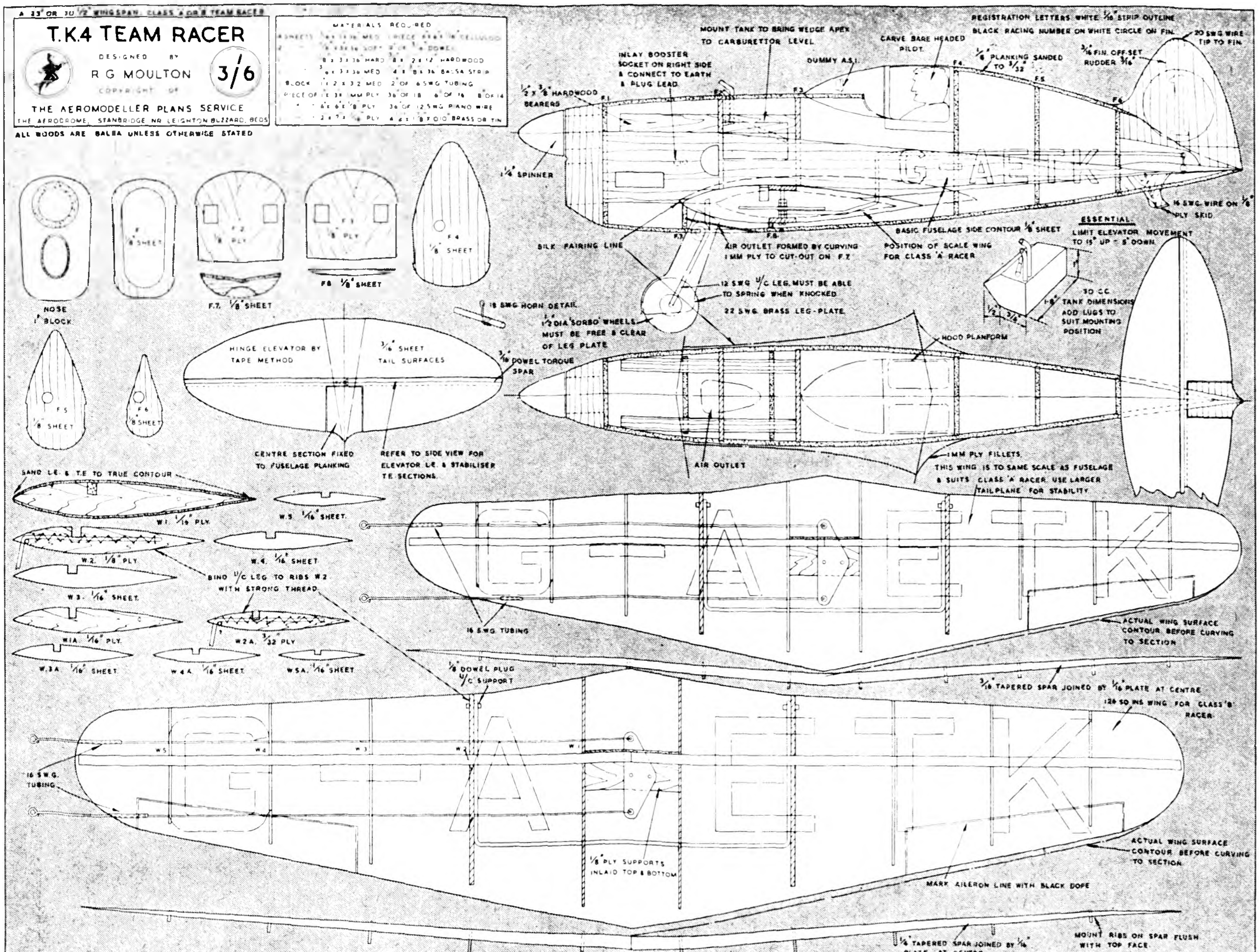
Flying.

Gliding trim is obtained by first balancing the machine on a finger of each hand at the points marked on the T.E.

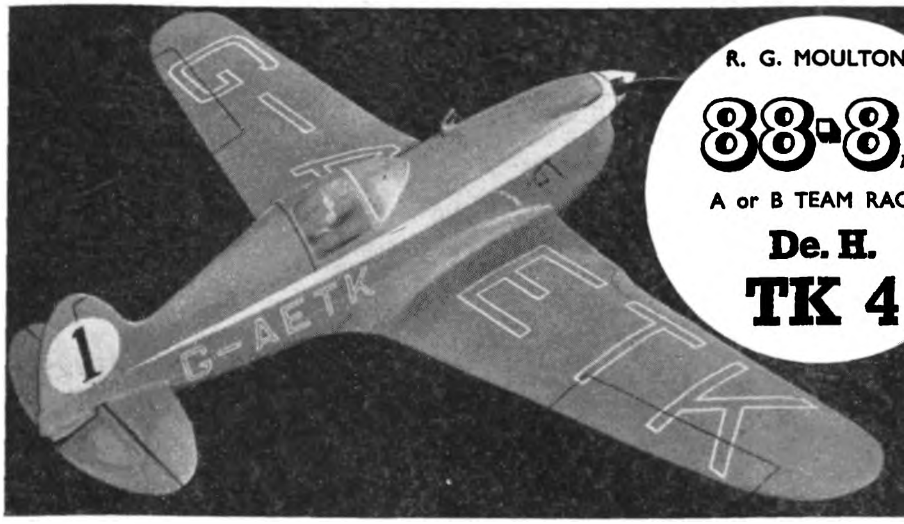
Lead shot may be inserted through small holes pierced in the celluloid centre-section covering and fixed in the front end by pouring in a small quantity of clear dope. Final trim and turning is effected by the use of elevons.

Launching is carried out with two hands holding the T.E.'s at the aforementioned balance points.

THIS IS A ¼ SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 2/6 POST FREE FROM AEROMODELLER PLANS SERVICE.



THIS IS A 1/4 SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 3/6 POST FREE FROM THE AEROMODELLER PLANS SERVICE



R. G. MOULTON'S

88·8 m.p.h. A or B TEAM RACER De. H. TK 4

OF the few British aircraft which have been specifically designed for air racing, the De Havilland Technical School T.K.4 appeals as the prettiest and most adaptable type to be built as a team racer. But the tiny 56 sq. ft. wing area of the full-size craft, and its comparatively large fuselage, produces an equally elephantine model fuselage if the wings are to be scaled to the minimum 125 sq. ins. This Class B design is actually a compromise in scale, with the fuselage built to the smallest size capable of absorbing a 5 c.c. engine, and the wings and tailplane enlarged to another scale to provide the necessary 125 sq. ins.

Using the same fuselage, however, and wings to the fuselage scale, one has an ideal class A racer of just over the minimum 70 sq. ins. required. Retention of the larger class B tail is recommended as an aid to longitudinal stability for the smaller model. The actual scale surfaces would be a diminutive 12 sq. ins.

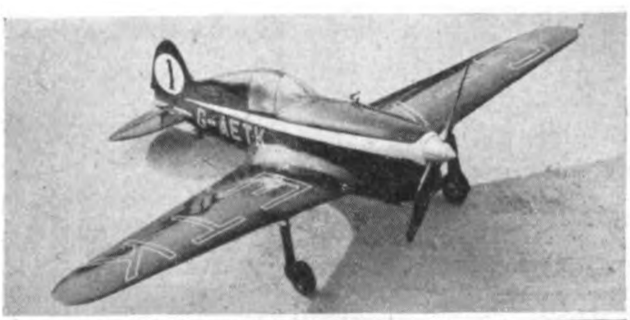
Small blisters at the wing and tail roots, the pitot head, and undercarriage jacks are completely omitted, while the cabin windscreen has been made one-piece without the bar down its centre and the undercart is sprung and raked forward. These are few of its discrepancies, which must be tolerated in lieu of efficiency.

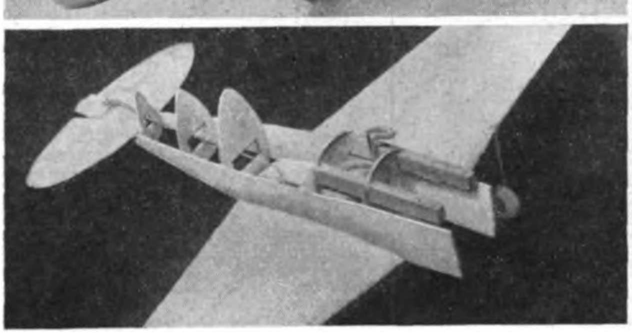
And what efficiency! The prototype weighed 25 ozs. exactly, was equipped with a little-used McCoy 29, and an unfinished Stant 8×8 in. prop. It had an unsprung 10 s.w.g. piano wire U/C which projected from the wing at 90°.

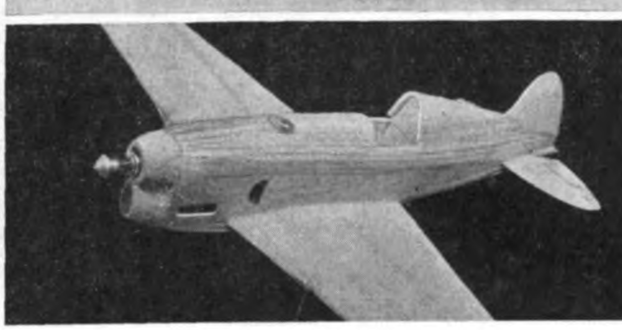
The very first flight sorted out the impracticability of that U/C, for the gliding speed had been sadly under-estimated. After the first take-off (which revealed the folly of having the wheels in scale position and the need for sweep forward on the U/C), we were more than satisfied that the 20% tail was of ample size. Excess elevator movement can make the little crimson speedster jump around like a high-speed stunter.

And the speed? Checked by three watches at the East London Club speed contest at 88·8 m.p.h.; it held that speed over the duration of the engine run. With pit stops cut down to a possible 15 seconds each (the inverted engine is a " first time " starter), any decent ringed racing motor should take the T.R., T.K.4, over ten miles at an average of over 70 m.p.h.

Full building instructions are issued with the plan.

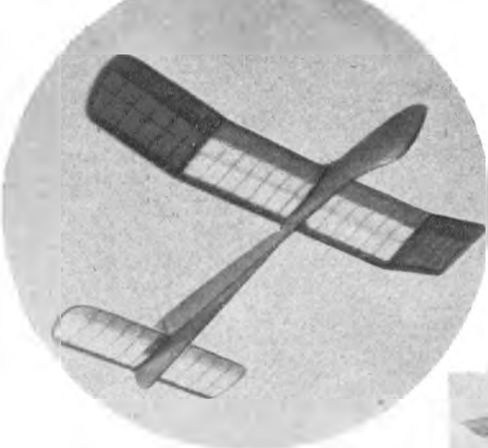






"NORD 2"

BRITISH A/2 HAND - LAUNCH RECORD HOLDER



DESIGNED BY
J. G. JOYCE

Member Leeds M.F.C.... age 18 ... lithographic artist ... mainly interested in sailplanes ... also keen on indoor models ... and breaking club and national records !

THIS model has been designed over a period of three years' development of the pod and boom type sailplane. Originally based on the "Sunanvind" layout, it was found to be too small to remain in sight for the full five minutes during contests. For the 1949 season a larger model was built, fitted with wing tip fins and twin fins on the tailplane. This model was quite successful, holding the Leeds M.F.C. Club tow launched record of 7 mins. 20 secs. and also the Club hand launched record of 5 mins. It gained third place at the 1949 York Rally with a three flight aggregate of 7 mins. 23·5 secs.

When the "NORDIC" A.2 class specifications were announced for 1950, it was decided to build a model down to the required size and incorporate several new improvements. These included a tip-up tail D/T.

The first version of the "NORD" was of light construction, the total weight being only 7½ ozs. It was therefore decided to keep this model as a lightweight and to build a stronger, heavier version for A.2 and F.A.I. competitions. This lightweight model holds the Club Lightweight tow-launched record of 8 mins. 21·5 secs.

The second model when completed weighed 15½ ozs., and in this trim it placed third at the Northern Area Glider contest on the 16th April, 1950, with time of 12 mins. 19·6 secs. A similar model built and flown by my sister B. M. Joyce, placed second in the Women's Challenge Cup contest at the 1950 British Nationals A further model built and flown by my father, was lost on its first flight in the K.M.A.A. Cup, with a time of 6 mins. 30 secs. o.o.s. Failure to find this model probably prevented him from gaining a place in the "NORDIC" 100, but this flight established a new Club F.A.I. record. On the 2nd July, 1950, my model placed third at the Beverley Rally with a two flight aggregate of 6 mins. 01·4 secs.

In preparation for the 1950 Northern Area Rally it was decided to fit the model with fin strakes to fly in the H.L. Glider contest, and at the same contest to make an attempt to break the existing British "NORDIC" class H.L. record. This it did, (subject to confirmation) on a flight before the contest with a time of 3 mins. 40 secs. o.o.s. the model being lost and therefore could not compete in any competition flights. This was also a Club H.L. record.

"NORD 2" is very strongly built and will withstand most "prangs" with the minimum of damage, as it was designed to fly in the rough weather to which we are accustomed in the Northern Area, and which we encountered in the 1950 Nationals. Tow line stability is very good but if required, automatic tow hooks can easily be fitted with a tab in the lower fin. The tip-up tail D/T is highly efficient, the amount of movement being regulated by the length of the restriction string which is fitted from the end of the boom to the T.E. of the tailplane.

Full building instructions and designer's trimming hints are supplied with each full-size A.P.S. drawing; but the following section on flying the record breaking hand-launched soaring version is reprinted below for the interest of others fortunately situated in hill-soaring terrain.

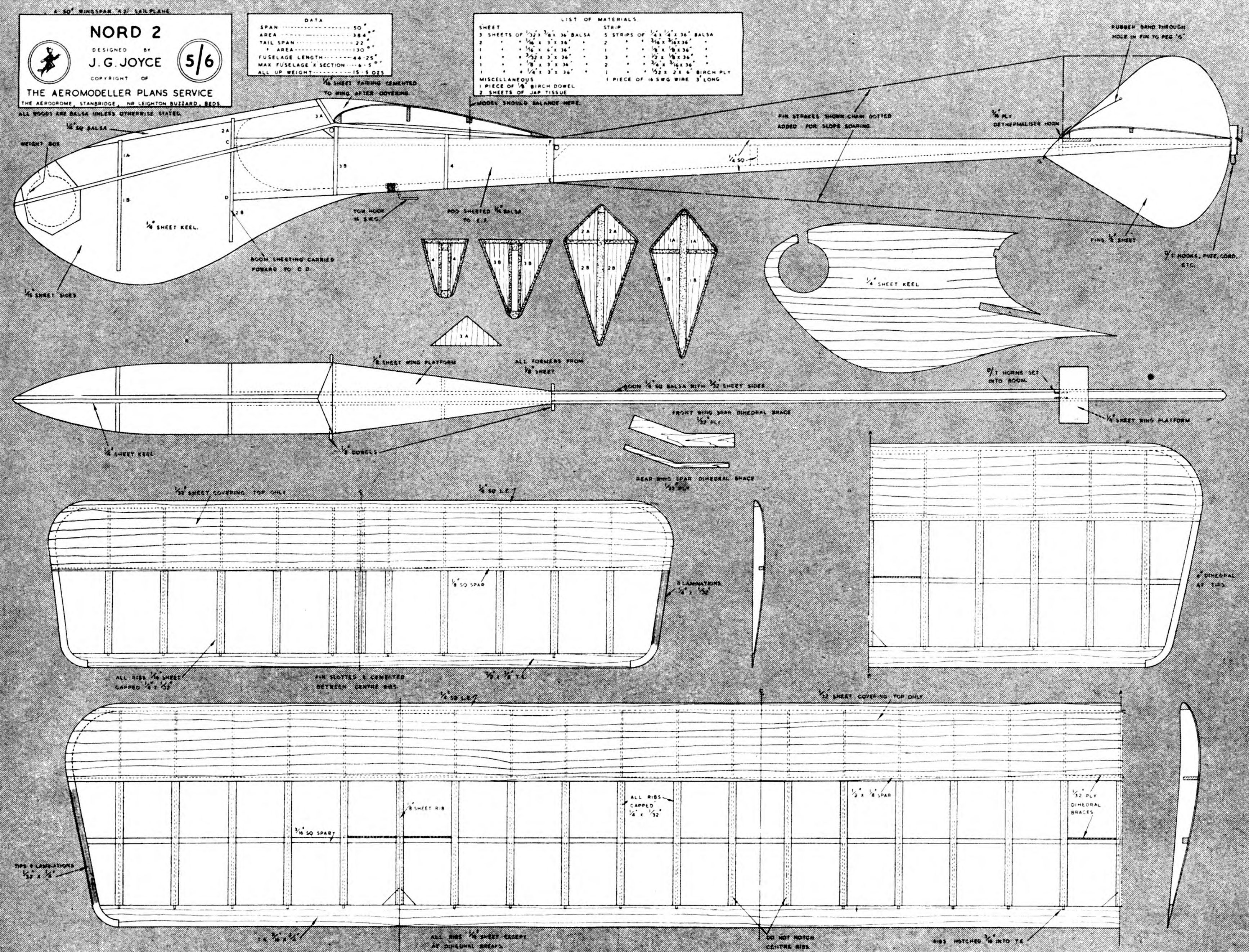
Hand-launch Trimming.

For slope soaring the fin area is increased by the addition of the fin strakes shown dotted on the plan. These are cut from ⅛ in. sheet balsa and cemented to the boom making sure that they are dead straight, otherwise the model will tend to circle. No trim tab will be required as a straight flight is needed to keep the model into wind. The ideal trim is when the model is slipping slightly away from the hillside with its nose into the wind. When launching, try to keep the nose dead into wind and let the model fly from your hands, as, on most days the speed of the wind will carry it, with very little forward motion of the model.

This model being designed for competition work, requires careful trimming, and when finally trimmed, locating blocks should be fitted to the wings and tailplane so that they retain their setting. Provided these instructions are faithfully carried out, this model should give you many happy hours of competition flying.

Full-size copies of the 1/5 scale plan opposite can be obtained price 5/6d. post free from the Aeromodeller Plans Service, complete with building instructions.

Two views of the NORD 2 in action emphasise the rearward C.L.A. of the hand-launched record holding version. Centre photo shows the weathercock attitude as the model soars.

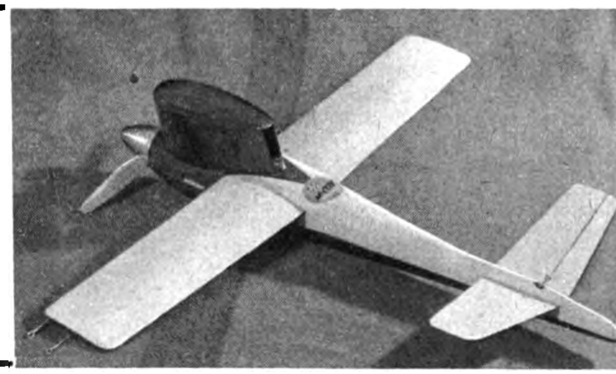

A 50" WINGSPAN 'A 2' SAILPLANE
NORD 2
DESIGNED BY
J. G. JOYCE
5/6
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD, BEDS.
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.
DATA
SPAN 50"
AREA 384 □"
TAIL SPAN 22"
" AREA 130 □"
FUSELAGE LENGTH 44·25"
MAX FUSELAGE X SECTION 6·5 □"
ALL UP WEIGHT 15·5 OZS
LIST OF MATERIALS.
SHEET
3 SHEETS OF 1/32" X 3/8" X 36" BALSA
2 " " 1/16" X 3" X 36" "
1 " " 1/16" X 6" X 36" "
1 " " 3/32" X 3" X 36" "
1 " " 1/8" X 3" X 36" "
1 " " 1/4" X 3" X 36" "
MISCELLANEOUS
1 PIECE OF 1/8" BIRCH DOWEL
2 SHEETS OF JAP TISSUE
STRIP
5 STRIPS OF 1/4" X 1/4" X 36" BALSA
2 " " 3/16" X 3/16" X 36" "
1 " " 1/8" X 1/8" X 36" "
3 " " 1/2" X 1/8" X 36" "
2 " " 3/4" X 3/16" X 36" "
1 " " 1/32" X 2" X 6" BIRCH PLY
1 PIECE OF 16 SWG WIRE 3" LONG
1/16 SHEET FAIRING CEMENTED TO WING AFTER COVERING
MODEL SHOULD BALANCE HERE.
1/4" SQ BALSA
WEIGHT BOX
1/8" SHEET KEEL.
1/16 SHEET SIDES
TOW HOOK 16 S.W.G.
POD SHEETED 1/16" BALSA TO E.F.
BOOM SHEETING CARRIED FOWARD TO C.D.
FIN STRAKES SHOWN CHAIN DOTTED ADDED FOR SLOPE SOARING
RUBBER BAND THROUGH HOLE IN FIN TO PEG 'G'
3/16 PLY DETHERMALISER HORN
1/4 SQ
FINS 1/8" SHEET
D/T HOOKS, FUZE, CORD, ETC.
1/4" SHEET KEEL
ALL FORMERS FROM 1/8" SHEET
1/8" SHEET WING PLATFORM
BOOM 1/4" SQ BALSA WITH 3/32 SHEET SIDES
D/T HORNS SET INTO BOOM.
1/8" SHEET WING PLATFORM
FRONT WING SPAR DIHEDRAL BRACE 1/32" PLY
1/4" SHEET KEEL
1/8" DOWELS
REAR WING SPAR DIHEDRAL BRACE 1/32" PLY
1/32" SHEET COVERING TOP ONLY
1/4" SQ L.E.
1/8" SQ SPAR
8 LAMINATIONS 1/4" X 1/32"
ALL RIBS 1/16" SHEET CAPPED 1/4" X 1/32"
FIN SLOTTED & CEMENTED BETWEEN CENTRE RIBS.
3/16" DIHEDRAL AT TIPS.
1/32" SHEET COVERING TOP ONLY
1/8" SHEET RIB
ALL RIBS CAPPED 1/4" X 1/32"
1/2" X 1/8" SPAR
1/32" PLY DIHEDRAL BRACES
3/16 SQ SPAR
TIPS 8 LAMINATIONS 1/32" X 1/4"
ALL RIBS 1/16" SHEET EXCEPT AT DIHEDRAL BREAKS
DO NOT NOTCH CENTRE RIBS
RIBS NOTCHED 3/16" INTO T.E.

NORMAN G. TAYLOR GIVES THE

LOWDOWN ON SPEED

PART III

Photo at right shows Cyril Shaw's McCoy 60 class VI model which has since parted company with its lines. This model displays a typical "Shaw" finish, note the light colouring for maximum visibility, also displayed in Lindy on opposite page.



ONE important item not yet mentioned in this series is the airscrew. Airscrew balance and finish are another two details which must be watched with the utmost care. You cannot hope to get " top notch " performance with a prop that is roughly finished, or unevenly balanced, so make a special point of devoting at least one or two evenings to checking your props for absolute perfect balance and giving them a really super high-gloss finish.

Getting the correct engine-propeller combination is one of the greatest secrets to high speed flying, and is one of the hardest things to obtain.

I always aim to get my props as thin as possible. There is a theory expressed that it is best to carve speed props a shade on the thick side to prevent flexing at high r.p.m. I entirely disagree with this, because I have found in practice that an ultra-thin highly finished prop is definitely more efficient.

Another little detail which can very often give *BIG* trouble just when it is not wanted is the spinner. The metal Supersonic spinner is a really good light job, and when fitted with a slightly thicker backplate, makes a practical spinner for mechanical starting. Both of my record-breaking class VI models were fitted with " Bat " Supersonics, these being used in conjunction with a lightweight dural " flywheel backplate " (see plan of " Lazy Bones III " in August 1950 issue).

Fuels.

When mixing your own fuel, keep the total number of ingredients down to a minimum. Correct fuel mixture, just like the many other things mentioned, plays an important part in speed flying, and it is advisable to keep a log of the exact fuel used, together with such details as date, speed, weather conditions and temperature at time of flight. A written record of this nature can be of invaluable assistance when trying to decide upon a formula which will suit your engine best for a given set of weather conditions. A minimum number of ingredients is advisable because this allows a variation of any one with quite noticeable results.

Many people have asked me for a really " Hot " Formula for Glow Plug fuel. Well, here is the formula which was used to raise my Class VI record from 111·1 to 132·2 m.p.h. There are no " fancy " ingredients in this, but believe me, this mixture will certainly make your motor turn over !!

Methanol ..	6 ozs.	Amyl Acetate ..	2 c.c.
Castor Oil ..	2 ozs.	Nitromethane ..	2 ozs.

The above formula is only suitable for use on a cool and somewhat damp day (remember last Easter at Brighton ?). For one of our somewhat rare hot summer days the oil content should be increased, and the Nitromethane content decreased. You will find the following a rather good mixture for such a day :—

Methanol ..	4 ozs.	Amyl Acetate ..	2 c.c.
Castor Oil ..	2 ozs.	Nitromethane ..	1 oz.

Nitromethane is quite an expensive item these days so it is a good idea to mix your fuel less the Nitro content, and then add this as and when necessary on the contest field.

Leave filling the flight tank until the very last moment, this ensures the fuel reaching the motor as fresh as possible.

I have noticed that many speed modellers suffer very severely from " contest nerves ". When flying on the local Club ground they can start their motors quickly and without bother, make perfectly good flights and dream landings; . . . but when it comes to a contest in front of a few spectators it is quite a different matter.

Excitement can run high at a contest. Perhaps you have been waiting quite some time to take the circle, perhaps you have never used the anti-whip pylon before, perhaps you are wondering if you *are* using the right fuel or prop, or glow plug ! Yes, there are a hundred and one things you can think of when it comes to the point of taking your chance and putting your hours of work to the test. But, as I pointed out in my first article, you must keep your head at all costs, and you must not let a large audience fluster you.

Background Colour—Model Colour.

Let us consider these two factors in relation to each other. The background against which you nearly always fly is dark. Trees, bushes, hangars, cars, crowds—all these tend to become a dark, blurred background. So you will see it is quite obvious for best " model vision " under such circumstances the model must not be finished in any of the darker colours.

A light colour scheme which contrasts with the background will give you better vision, and therefore better judgement and control of the model. Yellow, white and cream are about the best three colours to use for maximum contrast to the average background. Personally, I have found yellow to be the best of the three colours mentioned.

Take the utmost care of your Lines . . . everything depends on them !! It is advisable to keep a special set for contest flying, and you should ensure that these are made up to the exact length required for the class in which you are flying. Line length is measured from the centre line of the model to centre line of the handle, therefore the *actual wire* length is usually approximately twelve inches less than the total length called for. Remember all these small points . . . every inch of line over length loses you m.p.h., whereas one inch under length will disqualify from the contest !! So make certain you have the length checked and double checked.

If you have been flying on stranded control line wire you will find that line drag will be decreased, and speed increased, by changing over to a good quality single strand steel wire.

These few suggestions bring to an end my "Low Down on Speed ", which I do sincerely hope will have helped at least a few modellers to take a step further in the right direction towards obtaining that elusive " perfect " speed job.

I close with a correction to Part II in which R.A.F. 30 was given as a good all-round airfoil section for speed work, this should be amended to read R.A.F. 31.

LINDY

BRITAIN'S FASTEST CLASS IV SPEED MODEL

by

FRED GUEST

FIRST to demonstrate the Jet speed model, a pioneer among power modellers and manufacturer of spinners, tanks and bellcranks, Fred Guest has been a speed specialist since controlline came to Britain. His pair of Dooling-powered speedsters have become an expected entry at all Southern C/L meetings, each won its class in the National Contests, July 9th, and the smaller one, Lindy, has progressively raised its contest speeds, the latest being a new record claim of 116·9 m.p.h. at the London area Championships, Chigwell, 22nd October.

Apologising for the exposed cylinder head, Fred explains that it projects further than he would really like ; but the motor was absolutely brand new when installed, and not run in or even bench tested (such faith this man has in Doolings !). By having an entry duct to the barrel from the front and an exposed pot, Fred believes in running in while airborne, for the faster the motor goes, then so must the flow of cooling air be correspondingly faster, thus obviating all risk of seizure.

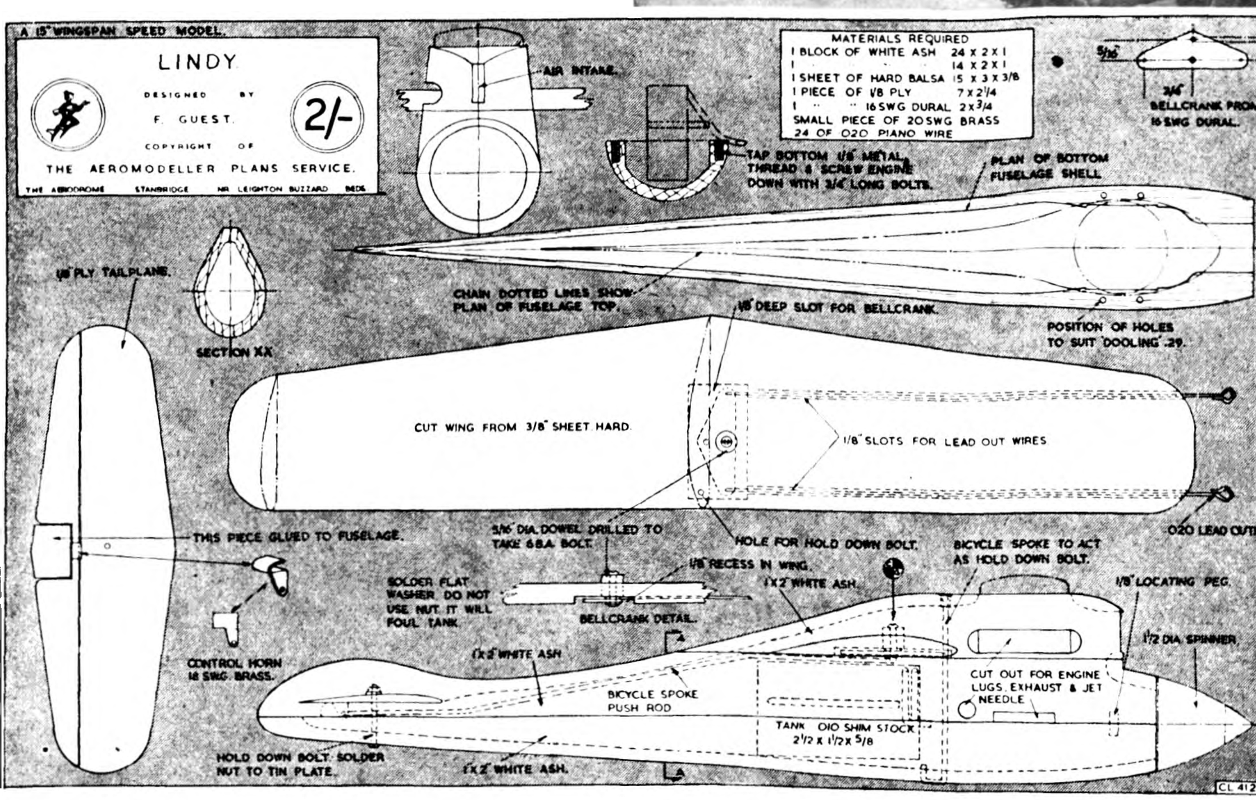
Questioned whether the motor was altered to make Lindy *the fastest class IV model in the country*, Fred retaliated with, " Are you kidding ? What could I do to improve a Dooling '29 ' ". . . . enough said !

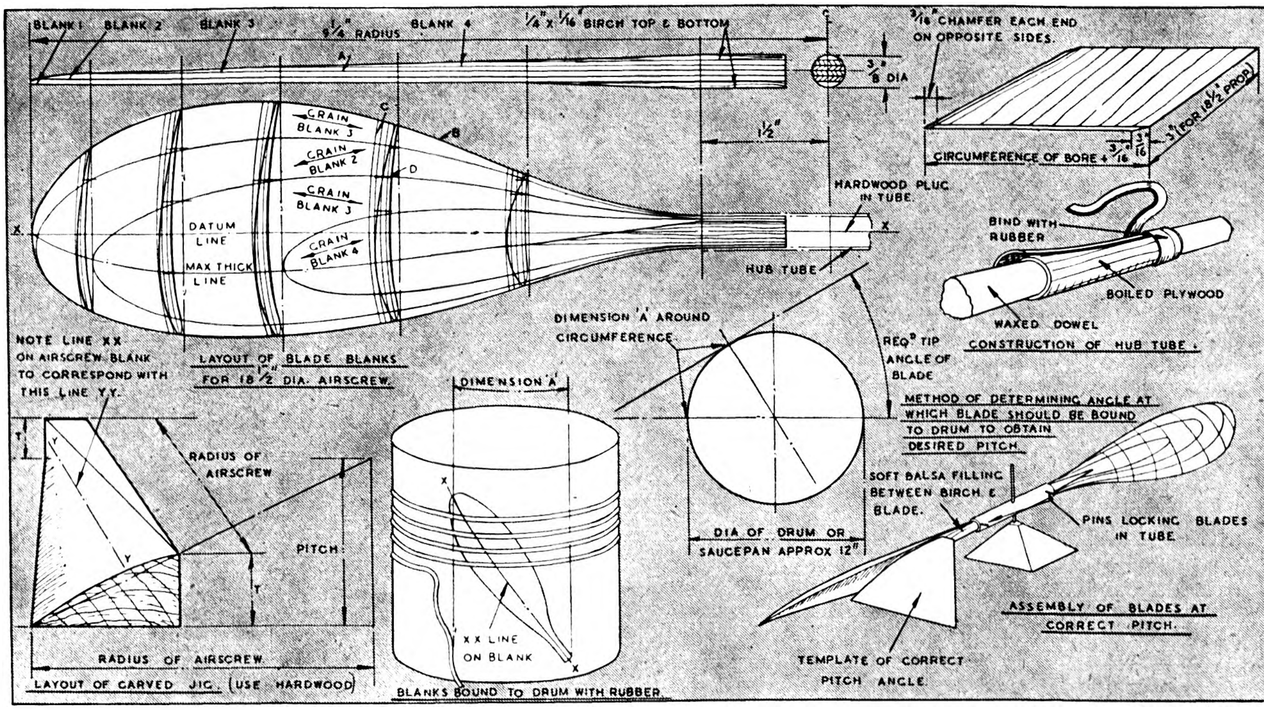
Building instructions are hardly necessary, the construction being solid throughout, and typical of the 1951 trend in speed design. It should be noted that the original hardwood fuselage lower pan was tapped to take an ⅛ in. metal thread, and the motor was screwed directly to the pan. It is a simple mod. to drill bolt holes directly through the pan and use the normal nut and bolt method if this is preferred.

Balancing at the bellcrank pivot point, the prototype weighed 14 ounces, and was hand launched in contests, though it will leave the two wheel drop-out undercart after a run of only 10 ft. Lindy flies light on the lines, yet is perfect to control.

A heavy copper spinner, with a 1/16 in. steel backplate gives slight flywheel effect for the light 7½ in. diameter, 9 in. pitch prop. cut down from an 8 in. Stant toothpick. Fuel is no more than straight Methanol/castor oil, mixed 5 : 1 ratio.

A familiar sight at all speed events, Fred with his mobile workshop/starter trolley, miniature jerrycan and of course LINDY and PRONTO.





GEORGE WOOLLS SAYS WHY NOT

LAMINATE YOUR AIRSCREWS

In the Aeromodeller of February, 1939, Mr. Renaut described a method of constructing built-up laminated airscrews. The following has been developed from this.

I claim that airscrews have the following advantages when made on this principle :

(1) Higher efficiency due to accuracy of blade section, and to low drag from the finer blade roots possible.
(2) High strength and freedom from splitting due to cross graining.
(3) Manual change of pitch possible, and ease of development of auto adj. pitch,
(4) In the event of breakages, one blade may be replaced, instead of a complete new airscrew.

Although I could think up more advantages, these will do to go on with I think, so we will now give the " Know How."

I have tried to make the drawings as clear and comprehensive as possible, but even so a few words regarding the layout of the blanks may not come amiss.

At this stage, required pitch of the finished airscrew may be ignored, as long as you know diameter, blade width, and section thickness.

With this knowledge, the blanks may be laid out.

In my experience four 1/16 in. sheet blanks are suitable for an airscrew of about 18 ins. dia. Draw these out as shown on the drawing (A), underneath draw an outline of the blade required (B).

Draw at convenient points, with a compass, lines 1/16 in. apart representing the required undercamber (C). Through these lines the required section at each point may be drawn in (D), and then, finally, the blanks may be plotted.

Card templates are now made of the blanks. Make sure that the datum line X–X is shown on each template.

Cut the blanks from sheet balsa, and again draw the datum line on each. Make sure that the grain of the wood is slightly diagonal across each blank, in an opposite direction to the adjacent ones.

Each set of blanks may be assembled to form a blade, either on an oil drum or saucepan of about 12 ins. dia., or on a specially carved forme.

If the oil drum method is decided upon (it is clumsier) the blanks are thoroughly cemented together, making sure that the datum line XX is STRAIGHT, and bound with rubber, to the drum at an angle as shown. The angle at which the blanks are bound to the drum determines the pitch.

A method of obtaining the angle at which the blade should be laid on the drum is shown.

Blades made in this way have a sweep-back which does not appear to detract from efficiency, and does allow the blade to lie closer to the fuselage, if a folding prop is decided upon.

If a carved forme is decided upon, it is carved in a similar fashion to a normal carved airscrew. The blade datum line X–X should lie along a line Y–Y on the forme, which lies in one plane. By this I mean that a straight-edge laid along the Y–Y line will touch the forme along its whole length.

Although, theoretically, one forme will only produce one pitch, a smaller dia. prop with consequently a smaller pitch may be made upon it if a slight inaccuracy in pitch change be accepted.

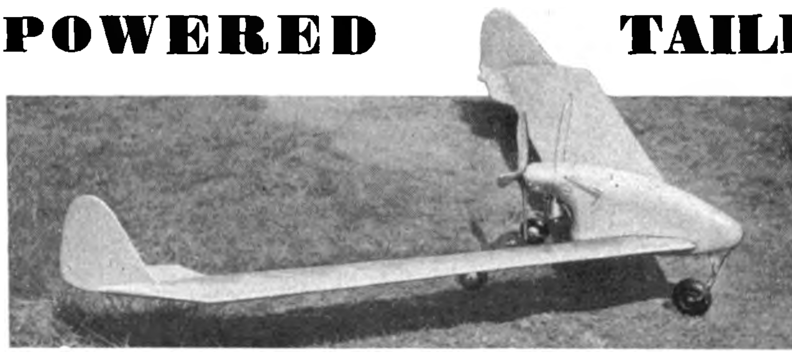
Sand the blanks until they merge into one another, and, after the hard wood reinforcement has been cemented to the blade roots, sand these to a circular section to suit the ply hub tube.

The centre of the hub tube is plugged with a length of hardwood dowel and the whole drilled and bushed to take the prop shaft.

Blades are pushed into the hub tube, set by means of a gauge to the correct pitch, hub tube and blade drilled through with a fine drill, and the whole locked by means of an ordinary pin. This drilling should be done through the hardwood at the blade roots.

Next month Mr. Woolls will describe a new method of airscrew folding).

POWERED TAILLESS MODELS



PART ONE OF A NEW SERIES BY

M. M. GATES

This typical tailless model was converted by the author from a glider by N. K. Walker. Shown here it is powered by a Frog 180 with a four bladed prop.

TAILLESS models hit the headlines for the first time since the war at the Handley Page contest, where there was a wide variety of shapes to be seen. Since then a degree of similarity has developed between designs. The average tailless glider employs moderate sweepback and taper, with a section heavily reflexed especially at the tips; small tip fins and a little dihedral are occasionally used.

Power models on the other hand have developed along a different line. Typical characteristics appear to be: 20° sweepback, ample dihedral to control torque, fairly large tip fins and a pusher engine mounted in a short fuselage above the wing. Longitudinal stability is obtained by fitting elevons at the tips, combined with about 6° washout. An aspect ratio of 6 and a tricycle undercarriage complete the picture. The thrust/weight ratio is probably only about 0·5. Since there is no slipstream for the tail to act on, the thrust line is normally above the centre of gravity to keep the nose down. On all but very low powered models, the wing operates at a smaller angle of attack in the climb than on the glide. A low thrust line can be tolerated if the model is trimmed to climb spirally, as with Bill Dean's " Jet-wing ". The nose-up thrust moment goes to produce the turn instead of a stall, but it is very doubtful if it is the most efficient arrangement, since lift is really wasted. For a straight or almost straight climb, the thrust-line should be above the C.G., and the greater the thrust the higher it must be. Providing this is realised, flying this type of model does not introduce any particular difficulty.

Once they have reached beyond the tyro stage in developing flying wings, most modellers will desire lighter models, with more power. The greater power/weight ratio of the latest engines and the good thrust/weight ratio of the Jetex motors (especially the 50 and 350) are likely to raise the thrust/weight ratio of the new generation of tailless models even greater. And that is where the trouble starts unless the design takes account of the difficulties which can be expected. A high thrust-weight ratio is especially easy to attain with Jetex motors on a tailless, since the absence of vibration makes a lighter structure possible.

Consider what happens to an " orthodox " tailless model when the thrust is increased to bring the thrust/weight ratio up to 1·2 or over. This was done when my Ghoul 2 had its Jetex 200 unit replaced by a home-made lightweight 350. The jet was mounted on a short pylon above the wing to place the thrustline slightly above the centre of gravity. Trimming the model to fly straight resulted in a series of loops. If it was given turn it would commence with a tilted loop and then progress into a spiral dive (making half charges essential).

Before going on to discuss the necessary features of a high-powered tailless model, perhaps we had better give a little thought to the theory of stability. Most of the general theory which is applicable to tailless models has been made known by the L.S.A.R.A. and is developed from full scale theory.

Lateral Stability.

When considering the lateral stability of a model there are four factors to be taken into account (see Fig. 1). A. The moment, mainly produced by the fins, which tends to turn the model into a sideslip. Thus it tries to make a turn, become more steep and is a destabilising effect. In addition to the effect of the fins and the fuselage (if any, it is increased by using sweepback, since the drag of the wings then produces a similar moment. B. The rolling moment on the wings, when yawed, which tends to roll a model out of a turn. It is usually obtained by the use of dihedral, but the same effect is produced by sweepback, except that it is then dependent upon the angle of attack as shown by the graph (Fig. 2). Notice that the " effective dihedral " increases with angle of attack on a sweptback wing, whereas it decreases with sweepforward. C. The yawing moment which tends to straighten out a model flying in a steady turn. It results from the side forces on the fuselage and fins, and the increased drag of the outer

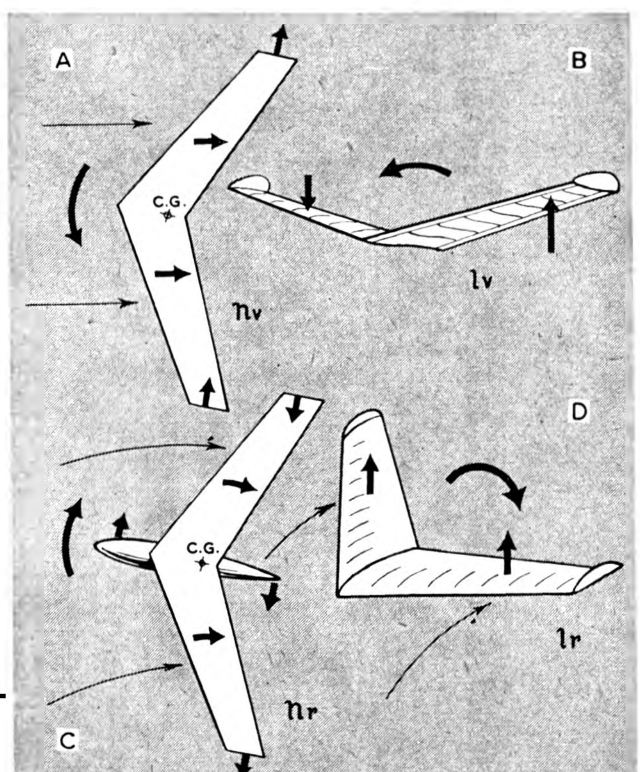


Fig. 1. Lateral stability—thin arrows indicate relative airflow and the thick arrows resultant forces and moments acting on a model.

wing due to its greater speed. Effects B and C go to improve stability. D. The rolling moment on a wing in a steady turn. The higher speed, and hence lift of the outer wing, rolls the model into the turn. Hence it is also a destabilising effect.

In full-size theory, these four factors, in coefficient form, are called n_v, l_v, n_r and l_r respectively. For a model to be spirally stable $l_v n_r - l_r n_v$ must be positive, and, according to Walker, l_v should be between 1 and 1·5 n_v. A higher value of l_v would cause Dutch rolling. In other words the two stabilising factors multiplied together must exceed the two destabilising effects multiplied together. So we endeavour to make the stabilising effects as large as possible and the destabilising effects as small as possible, at the same time

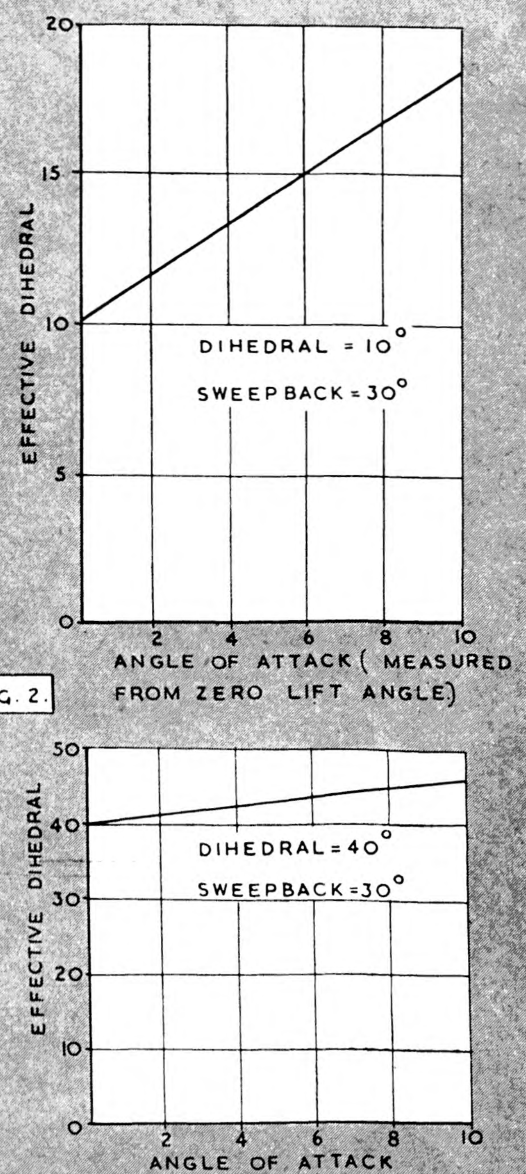


FIG. 2.

THE DECREASED IMPORTANCE OF SWEEP-BACK RESULTING FROM INCREASED DIHEDRAL

remembering that the dihedral effect l_v is limited, and must depend on the fin area. Excessive dihedral causes what I call superstability. In extreme cases this is shown by Dutch rolling (rolling oscillations). A smaller degree of superstability may only show up on a two launch, as bad oscillatory instability. A degree of superstability produces a safer model in free flight, especially in power models, where the large dihedral helps in controlling torque. Thus it is that high power models tend towards superstability, whereas gliders have to be perfectly stable. So it is not always possible to test a power model by towing it up, a suggestion which has been made, for saving props. and crankshafts.

On small models, Dutch rolling oscillations have a high frequency, and seem to be very easily excited by small gusts of wind. On the other hand, larger models (4–6 ft. span) have slower oscillations which seem to be less sensitive to gusts. It would appear therefore, that of two otherwise similar superstable models, the larger would fly more steadily.

The design of a high-powered model for satisfactory lateral stability is very much more difficult than that of a glider. A glider flies at a constant angle of attack (just below the stall) throughout its flight, including the tow. On the other hand the power model may climb at any angle of attack down to that for zero lift (as in a vertical climb). In any case the lift coefficient of a high-powered model is very low on the climb, whereas in the glide it is similar to a glider, flying at its maximum lift coefficient. So the designer has to reach a compromise which will give satisfactory stability under both conditions. It will be seen that the effective dihedral due to sweepback causes a model to be superstable at high incidences, but unstable at low angles. This is not what we want, as it is especially important to have plenty of dihedral on the climb. What can we do to abate this effect ? By increasing the actual dihedral, the constant part of the dihedral effect is increased, thus making the variable dihedral due to sweep less in proportion. The situation is not quite as bad as it sounds, for the destabilising yawing effect (A) depends on the drag of the wings, as so it is smaller at low angles.

One solution to the problem seems to be to use sweepforward, as proposed by Annenberg. Whether sweepback can be used with satisfactory results is still not certain, but it would seem to be much more difficult. A sweptforward flying wing would give good lateral stability characteristics, but the trouble is then to bring the C.G. far enough forward. The C.G. would have to be in front of the centre section, and the motor mounted on a boom in front of the wing. This would rather nullify the benefits of a tailless layout.

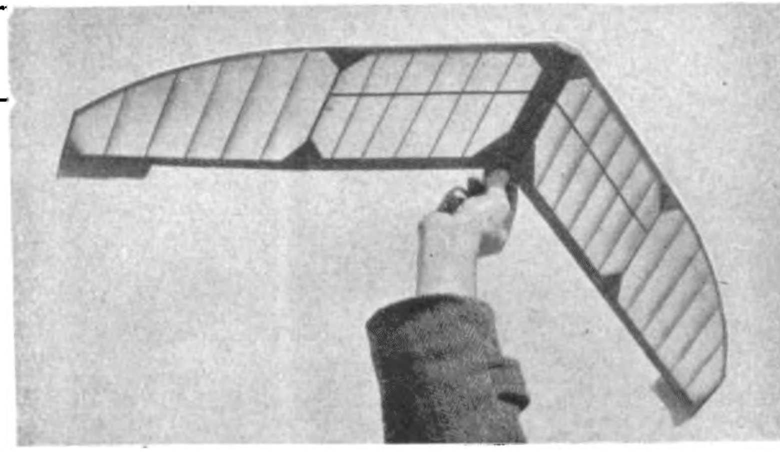
Longitudinal Stability.

The longitudinal stability of a model is proportional to the distance (h) of its C.G. in front of the aerodynamic centre or neutral point. This is normally at the mean quarter chord point for large wings, but L.S.A.R.A. tests on tailless models of up to 50 ins. span have shown it to be nearer 30% mean chord. " h " the static margin as it is called, was found to be 15% mean chord for best results, although I have found a higher value necessary when the C.G. is high (20–30%). If the C.G. is insufficiently far forward, dynamic instability will develop although the model may appear stable from a hand launch, a long glide will develop into undulating flight, growing into violent stalls, and even loops. A large static margin ensures that the model will not stall more than twice when the power cuts. To trim a tailless model with the required forward position of the C.G. it is necessary to provide a nose-up aerodynamic moment. The three ways of doing this are to use elevons, washout, or a reflexed trailing edge. Often two or three of these methods are used on one model.

Methods of obtaining Longitudinal Stability.

Of primary importance to the longitudinal stability of a tailless model is the choice of aerofoil section. To judge from successful model aircraft, aerofoil sections should be about 12% thick for a large model, down to 9% thick or less for small free flight models. If we assume these are the best

The author's "Ghoul II" lightweight high-thrust jet model, the span of which is 37".



thicknesses, pending detail aerofoil tests under model conditions, we are left with one other major choice, namely camber. Here there are four main groups of aerofoils used on tailless models.

1. The undercambered type, e.g., N.A.C.A. 6409, which is common on orthodox models. 2. The aerofoil with moderate camber and flat underside, e.g., Clark Y. 3. The section with little camber and reflexed trailing edge, e.g., Clark YH. 4. The type with large undercamber and highly reflexed trailing edge, as used on some "Flying Plank" designs. Up to now, types (2) and (3) have been most popular.

What are their characteristics ? A low centre of pressure movement, a low maximum lift, and a fairly low drag. Now sinking speed is inversely proportional to $\sqrt{\frac{C_L^3}{C_D^2}}$ in other words, to obtain a low sinking speed it is desirable to increase the lift coefficient even if it results in a similar increase in drag. From this I have evolved a theory that an undercambered section will give a better glide than a 'moderate' one. This seems to be true of orthodox models, but few modellers have tried undercambered sections on tailless models. Perhaps those who have tried them failed to appreciate that large elevon or washout angles that are necessary to make the model stable. Although these will result in a loss of efficiency, I do not believe it will outweigh the advantages to be gained by using an undercambered type. I have designed a model along these lines, and first flights indicate a better glide than previous types with reflexed sections. Of course, the climb, which is anyway at a low lift coefficient, is probably less efficient, but I feel that the glide is the more important consideration when choosing a section for a duration model, especially in good flying weather. A further theory of mine, thrown in for good measure, is that if you propose to design a model of an unusual type, it is more important to build in plenty of stability, rather than to design it for a really super performance, which may turn out to be unattainable because of inadequate stability.

But *revenons a nos moutons*. My practice is to build the central half of the wing with parallel chord and no washout. This to produce a high lift coefficient. The outer sections are designed to provide stability with the minimum of drag, but little lift. About 6 degrees washout is normally used. No washout would cause the wing tips to stall very easily and to make the model perform a sort of loop. Too much on the other hand can cause an inverted tips stall, especially in a climb. The most efficient use of washout is to change the aerofoil section along the span, thus using a symmetrical section where there is to be no lift and even an inverted section where a down-load is required. This will certainly reduce the possibility of an inverted stall as well as reducing the drag.

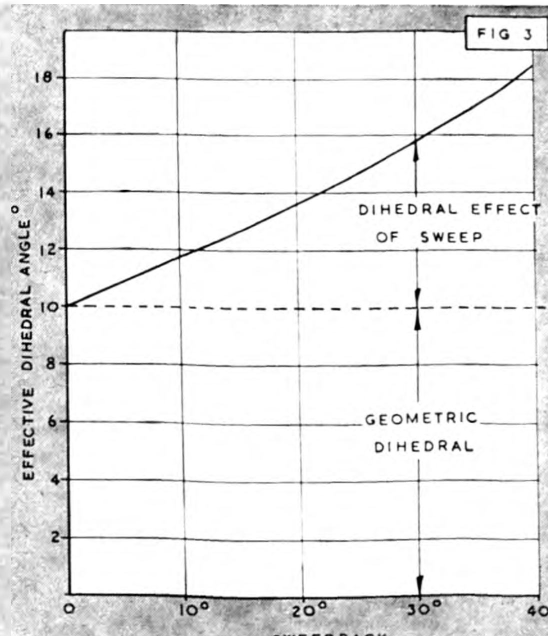
Taper should be used only in moderation. For this reason, I use it only on the outer sections and then in small quantities. There is a tendency for 'tired' boundary layer air flowing over a sweptback wing to drift out towards the tips, where it tends to separate. This effect is aggravated by excessive taper. One can best picture a large amount of 'tired' air drifting from the large centre section onto relatively small tips, where it must have a more powerful effect. Also small chord tips have an unfavourable scale effect.

Newcomers to the flying of tailless aircraft may ask why sweep-back is necessary at all. The answer is that it gives the elevons a greater moment arm, so that the down-load required on them is smaller. However, sweep should not be made excessive, or drag rises sharply. Also, the elevons will lose effectiveness due to the air 'sliding' out to their tips rather than being deflected upwards.

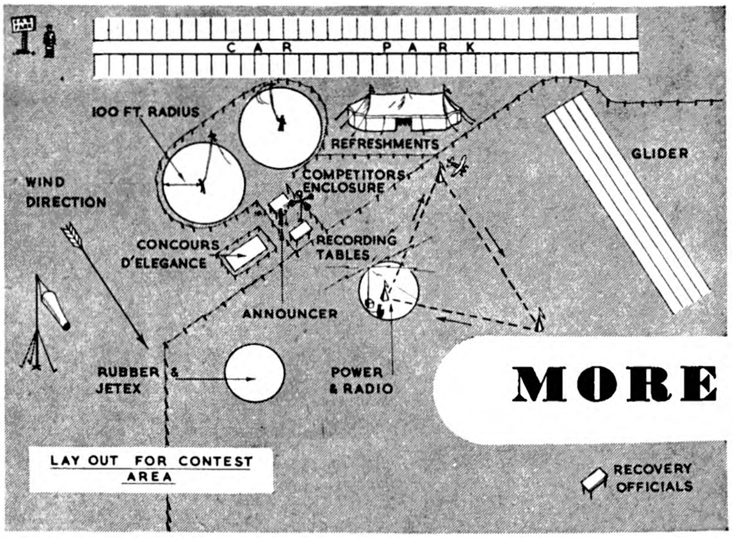
Torque and Gyroscopic Effects.

Most of my tailless models have been powered by jet units. There seems some reason for believing that diesel and glow-plug powered models will be rather easier to trim, providing the fundamental principles are appreciated. Engine torque is of little importance since it can easily be trimmed out by using sidethrust. The important effect is due to the gyroscopic action of the propeller. This causes a model in a turn against torque to put its nose down in a steepening spiral dive until . . . Or it will unless the model has upthrust, and is very carefully trimmed. In the opposite direction, i.e., with torque, the gyroscopic effect keeps the nose up in a turn. The faster the model turns, the more the nose is kept up, so a turn with torque is relatively safe. My own tests with orthodox diesel models have confirmed this, and that the safest trim is with slight turn with torque. *(Cont. next month.)*

FIG 3



THE INCREASE IN EFFECTIVE DIHEDRAL DUE TO USING SWEEPBACK.
CALCULATED FOR 10° DIHEDRAL AND ANGLE OF ATTACK 10° ABOVE ZERO LIFT.



As promised in last month's issue wherein Barry Haisman and Phil Guilmant expressed their views on competition organising, we give below some typical comments from an expert in competition flying, and depict on the left for your interest the winning design in our Competition Layout Contest by Mr. M. E. May of Huddersfield. We ourselves have one or two criticisms of Mr. May's field layout and have no doubt that the vast majority of our readers will study this and the comments below with keen interest, and we invite your constructive comments on this very important subject.

MORE ON CONTESTS

In our next issue we will summarise the subject ourselves together with any useful comments received from readers.

Contest Thoughts from Ron Warring

TOWARDS the end of every season we learn, directly and indirectly, of various suggestions and proposals for new rules, amendments to old rules, and the like. The ultimate result is usually very much the same—little or no change. Yet the time has more than come when some radical changes are both desirable and necessary.

The present system of rules and contest regulations has outlived its usefulness. Attempts have been made, year by year, to modify such rules as necessary to keep pace with changing conditions and new developments with the net result that the present S.M.A.E. Handbook is largely ambiguous. (It took, for example, half an hour's study of the Handbook on the evening before the Nationals at York to determine whether or not it would be permitted to launch a rubber model by holding the fuselage instead of the wing tip.)

An even better example describes an incident at the London Area "Weston Cup" Wakefield Eliminator. One well-known entrant lost a model on both his first and second flights and reported to Control accordingly. Control had no hesitation in telling him that he could use a third model if necessary, a decision which appears to have caused some controversy in certain quarters.

Under the printed rules, the Control ruling was quite correct. As given in the Handbook, a maximum of *nine models* could be used by any one entrant, the operative words being "to enable the entrant . . to complete the required three flights".

Arguments and controversies of this nature are not common only to the London Area. Operating in the London Area himself the writer is naturally more familiar with "on" and "off" the record happenings in that Area. But the whole point is that with a good set of rules as guidance more than one half of these troubles could be avoided right at the start.

With so many different types of competition models it seems a major disaster to have to sort out which rules apply to a particular competition from a "comprehensive" handbook with "General Contest Rules", "Special Contest Rules", "F.A.I. Contest Rules", "Special Notes for Timekeepers", "Timing Record Flights", and heaven knows what else. The time has undoubtedly come when each type of contest requires its own separate handbook. Even if this does mean duplicating a certain number of rules in each case, every enthusiast would at least know where he stood.

These would be separate and independent of the normal S.M.A.E. Handbook which could then confine itself mainly to constitutional matters, records and record claims, etc., and the competition programme listed (with reference to the separate booklets for rules), with any special contests particularly defined. The fact that this would mean, virtually, scrapping the present Handbook layout and starting again with a completely new set of rules and definitions would be a very good thing in itself. It would provide just that opportunity to straighten out the present ambiguities and get all contests established on a sound footing.

We need—and badly, too—separate rules books for :—

Rubber model contests	Free flight Power contests
Glider contests	Control Line Stunt
Radio control	Control Line Speed (Team Racing)

Let us imagine some of the major points of controversy at the moment. Take "substitute models" as the first example. During the 1950 season these were permitted in the Wakefield Eliminators and Trials, but not in the Final. They were not permitted in the Nordic Trials, but they were in the Finals. These—virtually the major events of the S.M.A.E. programme—were the only competitions where substitute models were permitted.

Now what are the "pros" and "cons" regarding the use of a substitute model or models? A genuinely lost model on a fly-away—or a model badly damaged through hitting a house or a tree or similar obstruction at the end of a long flight should not, in all fairness, penalise the entrant concerned. Even with efficient dethermalisers a five minute flight on many days will land the model some two miles away from the launching point—and not all clubs or areas operate from flying grounds with open retrieving country.

This is even more true at centralised events. As regards recovery, the local entrants have the advantage in knowing the terrain. With the Wakefield and Nordic Trials at Fairlop, for example, we will guarantee that the percentage of London Area models lost, for example, was less than that of most other Areas competing.

If, then, substitute models can reduce this side of the luck element, why limit the number of substitute models to one? What can happen on the first flight can well happen again on the second. And to get amongst the top placings in any keenly contested event like the Wakefield or Nordic Trials you have to make *three* good flights. Two five minute flights and a lost model with a zero score for the last round is just not good enough these days. Yet the fact that the fellow has done two five minute flights shows that he is not exactly a tyro at the game! If he is enthusiastic enough to prepare for a contest by getting *three* well trimmed models together, why not let him use them to complete his three flights?

Where the " substitute model " rule does rather fall down is that it lends itself to abuse by a modeller who starts with one model, finds that it is not trimmed as well as he thought and thinks he will do better with another machine. He can wilfully damage his first model and claim it hit a house, got run over, his fingers slipped, or anything else. This is outside the spirit of the rule which aims largely at eliminating the bad luck associated with losing or damaging a good model through circumstances entirely outside the control of the modeller concerned.

Then, again, it is a matter of some argument as to whether a broken motor constitutes a reasonable excuse for using a substitute model; or a take-off crash, which *may* be due to a badly trimmed machine.

The danger lies in the fact that in trying to eliminate the rule-dodger the genuine competitor may suffer. (*He always does—Ed.*). On the principle that it is better to let the guilty go free rather than punish the innocent there is a strong case in favour of making the substitute question as open as possible. No first-class contest flier would be unduly worried by the fact that a rival has already made a poor first flight and wants to change over to another machine in the hopes of doing better. The loss of time on that first flight will be sufficient penalty.

Now how about the vexed question of hand-launch *versus* rise-off-ground? This argument has been going on for years and is never likely to be settled amicably. On point of fairness the balance is in favour of hand launch. A badly trimmed model will still spin in from a hand launch as well as it does from the R.O.G. position, but a well trimmed model can get into trouble from an R.O.G. release when it would have got away with it if hand launched. Models themselves are peculiar that way. Properly trimmed out during the test flying stage, two models of identical design may well have entirely different take-off characteristics. One may be quite trouble-free and the other may always be in danger of dropping a wing and coming in.

Personally the writer feels that the acceptance of hand launch would be a bad thing. There is more satisfaction in making an R.O.G. get-away and the fact that certain models are persistently trouble-free in this respect is an indication that a " dicey " model is not completely trimmed—or designed—for R.O.G. take-off. But under some conditions, even with the best of models, R.O.G. attempts can be plain suicide.

In centralised events—and they are few enough, in any case—delegating authority to the contest controller (jury ?) to substitute hand launching instead of R.O.G. under adverse conditions is undoubtedly a very good thing. Where there are high winds and turbulent air around the take-off area this is more satisfying to all concerned—competitors and spectators alike. This applies particularly to power models where either take-off technique or take-off characteristics invariably appear inferior to rubber models.

For Area-centralised events it is necessary to ensure similar conditions—and hazards—in each Area, as far as possible, and it would seem that here a definite ruling for R.O.G. must stand. But for decentralised events, where one little club can make its R.O.G. flights from " somewhere near the ground " with a good heave of the arm for all we know, in fairness to other competitors who try to stick by the rules, make hand launching the general rule. The temptation to " assist " the R.O.G. take-off under bad conditions must be too great to resist in many isolated club areas.

In point of fact, probably more than half the contest fliers do carry out some form of assisted R.O.G., often quite involuntary. It is a most natural reaction to want to see the model at least starting in the right direction. What degree of involuntary—or sometimes deliberate—assistance constitutes a breach of the present rules is something that no two pairs of timekeepers are likely to agree on, except in obvious cases.

We could, the writer feels, well afford to make the rules a little more lax in this respect—particularly as the present wing-tip-and-prop release called for in Wakefield events is unsatisfactory. Holding a rubber model in this way it is often impossible to keep the tail of the model on the ground in a wind—and in a strong wind both the torsional and bending strength of the wing concerned is pretty well tested. Wonder is so few people seem to crunch a wing tip up in their agitation!

Holding the fuselage constitutes the best method of R.O.G. release in bad weather. This then allows the flier to let the prop pick up speed before release, reducing the risk of a well trimmed model dropping a wing by at least fifty per cent. If the rule then called for the hand to be drawn backwards from the model it would not be easy to push the model forwards at the same time—and not exactly helpful to *lift* the model up backwards before releasing it. The one other great advantage in being able to hold the fuselage would be that pointing the model into wind would be so much easier.

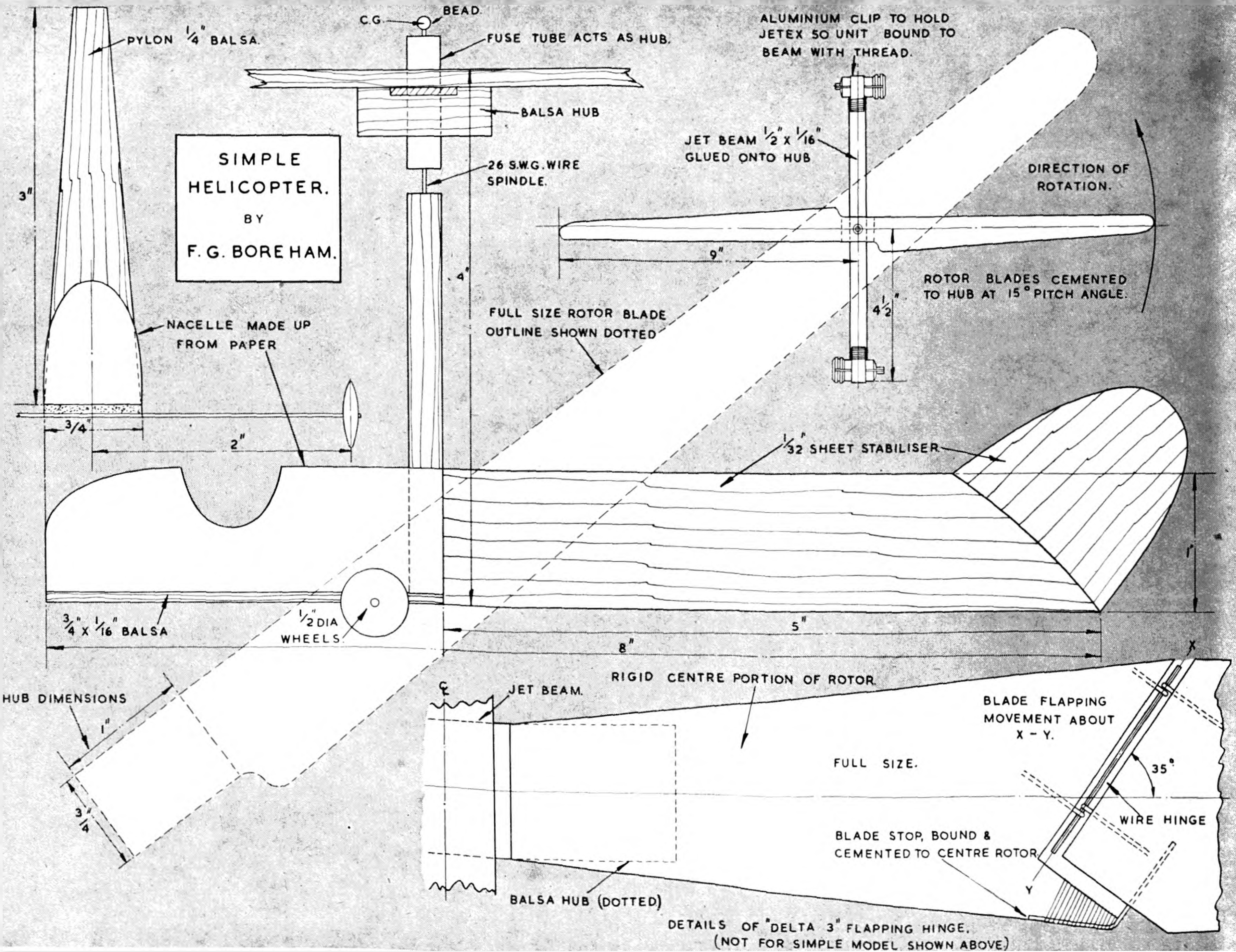
Now a few words about timekeepers themselves, who do a thankless job for just that—no thanks! Even this comment is not going to pat them on the back!

Too many important contests have been won and lost on account of timekeepers' eyesight. Two models in the air at the same time, flying a similar course and both actually remaining airborne for, say, six minutes odd may well have quite different official times recorded. One pair of timekeepers give up after, say, three and a half minutes, the others stick with the model until the last glimpse of sun on a polished prop fails to reappear at five and a half minutes.

Logically it is quite ridiculous to clock a model off as " flight ended " if it disappears out of sight upwards at some 2,000 feet after, say, three minutes. It is certainly going to remain airborne for longer than that. But at the same time there must be some definite ruling as to when a model must be clocked off as " out of sight " and thus flight terminated. Otherwise we may have a case of a model disappearing behind a tree at some thirty feet altitude after a minute and the timekeepers deciding that as there was a hill sloping down from behind the tree anyway and the slope of the hill was greater than that of the gliding angle of the model it would be good for another two or three minutes!

The present rules as to when a model is out of sight are satisfactory in most respects, but we feel that some specific instructions should be laid down for timekeepers, and possibly one or two amendments included. When a model is obviously well up and disappearing from view simply on account of distance and general visibility it generally disappears for a while, reappears, disappears again, and so on, as the light strikes different aspects of the model on its circling flight. It seems only fair to continue timing until the model has disappeared for good—not clock it off the first time it fades out of sight. And, being so high up and certainly not likely to come down for a good many more minutes, why not a bonus score of, say, 30 seconds to compensate for this?

Main argument against this suggestion is that some bonus scores may be easily come by—but not if the timekeepers concerned use a reasonable sense of judgement. In fact we have in mind a somewhat modified system of timekeeping applicable to all of the most important events. On hand, but not normally timing models, we would like to see, say, five *master timekeepers*, well experienced in the art. When any pair of normal timekeepers following a model feel that it is getting near the limit of visibility they could call for one of the " master timekeepers " to come over and assist in following that particular model to the last and if any question of adding bonus seconds arises there is then a three-man committee on the spot to reach a decision. And just to say " thank you " to all the timekeepers who do carry out their jobs so well, why not present them with a badge or similar token at the end of the season—qualification, say, twenty hours " on duty " at major events.



SIMPLE HELICOPTER.
BY
F. G. BOREHAM.
PYLON 1/4" BALSA.
C.G.
BEAD.
FUSE TUBE ACTS AS HUB.
BALSA HUB
26 S.W.G. WIRE SPINDLE.
ALUMINIUM CLIP TO HOLD JETEX 50 UNIT BOUND TO BEAM WITH THREAD.
JET BEAM 1/2" X 1/16" GLUED ONTO HUB
DIRECTION OF ROTATION.
9"
ROTOR BLADES CEMENTED TO HUB AT 15° PITCH ANGLE.
4 1/2"
3"
4"
FULL SIZE ROTOR BLADE OUTLINE SHOWN DOTTED
NACELLE MADE UP FROM PAPER
3/4"
2"
1/32" SHEET STABILISER
1"
3/4" X 1/16" BALSA
1/2" DIA WHEELS
5"
8"
HUB DIMENSIONS
1"
3/4"
RIGID CENTRE PORTION OF ROTOR.
JET BEAM.
BLADE FLAPPING MOVEMENT ABOUT X - Y.
X
FULL SIZE.
35°
WIRE HINGE
BLADE STOP, BOUND & CEMENTED TO CENTRE ROTOR.
Y
BALSA HUB (DOTTED)
DETAILS OF "DELTA 3" FLAPPING HINGE.
(NOT FOR SIMPLE MODEL SHOWN ABOVE)

HELICOPTERS JETEX

THOUGH photographs of working semi-scale helicopters have often appeared in overseas magazines, full credit for the first successful public demonstration of realistic helicopter flight in this country must go to pioneer F. G. Boreham, who lives at Waltham Chase, Southampton.

Aided through his lengthy experiments by his friend D. A. Smith, Mr. Boreham has spent many years of study with rotating wing aircraft. He is a Founder member of the Helicopter Association of Great Britain; by profession an Aircraft Inspector, and for most of his fifty years has pursued the unorthodox phases of aeromodelling. Small wonder then, that the hard graft of trial and error should have culminated in the magnificent display of stable ascent and descent on the occasion of the 1950 Thurston Helicopter Trophy, Northern Heights Gala . . . And what a pity this realistic demonstration should have been limited to the few fortunate viewers who happened to be on that side of the field!

However, Mr. Boreham's experiments have attracted the attention of the Jetex manufacturers and co-operation has produced a batch of models suited to kit production, so that now the pleasures of scale-like helicopter flight are freely available, in commercial kits.

Mr. Boreham has kindly supplied details of a simple fixed blade 'copter for twin Jetex 50 power. It is the very simplest form of model, utilising the "beam power mounting" developed to cure instability—one of the many difficulties so prevalent in earlier designs. This version should climb vertically for the duration of its power run, but will not auto-rotate in the ' glide ' as those with the hinged-blade system.

Design.

Preceded by rubber-driven experiments, Mr. Boreham's twentieth model was the first to be fitted with Jetex power units. With a rotor diameter of 24 ins., it had two ' 50 ' units mounted at the extremity of the rotor blades (referred to as the " Rotor System "). Though it had fixed blades it was capable of some ten secs. on each flight; but the units were remounted "beam" fashion in following models.

The balance of the rotor blades is important, otherwise the fuselage will oscillate badly and the model will be erratic in flight. Similarly, it should be remembered that both jet units should be ignited at the same time to avoid out of balance forces during the power run.

Though safe and scale-like ascents were easily accomplished by the earlier models, the descents were not always as desired and usually far too rapid. Various ideas were tried in an effort to obtain auto-rotation, and eventually a full-size practice, known as ' delta 3 ' was found to be the answer.

Briefly, this may be interpreted as a method of blade hinging, so that, when the blade flaps up (or increases its dihedral angle), it also decreased the angle of incidence on the blade. Similarly, the incidence increases as the blade flaps down. All the later models incorporate this system, which has reduced the rate of descent so effectively with auto-rotation, that experiment No. 45, of 36 ins. diameter, with twin Jetex 100 units, constantly averages around the 60 secs. mark.

Twin 100 Model.

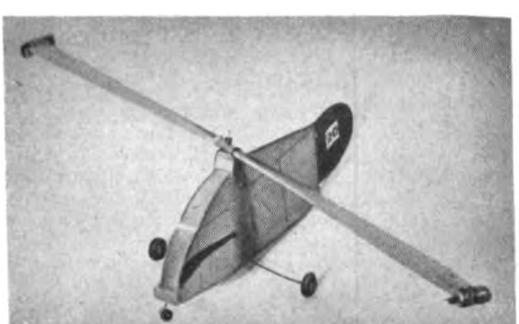
Rotary wing enthusiasts who might wish to try their own hand at Helicopter design will find Mr. Boreham's specifications for a twin ' 100 ' model invaluable. The blade diameter should be 34 ins. Two blades, each 14×2 ins. tapering to 1 in. wide at the tips are made from 1/8 in. sheet balsa, sanded to an airfoil section of Clark Y type. The Jetex 100 units are mounted on a 1/16 in. ply beam, 15 ins. long and 3/4 in. wide, which is glued and bound at 90° to a 6×1×1/4 in. centre section. This carries an aluminium tube to act as the hub.

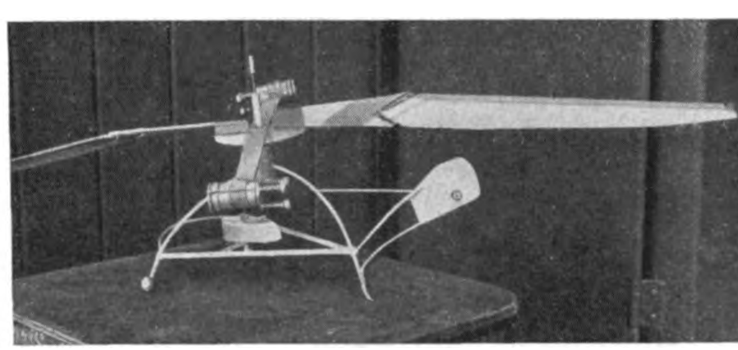
The blades are then hinged to the centre section beam, using 20 s.w.g. wire hinges, suitably bound with thread and glued. The delta angle of the hinge is 35° to the blade centre line, and the maximum pitch setting with the blades horizontal is 15°. Total weight, ready for flight, should be around 4½ ounces.

A 10 in. stabilising fuselage, 2 ins. deep at the front and tapering to 1 in. at the rear, with a 4½×1×1 in. nacelle in front of the rotor hub, will provide weathercock stability and not turn in flight. The undercarriage can be a simple wire axle with 5/8 in. wheels spaced 5 ins. apart.

It was a model built to the above data that made the outstanding show at Langley, and proved that realistic helicopter flight is no longer a pipe dream.

Heading shows designer F. G. Boreham and his twin 100 model at Langley. Below left: The first Jetex powered experiment, number 20. Right: Number 45 resembles a South American stick insect but illustrates the hinged blades detailed in the drawing opposite.





MODEL·NEWS· SELECTED ITEMS BY FLIAR PHIL

GET what you wanted at Christmas bods? A peek at this New Year's illustration of F.P.'s latest rage displays his Yuletide gift to great advantage—the Radio—clots, not that shining bright-eyed piece of feminine pulchritude Miss Polly Hedral. Seems like every time your scribe blasts the air with radio activity, there's a certain amount of inter-fuselage reaction, with heartening results.

Quite the most detailed model aircraft yet exhibited at any of the annual shows throughout the country, is this month's choice as feature model. Constructed by L. W. Harrison of London, S.W.6, it's a semi-scale version of what might have been a Hawker anti-submarine biplane. The general layout was made to an estimated scale of 9/72 full size, giving a wingspan of 5 ft. 1 in., and an overall length of 4 ft. including the floats.

The perfect dummy Bristol Hercules engine is made from balsa with stiff paper finning, while the cockpit is completely furnished to the state of all mod. con. In all, over 650 man hours went into the completion of the job which contains no less than 13,131 separate pieces; some patience, eh? No small wonder it's not to fly, though Mr. Harrison says it has passed flotation tests.

A wonder of more solid structure is the superb Westland Wyvern at top left. Though made professionally by the modelmakers at Westland's, the beautiful finish is the result of many hours of speed-merchant Cyril Shaw's elbow grease. Now we can easily understand how Cyril has been travelling so fast with his speedsters, on gloss alone that Wyvern should have quite a high speed glide! Congrats to Mr. Shaw for top-notch spraywork.

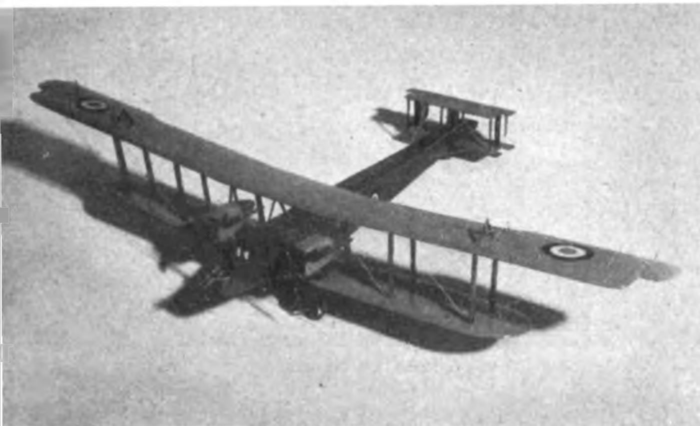
The gent. wielding his 54-in. shoulder wing power model at left, is Bill Ford of Liverpool. Despite the absence of a pylon, this 9½ ounce contest job will get up there as fast as the best, and averages two and a half minutes on a twenty second engine run using an E.D. Bee. Recent installation of an Allbon Javelin improves the rate of climb to the hot-stuff class and judging by the popularity of this "Mogul Mite", design by R. C. Poad, Darlington modellers should come somewhere with one of them in the '51 contests.

Get out that magnifying eyeglass bods, and take a good long study at the she-pilot in R. C. Noble's team racer at the bottom, left. Satisfied, mmmmm! You should see the original close up Fliar Phil is reserving for private viewing only. But stand by for the shivers, the name is the "Ghostly Counsellor"—must be a very cool running motor that E.D. Mk. IV, 3·46 c.c. diesel, the pilot certainly bears no relation to the name of the 'plane. Trials have found the airspeed to be around 67 m.p.h. for 50 laps. Finish is dark grey and white, the sweater is yellow to match those big blue eyes; oh boy, if you could only see the close up!

How about covering that motor, Mr. Noble?

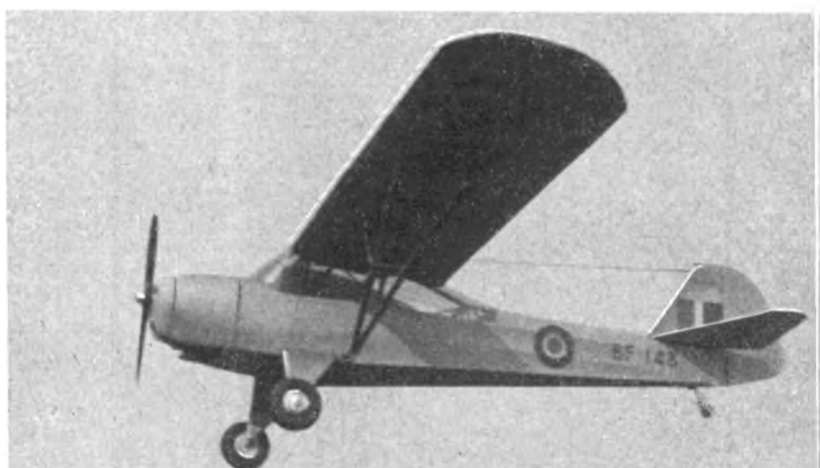
Top left on the right-hand page is a solid from way over in Missouri, U.S.A. One of a collection being assembled by H. R. McPherson, an old-timer free flight power fan. It's a 1/48 scale balsa model of the old Handley Page 0/400 bomber. Smooth grain filling on this solid is by the clear dope and talcum powder method, a cheap and easy way of getting a good surface on any free-flight balsa parts too.

Accent on charm in the top right corner is focussed on Jean Hibbert (sorry—no further details



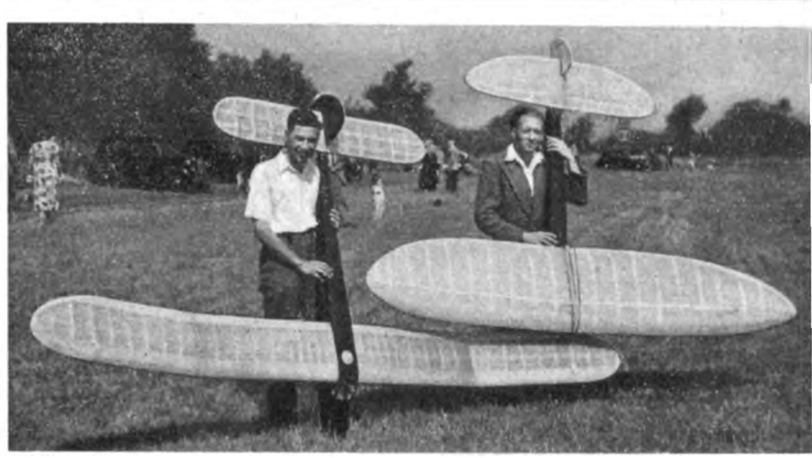
Model of the Month

bods !), who is supporting a twin-engined namesake " Genie " with feminine grace. A product of " Demon King " A. E. Burch, the stunter is a new experiment using two Elfin 1·8 c.c. diesels. So far, it seems that with either one or two motors it is quite easy to put the 28-ounce airframe through its paces. Speed with both pots rattling out the revs is about the 46 m.p.h. mark. Wing area is 300 sq. ins. and span 40 ins. Mystery markings on the wing stand for Experimental Twin Engined Stunt Job ; easy when you know what it means, isn't it ?



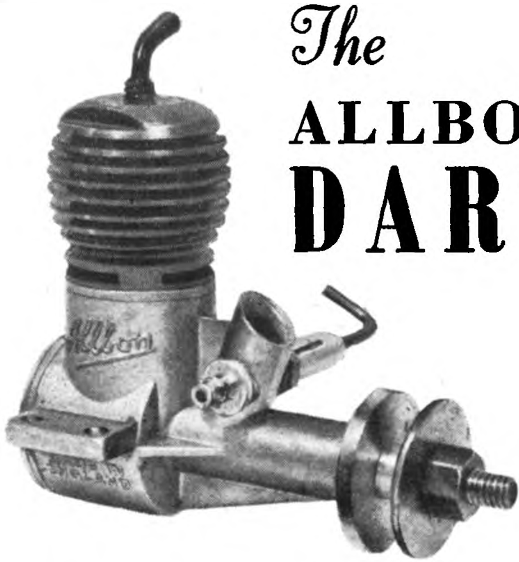
Another of those excellent Ed. Stoffel action shots taken on his regular Sunday camera sorties at London's Fairlop 'drome, is the pic of Sid Allen's (Battersea Club) accurate scale A.O.P. Auster gliding in after one of its radio-controlled flights. One of the first models ever to use the new " star " type actuator, and incorporating a receiver weighing only one ounce, this Auster features rudder control at the moment, but will soon be using elevators as well.

Span is 48 ins., and power unit a Frog 100 ; who would have thought of a radio ship using one of those diesels, say, two years back . . . it's progress with a vengeance.



Strumming F.P.'s Finale on their two monster A.P.S. sailplanes " Thermalist " and " Leprechaun." are double bass operators, R. Fielder and E. George of the Slough (but not slow, of course !) club . . . photo by club member D. Bassett. We've seen these monster models used as sunshades, rainshades, and picnic tables, we've also seen 'em fly : but this is the first time we've seen a tune strung out of 'em.

That's all for now bods, hope you've made all those New Year's resolutions, no cement on the old jerkin and all that.



The ALLBON DART

MODERN design, and the latest manufacturing methods, when applied to the ultra-small diesel engine promises interesting results, and in the Allbon " Dart " we have an opportunity of seeing this combination in action. It is, indeed, in engines of this small capacity that progress should be most beneficial, for it has been pointed out before in these pages that the miniature engine does, by reason of its very size, suffer a severe handicap in power/weight ratio when compared with engines of large capacity.

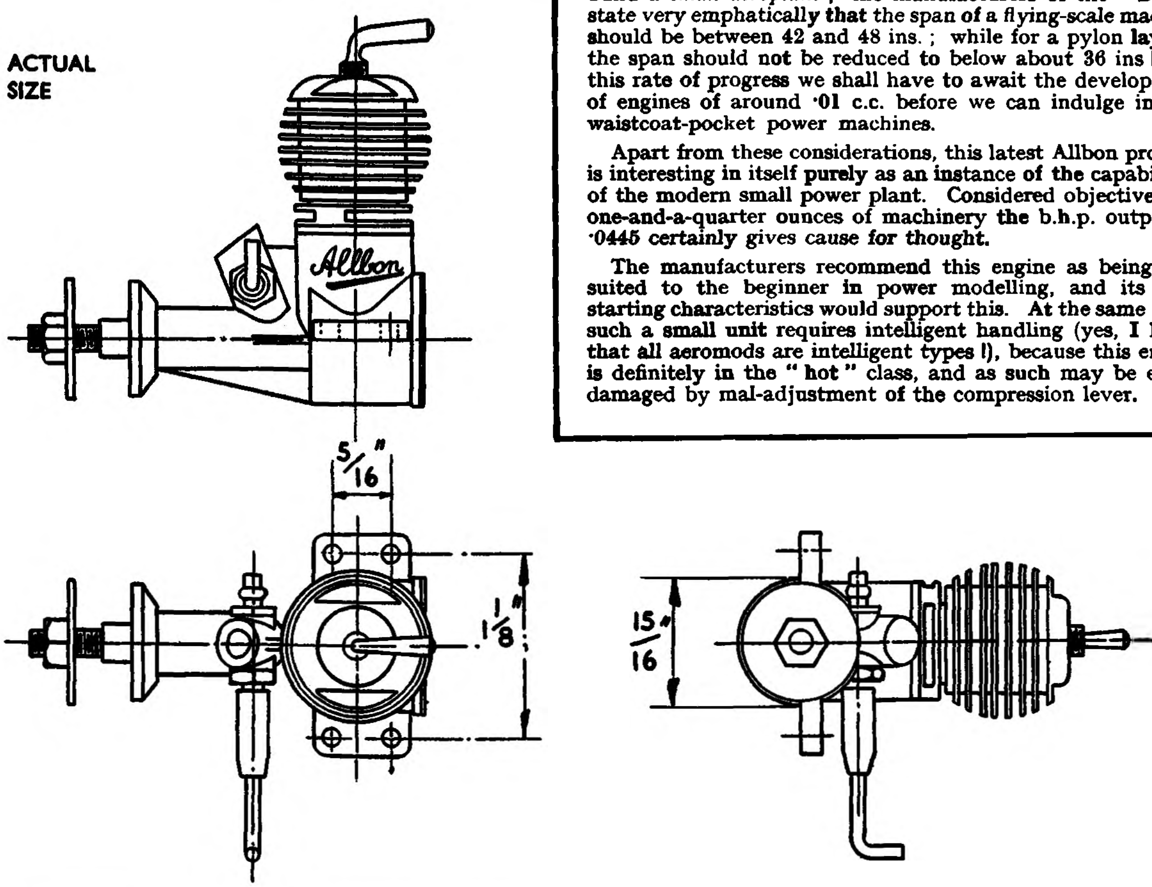
Thus, other things being equal, power/weight ratio is very much in the favour of the large engines. The figure of ·575 b.h.p./lb. obtained for the Dart engine is a big advance on anything previously found for engines of under 1 c.c. capacity, and compares favourably with many engines of four or five times the size. This factor, coupled with the large b.h.p. output, should open up a wide field for those modellers who favour the smaller engines. As a matter of fact, another quite new and strange problem may have arisen for those model flyers who favour the small engine because it enables them to build a *small aeroplane* ; the manufacturers of the " Dart " state very emphatically that the span of a flying-scale machine should be between 42 and 48 ins. ; while for a pylon lay-out the span should not be reduced to below about 36 ins ! At this rate of progress we shall have to await the development of engines of around ·01 c.c. before we can indulge in real waistcoat-pocket power machines.

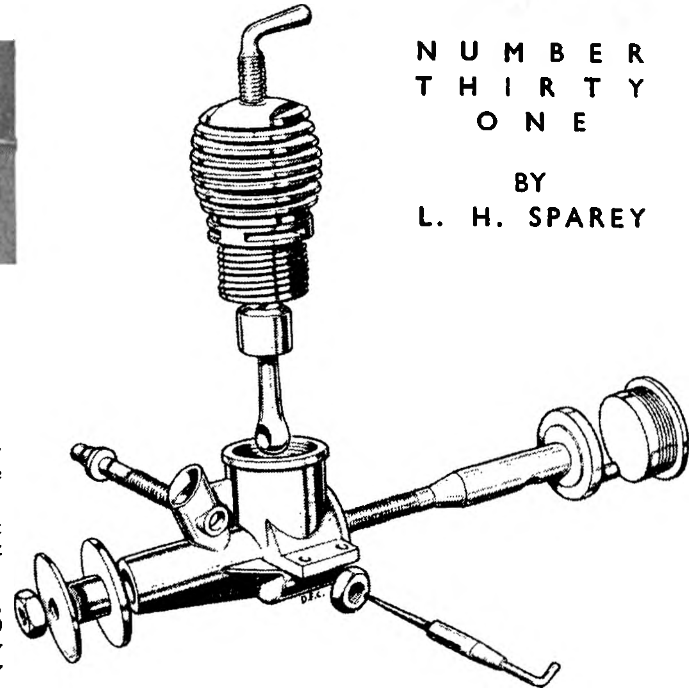
Apart from these considerations, this latest Allbon product is interesting in itself purely as an instance of the capabilities of the modern small power plant. Considered objectively as one-and-a-quarter ounces of machinery the b.h.p. output of ·0445 certainly gives cause for thought.

The manufacturers recommend this engine as being well suited to the beginner in power modelling, and its easy starting characteristics would support this. At the same time, such a small unit requires intelligent handling (yes, I know that all aeromods are intelligent types !), because this engine is definitely in the " hot " class, and as such may be easily damaged by mal-adjustment of the compression lever.

A ·5 c.c. LIGHTWEIGHT DIESEL

ACTUAL SIZE





NUMBER THIRTY ONE

BY L. H. SPAREY

TEST

Engine : Allbon " Dart " ·5 c.c. Diesel.

Fuel : Mercury No. 8.

Starting : Extremely good. Care must be taken not to flood the engine when run in an upright position, as the air intake of the carburetter is then vertical and may become filled with fuel.

Running : Very steady over a wide range of speeds, but careful adjustment of the fuel-control needle is necessary at speeds above about 13,000 r.p.m.

B.H.P. : Starting at ·012 b.h.p. at around 5,000 r.p.m., power rises steadily to a peak output of ·0445 b.h.p. at 13,300 r.p.m. The engine may be considered to be running efficiently at speeds between 11,000 and 13,500 r.p.m. so that a fairly wide choice of airscrews is presented.

Checked weight : 1·25 ozs. less fuel tank.

Power/weight ratio : ·575 b.h.p./lb.

Remarks : Tests were carried out with two separate engines, and the performance of one was better at the peak speeds. This may have been due to more careful running-in on the one engine, the latter having had two hours at about 6,000 r.p.m. with a fuel containing an added amount of lubricating oil.

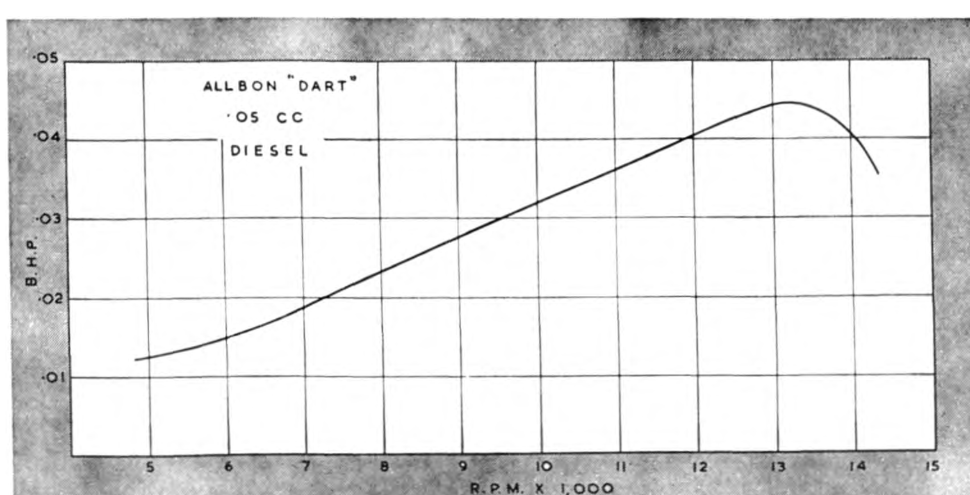
The ·033 cubic ins. capacity prompts a comparison of Dart performance with that of contemporary American glow-plugged miniatures of between ·035 and ·045 cubic ins.

Having operated the Dart quite successfully with an 8×4 ins. propeller, we would have little hesitation in stating that here at least is a capacity at which the diesel shows superior power over its glow-plugged equivalent. No doubt many of our friends in the U.S.A. will find this motor a must for their " half A " classification of contest models.

Mounting : Beam, upright or inverted.
Recommended Airscrew : 6×4 ins., or 7×3 ins.
Bore : ·350 ins. **Stroke :** ·350 ins.
Cylinder : Meehanite. Radial ports, 3 exhaust, 3 transfer. Cylinder screwed into crankcase.
Cylinder Head : Dural screwed on to cylinder.
Crankcase : Aluminium pressure die casting.
Piston : Meehanite, dural gudgeon pin carrier, conical top. No rings.
Connecting Rod : Dural.
Crankpin Bearing : Plain.
Crankshaft : Nickel chrome. Hardened, ground and lapped.
Main Bearing : Plain.
Little End Bearing : Plain.
Induction : Rotary shaft inlet valve.
Special Features : Gudgeon pin being retained inside piston prevents scoring of cylinder bore.

GENERAL CONSTRUCTIONAL DATA

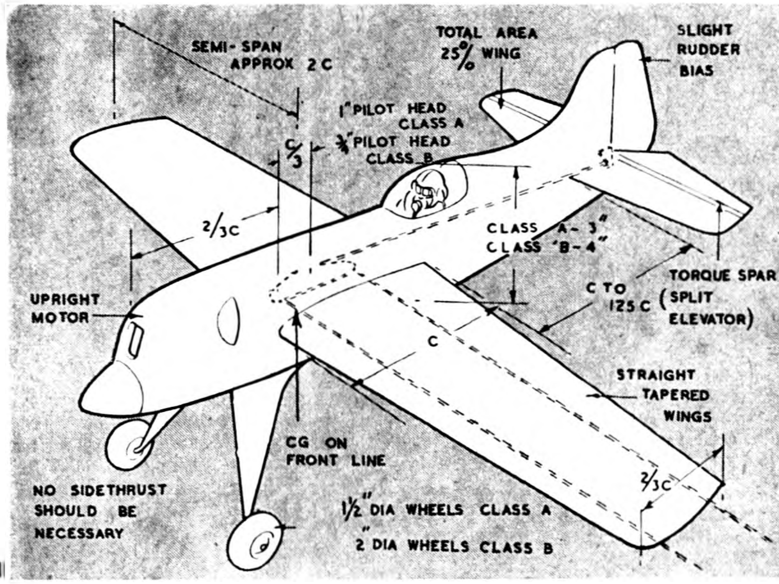
Name : Allbon " Dart ".
Manufacturers : Allbon Engineering Co. (Sunbury) Ltd., 51a, Thames Street, Sunbury-on-Thames.
Retail Price : 52s. 6d. plus purchase tax.
Delivery : Immediate.
Spares : Full spares and repair services available.
Type : Compression ignition.
Specified Fuel : Mercury No. 3 or No. 8.
Capacity : ·54 c.c., ·033 cu. ins.
Weight : 1·2 ozs.
Compression Ratio : Adjustable.



It's DESIGNED for YOU

NUMBER SEVEN

TEAM RACERS



TEAM RACERS—latest addition to the competition classes and, incidentally, just about the best type of sports control-liner—offer considerable scope for ingenuity in design. The field is still very open. No one has yet established the best compromise between speed and range. The actual competition course itself may be anything from five to ten miles. Five miles is usually chosen for the eliminating rounds; ten miles for the finals. The basic problem is one of matching speed against fuel consumption. Whether to go fast by using the most powerful motor available—and in gaining speed, sacrifice range, which means one, two, three or more stops for re-fuelling in the course of a ten mile run. Or whether to aim for maximum range by using a smaller motor and cruising at a lower flying speed and possibly cover the whole course without re-fuelling. There is no simple answer to this.

Specifications.

First of all, there are two definite classes of team racers, main specifications for each being:

CLASS A
Maximum wing area : 70 sq. ins.
Engine capacity : 0–2·5 c.c.
Maximum tank capacity : 15 c.c.
Line length (C/L handle to C/L model) : 42 ft.
Fuselage depth at cockpit : 3 ins.
Pilot head : ¾ in. deep.
Wheel diameter : 1½ ins.

CLASS B
Minimum wing area : 125 sq. ins.
Engine capacity : 2·51–5·0 c.c.
Maximum tank capacity : 30 c.c.
Line length (C/L handle to C/L model) : 52 ft. 6 ins.
Fuselage depth at cockpit : 4 ins.
Pilot head : 1 in. deep.
Wheel diameter : 2 ins.

In addition there are a number of general rules which apply to both classes. Models must be scale or semi-scale in appearance, with a cockpit or cabin, the foremost point of which must not be lower than the top of the engine cowling. The cockpit must contain a dummy pilot with the required depth between chin and crown. It must have a completely cowled engine, except for access to spark plug, glow plug and compression adjustment. Wheels must be of the correct minimum diameter and the undercarriage must be fixed or retractable—if the latter, it must be lowered for each landing.

Now there are three main aspects of the team racer to consider—the design of the model itself, the power unit and the operating or handling of the model during the actual contest or timed runs.

Good design means a high aerodynamic efficiency. The higher this efficiency, the faster the model can be flown on the same power; or the farther it can be flown at the same speed. The power plant is a separate, although closely related, problem. Selection of motor and best propeller combination must obviously depend to a very considerable extent on the design of the model. But there are additional problems associated with the power plant, such as the provision of a foolproof fuel feed system which runs out the full 30 c.c. (or 15 c.c.) capacity of the tank as far as possible, and also keeps the fuel feed reasonably constant, so that the motor is running properly all the time.

Operation of the model under flying conditions involves both the piloting of the machine and the "ground crew" efficiency. Obviously, if a number of re-fuelling stops have to be made, the quicker the model can be refuelled, started and taken off again the bettter. It is surprising just how much any stop can reduce a high average flying speed to a quite mediocre *overall average* speed. The model has to be designed for quick ground handling. The ground crew have to practice and attain the quickest "turn around" possible.

The Power Unit.

Let us examine the two team racer classes separately. First, the smaller class: Here motor capacity is limited to 2·5 c.c. maximum. Since line length is restricted to 42 ft. and wing area 70 sq. in. minimum, almost any motor of from 1 c.c. upwards can be expected to give satisfactory flight performance with this size of model. The smaller motors will have less power and thus fly the 70 sq. in. (minimum area) model more slowly. Against this they will gain in duration or distance covered without refuelling.

Some comparative figures are available for speed and distance performance of typical motors in Class A, these being related to an average aerodynamic design.

Motor	Estimated air speed	Distance covered on one tank, 15 c.c.
E.D. Bee	40	5
Mills II	40–45	5–5·5
Allbon Arrow ...	40	2–2·5
Allbon Javelin ...	50–55	4
Elfin 1·49	50–55	3–4
Elfin 1·8	55	2–2·5
E.D. II Comp. ...	50	2·5–3
Elfin 2·49	60	1·75–2
Mills 2·4	55	2

Of these it will be seen that the Mills II and E.D. Bee are about the only motors which could be expected to cover a five mile course on one filling of a 15 c.c. tank, and this at a moderate flying speed of some 40–45 m.p.h. The effect of pit stops on the overall average speed for the course can best be summarised in the form of a table, as under. It should be possible to land, collect, refuel the model and restart the motor and get away again in well under one minute but this latter figure is often quoted as typical.

TABLE I. REQUIRED FLYING SPEED FOR OVERALL SPEED OF 50 M.P.H. (CLASS A)

Number of Pit Stops

Course	0	1 of		2 of		3 of		4 of		5 of	
		30 secs.	60 secs.	30 secs.	60 secs.	30 secs.	60 secs.	30 secs.	60 secs.	30 secs.	60 secs.
5 miles	50	54·5	60	60	75	67	100	75	150	—	—
10 miles	50	52	55	55	60	57	67	60	75	63	87·5

FLYING SPEEDS REQUIRED FOR 60 M.P.H. OVERALL FLIGHT AVERAGE (CLASS B)

Number of Pit Stops

Course	0	1 of		2 of		3 of		4 of		5 of	
		30 secs.	60 secs.	30 secs.	60 secs.	30 secs.	60 secs.	30 secs.	60 secs.	30 secs.	60 secs.
5 miles	60	66·6	75·0	75·0	100	85·8	150	100	—	120	—
10 miles	60	63·0	66·6	66·6	75·0	70·5	85·8	75·0	100	80	120

Long Range or High Speed?

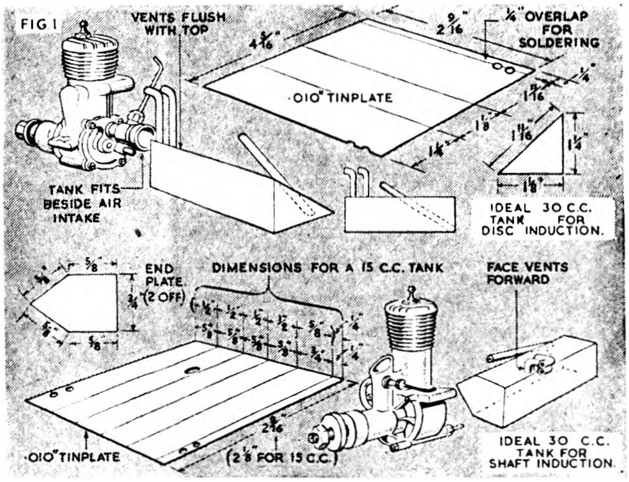
Given the choice of flying rather more slowly, but with less re-fuelling stops as against short, fast runs, human fallibility would appear to give preference to the former. The less the number of times the model has to be re-fuelled and the motor re-started in the heat of the competition, the less chance is there of the " human element " going wrong and adding to the overall flight time. Against this, of course, is the fact that if the ground crew really *know* the motor and have had plenty of practice at pit stops, there should be no undue delays. The pilot himself will have to bear part of the responsibility here for it is up to him to land the model as near as possible to the ground crew. Our personal choice would be for the model operating towards the upper end of the possible speed range.

In the Class B sizes, there are fewer motors to choose from. Data corresponding to the figures for Class A motors are as follows :

Motor	Average Flying speed m.p.h.	Distance covered on one tank 30 c.c.
E.D. Mk. IV	65	4–5
Amco 3·5	68	2–2½
D.C. 350	65	4
Yulon 5	70	2–2½
Eta 29...	85	2
Frog 500	75	2

The same generalisation as regards fuel consumption and speed apply, but it is interesting here to compare the performance of a spark-ignition motor in this class. Operating on petrol/oil mixture a good 5 c.c. spark ignition motor may be expected to give an average flying speed of around 65–70 m.p.h. with a possible range of 6–7 miles on a 30 c.c. tank.

On balance the glow plug motor still appears to be the best choice for Class B work. Most glow plug motors in these sizes are extremely easy starting, especially ringed motors, and reliable enough in running, although rather more influenced by tank position and fuel feed than spark motors.



Tanks.

It is very important to get the tank position correct—or best suited to the particular motor—so that the motor is running at its best throughout the power run.

For most purposes the simple rectangular tank will suffice, proportioned so that it is relatively long and narrow, but not so deep that the change from static head under starting conditions to actual flight conditions is such as to alter the mixture setting.

Some designers prefer the wedge type of tank as commonly used on stunt models, and there is some justification for this in that team racers often have to be pulled up sharply into tight manœuvres to avoid collisions. Some typical proportions are given in Fig. 1.

Vent positions are another feature which should receive careful attention. The vents should be at the forward end of the tank and the overflow vent right at the top of the tank so that the full 30 c.c. (or 15 c.c.) internal capacity can be filled with fuel.

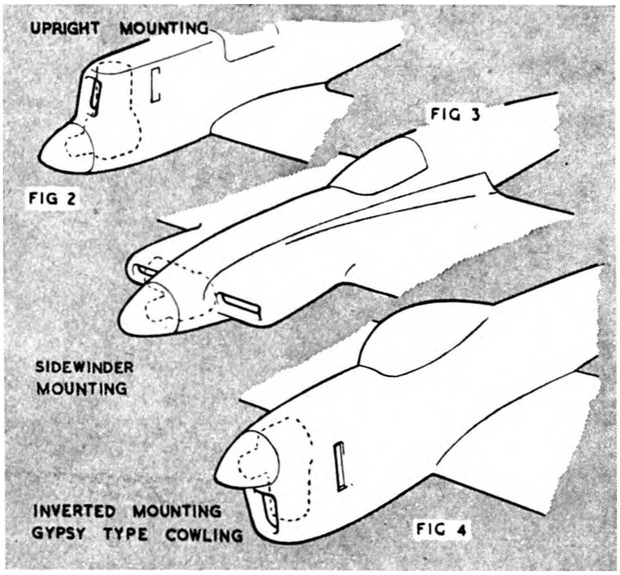
Cowlings.

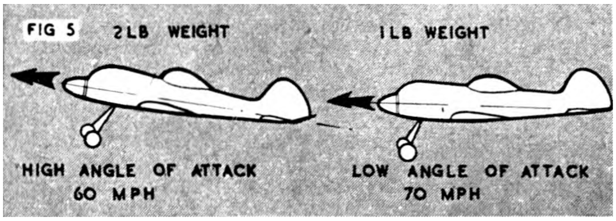
Finally on the question of power plants there is the point to consider of whether to mount the motor upright, sidewinder or inverted, remembering that the motor has to be fully cowled and at the same time readily accessible to adjustment, and, possibly, quick fault-finding.

From the point of view of operational simplicity, particularly with rotary valve motors, upright mounting is to be preferred, with the cowling flared back into the cockpit or cabin lines, for realism, Fig. 2.

Sidways mountings is the next choice, which calls for " apple-cheek " cowlings as used on many modern full size lightplane racing machines, Fig. 3. This can give a definite, and attractive, semi-scale appearance, but calls for a dummy

A full-size Biplane racer, the Laird Solution, can be made into an attractive team racer for Class B. This one, finished cream, with black and orange trim, was built as a sport model for the E.D. II. by Maurice Wilkinson of Glasgow.





cowling on the side opposite the cylinder, with resultant extra weight and extra drag. Upright mounting is still first choice, while inverted mounting would appear to have little to recommend it, other than the fact that it enables a good "scalish" appearance to be maintained—and a belief that the inverted two stroke can run on a leaner mixture. Fig. 4.

It is important, however, that whatever type of cowling is employed it should be properly ducted. Motors may be called upon to run anything up to ten minutes at a time and need a proper flow of air for cooling. Some of the smaller diesel and glow plug motors run very hot and if completely cowled in with no circulating air, may overheat and even seize up.

Design.

The aerodynamic and structural design of the model is the next thing to consider, and these should be developed together. The lighter the airframe the better, for this means that, with a fixed wing area, the model can fly with the wing at a lower angle of attack to generate the required lift. This means, in turn, less drag and therefore greater speed from the same thrust, (Fig. 5). Wing drag increases rapidly with increasing angle of attack and wing drag contributes a very considerable proportion of the total drag of the model.

At the same time it is no good obtaining a low total weight and thus enhanced performance, at the expense of making the model fragile. Team racers must be essentially robust machines. They have to be "put down" often quite roughly, may have to withstand quite violent manœuvres, and be capable of standing up to quite a lot of punishment. Not the least point of which, is that they will take quite a pounding from motor vibration during the course of a number of ten mile runs—and be liberally sprayed with fuel and oil.

Sheet covered wings can withstand handling better than tissue covered wings, and can be more effectively "proofed".

Similarly with the fuselage. Sheet sides and bottom with a sheet or planked turtle back offers the most attractive solution, hollow log construction would be good, but is rather on the heavy side, and costly. The compromise—hollow log underbody with built up sheet covered sides and top is generally excellent.

What efficient design layouts and component shapes fit in best with these practical requirements? Provided adequate tail area is used, 25 per cent. of the wing area being adequate, the pivot point located on or forward of the centre of pressure of the wings and the centre of gravity of the whole model on or in front of the front line—no stability troubles are likely to be experienced.

If there is any aerodynamic preference it would be for the mid-wing, which then has the additional advantage that the lead out wires can be taken through the wing to emerge at the tips and save a possible source of drag. The same can, of course, be done on low and high wing layouts, but in such cases it is more usual to run the lead out wires above and below the wing surface, respectively, emerging directly from the fuselage side and passing through a wing guide.

It will, whichever layout is adopted, be advisable to make the wing in one piece from tip to tip. This will give the greatest strength for the minimum weight. It is easier to accommodate such a wing in the high or low position rather than midwing. Of the respective merits of high and low wing control line models, appearance is all in favour of the latter.

Wing planform is of some importance. For high speed flying, induced effects are relatively unimportant. This means in practice, that tip shape is not critical, nor is it necessary to use a reasonably high aspect ratio for efficiency. From the structural point of view a low aspect ratio is very much better, giving a more rigid, stronger wing for less weight. This is really the deciding figure: with maximum aspect ratio not exceeding 6. Corresponding tip shape can be blunt or raked, with slightly rounded edges.

The tapered wing looks better and is possibly slightly more efficient, but any possible gain is not sufficient enough to justify an elliptic planform on this score, except solely on appearance.

A moment arm equal to the wing root chord or slightly greater—and a tail surface area of 25 per cent. of the wing area should then give ample longitudinal stability. At the same time, using an elevator of one third of the total tailplane area with a range of movement of about 25 degrees up and 20 degrees down should give snappy response to control when necessary, without danger of mushing or stalling.

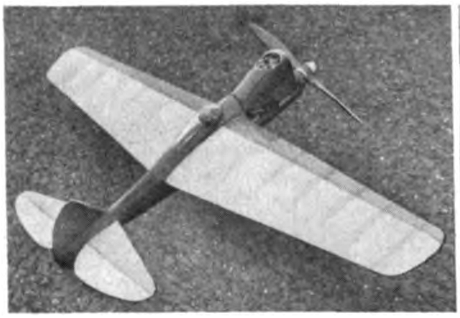
Some designers prefer to save a certain amount of weight and drag by using a dihedralled or "V" tailplane dispensing with the fin entirely. This is quite satisfactory on speed models, but where good stability may be required at the lower end of the speed range, such as in landing and taking off, we feel that a fin is most helpful. Hence we suggest the retention of a vertical fin of moderate dimensions.

This fin may come in for a fair amount of abuse. In the early days of control-line flying when fixed undercarriages were the rule, nose-over landings were common—most of the landing shock, in fact, often being taken by the fin ! !

The landing gear itself must be strong enough to withstand the roughest of landings without deformation. The model may have to land and take off again a number of times during the course of one competition flight and if time has to be wasted straightening out wire legs before the wheels will track properly for take off again the unit is obviously too weak.

For Class A models, at least, simple wire cantilever undercarriages will be sufficient—or the American type of bent dural bracket with stub axles bolted on—Fig. 6. Such legs must be of dural—not aluminium. Aluminium is too soft and will simply bend and "spread" under load.

This leaves just the fuselage to be proportioned—and a very vital component this becomes too. It has to locate all the components correctly and provide a really rigid anchorage for the motor unit and the undercarriage.



Left: Winning model at the London Area organised team race and W.E.A. all-team-race meeting by Chas. Taylor (W.E.A.) Airspeed 65 m.p.h. E.D. IV 3·46 diesel, lightweight construction.

Centre: Fastest refuelling method is the air pressure system here demonstrated by Len Steward. (W.E.A.) A large bore tube supplies air pressure to the fuel surface, neoprene feeds fuel to the tank.

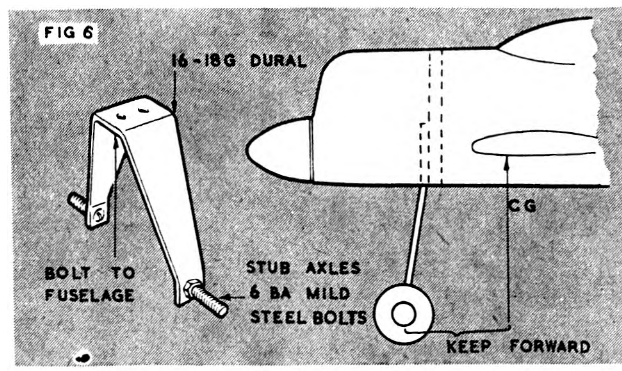
Right: An 85 m.p.h. racer by Ken Marsh known as the 'Saint' and later developed into the 'Gay Deceiver', has an ETA 29. This picture shows the starting assistant in the act of connecting the 'Kwickglo' connector, whilst the starter has already refuelled and is beginning to flick.

Appearance.

The layout, for a low-wing model, is essentially very simple The wing is located on or around the bottom line of the fuselage. Above this is located the thrust line, as near to it as possible (Fig. 7). Mid wing position would be located approximately on the thrust line. The cowling line, proportioned around the motor then fixes the basic height of the fuselage. The full height of the cowling can be maintained back to the cockpit position.

Width of the fuselage is governed simply by the width of the bearers necessary to accommodate the motor, these being taken as the full width and the fuselage tapered off from the front bulkhead back. The normal thin control line wheels would appear best for undercarriages, having considerably less drag than balloon tyres of similar diameter.

There is no doubt at all that team racers are grand fun. Three or more in a circle is thrilling to fly and interesting to watch. But we recommend that you first practice with an old sports model to get used to the technique of dodging the other fellow's lines ! First time we tried " two in a circle " some years ago, we had to untruss one of the participants when the second model eventually crashed ! !



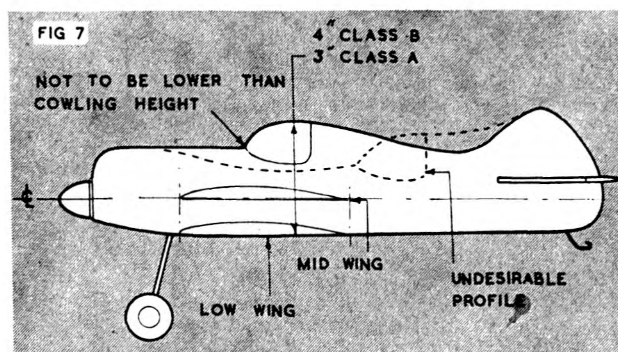


TABLE II. DESIGN DATA

Model	Motor	Prop. Dia. × Pitch	WINGS: Span	Root chord	Tip chord	Section	TAIL-PLANE: Total area	Elevator area	Overall length	Tank c.c.	Wheels ins.
Class A	0–2·5 c.c.	7 × 8	21½	4½	3½	10% Clark Y	20	8	19	15	1½
Class B	2·51–5·0 c.c.	8½ × 10	27½	6	4	10% Clark Y	30	10	24	30	2

TABLE III. STRUCTURAL DATA

Model	WINGS: L.E. (sheet)	Spar (sheet)	Covering (sht)	FUSELAGE: Sides (sheet)	Bottom (sheet)	Top	Bearers	Tail-plane	Fin (balsa)	Undercart (s.w.g.)	Lead wires (s.w.g.)
Class A	—	—	1/16	3/32	3/32	1/16	⅜ × ¼	1/16 ply	⅛	14	22
Class B	¼	¼	1/16	⅛	⅛	1/16	½ × ⅜	5/64 ply	3/16	12	20

This Mercury Mk. 2. Class A racer is powered by an Allbon Javelin. The open cockpit makes an attractive alternative to the commonplace 'bubble.'

✱ ✱ ✱ ✱ TRADE

The Ragg Reblade Knife.

ONE might think that the wide range of modelling tools already made available for balsa-butchery fully covered any possibility of further developments in that line. But the introduction of the Ragg Re-blade Knife provides us with a modelling tool which can be carried safely in the pocket when on the flying field, yet also possesses the virtues of the replaceable blade of the scalpel type.

The blade is held in a detachable slide, within a handle, in such a manner as to allow it to be quickly removed and replaced. When inserted for use, the blade is held rigidly, yet it may be detached by a simple sliding movement. This same movement, in reverse direction, withdraws the blade into the handle so that the tool has all the convenience of a pocket knife. A simple lock prevents accidental opening.

Our test knife has been subjected to many varied uses over a period of weeks, and though the three blades supplied with the handle have long passed the stage where they can be resharpened to their original quality, the handle still holds a new blade with perfect rigidity.

Priced at 4/6 complete with three blades of different shapes, each available separately for 7d., the Ragg Knife is manufactured by J. & W. Ragg, Ltd., 95, Eldon St., Sheffield.

Titanine Dopes and finishes.

We have recently had the opportunity of examining the complete range of dopes, cements and finishes marketed by Halfax Models Limited, and manufactured by the famous Titanine Company who are renowned for their special dopes for full-size aircraft. Our first test came naturally enough with the formula B and formula C cements. Formula B is a quick drying balsa cement with a slight twinge of camphor to its smell, and excellent adhesive qualities. It has a tendency to blush in damp weather. The tissue adhesive, formula C, is quite the most useful medium we have yet used with heavyweight Modelspan. Whilst it dries quickly and without stain in the tissue, it still allows time for a complete wing outline of power model proportions to be smeared before one begins to cover. Its only disadvantage is coupled with its powerful adhesion to one's fingertips, removal of which would appear to erase at least four of the seven human skins !

Besides the medium tautening Clear Dope, Titanine also supply an extra strong Glider Dope for use on silk, nylon or the heavy grade of Modelspan. It also comes in very handy as a second coat where the first coat of ordinary clear dope has failed to tighten up the tissue satisfactorily. Both dopes are available at the reasonable figure of 3/6 per half pint.

Titanine are renowned for their " Supergloss " coloured dopes applied to full-size aircraft, and their range of colours in thirteen shades, plus the transparent " Supergloss " finish, are equally worthy of the praise already bestowed on their full-size finishes. Thinners are, of course, available to suit any of the colour or clear dopes.

Perhaps the one item in the Titanine range which attracted our attention most is Sanding Sealer. Readers may have noticed the sheen on the T.K.4 illustrated in this issue, a finish which is entirely due to the smooth surface made possible with the use of Sanding Sealer. Over solid surfaces it is best first to cover with paper, and then, without sanding, apply up to four repeated and consecutive coats of the Sealer. The coats will dry so fast that it is possible to apply all four within a half an hour.

As the Sealer dries, then so the priming compound it contains will settle into each undulation of the surface, and fill each small grain crack. If left overnight to harden off completely and then sanded down with the " Wet and Dry " finishing paper also supplied by Titanine, it is possible to obtain an almost glass-like surface.

T.K.4 absorbed one complete half pint of Sanding Sealer, and yet the difference in weight was only 1½ ounces.

Hendon abrasive polisher type C can be used on the final colour as a first polisher. The white paste Hendon W is then used to get the perfect lustre required for Concours d'Elegance.

Completing the range, and the model, Titanine fuel proofer is a two-part mixture sold in handy two ounce sizes for 1/6. Additional hardener can also be obtained. Even without the use of the Hendon polishers, one can obtain a magnificent shine with the fuel proofer alone. Care should be taken in its application, for hasty work with the brush will produce an ugly set of bubbles.

Mercury Transfers.

One of the most versatile and attractive modelling products we have handled of late are these real paint transfers. They are of the water-slide variety and are exceptionally easy to use. Merely soak for 30 seconds in clean water, take out and shake off excess water, lay on a clean sheet of paper for another 30 seconds, and then slide off on to your wing, tailplane, etc. They are easily guided into position, and once in position, air and water bubbles underneath the transfer should be pressed out by means of the backing paper or a clean sheet of blotting paper. We have found no snags whatsoever in their use, in fact, " child's play " is no exaggeration, as small daughter aged six made excellent use of the odd pieces we had discarded.

There are various varieties available :—" Trimstrip," which comes in 12 in. lengths and a variety of widths. This consists, of broad two-colour bands for wing decoration in two colours, and similar narrower bands for tail surfaces. Colours available are black-white-black, maroon-cream-maroon, black-red-black, dark blue-light blue-dark blue, blue-yellow-blue, red-yellow-red.

" Chequers " are also available in the above colours in sheets size 8×4 ins. made up of ½ in. squares. Then there are " Streamline Pennants " available in red, yellow, orange blue, and cream, in sets of four per sheet, overall length of each pennant being 12 ins.

" Union Jacks," size 1¾×2½ ins., are yet another example of this range, and finally, " Letters and Numerals," 2 ins. high, in white, edged with black, complete the series.

Under no circumstances dope over any of these transfers with ordinary dope. They should be given a coat of clear transfer varnish or lacquer of a non-cellulose base when thoroughly dry, although this is not absolutely necessary as your reviewer has some on a model which has been in use for several months without any lifting of the transfers.

We found it possible to make up quite attractive insignia by using the " Chequers " as a background and overprinting designs or letters cut from pieces of " Trimstrip."

Veron Skyskooter. 25/-.

Packaging.

Sufficiently strong cardboard box to protect the contents and withstand normal handling. Parts fit well enough to avoid damage by being misplaced.

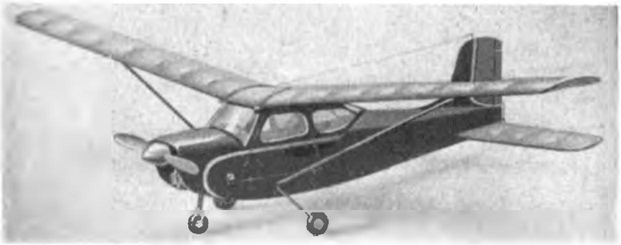
Quality of Contents.

Selected Solarbo balsa, clearly printed, pre-cut balsa and ply, Sorbo-tyred wheels with aluminium hubs, aluminium spinner and very detailed plan with sufficient building instructions. Kit contains everything needed to build the model and the few small extras for Radio Control adaptation are listed on the plan.

Completeness.

Pre-cut wing ribs are accurate and the notches fit the spars

REVIEW



without alteration. Cowling blocks, wing tips and ply formers also pre-cut are a definite aid to construction. There is a sufficient quantity of wood and the covering is Modelspan. All necessary wire and celluloid are included.

Ease of Assembly.

Aided by step-by-step drawings on the plan, the construction is conventional and straightforward. No difficulty should be experienced, but we found that the tailplane built exactly as per plan did not fit the fuselage and it was necessary to reset the upper halves of the centre ribs. Also, if the doors are hinged at the top as shown, it is not possible to open them with the wing struts in place; we hinged ours at the bottom. This would be of no importance if the model were being used for free flight only. The method of strut attachment could be improved; ours vibrated loose with the engine running. At the tail-end, we used a short length of dowel for connecting the tail attachment bands to the fuselage; the suggested pin was not satisfactory. Radio installation could, we feel, have been dealt with at greater length on the plan, as the design is very good for that type of flying. Apart from these points, building was a pleasure.

Instructions.

Ample, save as remarked upon above in connection with the radio and components installation.

Value. Good value.

Flying.

After a trimming session in which the absence of longitudinal dihedral was corrected with wing incidence, the model was tested with a Mills Mk. II. For either free flight or radio work, this is a really pleasant little job to handle. With the greater power than that of the engine for which Skyskooter was designed (with necessary down and right sidethrust), she was able to make headway into a fair breeze and gave us some good flights with an E.D. Miniature R.C. outfit.

Mercury Team Racer Mk. I. 17/6.

Packaging.

The rigid card box completely protects its contents which are packed tight enough to prevent parts from working loose.

Quality of Contents.

Good grade balsa and hardwood parts, plus clear celluloid and a hard-wearing fibre bellcrank.

Completeness.

We ran out of cement just before adding the final touches

but otherwise found this an absolutely self-sufficient job save for spinner, wheels, tank and pilot.

Ease of Assembly.

The prepared hollow log fuselage bottom and simple lines of the planking simplify assembly, though some care must be exercised in lightening the bottom. Ours was hollowed extra deep on the INSIDE, leaving the original outer contour. Thus the formers failed to match up in width and we also wound up with an illegal 120 sq. ins. wing due to excess fuselage width. The bottom should be lightened from the OUTSIDE face. Otherwise, the model was a straightforward construction finished in approximately 14 hours working time.

Instructions.

Greatly aid the speed of assembly; but need to clarify the above-mentioned point.

Value. Is definitely 100%.

Flying.

It might be sufficient to mention that the test model won the first race it entered, at a creditable average speed of 54 m.p.h. over ten miles. The swept forward U/C prevents a nose-over, the crank mechanism gives insensitive control over a wide range of handle movement. A good model, to be recommended for any of the Class "B" team racing engines. Realism could be improved with another U/C.

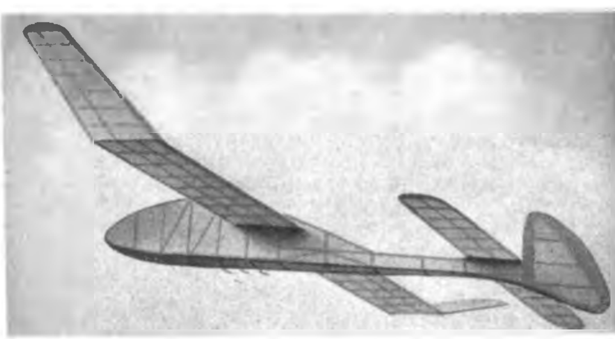
Halfax Roma. Lightweight glider. 7/6.

Packaging.

Rigid stiff card box, with attractive label, is obviously designed to fit tightly around its contents.

Quality of Contents.

Good grade balsa, including very handy ready-shaped trailing edges and two grades of cement. Sheet printing is apt to be extra bold on some sheets, though never indistinct.



Completeness.

Ample cement, both for assembly and covering. Surplus balsa is sufficient for field repairs or trimming.

Ease of Assembly.

The slab-sided fuselage and conventional structure make this kit an easy 10-hour job. Some indications of the actual wing incidence required would be a useful check.

Instructions.

The building instructions are first-class; but close adherence to the section devoted to trimming failed to provide a desired flight performance. With the centre of gravity at the specified 33% position only the shallowest of tows was possible, and the rate of descent high. Additional negative trim on the tail surfaces did not greatly improve the glide until the C.G. was moved aft.

Value. Absolutely 100%.

Flying.

After correction of the C.G. position as mentioned above, it was also found necessary to attach another tow hook 1¼ in. behind those specified. With correct trim, this lightweight is equal to any other contest design.

ESPECIALLY for the BEGINNER

PART XI

BY THE REV. F. CALLON

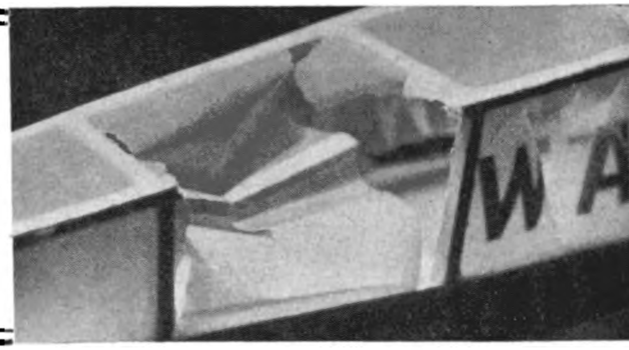


Fig. 1. Damaged glider fuselage, showing crushed longeron and torn covering tissue. A commonplace piece of damage that can be easily repaired if you go about it the right way.

Make or Mend?

Have you noticed that there always seems to be a very special something about your latest model that makes it for the time being far more interesting than any of your earlier efforts? What care you take over trimming and test glides the first day out, and what a thrill you get out of the first few successful flights! Forgotten for the moment is your last model but one, which used to give consistently better flights until careless trimming put it on the casualty list.

I imagine that in most modellers' homes there is a dark, out of the way corner which visitors never see, a sort of aeronautical graveyard where, under a pall of dust, lie the broken remains of many a veteran model. They have never been given a thought for months, and yet, except in extreme cases, a few hours work would put any of them back in the air. At first glance they may seem as boring as last week's newspapers, but the amazing thing is that, by the time you have given an old model the couple of hours' attention it needs, you will find that it has become as interesting as it ever was. So I suggest that you take a deep breath and an electric torch, and visit your own particular " morgue " as I did mine the other day.

And you never saw such a collection! Indoor models, gliders, rubber models, jets and diesels were strewn around in various stages of disrepair. I finally picked out a small glider, blew the dust off it, and viewed the wreckage. Not too bad, after all; about twenty small holes and tears in the covering, and a slightly crushed fuselage. Its last flight had been an O.O.S., I remembered, and it had been hauled out of a large rose-bush by a non-modeller—hence the broken longeron. It was as a matter of fact, the very Walthew glider built for the first of these articles, and it took just about two hours to make it as good as new.

Mending a Broken Longeron.

Fig. 1 shows the extent of the damage done to the fuselage. The top starboard longeron has been pushed in, but the other three longerons are still sound.

The first thing to do is to trim away all the torn covering tissue from the top and nearside panels with a razor blade, and remove the broken pieces of longeron quite close to the spacers at either side of the break. The remaining ends of the longerons are then trimmed off to slant inwards, towards the gap: the cut should start well above where the spacers meet the longeron ends, and be made in such a way that when viewed from above the cross-section appears diamond-shaped.

Now make the same slanting cut diamondwise on the ends of a fresh piece of the correct size of spar, just long enough to rest between the two ends of the old longeron across the gap. Fig. 2 should give you the general idea. Cut the new piece of spar slightly on the long side to start with, and pare or sand the ends down gradually until the length and the angles of the cuts at each end are exactly right.

Fig. 3 shows the joining piece cemented in position. The idea of the slanting cuts at either end is to prevent the tightened tissue from pulling the extra piece of spar inwards later on. When the joints are cut in this way, the tightening of the covering paper tends to strengthen them rather than the reverse. When quite dry, sand lightly over the joints and remove any hard blobs of cement which may have appeared.

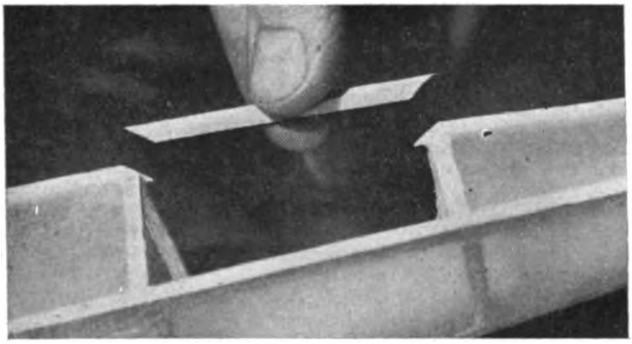
Recovering the damaged portion is a very simple matter, but you must use tissue cement, since paste will not take well over dope or banana-oil. Cover one panel at a time by cutting a strip of tissue wide enough not only to span the gap but also to cover the tops of the spacers at either end of the gap. Cut this tissue patch big enough to leave about an inch of overlap past the longerons at either side. Now run a line of tissue cement round the four sides, and smooth it off again with the finger; banana-oil generally comes off with this first coat of cement. Follow up with another line of cement all round, and carefully lower the tissue patch into place and smooth it down firmly. When dry, trim off the overlap along both longerons. The second panel is covered in exactly the same way. The overlap along the newly inserted piece of longeron may be trimmed off to ⅛ in., folded round and cemented down, but this is not necessary.

When the cement has quite dried, the patched panels are doped and left to tighten in the ordinary way. If banana-oil alone is to be used, watershrink the patches first; if dope is used this will not be necessary. So if you are using rag tissue you should use dope to get a tight finish, for rag tissue does not take kindly to water.

Back to the Box Brownie.

How did you get on with the " Spot the photo " exercise last month? I wonder how many people noticed how often a photograph is made or ruined by the background? After all, if we are taking a photograph of a model plane (and possibly the person holding it), we do not want to be distracted by the addition of next door's chimney pots or Uncle Joe's herbaceous border. The least distracting and most natural background against which to take an outdoor photograph of a model is undoubtedly the sky. This means that you must hold the camera at a lower level than the subject, and point it upwards. If there is a rise in the ground nearby, or a handy five-barred gate or low stone wall, then the person holding the model can be actually standing at a higher level than the photographer, and the camera can be held at about waist level and pointed upwards. If the ground is quite level, then the best thing is for the subject to hold up the model above his head, while the photographer squats down and holds the camera as near to the ground as possible.

Another reason why models photograph well against the sky is that the light shows through the flying surfaces and the ribs in the wing and tailplane show up in what is to my mind a very pleasing manner. This, however, is a matter of opinion.



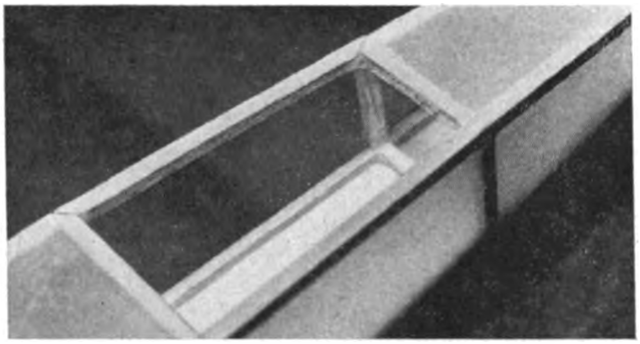


Fig. 2. Broken portion of longeron and torn tissue trimmed away. New piece of spar ready to span the gap. Note the angle at which the ends of the old longeron and the new piece are cut.

Fig. 3. The new piece of spar cemented in place ready for sanding and covering.

Composing the Picture.

The "composition" of a picture means the careful arrangement of the subject to be photographed in the picture-frame—or in the viewfinder of the camera. A very simple but reliable rule of composition is that the subject should be coming into the picture rather than going out of it. In other words, if the subject is facing slightly from left to right as you look at the picture, he should be placed slightly towards the left side of the frame as though about to walk into the centre of the picture. If you put him near the righthand border and he is facing that way, the result looks as though he is just walking out of sight, and the picture appears lop-sided.

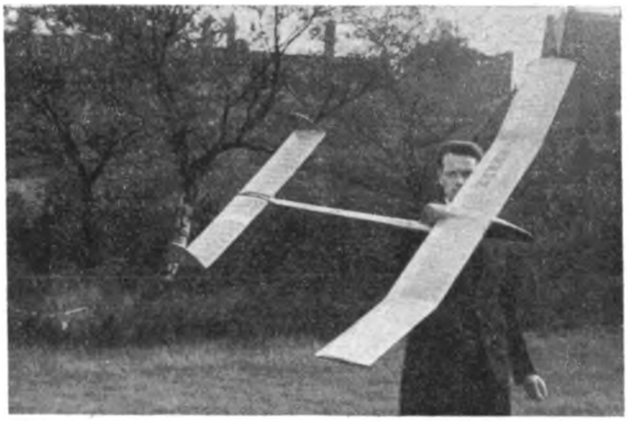
Now suppose we look at the examples. They were all taken within a few yards of each other—and within a few minutes for that matter. Fig. 4 is photographically a poor effort. Can you see what mistakes have been made? Look at the background: trees, buildings, and white patches of sky. And what about the composition? The model is pointing right out of the picture, and there is a lot of waste space on the left side of the frame.

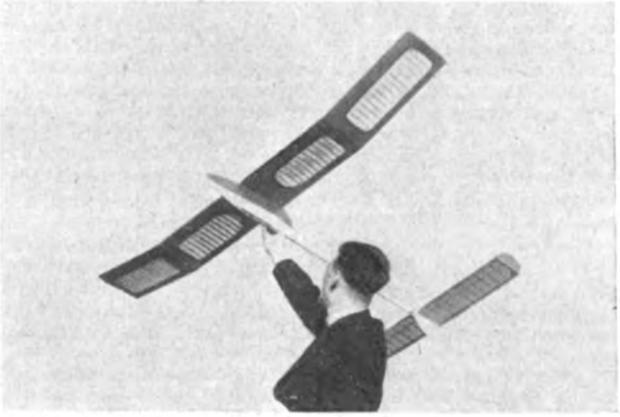
Fig. 5 is an improvement, but part of the model is hidden by the holder's head and shoulder. The ribs do show up slightly, but if the sun had been shining directly onto the upper surface of the wing, they would have stood out far more clearly.

Now look at Fig. 6. A big improvement, don't you think? To get this effect the model was swung over slightly so that the sun shone on the top of the wing from the right of the camera. In order not to hide parts of the model the holder changed to a left hand grip and moved across to the other side of the frame. And something else was used to give a big improvement in the tones and quality of the picture.

Coloured Filters.

Yes, a filter was used for Fig. 6, but not for Fig. 5. Can





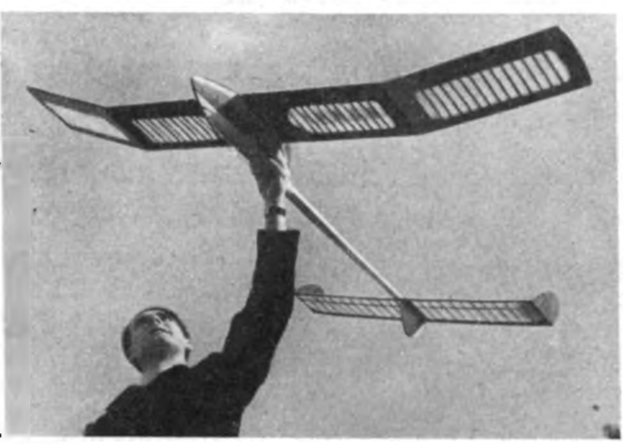
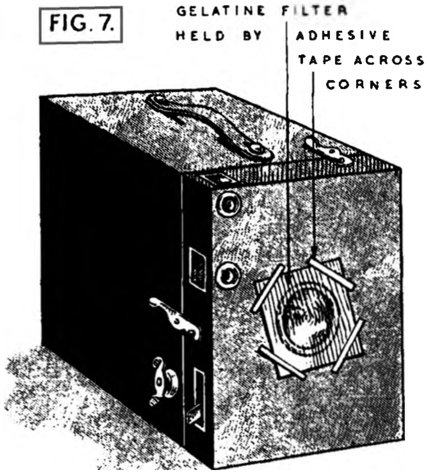


Fig. 4. A poor photograph. The background is distracting, and the subject appears to be going out of the picture.

Fig. 5. An improvement. The lower viewpoint brings the model against a plain background, but the ribs do not show up well because the sun was not shining on the top of the wing.

Fig. 6. Much better. The sun is now shining through the wing, and a filter has been used to tone down the blank white sky. The person holding the model has moved across so as not to block the view. (The glider was designed by Roland Scott of Walthew fame: six-foot span, incorporating sheeted-in wing and 72 ribs, capped top and bottom. What a job!)

FIG. 7.



you see the difference it has made to the sky and the general contrast of the picture ? The sky in Fig. 5 is an uninteresting dead white, while that in Fig. 6 has been toned down considerably. Unfortunately, when these photographs were taken the sky was a clear light blue ; if there had been any clouds about they would have shown up like puffs of cotton wool on Fig. 6, but Fig. 5 would not have shown them. In sunny weather it is always worth your while to put a coloured filter over the lens of the camera whenever the sky comes into the picture.

Are they expensive ? How are they attached ? What colour of filter should be used ? Where can you buy them ? All these are important questions, and are easily answered.

Properly mounted glass filters are rather expensive, generally costing something in the region of £1, but they are not necessary. Exactly the same results can be got by using a piece of correctly coloured gelatine ; you can buy a small piece from any photographic shop for about 1/-. If you are using Orthochromatic film—Verichrome or Selochrome are common types—ask for a pale or medium YELLOW gelatine filter. Yellow is the only colour to use with chrome films. If your camera is a box, mount the little square of gelatine by laying it flat over the circular hole round the lens, and secure it by means of four thin strips of adhesive tape, one across each of the corners of the square—see Fig. 7. If the lens on your camera projects on a circular mount, then the best thing to do is to make a short cardboard tube just big enough to slip over the lens mount, and attach the filter permanently over the end of the tube.

It must be remembered that filters hold back some of the light which would otherwise pass through the lens onto the film, and so a longer exposure must be given. If your camera allows for different lengths of exposure you will have to give two or three times the normal one. With box cameras of the simpler type, it is quite sufficient to make sure that the sun is shining brightly when you use a filter.

A much wider range of filter colours can be used with fast panchromatic films such as Super XX or Ilford H.P.3, but don't forget to cover over the red window at the back of the camera with adhesive tape except when actually winding on the film. The normal filter to be used with Panchromatic film is a medium green one which needs about three times the usual exposure—or sunny weather with a box camera. For dramatic results—dark blue skies and billowing white clouds—a dark yellow, orange, or even light red filter may be used, but the last mentioned need about six or eight times the normal exposure.

The final print will still be black and white, not coloured, but the filter affects the appearance of different colours in the subject being photographed. The simplest way of knowing what to expect is to remember that anything which is the same colour as the filter being used will appear bright or light coloured on the photograph, while things which are the opposite colour to the filter will appear dark. Thus a blue sky appears almost black when a red filter is used, and a model doped green would look practically white if you used a green filter.

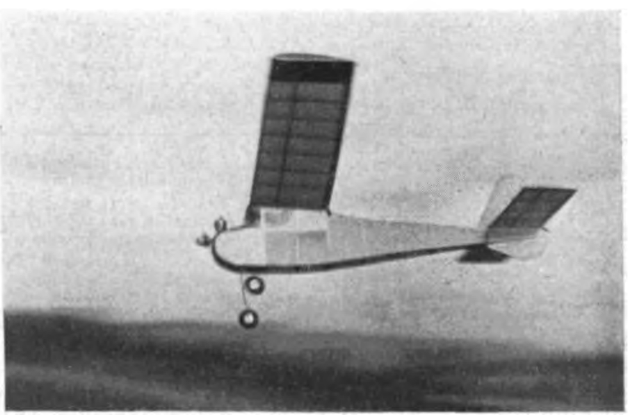
Action Photographs with a Box Camera.

In order to record a model actually flying or gliding in the air, a very short shutter speed is normally required—1/200 or 1/500 of a second. Otherwise the model will appear blurred. But if you are prepared to risk wasting a couple of exposures on the roll, it is *possible* to take quite dramatic action photos even with a box camera, the fixed shutter speed of which is only 1/25 of a second. To do this successfully, it is necessary to swing the camera in the same direction as the path of the model and click the shutter while the camera is still being swung ! Seems to be against all the rules, doesn't it ? But Fig. 8 and 9 prove that it can be done with practice.

Fig. 8 was taken with a shutter speed of 1/25 of a second and with the camera held steady. The moving model appears as a mere untidy blur. Fig. 9 was taken with the same shutter speed, but this time the camera was swung from right to left following the gliding Tomboy, and the result, though not very good, is at least passable. The blurred mass in the background was actually a hedge ! But before taking any photographs in this way, be sure to give yourself plenty of practice swinging the camera without actually making an exposure. It is essential that the moving object be kept in the same position and apparently quite steady in the view-finder, and this only comes with practice. Otherwise, you will have a repetition of Fig. 8 and my mail will be full of brick-bats.

Fig. 8. Shows what happens when a moving object is photographed with a slow shutter speed and the camera held steady. Moving model is blurred and static objects clear.

Fig. 9. The shutter speed as Fig. 8, but this time the camera was swung across following the path of the gliding TOMBOY. The background is blurred, the model reasonably clear.



RADIO CONTROL NOTES

BY HOWARD BOYS

THIS is the first issue of the New Year so H.B. wishes everyone a Very Happy New Year, with better flying weather than was general through 1950.

It is usual at the beginning of a new year to take stock of the old one, so let us look back for a few moments.

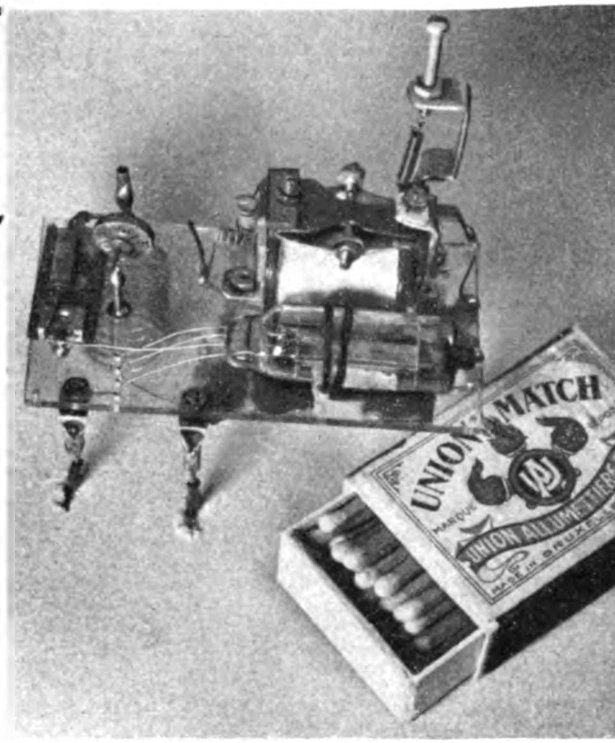
The most outstanding point is no doubt the introduction of the Hivac XFG1 Gas Triode valve. Some of the early ones were troublesome, but others gave excellent results. It was only to be expected that a satisfactory type would evolve. As a result of this we come to point two, which is the greater reliability of the radio equipment. The larger current change of the XFG1 makes the relay operate with less " fiddling ". The third point is the introduction of smaller models for radio control, which has been made practical by the lighter equipment which has again been made possible by the XFG1 valve. The fourth point is the introduction of a handbook by Mr. G. Honnest Redlich which will be a great help to all radio controllers. All these things have added up to a much better standard of flying in 1950 than in 1949. Another item the writer feels worth mentioning, was the lightweight transmitter and receiver using standard " hard " radio valves, designed by Mr. L. P. Dalton.

Although it is a case of " blowing one's own trumpet," the writer feels that his own proportional control system should be mentioned. Since it was discovered in September, 1949, no other system has been used, though " Mighty Midget " motor has replaced the magnetic actuator for all but the smallest model, to reduce the actuator battery consumption.

Now for some replies to correspondents, giving each question an answer in turn. Here are extracts from a letter from Mr. Holland of Warminster. *If up elevator combined with rudder permits a tighter turn without loss of height, would not a simple pendulum control fix that?* **Answer:** " Unlikely." **Explanation**—The first thing a model does on applying rudder is to bank. The first thought then is to make the pendulum lift the elevators when the model banks, but how? When the model banks it turns, and the centrifugal force will throw the pendulum to a central position under the model. (See Fig. 1.) The next thought is to fix the pendulum to lift the elevators when the nose drops as it does if the turn is sharp enough. In this case the elevators will not be held up in a level turn, so a level turn would not be maintained. Also, the elevators would be held up on the glide, so altering the trim.

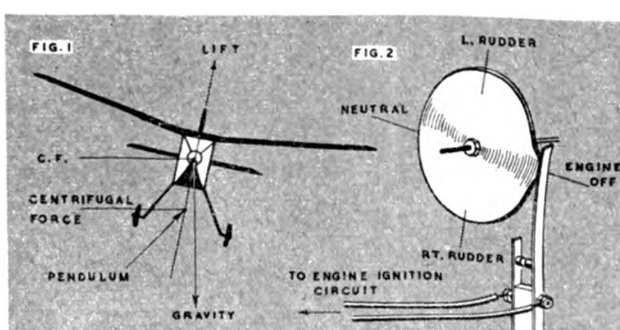
Next extract: *In the article " It's Designed for You," I see that Class A models, i.e., lightweight R.C., just embraces the wing loading of the Rudderbug. Why, if the E.D. outfit will pull the rudder of a Skyshooter over, will it not do the same for the rudder on, say, a Junior 60, or even a Rudderbug for that matter?* " **Answer:** It will do so. **Explanation**—It is the power of the actuator, and not of the radio that pulls the rudder over. The radio controls the actuator. The relay on the E.D. set could be connected to further relays, which could control an actuator for a full scale aeroplane rudder.

Another extract: *In the case of a petrol engine, is it possible to wire the ignition through the transmitter, thus, in case of trouble, one could switch off momentarily and avoid a crash? One would need, presumably, a self-centering actuator.* **Answer:** An engine cut-out can be worked from the transmitter, but it is not simple to arrange. It needs a more complicated radio and cannot be done by just switching off the transmitter of the usual type. It is, however, possible to arrange an engine cut-out in sequence with other operations, but this leads to complications. The simplest way would be to fix up a cam as shown in Fig. 2. This gives " engine off," " rudder right," " neutral," " rudder left," and so on. After " rudder left," a quick press and release on the control button would jump the " engine off " and " rudder right " positions to the next " neutral rudder " position. A similar sort of scheme could be worked out for a diesel engine using a cam to operate the cut-out through levers.



A one and a quarter ounce R.K.61 receiver built by De Wals of Belgium for our old friend Guy Ramaekers who is responsible for the excellent photography.

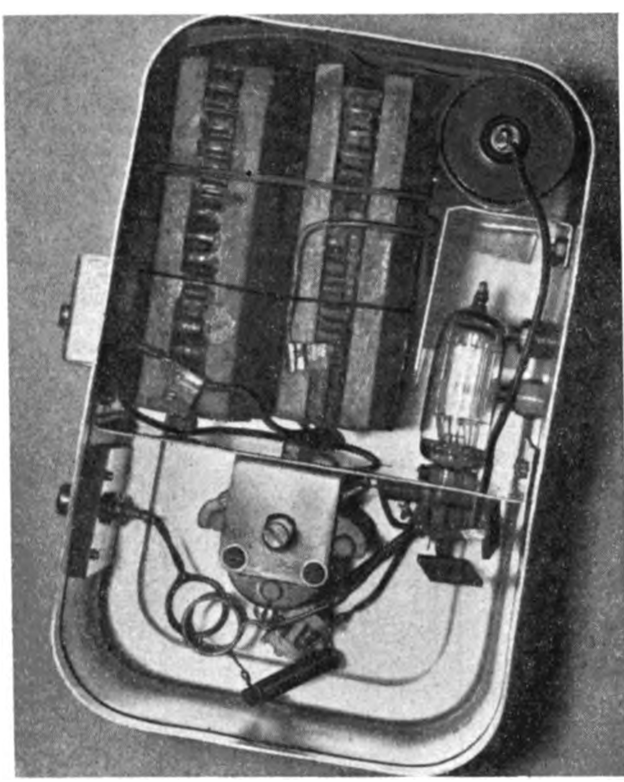
Now another reader, Mr. R. C. Salmon of Hitchin, writes thus: *With reference to your article in the November* AERO-MODELLER, *I wonder if you would be kind enough to answer a query of mine. It refers to Cpl. Johnson's transmitter and I should like to know if it would be satisfactory on* 150 *volts H.T. from a vibrator pack, and using the* 6V6G *valve as shown. And if used on* 150 *volts H.T., would any of the component values have to be changed?* **Answer:** 150 volts will be all right as long as there are enough milliamps available at this voltage. For the full five watts power allowed, 33 milliamps will be needed, but less than this may easily give satisfactory results.



Five watts is necessary for extreme range, but extreme range is seldom necessary. As little as 1 watt will often give enough range. With only 150 volts it may be necessary to use a lower value of grid resistor; this should be tried if the transmitter does not give good results. When altering this resistor, keep a check on the H.T., measuring the volts and milliamps together to ensure 5 watts is not exceeded.

This is a suitable place in which to make a correction to Cpl. Johnson's description. In the component list under Fig. 4 on page 730 of the November AEROMODELLER a printing error has crept in. C4, C5, and C6, should be mfd and not pf. I also inadvertently neglected to mention the length of aerial required for the frequency meter described in my last article. This should be between 18 to 24 inches.

Mr. Lovett of Bristol is having a whole lot of trouble trying to get Mr. Dews' receiver to work. It is probably quite a small point, but even small things can be very puzzling to a radio expert, so pity the poor tyro under such circumstances. Well, here is an extract from Mr. Lovett's letter. *The transmitter, in which I am using a 3A5 valve, appears to be working satisfactorily, as a 3·5 volt flash lamp bulb with a wire loop connected glows with quite a bright light when inserted in the anode coil. The receiver does not appear so satisfactory. I have managed to obtain a 1 ma. current drop, with the transmitter close to the receiver, but was unable to repeat this. By carrying the receiver aerial (insulated wire) so that it touches the output sockets of the transmitter, I can easily obtain a 1 ma. current drop, but after adjusting the receiver tuning to give maximum response in this position, removal of the aerial gives a maximum response of 0·15 ma. Removal of the receiver to a distance of anything above six feet results in almost complete cessation of response. I have tried various values of grid leak, varying positions of both aerial connection and H.T. connection to the tuning coil. I can obtain a plate current of 0·3 to 5 ma. by the use of the variable resistance incorporated in this circuit. I have tried different types of variable condensers, and the American 3S4 valve, also its Mazda equivalent. One thing which happens does not appear to be in order—as the anode current is increased, whether by alteration of the variable resistance or the series connected aerial condenser, the current increases steadily until at about 1 ma. the relay cuts in, and the current consumption shoots up to about 2·5 to 3 ma. This is not the coincidence of tuning between receiver and transmitter, as operation of the transmitter on-off switch gives no response in the receiver. Surely, closing the relay should not affect the circuit current? This happens with two relays which I have tried. I think I may say that every component in this set has been changed without improvement. It is somewhat of a handicap that I have no proved transmitter or receiver to start with, but this should not have caused such a degree of difficulty. One further point is that at certain settings of the tuning I obtain a reverse effect, increased current flow when receiving, and vice-versa."*



It is obvious from this letter that Mr. Lovett is no " mut." He has tried hard but been unlucky. However, let us look into this problem and try to overcome the difficulty.

Firstly, the transmitter does not seem to be at fault since the flash lamp bulb glows brightly. Then, again, the receiver current rising with signal at certain settings of the tuning also indicates that the transmitter is working.

Next take the point about the current going up when the relay operates. There are two possibilities here. When the armature moves it reduces the gap in the magnetic circuit, increasing the inductance of the coil. This will affect the anode current, but the writer has never experienced a change of more than 0·1 ma. due to this. The first thing then is to check up that the armature movement is small. The next possibility is that at the point when 1 ma. is flowing the receiver is in a critical condition and stops oscillating. A receiver going off oscillation is usually the cause of the current rising to such an extent. Of course, it may be the sudden rise in the anode current that causes the relay to operate.

At this point, the best thing to do is to set out on a course of experiment with the receiver. First check the radio frequency choke. The type known as the Edystone No. 1011 is a good reliable type. See that all other circuit values are as stated by Mr. Dews. Set the aerial condenser about half way. Set the variable resistance nearly to zero. Set the tuning condenser to minimum value. When the set is switched on, the anode current should be quite low, perhaps about a quarter of a milliamp. Increasing the tuning condenser should now raise the anode current. Set it at about 0·9 ma. Touching the valve grid should now cause the current to rise to about 2·5 or 3 ma. If this cannot be done so far, check all the component values and the batteries. When the 0·9 ma. has been set, try tuning the transmitter to the receiver. It should be possible to do this without the transmitter aerial. If the receiver shows no response, try with a different setting of the tuning condenser, though this will also give a different anode current. As soon as the receiver responds, adjust the aerial condenser to give the greatest response. While doing this, remember that the transmitter will most likely be off the allowed frequency, so use no aerial if possible, and cut down the H.T. to a minimum. When using no aerial, the transmitter can be as near as one or two feet to the receiver. Try to find a setting of the tuning condenser, that gives about 0·4 to 0·5 ma. change of anode current with signal. Note the position of the tuning condenser for this; it can be marked with a pencil, and then try slightly different positions to see if a greater range can be obtained, this being determined by taking the transmitter as far away as possible, still giving a useable current change. A current change of 0·3 ma. can be used, but at least 0·4 is much better. Usually the greater the current change, the less the range. If a better setting of the tuning condenser is found, mark it. It will now be necessary to get the receiver to tune to the allotted frequency of 27·12 mc/s, and this can first be tried by using the tuning condenser, adjusting the anode current with the variable resistance. If this does not prove satisfactory, set the tuning condenser to

A half size picture of Ramaekers' transmitter used in conjunction with the receiver on the previous page. Valve used is a 3A5.

the best position, which has been marked, and make a new tuning coil. The writer has had experience of three or four receivers to Mr. Dews' design, and good results have always been obtained from working on these lines. The layout of the components has varied with different receivers, but the best noted followed the layout of Mr. Dalton's receiver, except that, in effect, the grid leak and resistor, and the anode lead, to the tuning coil were changed over.

We will finish this month's notes with a description of an escapement, by Mr. Higgins of Bradford Moor. The writer has not made one of these but believes the design to be sound enough to make such a check unnecessary. Here it is then, in Mr. Higgins' own words.

This escapement is of the normal two-pawl type and is quite orthodox in operation. The design was developed with a view to eliminating all the bugbears normally found in rubber-driven actuators, namely, slipping and sticking. It was found that these faults could be completely cured by correct design, and reasonably accurate construction. Fig. 3 shows the assembly and details.

The original will handle a fully-wound motor of four strands of 1/8 flat rubber with a three-volt battery quite easily, though two strands are sufficient for all but the largest models.

Construction. The end plates, stop and claw are cut from 16 g brass sheet, the holes and claw end being made as accurately as possible. The claw is then soldered in the centre of a 7/8 in. long piece of 18 g. brass tube.

The rotor is bent from a strip of brass 1/8 × 1/32 in. and is trimmed to size *after* soldering to a straight piece of 14 g. wire which forms the shaft. It is important that the leading surface of each tip should be radial to the shaft.

The core and armature are made from soft iron, 1/4 × 3/32 in. Suitable material can be obtained from the frame of a scrap G.P.O. type relay costing about 1/–.

The coil former is built up on the core. Start by wrapping a strip of thin card 11/16 in. wide round the core one turn. The ends are then cut from stiff card about 3/4 in. diameter, and glued in place.

The core is wound with 60 feet of ·36 gauge enamelled copper wire, the ends being brought out through holes in the former ends. The coil is completed by glueing a strip of thin card round the outside.

The return spring is wound from a length of 26 g. wire, a vacuum cleaner brush spring being suitable.

Assembly. One end plate is screwed to the core with 8 B.A. bolts. The rotor shaft is pushed through the bearing hole, a cup washer dropped on the shaft, followed by the other end plate which is then screwed in place. The stop is pushed on the claw bearing tube, and the spring pushed on the other end of this tube. The end of the spring is pushed through the small hole in the claw, and bent over. The claw is held in place with a piece of 18 g. wire through the tube and the holes in the end frames.

The centre of the armature is tinned and held in place on the core ends while it is soldered to the claw. The stop is then soldered in place. Solder a cup washer each side of one bearing plate to hold the shaft with the rotor opposite the claw. A spot of oil on the bearing will prevent the shaft being soldered to the end frame.

The neutral position stop should just clear the claw when the armature is pulled down, and it should be adjusted by re-soldering the claw to the armature or filing a little from the top of the claw end. Both rotor arms should be exactly the same length, but apart from correcting these if necessary, their length should not be altered. The stop should be soldered to the tube so that it allows 1/32 in. movement of the claw ends. The upper end of the claw should just clear the rotor with the armature up, and just overlap by 1/32 in. with the armature held down.

Check that the rotor leading edges are smooth and radial and that the surfaces on the claw which are struck by the rotor are also radial, when in the operating position, *i.e.*, the tip of the claw makes full length contact over the 1/32 in. overlap. The ends are corrected with a Swiss file if necessary.

Before fixing the other end of the return spring it is necessary to decide on the power of the rubber motor to be used, this depending on the size of the model. A hook is bent on the rotor shaft and the escapement fixed up with full turns on and the coil connected to a 4½ volt battery. The spring tension is increased until the claw moves smartly back when the current is switched off. If the tension is not enough the friction at the rotor tip will cause sticking. When the correct tension has been found, the spring end is wrapped round the frame to hold it. The claw shaft should then be soldered to a frame at one end.

The escapement is now complete and if it has been carefully made, there will be no tendency to slip a tooth no matter how much the motor is wound.

The original escapement worked on 3 volts on all sizes of motor, but 4½ volts could be used to be on the safe side with heavy motors.

The weight works out at 1½ ounces, but this is compensated for by the lower voltage required compared with most commercial escapements. In any case, reliability is far more important than ultra light weight.

" Thank you," Mr. Higgins.

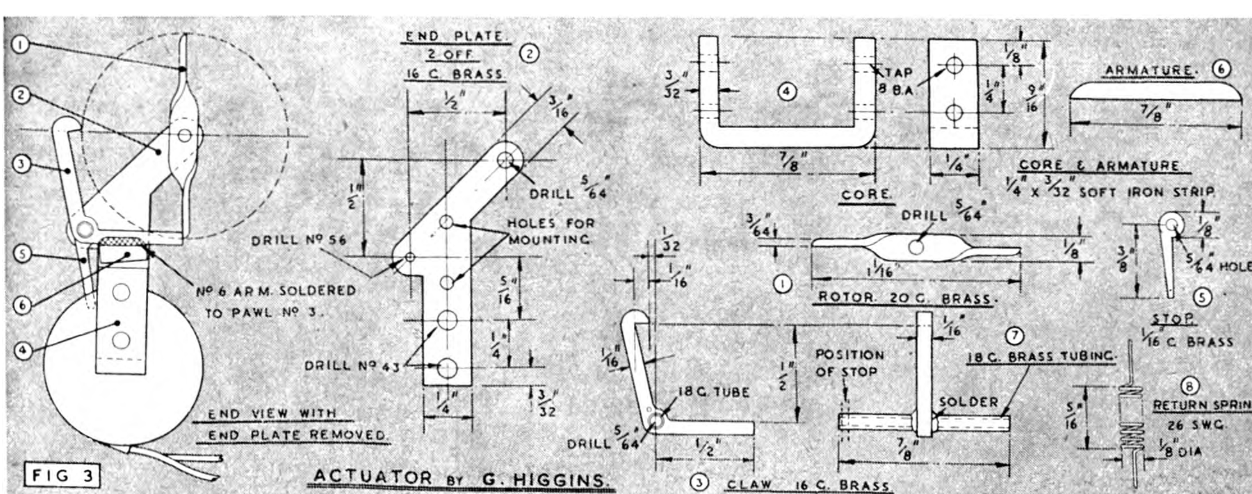
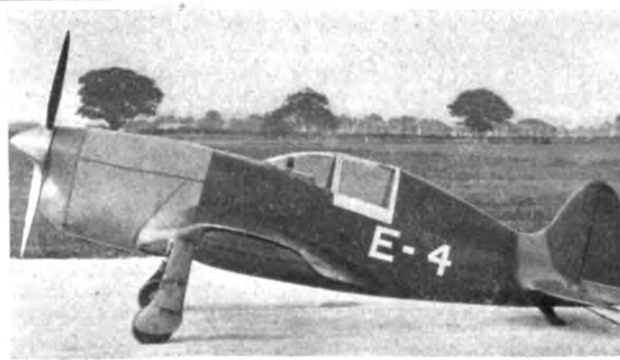


FIG 3

AIRCRAFT DESCRIBED NO. 38. BY G. A. CULL

THE D.H. AERONAUTICAL TECHNICAL SCHOOL T.K.4.

***Left.** The TK4 in racing regalia bearing the racing No. 1. on the fin and rudder, (Central Press Photo). **Below,** before the final coats were applied bearing experimental marking. (Aeroplane Photo.)*



FORMED in 1928, the De Havilland Aeronautical Technical School soon became known for the enthusiasm of its students which was given an outlet in the design and construction of the T.K. series, under the expert eyes of the instructors.

The biplane T.K.1 was followed by the famous T.K.2, and while the T.K.3 was not built, it was decided in 1936 that the fourth design would be a racer, the likes of which had never been seen before, or since, in this country.

The new 137 h.p. Gipsy Major II driving a " 1,000 " size D.H. v.p. metal prop was chosen to supply the power, and behind this was built the smallest practicable airframe that would contain a pilot. No effort was spared to win every possible m.p.h., and so wetted area was kept to minimum by tiny flying surfaces, resulting in a comparatively high wing loading. Performance-winning refinements, at that time very new in the latest first line military machines, such as hydraulically operated retracting undercarriage and split flaps, were employed together with H.P. automatic wing tip slats to curb the stalling speed. The undercarriage was made and designed by the students and was assembled by Dowtys' with two students on the job. A close fitting cowling was made with air for the carburettor bled from the engine cowling air intake so as to avoid a separate drag-creating scoop.

The fuselage was an object lesson in streamlining and the windscreen was a beautiful perspex two-piece moulding, fairing into the canopy which was fitted with a rubber strip to protect the pilot's head in bumpy weather.

First flight was made on July 30th, 1937, from Hatfield, and after successful handling trials at Martlesham Heath the new racer was prepared for the King's Cup Race. On the day of the race the T.K.4 was the smallest, fastest and most highly polished machine in the field, and for the race the slats were deleted as, in the light of inexperience with them, it was decided not to risk their uneven opening which might lose vital m.p.h. Flown by R. J. Waight, chief test pilot of the De Havilland Co., the T.K.4 was scratch machine, being handicapped at 235 m.p.h., and was flown into ninth place after averaging 230·5 m.p.h.

Two months after making the maiden flight, R. J. Waight was killed while practising for an attack on the 100 km. class record when the T.K.4 crashed at Hatfield and was completely destroyed. Justly called " a little beauty ", the T.K.4 would not be out of place in the all-too-thin ranks of racing machines to-day.

CONSTRUCTION.

Fuselage: Four longerons with stringers, completely ply-covered; rear decking was one piece Elektron fairing as was fin and tailplane root fairing.

Tail surfaces had balsa ribs with ply covering. **Wings** had balsa leading edge and four spruce boom and ply box spars. Top surface covered with spruce strips in two layers with grain on the bias. Lower surface ply covered. All control surfaces and slats of solid balsa with lightening holes sheathed in ply.

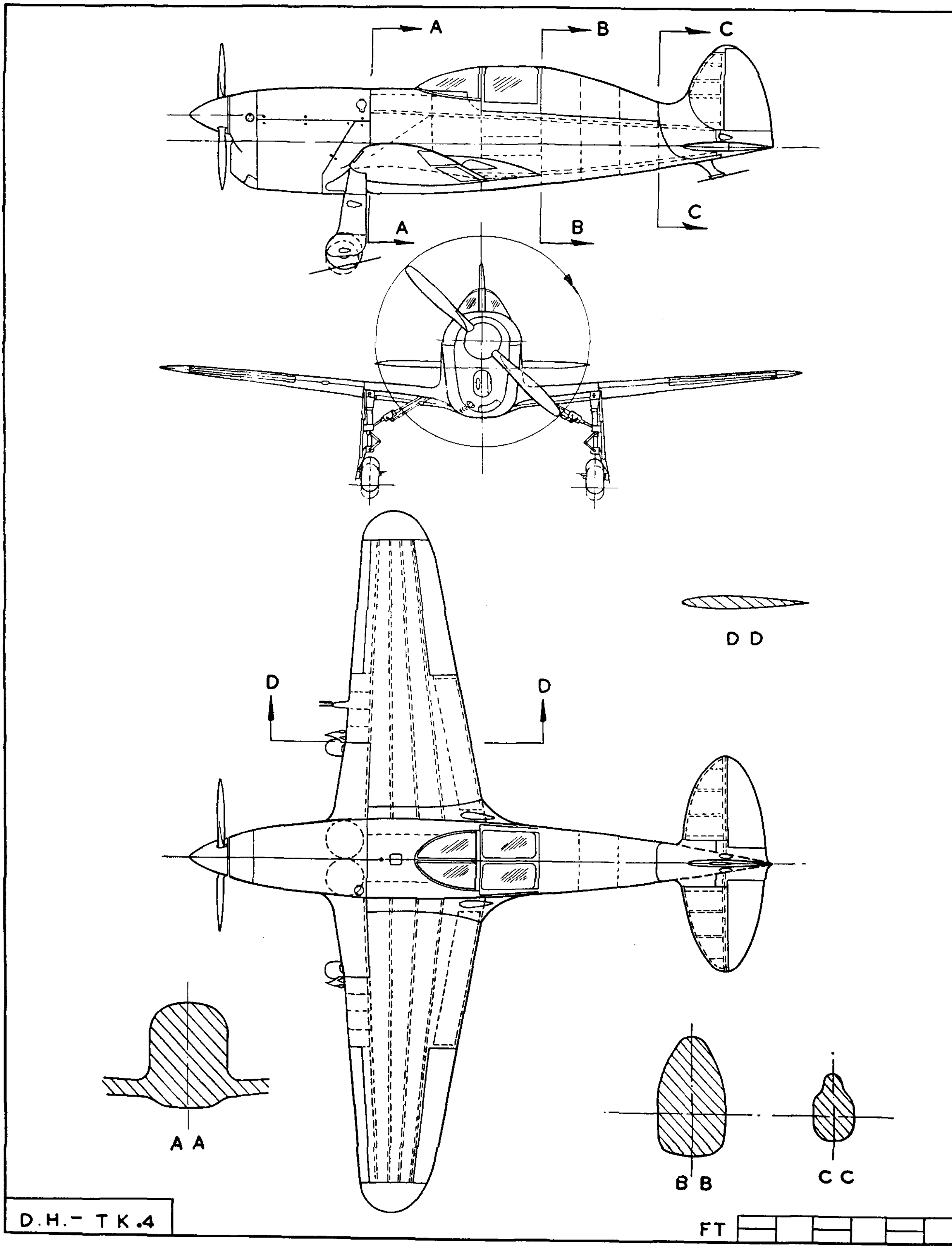
Colour: Bright glossy red (Titanine T.10 Lacquer) all over, with white outline letters and flash.

Specification: Span: 19 ft. 2 ins. Length: 15 ft. 10 ins. All-up weight: 1,356 lbs. Wing loading: 24 lbs. per sq. ft. Max. Speed: 244 m.p.h. at 1,500 ft.

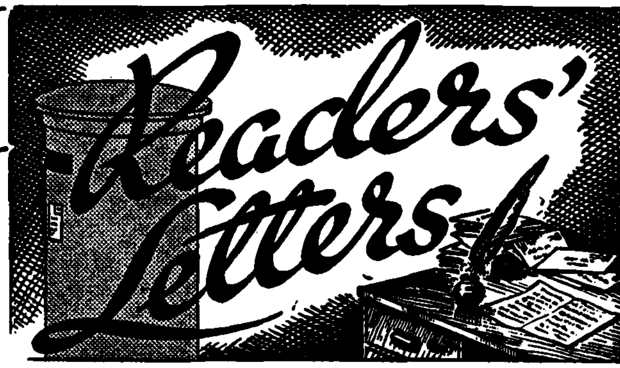
***Left** shows the minute inwards retracting undercarriage, and **right,** is another view of the machine before doping*

"Aeroplane" Photo

"Flight" Photo



D.H.– T K.4



The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

Tucker:—A Callon finale.

DEAR SIR,

After reading Mr. Tucker's letter in the November number of the AEROMODELLER I must agree with him in deploring the fact that model planes do not rival full sized aircraft both in appearance and performance. In particular, it seems a shame that on touching down they should promptly toss over instead of treating us to the sight of a perfect three-point landing. The conclusion is, of course, that models should be built to scale, and that wheels should be large enough to ensure smooth landings.

Carrying out this theory to its logical conclusion with regard to the Walthew rubber model—to which Mr. Tucker refers—provides quite a stimulating mental exercise.

My club considers itself lucky in having the use of some thirty acres of ground for flying purposes, but we have so far been unsuccessful in persuading the farm bailiff to roll it level and plant it with lawn seed. He appears to consider cereal crops more profitable, and he sows and reaps them by tractor. The resulting ruts plus stubble and odd stones cause variances in the surface level of as much as three or even four inches. Now it is a well known fact that no wheel will surmount an obstacle which rises suddenly to a height exceeding its own radius. So to ensure good landings every time on our particular flying field, the U/C wheels must be at least 8 inches in diameter. And for first-class cushioned landings balloon type airwheels are preferable. (They cost more than £3 per pair, but no matter).

We now proceed to scale up the Walthew rubber model in a realistic fashion over its new airwheels. Picking up an AEROMODELLER which happens to be at hand, I see that the Auster Autocar has a span of 36 feet to a wheel diameter of 18 inches—a ratio of 24 : 1. According to this ratio, the new scale version of the Walthew rubber model must have a wingspan of 16 feet. This brings in a new ratio of 32 : 5 between the new and old wingspans of the model, according to which (though perhaps not the best way of reckoning it) the new motor ought to be roughly 50 strands of $\frac{1}{4} \times 1/30$ rubber strip. The propeller, being an external unit, should be scaled down from the full sized original, and at 9 : 4 works out at 2 ft. 10 ins. diameter. As a matter of fact, in view of the additional weight resulting from the amount of hardwood necessary in the construction of so large a model, it might seem best to scrap the idea of a rubber motor altogether, and instal a 15 c.c. power unit.

But why stop here ? After all, scaling down the 145 h.p. original motor, whether according to weight, area of flying surfaces, or any other method you wish to choose, is bound to leave a very handy margin of power. So why not buy a second-hand car engine, and give the junior members of the club the opportunity of gaining their pilot's certificate ?

Wigan, Lancs. FATHER F. CALLON.

(Though closed last month, correspondence on Mr. Tucker's plea for realism continues to pour in. Father Callon's reply is a definite finale.—ED.)

Independent's Correspondence Club.

DEAR SIR,

To belong to a club is a great encouragement to modelling, for then the modeller has a chance of talking models, exchanging views and flying with other modellers. The obvious reply to this argument is " Then why not join a club ? ". But it is not always possible to join a club. I myself could join two local clubs, but I haven't the time available to go to club nights of either of them, and I have no means of getting any large models, which I specialise in, to the flying grounds used by these clubs.

There must be many aeromodellers in the same position as myself, and I ask, is it not possible to link these model fans into some sort of a club, and give them an opportunity to exchange views, etc.

Can nothing be done in this line, or must we give the case up as hopeless ?

Normandy, Surrey. G. H. HARRIS.

(Mr. Harris could become an S.M.A.E. country member or ask for correspondents through Clubman.—ED.)

Forewarned is Forearmed.

DEAR SIR,

In your report of the F.N.A. contest held on September 10th at Cormeil en Vexin there occurs a suggestion that the British Team could have won if they had not been unlucky.

Let me be the first to state frankly that the British Team caused our Dutch Team the greatest worry, and, of course, they could have won. Warring's missing flight might have turned the tables ; there is no doubt of it !

Permit me, however, to remark that there was no reason why a competitor should not have kept his spare model in readiness for the critical moment when it would be needed. The rules stated quite clearly that the use of a spare model was permitted.

I think it is up to the organization sending a team to a contest abroad, to supply the members, or the team captain, with all relevant particulars in the rules and instructions. The Italians had one flight disqualified because the competitor did not himself wind his rubber motor as the rules demanded. Very few entrants, except our team, were fully prepared with cardboard templates of wing, tailplane and fuselage cross-section, as the rules also demanded.

I trust you will understand that I have no intention to advertise our means of preparing our teams—we are not trying to canvass for custom outside our borders ! But it may serve as a reminder that a team is not fit to face all competition when " only " the models and owners are in A.1 condition : it also needs complete knowledge of the rules.

The fact that we intend to apply for the honour of running the 1951 Contest for the magnificent F.N.A. Cup may serve to remove from this letter the element of vain assurance and help to stimulate those responsible to ensure the complete preparedness of their teams.

Royal Netherlands Aero Club. J. van HATTUM.

(We heartily endorse Mr. van Hattum's remarks, for on average the British competitor does not apply himself to the details required, for which laxity there is no excuse. Proper briefing is the answer, and should be undertaken well before the participants leave this country.—ED.)

CLUB NEWS

BY CLUBMAN

A general scene during the 1950 East Midland Rally at Cranwell aerodrome, Lincs.

TO read the current (September) issue of the American A.M.A. journal, " Model Aviation ", one would think that competition classes over there are extended ad lib. to accommodate every weird and wonderful contraption the boys can think up ! To find the results listed of no less than 72 contests makes one wonder where all the models come from, but a closer scrutiny discloses that all events are split into three groupings for Senior, Junior and Open categories. Worked on the age basis, the Open class is for the over-twenty-oners, and a Senior is, we believe, aged between 16 and 21 years.

Nevertheless, the number of model categories accommodated is really something, accounted for in the main by sub-division of the main groups in different contests according to engine capacity, etc. Top control-line speed was made by World Record holder Eugene Stiles of California, whose McCoy 60 powered model clocked 147·48 m.p h. to win the Class D Senior event, this being a full nine miles per hour faster than the top speed accomplished with a jet.

Other top times, which make interesting comparison with our own 1950 contests were :—

Hand-launched Glider	Don Tune (Junior)	9 : 31·1
Tow-launched Glider	M. Feigenbaum (Senior)	11 : 50·6
Rubber-powered (Fuselage)	Dick Everett (Open)	15 : 23·3
" (Stick)	C. E. Hallum (Senior)	17 : 50
Power (Class B)	J. Foster (Open)	26 : 11·4
Power R.O.W.	K. Kriegh (Open)	10 : 59·2
Indoor Stick	R. J. Plotzke (Senior)	20 : 13·4
Indoor Fuselage	J. Bilgri (Open)	16 : 10

These times are, of course, the full contest scores, and we do not know the best individual flight times, but it is obvious that the five minute limit does not operate in the States as here, their top mark being 10 minutes. I still think our mark is best, for even at five minutes, very few models get anywhere near that mark on ability, and all else is at the mercy of conditions.

Whatever the result of the recent S.M.A.E. questionnaire on the subject of next year's contest programme, and in particular the proposal to extend the competition season through some of the winter months, the **NORTH WESTERN AREA** are going ahead with arrangements for a Winter Rally. Tentative date is January 14th, when a full programme of events will take place. It is now definitely fixed that a large Indoor Rally will take place the day before the 1951 Daily Dispatch Rally, thus making a real aeromodellers' week end.

Following a full season of inter-club flying, Croydon proved the winners of the **LONDON AREA** Challenge Cup, and further won the team glider championship for the T.M.A.C. Cup with a score of 1039. Wayfarers were top in the team rubber class, while Kentish Nomads won the London Area Keil Trophy, presumably a power event.

The **EAST ANGLIAN AREA**, whose A.G.M. I had the honour of attending last November, have secured a fine trophy for Radio Control competition for aeromodellers resident within the Area. First contest for this takes place on December 31st at Willingale Airfield, commencing at 11 a.m., with rules as for the 1950 Taplin Trophy contest. Best area men in the last combined contests on September 3rd were G. Lowe (Colchester), who scored a ratio of 11·4 in the Astral J. A. Gorham (Ipswich), total 8 : 51·3 in the Farrow Shield, and R. Landymore (Brentwood), 11 : 16 in the M.E. Cup.

Newest of the Areas is the **WEST OF SCOTLAND AREA**, who are in the process of settling down, and already are preparing to introduce a very sound type of annual contest. This, a United Kingdom Championship, is proposed to take place in Scotland in the initial stage, contests, etc.. yet to be decided, but roughly the scheme would be to select teams representing England, Wales, Scotland and Northern Ireland to battle out for National honours. It is suggested that a points system would decide the winning country, and the annual Championship would then be staged by the winners on similar lines to the current Wakefield system. Personally, I'm all for such a meeting, and sincerely trust negotiations are successfully carried out in order to commence the series at the latter end of 1951. (Should any readers have any suggestions on this subject, I shall be pleased to collate them and forward to the West of Scotland organisers in due course.)

First of the **WESTERN AREA** Winter Rallies was held on October 29th at Lulsgate Aerodrome in cold weather, but this did not prevent several o.o.s. flights. A couple of nice scale models were on view, one being an " Attacker " with a totally enclosed Dyna-jet, which unfortunately was not flown, the owner being too busy running the Team Racing event. Full results were :—

Rubber	–. Clack	(Bristol Aces)	11 : 28
	G. Woolls	(Bristol & West)	10 : 02·7
	D. Stowe	(Bristol Aces)	7 : 15
Glider	A. Taig	(Bristol & West)	13 : 56
	A. Sutcliffe	(Bristol Aces)	9 : 45
	J. Bennett	(Yeovil)	9 : 20
Power	J. B. Mayes	(South Bristol)	31·2 ratio
	V. H. Smith	(South Bristol)	8·66 "
	G. G. Mills	(South Bristol)	8·56
Team Racing	5 c.c. class	G. Elliot and –. Phipps (tie)	
	2 c.c. class	N. Blagg	

Chief news from the **NORTHERN AREA** this month indicates that " Sam " (Fiddler) Messom has resigned from Secretaryship, though continuing to work for the Area by looking after the dibs. Peter Stringer, of Huddersfield, takes over the duties of Hon. Sec., and will no doubt be ably assisted by Sylvia ! Vic Dubery, P.R.O. of the Area, seems to be conducting a rival to this column, his batch of club news from his members being very interesting (Apparently, following his last issue, someone took him to task for comparing present day modellers with their tougher counterparts in pre-war days ! We used to have some really fine fun during the winter months way back, and I trust we shall see more hardy fliers out this winter. A finger in the prop doesn't feel half so bad when said digit is numb with cold—but it bleeds just the same ! !)

After a hard struggle, Sheffield M.A.S. won the inter-club knock-out contest, their opponents being West Yorks. The weather was a test of fliers and machines, wind not too strong to prevent a maximum, and very little lift to help one.

Informal picture at the S.M.A.E. Prizegiving Dinner featuring:— top left, Brian Hewitt 1950 C/L Champion, left foreground, Ray Parker of Kentish Nomads, then from left to right, D. H. Rumley, 1950 Junior Champion, F. Hawkins of Birmingham, J. B. Knight and J. H. Gorham of Ipswich, 1950 Senior Champion.

Nearest to a maximum was Terry Poole's (Sheffield) 4 : 20, followed by Preston (W. Yorks) 4 : 19, and Cartwright's (Sheffield) 4 : 12. These were the only three to exceed the 4 minute mark. In spite of what appear to be low times, some excellent flying was seen in dull, damp conditions, and the contest result was in doubt until the last flight of the day. Exley of Sheffield, who was well off usual form, was the last man to fly, and at this stage West Yorkshire had a 55 point lead. However, Chas. pulled out his best flight of the day, and gave the match to Sheffield with 1338 against their rivals, 1282. Full details :—

SHEFFIELD :	T. Poole	3 : 02	2 : 40	4 : 20
	J. Cartwright	1 : 54	4 : 12	1 : 57
	C. Exley	1 : 17	1 : 05	1 : 51
WEST YORKS :	H. Preston	2 : 38	4 : 19	2 : 35
	J. Hepworth	2 : 34	2 : 33	2 : 45
	W. Farrance	1 : 04	1 : 44	1 : 21

The **EAST MIDLAND AREA** managed something that few other Rally committees organised during 1950, and that was fine weather at their Rally at Cranwell Aerodrome on Sunday, the 22nd September. The event was well attended by local clubs with quite a few London clubs in attendance. These had the pleasure of joining the R.A.F. for a night being accommodated in the College. Croydon was there in strength, pretty near sweeping the board in most of the Comps. They took first place in the Rubber, Glider and C/L Stunt events and second place in the Power and Team Race events. The St. Albans boys won this latter comp. flying a beautifully finished model of extremely clean design. Page of Gainsborough proved to be the only local boy making good by taking first place in the Power comp.

Most contestants felt that the organisation could have been better, but as this was the first really large Rally held by this area one could not expect perfect conditions. Certainly one and all had a good day's flying and what a wonderful aerodrome Cranwell is. Let us hope that it is definitely the venue for this year's Wakefield and A2 Trials.

Power :	1st	Page, J.	Gainborough	665·6
	2nd	Marcus, J.	Croydon	554·9
	3rd	Wright	St. Albans	410·6
Rubber :	1st	Ladd, R.	Croydon	718
	2nd	Fuller, G.	St. Albans	546
	3rd	Munday, P. G.	Grimsby	477
Glider :	1st	Satterfield	Croydon	787
	2nd	Yeabsley	Croydon	767
	3rd	Nixon, T.	Hinckley	555
T. Race :	1st	Buxton, T.	St. Albans	
	2nd	Butcher, N.	Croydon	
C/L Stunt :	1st	Butcher, N.	Croydon	
	2nd	Roberts, A. T.	Lincoln	
	3rd	Brown, C.	Grimsby	

Cup presented by Cranwell College for most points : T. Ladd, Croydon—53 points.

Cup for R.A.F. member : Mr. North—Cranwell.

Top marks to the **UPTON M.F.C.** members for a rattling good idea. They are decorating a ward in the Samson Street Hospital with planes representing the various air routes, and are putting on a week of indoor flying in the ward. It should certainly brighten up the days of the inmates, and be a good relaxation for them, particularly if they can be given the stopwatches and allowed to join in the fun. I know of a number of hospital cases who find aeromodelling—yes, even in bed—a good way of passing the time, and the few tools required and the general ease of working the normal materials has cheered many an otherwise gloomy outlook.

"S.M.A.C. Digest," the official journal of the **SOUTHAMPTON M.A.C.** is again in circulation, and I welcome this well produced club mag. as one of the best in its field. Southampton again won the Hobart Challenge contest against their close rivals Portsmouth, though the times were not spectacular, best being the 3 : 09·9 by Gordon's glider on his first flight. I spent a thoroughly enjoyable evening with these chaps and many others from the surrounding clubs when giving a film show at A.S.T. Hamble recently, the long session of questions that followed being—for my part—the most interesting part of the evening. These get-togethers are really worth while and I only wish it was possible to get to more places more often, but time, etc., etc. Must work sometimes you know !

In celebration of the end of summer (who's kidding who ?) the final round of the **OLDHAM & D.M.A.C.** club championship was flown off, after weeks of postponement due to unmentionable weather. K. Stott maintained his lead, and thus became 1950 champ. Their A.G.M. included the showing of the club film, for which the budget provides 300 ft. per annum, an idea well worth copying by others as the finest way of seeing yourselves as others see you !

John Done of the **LIVERPOOL M.A.S.** must be one of the luckiest modellers in the country. Whilst flying his new A/2 glider at Bidston Moss, the job disappeared after some seven minutes into the hazy distance, and he finally gave it up for lost. On arrival home, he found the model had been returned undamaged, having landed about a mile from his residence. Talk about " come 'ome Jim Edwards ".

Another club who had to wait weeks to finalise their 1950 programme was the **WEST BROMWICH M.A.C.**, but they were eventually rewarded with a dead calm Sunday on Guy Fawkes day. Marking the opening of a new flying ground, obtained through the co-operation of a very public-spirited farmer, competition was keen except in the rubber, in which N. A. Groucutt had a walk-over with one flight of 2 : 40·2, but this has undoubtedly wakened some interest in the club. P. Littley won the power event with an aggregate ratio for three flights of 27·143, Groucutt running him very close with 27·079. Remaining class for gliders went to Ron Clarke with an aggregate of 5 : 44.

A complete reorganisation has taken place in the **ST. HELENS M.A.C.** and, with a flow of new members, it is hoped that the club will soon be making its presence felt. Team racing is all the rage now, but free flight jobs are appearing in increasing numbers. R. Scott had a good time at the Isle of Man Rally, taking 1st in C/L Stunt, 2nd in Speed and 4th in the Tailless class.

Any Service aeromods. camped anywhere near the **DARLINGTON M.A.C.** are welcomed along to their clubrooms at Burton's Chambers, 9, High Northgate, Darlington, though as times are not given it will be as well to contact the club sec. J. T. Walker, of 90, Blackwell Lane first. Free flight flying scale models are becoming very popular with these chaps at the moment, P. Shutt's 6 ft. span Gypsy Moth (3·46 E.D.) being a really fine piece of work. We understand it will soon be fitted with R/C.

WHITEFIELD M.A.C. chaps are still working with an eye on British Records, particularly the new lightweight classes, and J. of the famous O'Donnell's has a claim in for the Lightweight Biplane class with a time of 2 : 53, made with a much modified " Raff V ". Much hard work has also gone into a couple of exhibitions recently, this tempering to some extent the flying activities, though a number of three minute

St. Albans Team Race pit men featuring Pete Wright and "George", with Ted Buxton's McCoy powered "Super Wow". This photo. was taken at the East Midland Rally at Cranwell as was the shot below of a twice size Warring glider flown by Percival of Lincoln.

and over flights have been put up in spite of colder weather.

Season for the **NORTHAMPTON M.A.C.** was rounded off by my giving a showing of the 1948, 49 and 50 Wakefield films, the meeting being attended by many other clubs from the surrounding district, and honoured by the presence of the Mayor of Northampton. This gentleman's observation that the hobby of Aeromodelling would be encouraged by the Council was well worth the trip, and it should encourage others to keep pegging away in spite of difficulties with their local authorities. With so many top line Wakefieldites in the town, Northampton was naturally keen on the films, and it is obvious that 1951 will see even keener competition from this district.

The **BLACKHEATH M.F.C.** will hold the 3rd annual "Bill White Memorial" competition on Sunday 7th January at Fairlop, commencing at 10 a.m. In addition a glider contest will be staged, and all interested who have not yet received entry forms are asked to contact the Hon. Sec. K. C. Hackman, 22, Lambert House, Beckenham Hill, London S.E.6.

More odd comments from the interesting **WEST ESSEX AEROMODELLERS'** news sheet :—

"Is that model up there Radio Controlled ?"
"No—it's just naturally unstable !"

"I told him it wouldn't take a 1,000 turns, but he was too thick skeined."

Recently a newspaper article lamented that our beautiful countryside was becoming disfigured by ugly pylons. Probably they were thinking of Fairlop !

A lively item entitled "How to obtain that five minute maximum" could be taken quite seriously, for the series of incidents treated so facetiously are true in fact, and I have no doubt that "L.R." has the same club in mind as I ! !

The **STOCKTON & D.M.F.C.** held a Challenge Cup event for rubber driven models between showers, and in a cold strong wind, which made the winner's success rather surprising in view of the fact that he flew a lightweight "Raff V". Aggregate time 6 : 49·2. Tom Chambers has raised the club r.t.p. record to 3 : 15·5, but L. Stevens is not so lucky, and is still looking for the blighter who pinched his Elfin 2·49 (No. 1245) when he and others paid a visit to Newcastle last August.

Culled from the **BLACKPOOL & FYLDE M.A.S.** club mag. is the news that S. Newton has just pipped Cliff Davey for the Club Championship, with M. J. Davidson placing as top junior for his flight of 4 : 56 in the Halfax Trophy. Mike Thomas, only two months in the club, cleaned up the opposition in the Stevenson Cup with a score of 202 seconds in filthy weather. A big drive for S.M.A.E. Merit Certificates is on now, as with most North Western Area clubs, these being required for entry into the Area Championships.

PHOENIX (Mansfield) M.F.C. held its first contest in two halves. Free flight was an all-in affair with rubber, glider and power vieing with each other, the first two categories being based on the best flight of two, and power on a ratio system, with the final ratio multiplied by 20. Thus S. Cowlishaw, flying a "Raff V" modified to glider, clocked 4 : 06 to place first ; W. Barker, with an Elfin 1·8 powered "Jimp" was second with 170 points, and L. Mills' ancient Amco powered pylon design came third with 163·2. For the C/L events held the following Sunday the weather was colder and windy, when L. Mills won the Target Speed contest with 66 m.p.h.—101·5% of his target figure. A. Swanson clocked a magnificent 117 m.p.h. but was too far short of his target of 120. P. Russell of Worksop again showed his prowess in the stunt event to rack up 287 points against his nearest rival's 248.

With one or two shows to give experience, the **KNUTSFORD & D.M.F.C.** chaps state that ordinary stunt models are out as far as the general public are concerned—they prefer models that look like planes !

A good afternoon's flying was enjoyed by all who attended the **HUDDERSFIELD AIR LEAGUE M.A.C.** for their invitation rally held on October 15th. The weather was very favourable, and the go-as-you-please atmosphere made for an easy day for both competitors and officials. Results :—

Glider	G. A. Paxman	(Huddersfield)	7 : 09·5
	D. Ford	(Huddersfield)	6 : 21·1
	C. Easter	(Hall Bower)	4 : 51·5
Rubber	P. H. Stringer	(Huddersfield)	6 : 38
	H. Lawrence	(Huddersfield)	3 : 52·4
	C. Woodcock	(Lockwood)	2 : 20
Power	R. Steele	(Lockwood)	5 : 20·5
	B. Moorhouse	(Lockwood)	3 : 32·2

Team racing is going strong with the **TAUNTON & D.M.A.C.** boys, the last competition being won by Roger Burfitt who beat J. Ford by ten laps at an average speed of 37·5 m.p.h. over five miles. Despite this accent on C/L, free flight models are still taking the air, of note being T. H. Robert's Mills ·75 powered "Elfin II" which has the much sought after vertical climb.

With Leconfield Aerodrome only ten miles away, you would expect that members of the **HULL PEGASUS M.F.C.** would be there in force on every available occasion, but you'd be wrong! It always seems to be the case—find a club that has great difficulty in getting somewhere to fly, and you usually find a live and keen group. As with most things I suppose, it's only what you can't get that you worry for!! Club Sec. G. ("Canard") Harrison is working on a canard Wakefield, and if his earlier attempts are anything to go by, we should see something really interesting next season.

UPTON M.F.C. (yes—second mention, but this is their ordinary report, and not to be confused with their "special mention" earlier) held their last comp. of the year on October 22nd, this being a power comp. to a fixed time of one minute. A Roberts won with a flight of 59·5 seconds, S. Reynolds was a close second with 60·8 and Mrs. Eves third with 64. Not bad timing that! Had Reynolds won this event he would have displaced J. Holt from the Championship Shield by ten points—but . . . Better luck next year.

Starting in February, 1950, with 12 C/Line members, the **SKYSCRAPERS (Rossendale) M.F.C.** have increased to 21 and roped in some free flight enthusiasts, one of whom put up a time of 5 : 20 o.o.s. in the Halfax event, but unfortunately lost the job on this, his only flight.

The date of the 1951 North Hampshire Rally is announced by the **ALTON & D.M.A.C.** as April 29th, the venue to be announced later. Further details may be obtained from Mr. S. J. Hunt, 75, High Street, Alton, Hants.

R/C is due to make its debut in the **FLYING SADDLERS M.A.C.** D. Braes and A. E. Reynolds combining efforts to produce a "Javelin" powered "Sky-skooter" with E.D. III equipment. Another combine, S. Pritchard and M Gilbert, are producing hordes of modified "Fugitives", though little remains to remind the original designer of his A.P.S. plan. Such things as auto-rudder, forward fin, and tip-up tail D/T, and either flat or anhedralled tailplane would confuse D. C. Butler! Times are quite good, Pritchard clocking an unofficial 9 : 35, whilst Gilbert obtained his "A" Merit Certificate with three consecutive "Fugitive" flights. Club records are :—

Glider	M. Gilbert	8 : 38
Rubber	M. Gilbert	6 : 05·8
Power (A)	D. Braes	22·65 ratio
Power (B)	R. Bedale	9·05 ,,

CARDIFF M.A.C. entered the "Bartlett Trophy" event at Bristol, flown in shocking weather on September 24th. Although unable to muster a full team of six, they were not disgraced, taking 1st and 2nd in power, Pete North and Johnnie Woodhouse getting very wet in the process! Gallant attempt was that of junior member L. Jones, who risked (and lost) an untested "Jaguar" to gain a few extra points for the club in the rubber event.

I learn from the **SOUTHERN CROSS A.C.** news-sheet that the 1951 South Eastern Area control-line meeting may take place at Whitsun instead of Easter as in the past, and will probably be sponsored by a national newspaper. Proposed venue is Stanmer Park, but I have no idea what town that is in! Last of the club's contests, for free flight power, was the only one fortunate to be held in decent weather, and resulted in another win for Bill Gravett. Flying a Micron 2·8 powered pylon of his own design, his first flight was 7 : 42, thus breaking the club Open and Senior class record, ratio being 29·5.

Taking advantage of four fine week ends on the run, the **WIGAN M.A.C.** got through a full programme of contests, some good times being set up in the process. B. Picken clocked four minutes plus with his power job from a 25-second engine run, and R. Baldwin did a minute better on 30 seconds. Wakefields are taking their place in the club. Club records to date are :—

Rubber (Lightweight)	R. Chisnall	5 : 03
Wakefield H.L.	B. Picken	29 : 00
,, R.O.G.	B. Picken	4 : 18·2
Glider	M. Marton	10 : 32
,, (Tailless)	R. Baldwin	2 : 57·2
Power	A. Ashurst	5 : 17·3

A couple of Australian readers are anxious to start up a correspondence with chaps over here, so if any of you feel like a dose of writer's cramp, try the following: W. Fenner, 7, Wharfe Street, South Woodville, Adelaide, S. Australia, who is 19 years old, mainly interested in sailplanes—especially tailless, Wakefield and power. The other fellow is Wallace Wood of Power House, Port Wakefield, South Australia, who is a sailplane pilot and a founder member of his local glider club. He is by force of circumstances a free lance, his nearest club being 60 miles away.

That's all for this month folks, so I'll leave you to try a spot of cold weather thermal hunting. As a well known radio character states . . . "It may be cold Mrs. 'Oskins, but it's lervly—it's lervly!!"

ERRATA NOTICE

Last month's Club News heading photograph was not, as we stated, of the Western Controliner's Club; but included members of the Aces, Bath, Trowbridge, Glenum and Phoenix Clubs from the Western Area.

THE CLUBMAN

NEW CLUBS

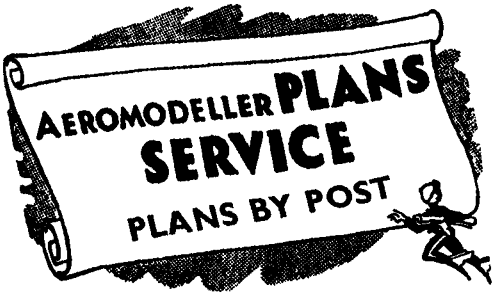
LITTLEHAMPTON M.A. & M.C. (formerly West Sussex M.A.S.)
R. G. Halfpenny, "Mont Colne", High Street, Angmering, Sussex.
ST. LUKES (Blackburn) M.A.C.
N. A Marsh, 3–5, Dickinson Street, Blackburn, Lancs.
MILL HILL & D.M.A.C.
P. H. White, 10, Holders Hill Crescent, Hendon, London, N.W.4.
BICKENHILL M.A.C.
J. G. Sly, "The Hawthorn", Coventry Road, Bickenhill, Near Birmingham.

SECRETARIAL CHANGES, ADDRESSES, ETC.

OXFORD METEORS M.C.
W. J. Barrett, Jnr., 2, Bridewell Square, Speedwell Street, Oxford.
TOTTENHAM M.F.C.
A. G. Ramsdale, 46, Selby Road, Tottenham, London, N.18.
NORTH WEST MIDDLESEX M.F.C.
D. Arthur, 86, Drummond Drive, Stanmore, Middlesex.
VIKING M.A.C.
A. J. Comber, "Rosemary", Queens Avenue, Byfleet, Surrey.
IRVINE & D.M.A.C.
R. H. Dunlop, 19, Glasgow Vennel, Irvine, Ayrshire.
DARLINGTON M.A.C.
J. Walker, 90, Blackwell Lane, Darlington.
BLACKBURN M.A.C.
J. I. Braithwaite, 13, Nottingham Street, Blackburn, Lancs.
WAYFARERS M.A.C.
D. E. Jones, 74, Bushey Hill Crescent, Watford, Herts.
BRISTOL & WEST M.A.C.
P. J. White, 35, Cleeve Lodge Road, Downend, Near Bristol.
KNUTSFORD & D.M.F.C.
A. Caveney, 53, Manor Crescent, Knutsford, Cheshire.
BELFAST M.A.C.
A. Hutcheson, 14, Porter Park, Finaghy, Belfast, N.I.
PERTH M.A.C.
J. Attwood, Newlands House, Perth.
HASTINGS AEROMODELLERS
L. C. Breach, 6, The Croft, Hastings, Sussex.
MERSEYSIDE M.A.S.
D. R. Hughes, 62, Pensby Road, Heswall, Cheshire.
ST. HELENS M.A.C.
A. Scott, 15, Kingsley Road, St. Helens, Lancs.
PRESTWICK M.A.C.
R. C. Parsons, 29, Clune Drive, Prestwick, Ayrshire.
PONTEFRACT & CASTLEFORD M.F.C.
S. Woodhead, 18, Banks Avenue, Pontefract, Yorks.
HENLEY M.C.
J. G. Waldron, "Rhodesia", Victoria Road, Wargrave, Berks.
WALSALL M.A.C.
G. Williams, 110, Sandwell Street, Walsall, Staffs.
WIGAN M.A.C.
R. Baldwin, 10, Rose Avenue, Beech Hill, Wigan, Lancs.
BEVERLEY & D.M.A.C.
P. Done, Longcroft Park, Beverley, E. Yorks.
NORTHERN AREA S.M.A.E.
P. H. Stringer, "Dunern", Wakefield Road, Denby Dale, Huddersfield, Yorks.
DOVER & D.M.F.C.
M. Tolputt, 56, Hamilton Road, Dover, Kent.
BRIXTON D.F.C.
M. A. Billinton, 15, Raleigh Gardens, Brixton Hill, S.W.2.
DEFFORD M.A.C.
E. R. Holloway, M. of S., Defford Air Station, Worcs.
CHELMSFORD M.A.C.
R. Wright, 26, Writtle Road, Chelmsford, Essex.

SECRETARIAL CHANGES

FOREST COTTAGE M.A.C.
G. Dawson, 4, Earl Terrace, Lee Mount, Halifax.
COVENTRY & D.M.A.C.
G. Ginns, 52, Macauley Road, Wyken, Coventry.



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Here are a few which will appear in the coming months—

Ron Yeabsley's A2 Winner.
"Jaded Maid" by N. G. Marcus.
1950 Jetex Comp. Winner—Allaker.
A Gus Gunter Power Model.
Fokker Tri-motor Flying Scale, etc., etc.
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In this Issue

- **G.409.** **NORD 2.** British Record Holder Nordic A2 Sailplane by J. G. Joyce. 60" span. 5/6
- **FSP. 410.** **GAMECOCK.** A. P. E. Norman Flying Scale Free Flight Stunt model for ·75 to 1 c.c. engines. 36" span. 5/6
- **CL.411.** **TK 4.** 125 sq. ins. semi-scale Team Racer of the 1937 King's Cup Aircraft by Ron Moulton. For 5 c.c. engines, with alternative wing for 2·5 engines on plan 3/6
- **U.407.** **MANX ARROW** by C. S. West. An auxiliary powered Flying Wing Sailplane of 79" span for 0·2 c.c. diesels 2/6
- **CL.412.** **LINDY.** Fastest Class IV. Speed Model in Britain. 117 m.p.h. with a Dooling 29. Designed by F. Guest... 2/-

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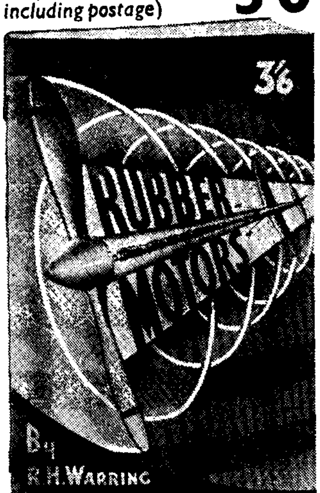

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No one has ever equalled George Temple for his mastery of the high performance sailplane. To-day, more than ever, with the growth of interest in Continental Contests and the Nordic A2 Class his special knowledge is necessary for he alone has had extensive experience of foreign design technique. Mainly dealing with the effective employment of hardwood construction it is invaluable to every serious builder. In addition to superb illustrations there are reduced scale plans of his famous models.

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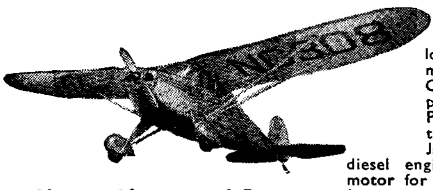

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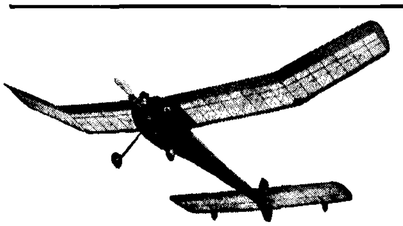

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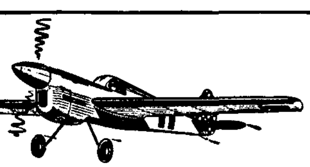

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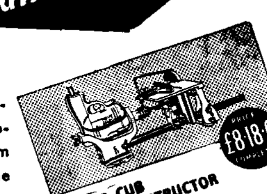

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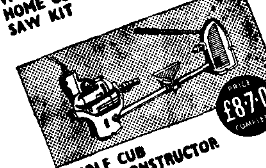

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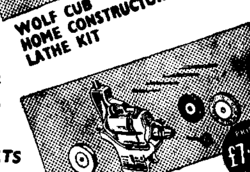

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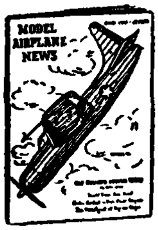

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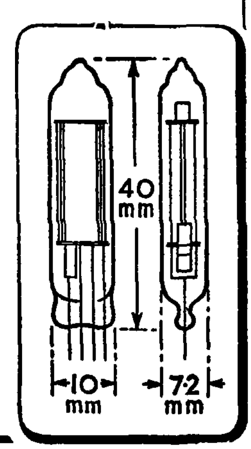

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