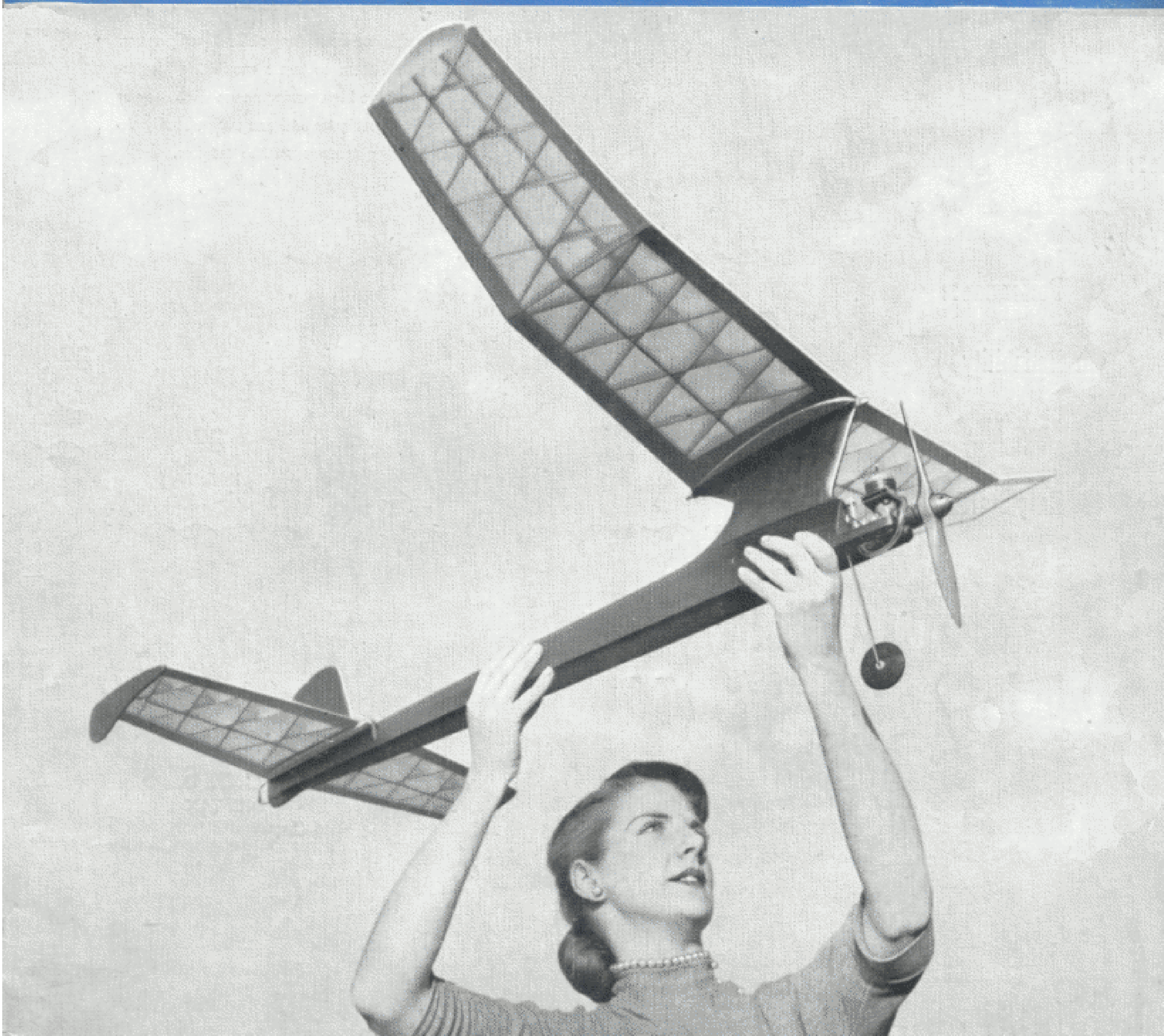
AERO MODELLER

FEBRUARY 1953



SPECIAL DELTA FEATURE

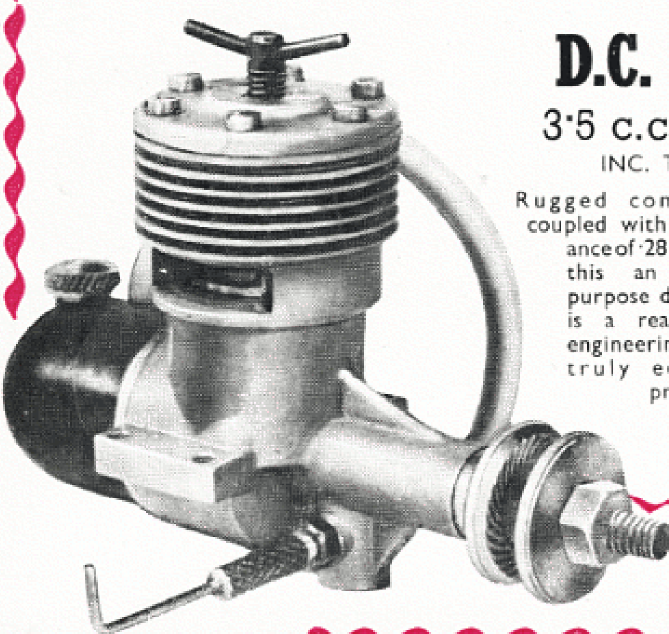
- WORLD CHAMPIONSHIP SPEED MODELS
- "QUICKIE" CONSTRUCTION
- R/C FOR THE BEGINNER
- SIDELIGHT ON SOLIDS

1'6

Four of the Best !

Whatever your requirements in the model engine, you will find them catered for in the Davies Charlton—Allbon range.

Manufactured by skilled engineers, who build them to last a modelling lifetime, they combine high performance with easy handling characteristics and are undoubtedly the best-looking motors on the market.



D.C. 350

3·5 c.c. 82/6

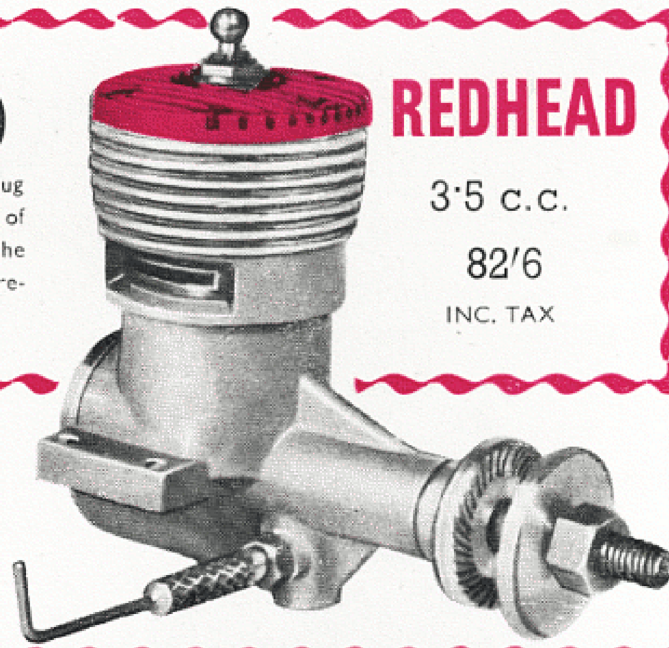
INC. TAX

Rugged construction coupled with a performance of ·28 B.H.P. make this an ideal all-purpose diesel. Here is a really finished engineering job at a truly economical price.

- Performance
- Reliability
- Long Life
- Easy Starting

D.C. 350 (G)

This high powered glow plug engine combines the virtues of very easy starting with the performance and reliability required for contest work.



REDHEAD

3·5 c.c.

82/6

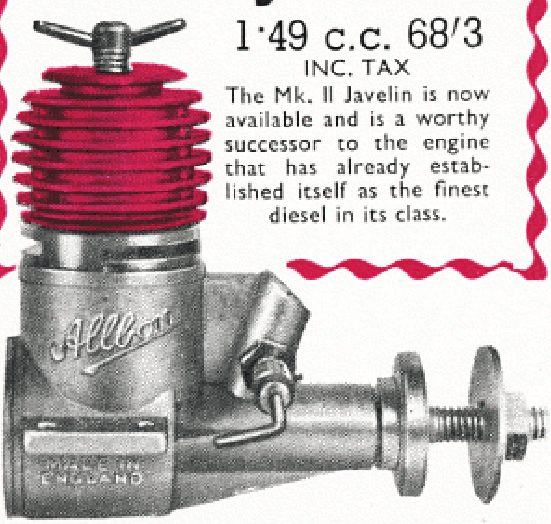
INC. TAX

Mk II JAVELIN

1·49 c.c. 68/3

INC. TAX

The Mk. II Javelin is now available and is a worthy successor to the engine that has already established itself as the finest diesel in its class.

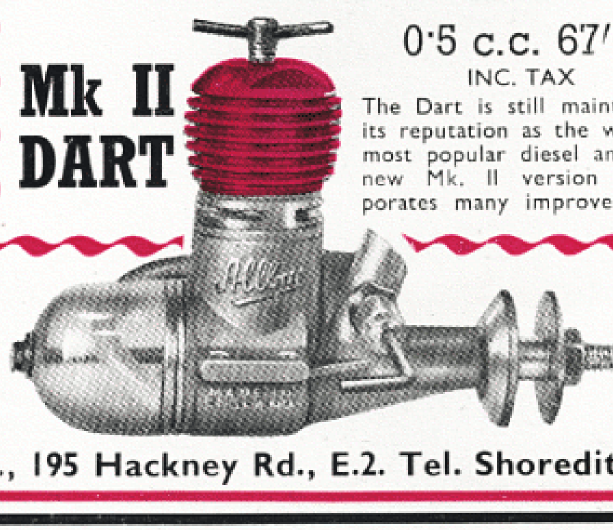


Mk II DART

0·5 c.c. 67/6

INC. TAX

The Dart is still maintaining its reputation as the world's most popular diesel and this new Mk. II version incorporates many improvements.



Sole Distributors: E. KEIL & CO. LTD., 195 Hackney Rd., E.2. Tel. Shoreditch 5336

Not Magic

JUST GOOD SERVICE

NORTH SOUTH EAST WEST

GREGORY'S

Service is the Best

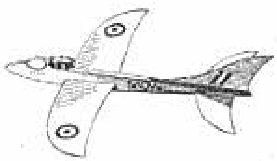
GLIDERS

	P.T.
K.K. Soarer Minor ...	8/0+1/9
K.K. Soarer Baby ...	5/0+1/1
K.K. Soarer Major ...	11/6+2/7
K.K. Minimoa, 50" ...	7/0+1/7
K.K. Invader, 40" ...	6/6+1/5
K.K. Cadet, 30" ...	4/0+11d.
Veron Coronette ...	3/6+9d.
Veron Verosonic ...	10/6+2/4
Mer. Norseman, 58"	29/3
Frog Prince	20/6+4/6
Frog Diana, 36" ...	7/5+1/7
Mer. Grebe, 49" ...	12/0+2/8
Frog Vespa, 30" ...	5/9+1/3
K.K. Chief, 64" ...	18/6+4/2
Mer Marauder	17/9
Mer. Martin, 40" ...	9/2
Mer. Gnome, 32" ...	7/4

NEW JETEX KITS

Prefabricated throughout

Voodoo (50) ... 6/4+1/5 P.T.
Hawker Hunter. Accurate scale, for Jetmaster and Augmenter Tube, 15/6+3/5 P.T.



READY-TO-FLY MODEL

Sharky. Complete with Jetex 50 B motor, fuel, gauzes, washers, wicks, etc. ... ... 13/0+2/11 P.T.

BOOKS

Aeromodeller Annual ...	10/5
A.B.C. Model Aircraft ...	5/4
Miniature Aero Motors ...	7/9
Glow Plug Engines ...	3/9

All post free.

XACTO TOOLS. From 3/0 to 84/0. All spare blades in stock. No. 86 Tool Chest, **84/0**; No. 82 Tool Chest, **30/0**; No. 78 Wood Carving Set, **37/6**; No. 77 Wood Carving Set, **23/0**; No. 1 Knife (with No. 11 blade), **3/0**; No. 2 Knife (with No. 22 blade), **3/6**; No. 5 Knife (with No. 19 blade), **6/6**; No. 51 Knife Set (No. 1 knife and 6 blades), **5/6**; No. 52 Knife Set (No. 2 knife and 6 blades), **6/9**: No. 62 Knife Set (No. 1 and 2 knives with 12 assorted blades), **12/3**. See Xacto advert. for illustrations.

An XACTO illustrated leaflet will be sent on receipt of S.A.E. Contains full range, prices and contents of tool chests, etc.

ORDERING INSTRUCTIONS

HOME CUSTOMERS. Cash with order or C.O.D.
POSTAL INSTRUCTIONS. All orders under 10/- add 9d., 25/- add 1/1, 40/- add 1/6, over 40/- post free. For overseas according to postal service requested and destination. Postal information concerning dispatch to any country given on request.
NOTE. Will all customers requiring information please include a S.A.E., or if overseas International Reply Coupons.
OVERSEAS CUSTOMERS
Cash with order or C.O.D. C.O.D. Service is not available to all countries. Complete list will be found in back issues.
At present, Mercury Kits are only available at Home Market prices. Those showing P.T. separately are still available tax free (subject to being unsold).
Customers resident outside United Kingdom, including H.M. Forces, buy free of Purchase Tax.
Correct rates of exchange given.
FORCES CLUBS. Recognised Clubs can buy on a credit account. Details on request.
Model Shops abroad—We will act as your buyer.

C/L KITS

	P.T.
Frog	
Vanfire	24/2+5/4
Vandiver II	12/3+2/9
Vantage	17/2+3/10
Keil Kraft	
Ranger	10/6+2/4
Pacer	15/0+3/4
Stunt Queen... ...	21/0+4/8
Skystreak, 26" ...	9/6+2/1
Skystreak, 40" ...	10/6+2/4
Phantom	18/6+4/2
Scout Biplane ...	22/6+5/0
Phantom Mite ...	11/6+2/7
Veron	
Beebug	12/0+2/8
Panther	25/0+5/6
Minibuster	15/0+3/4
Philibuster	23/6+5/2
Midget Mustang ...	22/6+5/0
Focke Wulf 190 ...	21/0+4/8
Sea Fury Mk. IX ...	23/6+5/2
Spitfire Mk. XXII ...	27/6+6/1
Wyvern	23/6+5/2
Nipper	10/6+2/4
Mercury	
Team Racer I ...	23/0+5/1
Team Racer II ...	23/3
Marlin	19/6+Nil
Speedwagon 20 ...	14/3+3/2
Midge... ...	6/5
New Jnr. Monitor ...	23/6
Skyleada	
Hornet	9/0+1/11
Auster	7/4+1/8
Curtiss Hawk ...	15/7+3/5
Doughty Ambassador	21/0+Nil

JETEX MOTORS

	P.T.
50 Outfit	10/11+2/5
200 Outfit	31/8+7/11
350 Outfit	43/2+9/7
Jetmaster	24/0+5/4
Augmenter Tube ...	5/0+1/1
50 motor only ...	7/6+1/8
100 motor only ...	16/8+3/9

KITS FOR R/C

	P.T.
K.K. Junior 60 ...	39/6+8/9
Ver. Skyskooter ...	25/0+5/6
Ver. Stentorian ...	69/6+15/6
K.K. Falcon, 96" ...	107/6+23/11
Mer. Aeronca Sedan, 65"	69/6
Mer. Monocoupe, 64"	69/6

FREE-FLIGHT KITS

	P.T.
Veron	
Streaker, 37" ...	19/9+4/4
Cardinal, 35" ...	14/6+3/2
Lavochkin	25/0+5/6
Mercury	
Mallard, 48"	22/4
Jnr. Mallard, 34" ...	15/0+3/4
Monocoupe, 40" ...	27/10
Stinson 105, 42" ...	28/6+6/1
Chrislea Skyjeep, 40"	34/7
Tiger Moth, 33" ...	34/7
Frog	
Cirrus, 48"	21/0+4/6
Fox, 40"	17/2+3/10
Firefly, 36"	18/5+4/1
Janus, 44"	14/4+3/2
Vixen, 36"	12/4+2/8
Powavan, 48" ...	22/1+4/11
Zephyr, 33"	10/3+2/3
Keil Kraft	
Skylon	10/3+2/3
Slicker 42	17/6+3/11
Outlaw	22/6+5/0
Bandit	18/6+4/2
Ladybird	18/6+4/2
Pirate	12/0+2/8
Cessna 170	18/6+4/2
Luscombe Silvaire ...	18/6+4/2
Piper Super Cruiser	18/6+4/2
Southerner, 60" ...	40/0+8/11
Southerner Mite, 32"	10/6+2/4
Skyleada	
Point Five	7/10+1/8
Doughty Eliminator	19/6+Nil

RUBBER POWERED KITS by all leading makers.

SOLIDS by Veron, Keilkraft and Bateman.

RADIO CONTROL

E.D. Mk. I, 3-valve unit. Complete transmitter, receiver and escapement. **290/0+69/9 P.T.**
E.D. Mk. II, 3-valve unit. Complete transmitter and receiver only. **296/0+74/0 P.T.**
E.D. Mk. III Miniature (Hivac) Unit. Complete transmitter, receiver and escapement. **159/6+38/5 P.T.**
E.D. Mk. IV Tuned Reed. 3 channels unit. Complete **400/0+100/0 P.T.**
Any of the above can be purchased as separate items.
E.D. Mk. III transmitter & aerial. **92/6+22/3 P.T.**
E.C.C. International transmitter. **150/0+37/6 P.T.**
E.D. Mk. III receiver. **60/0+14/5 P.T.**
E.C.C. 951A hard valve receiver. **70/0+17/6 P.T.**
E.D. escapement, compact and normal type. **18/6+4/5 P.T.**
E.D. polarized relay. **30/0**
E.C.C. 5A relay. **25/0+6/3 P.T.**
E.C.C. escapement. **17/6+4/5 P.T.**
E.D. Reed Unit (high or low frequency, state which). **60/0**
Frequency Meter. **21/6**
Hivac Valve **17/6+3/10 P.T.**
Milliameter, 0·5 M/A **12/6**
Batteries stocked for any of above.

VENNER ACCUMULATORS. Leaflet on request.

ENGINES

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

AMCO B.B. 3·5 **92/0+23/0 P.T.**

Allbon Dart 1·5 c.c.	54/0+13/6
Allbon Javelin ...	55/0+13/3
Allbon Arrow G.P.	55/0+Nil
D.C. 350	66/0+16/6
E.D. ·46	45/0+10/0
E.D. Bee I c.c. ...	47/6+10/0
E.D. 2·46 Racer ...	72/6+10/0
E.D. Mk. IV 3·46 c.c.	72/6+10/0
E.D. 1·46	52/6+7/6
E.D. 2·46 Watercooled	98/6+16/6
E.D. 3·46 Watercooled	98/6+16/6
Frog 50, ·5 c.c. ...	40/6+9/0
Frog 150 Diesel ...	40/6+9/0
Frog 500 Red Glow	61/8+13/4
Frog 500 Petrol ...	69/9+15/3
Mills P.75	60/0+10/9
Mills S.75	55/0+11/9
Mills 1·3	75/0+16/1
Elfin ·5 c.c.	54/0+13/6
Elfin 1·49 c.c. ...	47/6+12/0
Elfin 2·49 c.c. ...	56/0+14/0
E.T.A. 29	119/6+29/11

P. E. GREGORY & SON

(ALTON) LTD., ALTON *TEL. 3376* HANTS

AN UNEQUALLED RETURN POST SERVICE. 3d. STAMP FOR LISTS.

WORLD WIDE MAIL ORDER Service

A FLYING START TO A MEMORABLE YEAR

The eyes of the World are on Britain this year, and it is a great source of pride that for aeromodelling, as in so many other fields of British enterprise, our designers and manufacturers more than hold their own. This year, we are determined to make British model aircraft known throughout the world more than ever. I am certain our high-speed overseas mail order service is going to help quite a lot. **A.M.**

If you are not served by a Model Shop in your district, order with confidence from my Mail Order Department. Return Postage Guaranteed.

Five Star Reasons why Customers overseas should use my Mail Order Service.

- All Overseas orders, including ALL Forces Overseas are FREE of P.T.
- All Orders despatched on day of receipt and acknowledged by Air Mail.
- Packing guaranteed to stand passage to any part of the World.
- As a Licenced Exporter, I supply direct.
- Correct rates of exchange on all foreign currency.

KEILKRAFT KITS

Gliders

		P.T.
Cadet, 30"	4/0 +	11d.
Soarer Baby, 36"	5/0 +	1/1
Soarer Minor, 48"	8/0 +	1/9
Soarer Major, 60"	11/6 +	2/7
Invader, 40"	6/6 +	1/5
Minimoa, 50"	7/0 +	1/7
Chief, 64"	18/6 +	4/2

Rubber Powered

Achilles, 24"	4/0 +	11d
Eaglet, 24"	4/6 +	1/0
Ace, 30"	5/0 +	1/1
Senator, 32"	5/6 +	1/3
Ajax, 30"	6/0 +	1/4
Competitor, 32"	7/0 +	1/7
Gypsy, 40" (W)	10/6 +	2/4
Contestor, 45" (W)	23/6 +	5/2

Flying Scale Series 3/0 + 8d.

Free Flight Power

Slicker Mite, 32"	9/6 +	2/1
Southerner Mite, 32"	10/6 +	2/4
Skylon, 38"	10/6 +	2/4
Pirate, 34"	12/0 +	2/8
Slicker, 42"	17/6 +	3/11
Slicker, 50"	25/0 +	5/6
Slicker, 60"	35/0 +	7/9
Southerner, 60"	40/0 +	8/11
Junior, 60"	39/6 +	8/9
Bandit, 44"	18/6 +	4/2
Outlaw, 50"	22/6 +	5/0
Ladybird, 41"	18/6 +	4/2

Flying Scale Power

Piper Super Cruiser	18/6 +	4/2
Cessna 170, 36"	18/6 +	4/2
Luscombe, 40"	18/6 +	4/2

Control Line

Phantom Mite, 16"	11/6 +	2/7
Phantom, 21"	18/6 +	4/2
Scout Bipe, 20"	22/6 +	5/0
Ranger, 24"	10/6 +	2/4
Pacer, 30"	15/0 +	3/4
Skystreak 26	9/6 +	2/1
Skystreak 40	10/6 +	2/4
Stunt Queen	21/0 +	4/8

Rubber Powered

Mentor, 36"	9/0 +	2/0

Free Flight Power

Jr. Mallard, 34"	15/0 +	3/4
Mallard, 48"	18/3 +	4/0
Stinson, 42"	28/6 +	6/1
Aeronca Sedan, 65½"	57/0 +	12/6
Monocoupe, 64"	57/0 +	12/6
Monocoupe, 40"	22/9 +	5/1
G.H.3. Skyjeep, 45"	28/6 +	6/1
D.H. Tiger Moth, 33"	28/6 +	6/1

Control Line

New Jr. Monitor	19/3 +	4/3
Monitor	18/3 +	4/1
Mk. I T. Racer, Cl.B	23/0 +	5/1
Mk. II T. Racer, Cl.A	19/0 +	4/3
Midge	5/3 +	1/2

MERCURY

Gliders

Magpie, 24"	4/0 +	11d.
Gnome, 32"	6/0 +	1/4
Norseman, 58"	24/0 +	5/3
Martin, 40"	7/6 +	1/8
Marauder, 65"	14/6 +	3/3
Grebe, 49½"	12/3 +	2/9

VERON

Gliders

Verosonic, 46"	10/6 +	2/4
Vortex, 66"	18/6 +	4/1

Rubber Powered

Rascal, 24"	5/6 +	1/2
Sentinel, 34"	10/6 +	2/4
Hi Climber, 38"	25/0 +	5/6
Fledgeling, 24"	7/6 +	1/8

Free Flight Power

Streaker, 32"	19/9 +	4/4
Skyskooter, 48"	25/0 +	5/6
Cardinal, 37"	14/6 +	3/2
Lavochkin, 37"	25/0 +	5/6

Control Line

Bee Bug	12/0 +	2/8
Midget Mustang	22/6 +	5/0
Sea Fury	23/6 +	5/2
Wyvern	23/6 +	5/2
Philibuster	23/6 +	5/2
Spitfire	27/6 +	6/1
Panther	25/0 +	5/6
Goshawk	79/6 +	17/8
Focke Wulf	21/0 +	4/8
Minibuster	15/0 +	3/4

INTERNATIONAL MODEL AIRCRAFT (Frog)

Gliders

Vespa, 30"	5/9 +	1/3
Diana, 36"	7/5 +	1/7
Prince, 60"	20/6 +	4/6
Fortuna, 48"	12/3 +	2/9

Rubber Powered

Frog Racer Series	2/11 +	7d.
Goblin, 24"	4/6 +	1/0
Minx, 30"	6/6 +	1/6
Witch, 36"	10/6 +	2/4

Free Flight Power

Frog 45	25/9 +	5/9
Janus, 44"	14/4 +	3/2
Zephyr, 33"	10/3 +	2/3
Vixen, 36"	12/4 +	2/8
Powavan, 47"	21/0 +	4/6
Fox, 40"	17/0 +	4/0
Firefly, 36"	18/5 +	4/1
Cirrus, 48"	21/0 +	4/6

Control Line

Vanfire	24/2 +	5/4
Vantage	17/2 +	3/10

SKYLEADA

Gliders

Three Footer	5/0 +	1/1

Flying Scale

Auster, 26"	3/0 +	8d.
Grasshopper	3/0 +	8d.
Tiger Moth	3/0 +	8d.
Avro 707	3/0 +	8d.
M.I.G.15	3/0 +	8d.

Control Line

Auster	7/6 +	1/6
Curtiss Hawk	15/6 +	3/6
Thunderbird	14/0 +	3/6
Flying Wing	14/0 +	3/6
Hornet	8/6 +	1/11

Free Flight

Point Five	7/9 +	1/9

RADIO-CONTROL

E.D. Polarised Relay **30/0**
E.D. Escapements **18/6** + 4/5
E.D. Miniature Transmitter & Receiver **159/6** + 38/5
and all E.D equipment as advertised

E.C.C. International Transmitter ...**150/0** + 37/6
& all E.C.C. equipment as advertised
Hivac XFGI. Valve... **17/6** + 3/10
Flight Control as advertised.
Venner Accumulators

ENGINES

For immediate delivery from stock.

Diesel

		P.T.
Allbon Dart ·5	52/1 +	13/1
E.D. Baby ·46 c.c.	45/0 +	10/0
Elfin ·5 c.c.	54/0 +	13/6
Frog ·5 c.c.	40/6 +	9/0
Mills 0·75 c.c.	50/0 +	10/9
Mills 0·75 c.c., with cut-out	55/0 +	11/9
E.D. Bee 1 c.c.	47/6 +	10/0
Mills 1·3 c.c.	75/0 +	16/1
Elfin 1·49 c.c.	47/6 +	11/10
Javelin 1·49 c.c.	55/0 +	13/9
Frog 150 1·5 c.c.	40/6 +	9/0
E.D. Comp. 2 c.c.	57/6 +	7/6
E.D. 2·46 c.c. Racer	72/6 +	10/0
E.D. Mk. IV 3·46 c.c.	72/6 +	10/0
D.C. 350 3·5 c.c.	66/2 +	16/4
When ready—		
Amco 3·5 B.B.	93/0 +	23/0

Glo Plug

Frog 500	61/8 +	13/4
Frog 500 Spark	69/9 +	15/3
Fuel Cut-off Valve	3/6 +	10d.

JETEX

Jetex 50 motor	7/6 +	1/8
Jetex 50 Outfit	10/11 +	2/5
Jetex 100 Outfit	22/5 +	5/0
Jetmaster	24/0 +	5/4
Jetex 200 Outfit	31/8 +	7/1
Jetex 350 Outfit	43/2 +	9/7
Augmenter Tube	5/0 +	1/1

Fuels and Spares in stock.

Special

BARRY WHEELER'S ELIMINATOR KIT
World's Championship Winner 1952 **19/6**
ABC of Aeromodelling **5/-**
HOME ORDERS
Over £2 in value, post free. Minimum posting and packing charge 1/3.

TRADE BUYERS OVERSEAS

Please turn to page 125.

Coronation Visitors

I hope that those of you lucky enough to come to Britain for the Coronation will not do so without visiting me at Brighton. It's very easy indeed to reach from London. As thousands of aeromodellers in this part of the world will tell you, the shop is in one of Brighton's most famous thoroughfares, and despite the way in which Meeting House Lane turns and twists with its charming old-world shops and houses, we are only two seconds from the main road (North Street). So here's to seeing old friends in person, and making new ones, too!

- FUELS DOPES, CEMENTS
- BALSA OBECHI, SPRUCE—Strip and Sheet.

Telephone : BRIGHTON 27963

ARTHUR MULLETT
16 MEETING HOUSE LANE
BRIGHTON - SUSSEX - ENG.

Raeburn

BOAT KITS SUITABLE FOR R/C

Wavemaster...72/10
Adamcraft ... 70/0
Veron Police Launch ... 44/0

Mercury Musketeer ... 24/9
Junior Musketeer...20/10
Frog Strato D 17/6
Skyleada Jeep 4/0
Skyleada Hawk 4/6
Skyleada Grasshopper ... 3/8
Skyleada Skylark 4/6
Elf King ... 12/6
All Trix Sets
Keil Kraft Pixie 4/11
Jetex 200 Contest... ... 10/7
Mercury Glebe
Veron Martinet 25/8
Mercury Junior Monitor ... 17/6
Veron Fouga Cyclone ... 6/1
Veron Sea Hawk 6/8

(continued)

Veron Thunderjet 6/8
Jasco Scout ... 5/6
Jetex Rota Kite 10/0
Challenger (Ready to fly) 44/0
Frog Avenger (Ready to fly) 9/2
Frog Spitfire (Ready to fly) 9/11
Frog Mk. IV Fighter (Ready to fly) 12/6
E.D. Radio Queen ... 84/0

GLIDERS

Vortex A.2 Sailplane ... 22/7
Soarer Minor 48" 9/9
Cadet 30" ... 4/11
Chief A.2 Sailplane ... 22/8
Verosonic 40" 11/7
Norseman A.2 Sailplane ... 29/3
Marauder A.2 Sailplane ... 17/9
Prince 60" wingspan ... 25/0
Diana 36" ... 9/0
Fortuna 48" ... 15/0

NEW ENGINES

Cash Price

E.D. 1·46
E.D. ·46 ... ... 55/0
Elfin 0·5 ... 67/6
Allbon Dart ·5 c.c. 65/2
Mills S ·75 c.c. ... 67/3
Mills P ·75 c.c. ... 61/2
E.D. Bee 1 c.c. ... 57/6
Mills 1·3 c.c. ... 91/8
Allbon Javelin 1·49 c.c. ... 68/3
Elfin 1·49 c.c. ... 59/6
Frog 150 ... 49/6
E.D. Mk. II 2 c.c. 62/6
E.D. 2 c.c. Comp. Spec. 65/0
E.D. Mk. III 2·5 c.c. Series II ... 82/6
E.D. Mk. IV 3·46 c.c. 82/6
D.C. 350 3·5 c.c. 82/6
Frog 250 2·5 c.c. 76/0
Frog 500 ... 78/9
Frog ·5 49/6
.I.A. 19 ...
Reeves 2·49 ... 70/0
Elfin 2·49 c.c. ... 70/0
Frog 150 ... 49/6

FREE FLIGHT KITS

Southerner Mite 32" 12/10
Pirate 34" ... 14/8
Bandit 44" ... 22/8
Ladybird 41" ... 22/8
Outlaw 50" ... 27/6
Robot 56" ...
Junior 60, 60" ... 48/3
Southerner 60" 48/11
Falcon 96" ...131/5

PYLON MODELS

Slicker Mite 32" 11/7
Slicker 42" ... 21/5
Slicker 50, 50" ... 30/6
Super Slicker 60" 42/9
Skylon 38" ...12/10
Junior Mallard 34" 18/4
Mallard 48" ... 22/4
Stentorian 72" ...84/11
Sky-Skooter 48" 30/6
Martinet 36" ... 25/8
Streaker 37" ... 24/1
Cardinal 37" ... 17/8

IMP

Lavochkin 17, 37" 30/6
Frog "45", 45" 31/6
Strato-D 42"... 17/6
Cirrus 48" ... 25/6
Zephyr 33" ... 12/6

JETEX MODELS

Gort Space Ship, 9" 3/1
Cub, 20" ... 3/1
Skyjet 50, 18" ... 4/7
Skyjet 100, 24" 6/9
Skyjet 200, 32" ... 9/2
Saunders Roe ... 10/7
200 Contest M.'s 10/7

SECOND HAND ENGINE LISTS

"K" Kestrel 1·9 c.c. ... 22/6
E.D. Mk. III, 2·49 c.c. ... 27/6
"K" Vulture, 5 c.c. ... 30/0
Elfin 2·49 c.c. radial ... 42/6
E.D. Mk. IV, 3·46 c.c. ... 50/0
Ohlsson 23 (Glo Plug) ... 45/0
Frog 500 (5 c.c. Glo Plug) ... 52/6
Yulon 29 (5 c.c. Glo Plug) ... 45/0
D.C. 350 (3·5 c.c.) ... 50/0
Frog 1·75 (Spk. Ign.) ... 30/0
E.D. 0·46 c.c. 40/0
Frog 250 (2·5 c.c.) ... 40/0

RADIO UNITS

E.D. Mk Unit £17 19 9
E.D. Mk. III Unit £9 17 11
E.D. Mk. I Transmitter £6 1 0
E.D. Mk. I Receiver £9 12 3
E.D. Mk. I Escapement £2 18 11
E.D. Mk. III Transmitter £5 14 9
E.D. Mk. III Receiver £3 14 5

(continued)

E.D. Mk. III Escapement £1 2 11
E.C.C. Receiver £4 7 6

CONTROL LINE VERON

Nipper 17" ...12/10
Bee-Bug 22" ... 14/8
Speedee ... 22/7
Stunter ...23/10
Focke Wulf 190 25/8
Midget Mustang 24" 27/6
Sea-Fury 25½" 28/8
Wyvern ... 28/8
Philibuster 28½" 28/8
Minibuster 19" 18/4
Spitfire 27½" ... 33/7
Panther 41" ... 30/6

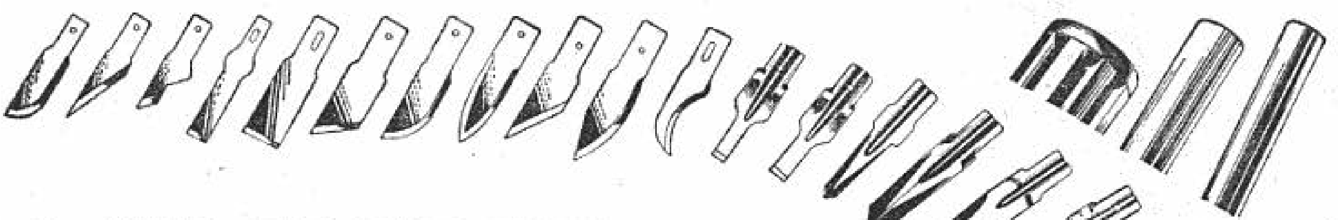
FROG

Vanfire 40" ... 29/6
Vantage Team Racer ... 21/0
Vandiver 27"... 15/0
New Mk. II Vandiver 15/0

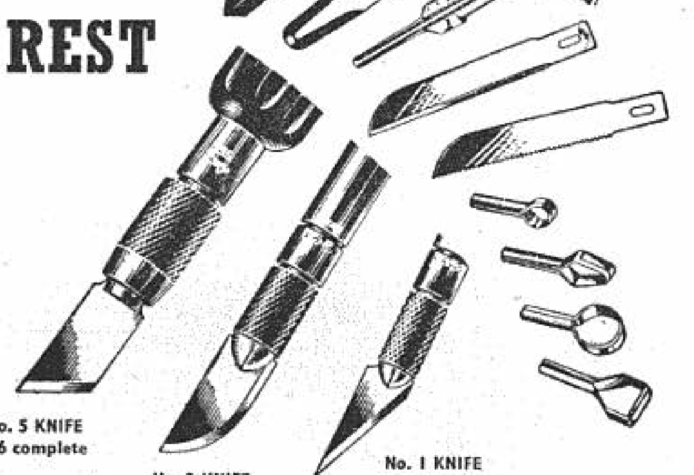
MERCURY

Monitor ... 22/4
New Junior Monitor ... 23/6
Midge, Class "A" ... 6/5
Mk. II Team Racer Class "A" 23/3
Mk. I Team Racer, Class "B" 28/1

RAEBURN-COLNE
9 ARCADIA, LANCS



A CUT ABOVE THE REST



SEARCH where you will, you won't find better knives than X-acto.
The blades are made from the finest surgical steel available, ground to a really keen cutting edge; each shape designed to do a specific cutting job and to do it well.
The perfectly balanced handles lock the blades firmly in a positive grip yet they let go at a twist of the sleeve.
X-acto puts *more* skill at your fingertips for there's

an X-acto blade for every cutting job

Obtainable only from X-acto stockists.

TRIX X-acto

Blades are sold in packets from 2/6 for five; Gouges 5/- for five and Routers 4/- for four.

Write for illustrated folder showing the complete range of X-acto Tool Kits and Tools to:—

TRIX LTD., (Dept. K) 11 Old Burlington Street, London, W.1.

G&S

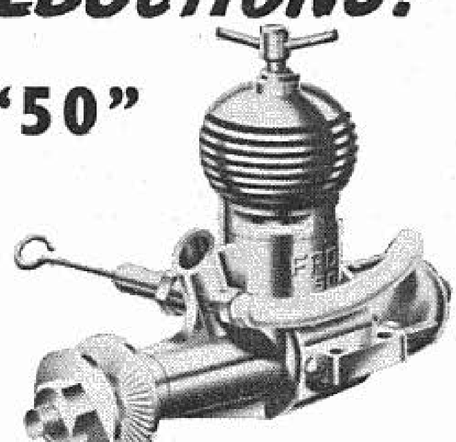
FROG *Announce BIG. Price Reductions!*

TRADE MARK

Good news for power fans! FROG leadership enables us to GREATLY REDUCE the price of Britain's best miniature diesel and to SLASH airscrew prices. Study them in detail—see them at your model shop—and BUY FROG!!

FROG ensure power-plus modelling at prices YOU can afford, with the finest technical advances at your service. The new FROG NYLON airscrews and the "hotted-up" Powamix fuel are typical examples of why IT PAYS TO BUY FROG!!

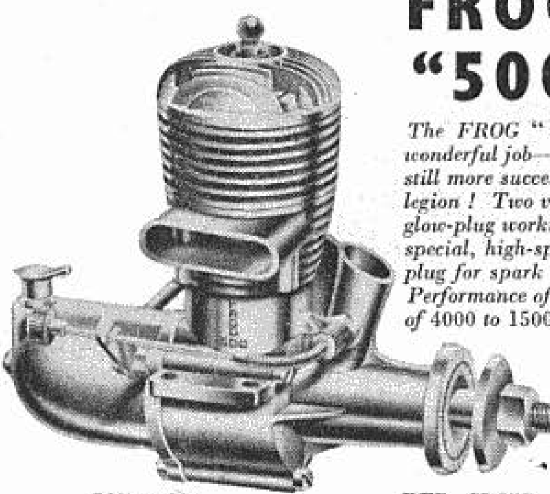
FROG "50"



Product of over two years' experiment, the "FROG 50" has already taken its rightful place as Britain's premier miniature diesel. Now, FROG are able—once again—to pass on the benefits of their technical superiority by reducing the price to only 45/–. Details of the "50" are now well known—the speed range of 500 to 1500 r.p.m., the weight of only 1 oz., height of 1⅛ ins. and length of 2½ ins. overall being appreciated by modellers everywhere. Whatever type of model—free-flight, C/L or R/C—the "50" is ideal for the job. See the FROG "50" today and order at once—you will never regret it!!

45/-

FROG "500"



The FROG "500" is known the world over as a wonderful job—every day we receive letters telling us of still more successes abroad, whilst in Britain they are legion! Two versions are available—the 500 RG for glow-plug working and the 500 P which is fitted with a special, high-speed type contact-breaker and K.L.G. plug for spark ignition.

Performance of these motors is similar—a speed range of 4000 to 15000 r.p.m. with perfect throttle control at all speeds—with other vital details as follows—capacity, 4·92 c.c., bore, ·750 in., stroke, ·680 in., weight, 7·75 ozs., beam or radial mounting.

IGNITION **85/-**

RED GLOW **75/-**

FROG "150"

The FROG "150" is another perfect example of FROG design for performance! Independent tests carried out by the aeromodelling press confirm our claims for super power combined with flexibility and reliability—and at the amazingly low price of 49/6 the "150" is first in its class!

49/6

BETTER–LOWER PRICED–AIRSCREWS

Another example of FROG price slashing! Note new LOWEST EVER prices of plastic airscrews—still the best and most efficient.

Size	Standard Plastic	Nylon
8″×5″ pitch	1/3	2/9
8″×6″ ,,	1/3	2/9
8″×8″ ,,	1/6	3/3
10″×6″ ,,	1/6	3/3
9″×6″ ,,	1/6	3/3
6″×4″ ,,	–/9	1/6

NEW! NYLON AIRSCREWS

20% lighter in weight—100% stronger—these new FROG super-efficient airscrews are the last word in power design. Never before has there been this combination of light weight and amazing strength.

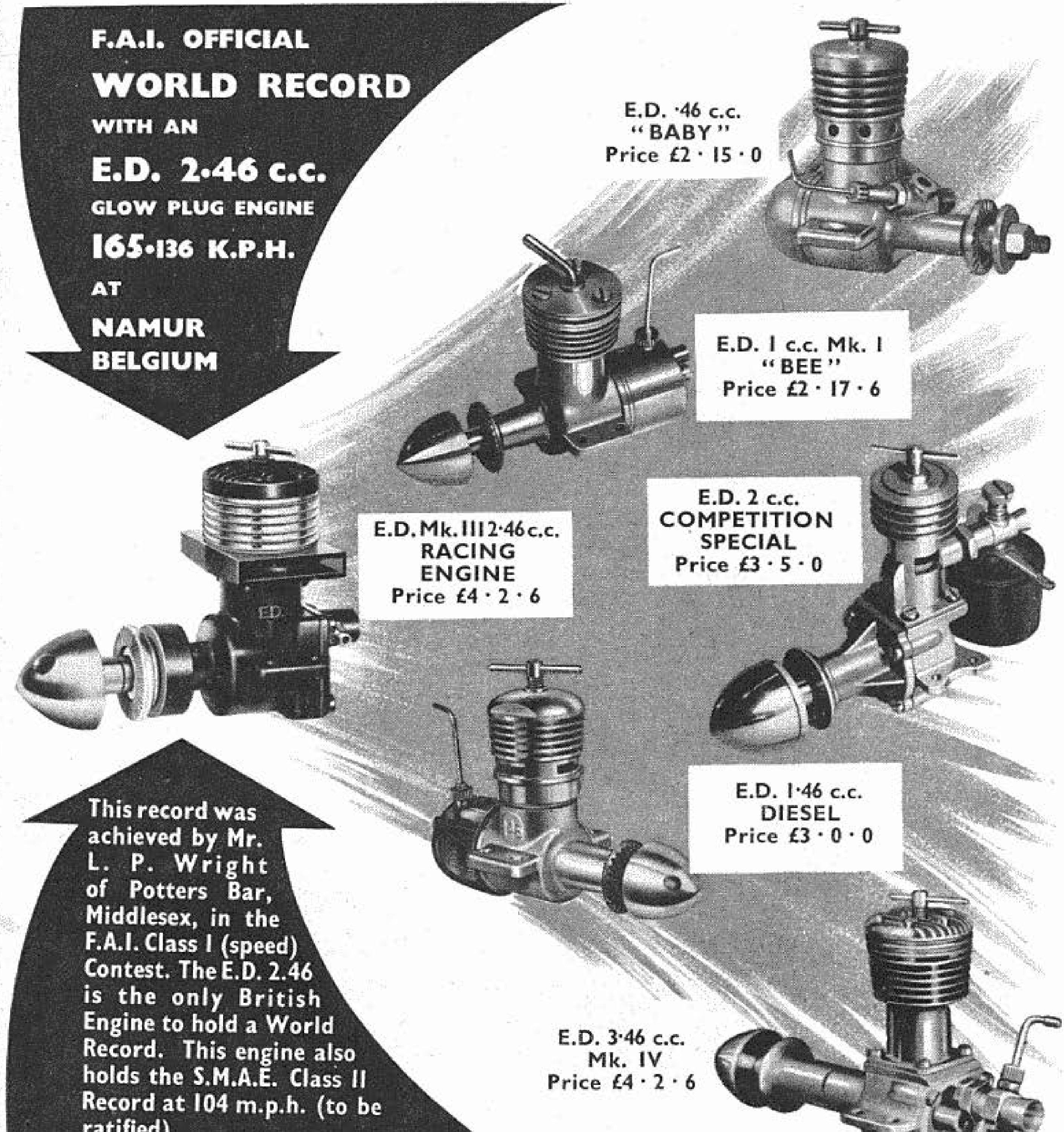
FROG FUELS

POWAMIX for 1953 has new SHELL formula to boost power and improve starting. NOW INCLUDES ETHER! Try this super-fuel in your diesel and see it really roar! RED GLOW—the experts' choice for glow-plug working is still the finest. Frog Shell-blended Fuels are supplied in the Pressure Feed Cans as shown.

Price **2/6** per can

LINES BROS GROUP

International Model Aircraft Ltd. Merton, London, S.W.19 England.


F.A.I. OFFICIAL
WORLD RECORD
WITH AN
E.D. 2·46 c.c.
GLOW PLUG ENGINE
165·136 K.P.H.
AT
NAMUR
BELGIUM
E.D. ·46 c.c. "BABY" Price £2 · 15 · 0
E.D. I c.c. Mk. I "BEE" Price £2 · 17 · 6
E.D. Mk. III 2·46 c.c. RACING ENGINE Price £4 · 2 · 6
E.D. 2 c.c. COMPETITION SPECIAL Price £3 · 5 · 0
E.D. 1·46 c.c. DIESEL Price £3 · 0 · 0
E.D. 3·46 c.c. Mk. IV Price £4 · 2 · 6
This record was achieved by Mr. L. P. Wright of Potters Bar, Middlesex, in the F.A.I. Class I (speed) Contest. The E.D. 2.46 is the only British Engine to hold a World Record. This engine also holds the S.M.A.E. Class II Record at 104 m.p.h. (to be ratified).

ESTABLISHED 1935

AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

VOLUME XVIII
NUMBER 205
FEBRUARY 1953

"Covers the World of Aeromodelling"

Editor:
C. S. RUSHBROOKE

Assistant Editor:
H. G. HUNDLEBY

Public Relations Officer:
D. J. LAIDLAW DICKSON

Published monthly on the 15th of the previous month by the Proprietors:
THE MODEL AERONAUTICAL PRESS LTD.
38, Clarendon Road, Watford, Herts.
Subscription rate 21/- per annum prepaid (including Christmas Double Number).

Contents

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

'Tis Valentine's Day

WE are pleased to think that the old custom of sending Valentines on February 14th—St. Valentine's Day—is coming back into favour. We have succumbed to the general atmosphere by including a fair young damsel on our front cover—but whether photographer Bill Dean would appreciate our sending her a Valentine is a moot point!

In Victorian days it was usual to dispatch two kinds of Valentines, which can be classed as "brickbats" and "bouquets". Well, we have a small collection of both varieties and will save postage by sending them via our editorial columns. First, the "brickbat" Valentines, each of which could well be illustrated with a horned gentleman in one corner, his long forked tail curling up around the card. There is quite a list of recipients and high-ups; we would place the lynx-eyed club time-keeper who can always keep his friends' models in sight, and then stumbles over a model he is too blind to notice.

Then, of course, the grumbling type for whom nothing is ever good enough, though he is good for nothing in the way of hard work.

We would add the trader who never sends the goods by return of post—and does not bother to acknowledge our money!

Nor must we forget some of the die-hard manufacturers who just won't produce what the boys really want but dish up the same old "mixture as before".

But enough of gloom—let us address those lace-edged cards for the halo wearers of the aeromodelling world. One each to our various team members in 1952 who kept the flag flying, with especially frilly ones for the lads who paid their own way in the F.N.A. Cup and the French radio event.

Another choice set to the brighter kit manufacturers who are turning out a job at least the equal—if not better—than anything the kit concerns in America can do, with moulded balsa shells and really fine die-cut parts.

And to the model trade in general who have supported us so long; we can say with pride and pleasure that over 95 per cent. of the active model trade are intent on increasing their business through advertising.

To the hard-working, but generally unappreciated, handful of Society and Club officials who continue to look after the general interests of all modellers, and in return usually get kicked for their efforts. Here for a change is a sincere appreciation which may alleviate their load.

Just one card left—who shall we send it to? Well, charity begins at home, so we'll put it on the mantelpiece, for after all some people might think that the AEROMODELLER deserves a lacy Valentine.

Cover Picture ....

"Of models two to be our Valentines,
In trim designs and pleasing lines.
Canadian Mavis Saphir holds enthralled
An F/F power, with E.D. 2·46 installed,
Its kiss-crossed wings a token
Of the words of love unspoken
And the ever hopeful gleam
A-glinting from designer-cameraman—Bill Dean."

Heard at the Hangar Doors

Cut out All Rules !

We heard this cry at a recent meeting, aired by a well-known aeromodeller whom we know from past experience could be trusted to play the game were no regulations in force. However, could such a Utopian condition ever come to pass ? Browsing through some old volumes of the AEROMODELLER recently, we came across the following discourse in the Club News columns of our November, 1942, issue, and feel they are pertinent enough to merit repeating.

Rules, or laws, or regulations in sport are made by the majority in order to ensure that everyone who plays the particular game does so as near as possible in the manner in which all the other competitors play that game.

The primary reason for rules in sport is to provide an equal opportunity for all to take part in the contest. Rules then are necessary, and no sport could exist long without them.

It is essential to acquire the proper mental attitude towards rules in sport, and to endeavour to understand why they are made . . . The perfect rules have yet to be formulated.

So you can see how important rules are to our hobby, as indeed they are to every other sport that is played seriously . . . When we learn to match our prowess one with the other for the goodwill of the competition, then, perhaps, we shall need no rule books. But we haven't reached that ideal yet. We each struggle hard to achieve personal success and it is essential that all of us shall compete as near as possible to one common standard.

That is why rules are so important. That is why we must all subscribe to them and, equally important, understand the purpose behind them.

We fully agree that present day rules could well be streamlined, but while the timing and conduct of Power contests alone are conducted under *five* differing sets of regulations, we can see little hope of cutting out many detailed rules from the admittedly overpowering list.

Bewildered !

There are many aeromodellers employed in the aircraft industry and no doubt many of them are dogged by the official inspection department which bears the simple initials A.I.D.

The work of the A.I.D. has always seemed shrouded in a mysterious fog. Even when we have managed to penetrate the gloom and catch a glimpse of what we took to be its function, we are sorry to to say that "redundant" was the word which at once came to mind.

A few days ago, consulting a dictionary for quite another reason, we happened upon the abbreviation A.I.D. Only one meaning was given, and now, we thought, the problem is solved at last. But, after consideration, we are more puzzled than ever; we see no connection at all between an aircraft factory and the A.I.D.

Oh, the meaning — " Artificial Insemination by Donor ".*

* *Definition from Concise Oxford Dictionary—latest edition (for the benefit of those not au fait, A.I.D. is actually the Aeronautical Inspection Directorate).*

Where Ignorance is Bliss !

The production of this magazine naturally entails that we are usually better informed than most of our readers, but we are none-the-less astounded at times by the abysmal lack of " gen " existent in so many places. The following letter received from an affiliated club displays such a surprising ignorance of general conditions that we wonder just how they conduct their normal activities. However, read for yourselves :

"The trend in the British Model Aircraft movement at the moment appears to this club, and to many others both locally and distant, to be the limitation and eventually the complete ban on any combination of engine and aircraft likely to exceed 100 *m.p.h. (Ref. jet powered aircraft and now the proposal to limit engine capacity to* 5 *c.c.)*

The banning of jet models was in our opinion the most retrogressive step ever taken in the British Model Aircraft movement. Now with this proposed 5 c.c. limitation looming above us we can see the same thing happening to everything over 5 c.c., and eventually, with power getting less and less, we foresee the end of all Control Line flying.

It appears that the S.M.A.E. is trying to stop some of the finest examples of workmanship and engineering produced in this country and we are now led to the *conclusion that this Society is not entitled to be called Model Aeronautical Engineers.*

It has been noticed by all the countries attending the International C/L Championships, e.g. Spain, Belgium, America, France, Switzerland, etc., the magnificent standard of engineering incorporated in the British models and the dividends they paid off. Now it seems, all this must stop.

It is thought that the Society did little enough for the C/L enthusiasts who have brought back more honours to the country under more of a handicap than any other team, and it is well nigh time that at least as much might be done for them as for the Wakefield enthusiasts, whose average placings in all the International Meetings do not warrant the expenses allocated to them."

D. E. Mason, Hon. Sec., D.M.A.C.
R. Gibbs, East London M.A.C.
J. Alexander, Comp. Sec., D.M.A.C.
Devizes Model Aircraft Club.

It should be pointed out that the proposed " limitation to 5 c.c. " came from the F.A.I. and was passed on by the S.M.A.E. to its members in the form of a referendum for voting upon. We understand that the majority wish to retain the present top limit of 15 c.c.

Our contributors appear sadly misinformed regarding the " banning " of Pulse-Jet driven models. The S.M.A.E. Insurance Policy has never been able to cater for this class of machine, and, following the serious accident at Fairlop in 1951, the relevant clause in the N.G.A. Policy was cancelled. As a very necessary requirement for entry into any Power Contest is that the competitor shall be in possession of a valid Third Party insurance cover, inability to provide this imposed its own " banning ".

Criticism of the amounts spent on International Contests is sadly out of perspective, for the Society has continued to send *full* teams to *all* International Championship events—as the present state of Society finances clearly indicates! The fact that the Belgian hosts paid all other than travelling expenditures was both fortunate and welcome, but future budgeting cannot be based on such a happy state continuing.

False Alarm ! !

Two fire engines of the Derby Fire Brigade rushed to the alerted R.A.F. Station at Alvaston, Derbyshire on Sunday December 14th. The general fire alarm had been sounded, and there was no telling just how serious the conflagration could be. One can well imagine the Fire Brigade's remarks when they found, beside the broken glass and alarm button . . . . a model aeroplane ! ! To which we award full points for a perfect spot landing!

Fair Exchange

There are many of our readers who have availed themselves of the engine exchange service so efficiently organised by the North Eastern Engine Depot, whose advertisement regularly appears in our popular classified ads. section. That the service is by no means limited to British modellers is typified by the following example.

One of the American clients expressed the wish, that instead of an exchange motor for his used engines he would prefer it if the Exchange Depot could send him an air pump for his fish tanks. No trouble at all . . . with the aid of the local pet shop, a pump was soon on its way (free of tax, moreover) and another customer satisfied.

. . . From Little Acorns

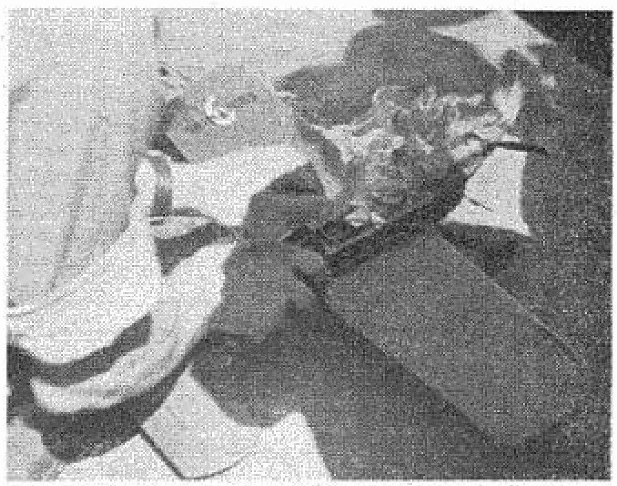
Modelling practice is often put to good use in other fields and the latest venture of the irrepressible H. J. Taplin deserves special mention —particularly as nowadays motor-cycling seems to go hand-in-hand with aeromodelling.

Following experiments with a " diesel " engine of 98 c.c's., Mr. Taplin has converted a standard 123 c.c. B.S.A. " Bantam " motor cycle to compression ignition by the substitution of a special head incorporating a form of contra-piston, operated by a cable controlled lever arm. Initial tests have proved highly successful, and we look forward to the day when motor-cycle tanks are raided for the odd spot of juice when out on the flying field.

We may yet see the development of " diesel ankle " to accompany the many swollen digits caused through prop flyback, and it is our sincere hope to be on hand when a proud owner lets in the clutch—to find that the engine is running backwards!

Action Shot

Peter Donavour-Hickie is a modeller who always has his camera at the ready for candid shots of the many untoward incidents to be seen on the flying field. In the photo which we reproduce here without any retouching whatsoever, he " stopped " an embarrassing incident at the Northern Heights Gala. A. Edwards of Godalming club was preparing his ETA 29 team racer for action, when a backfire ignited spilt fuel in the fuselage, the result is obvious. Fortunately, the fire was snubbed quickly, and the model saved.



SPEED MODELS

PLANS AND PHOTOS OF FOUR OF THE
CONTEST WINNING HINTS AND TIPS BY

Pete Wright and his two record holders, each built with the same quality and precision that he puts into his part of the De Havilland Comet wing assembly line. Aged 24, and for a long time a member of the St. Albans M.A.C., Pete's other interests extend to team racing and free flight power.

CONTEST SUCCESSES, AND OTHERWISE, OF THE "GOOK"

Event	Place	Speed m.p.h.	Prop.	Remarks	Igntn.
British Championships, Wembley Stadium, 1951	0	0	0	Dead loss. Not test flown	—
1st World Championships, Knokke, Belgium, 1951	2nd 1st	90 —	7×9 —	Concours d'Elegance	Diesel
All Herts. Rally, 1951, Radlett	2nd	93	7×9	—	Diesel
London Area v. USAAF, Fairlop, 1951	1st	89·5	7×9	Flown on A.M. A.52-ft. lines	Diesel
Club Speed Comp., 1951	1st	92	7×9	—	Diesel
C/L Eliminators, 1952, Chigwell	1st	105	6×10	—	Glo
2nd World Championships, Melsbroek, Belgium, 1952	1st	99·5	6×9	Very hot day	Glo
Nationals, Gosport, 1952	1st	103	6×10	World Record, 42-ft. lines (not yet ratified)	Glo
Great Britain v. Belgium, Namur, 1952	1st	104	6×10	World Record (ratified), 37-ft. lines	Glo

HAVING secured for myself a place in the British C/L team for Knokke with an F.A.I. Class II model, "Bazooka IV", I decided to build a smaller Class I version. It was then early in 1951, and the choice of a suitable motor of up to 2·5 c.c. was very limited. I eventually chose to use the then new E.D. 2·46 Racer, mainly because the disc-valve induction and the roller-bearings give it the definite advantages of wide tolerance timing and smoother running.

"Gook" is definitely not a beginner's model but the construction is fairly straightforward. Metal for the different components can be obtained at hardwear and Government surplus stores.

Fuel Tank

The tank is very definitely the most vital part of a speed job. It is possible to return a *good* speed with a fair motor with a long, even run, but I have seen many hot motor-model combinations fail because of a poor, uneven run.

My discovery is that a speed tank will not operate correctly unless it is pressurised by air pressure or centrifugal force, the latter varies with the fuel level as it is used up, so is ruled out, leaving us with air pressure.

There are two main methods. One is the De-Bolt type pressure system, using the engine as a pump; the other is the very simple one of turning the tank vents or angling them into the air flow. The De-Bolt system is very good but subject to too many weaknesses, the main ones being that with the smallest air or fuel leak the whole system could collapse. The other being the trouble entailed in breaking the model down and unsealing the tank every time it requires filling. In the "Gook" I used the angled vent system and the tank centrally mounted in the fuselage. The layout worked satisfactorily with the E.D. diesel. Setting the needle a ¼ turn open from the peak revs. position, I found that the flight started a little rich, so I leaned out to max. r.p.m., then holding them for the rest of the run. With the Glo head fitted it was a very different story, so the tank had to be moved to the outside of the model to achieve the best run.

The E.D. Glo is more sensitive to needle settings than the diesel, but is more flexible, and so better suited to speed work. By "more flexible" I mean that the revs. are not governed by the compression setting (as with the diesel), and will go on building up until the motor is giving maximum performance, providing the prop. will let it. Proof of this is given by comparative figures.

By Pete Wright

FASTEST MODELS IN THE WORLD, PLUS THE 1952 BRITISH CONTROL-LINE CHAMPION

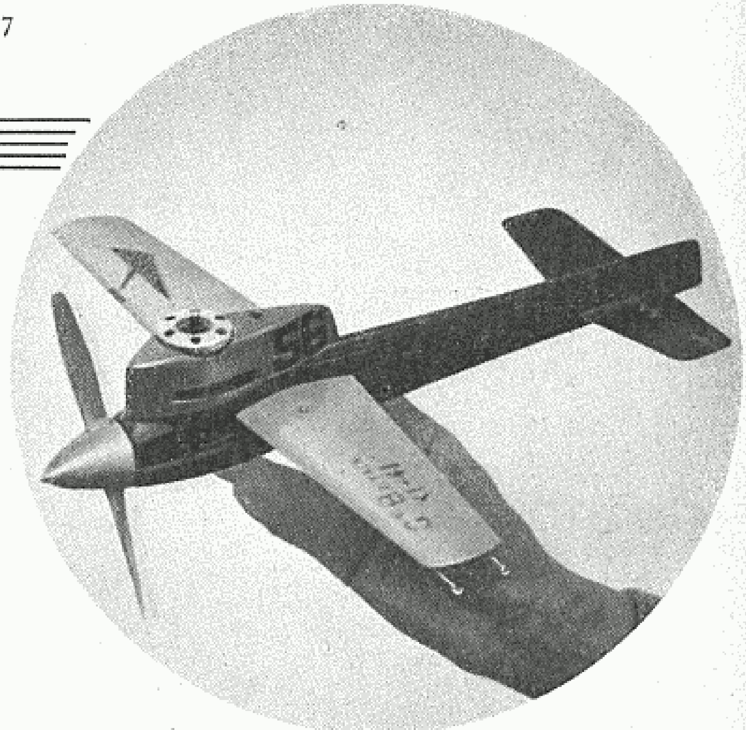
MAX. R.P.M. ON THE GROUND

Prop. used	Diesel	Speed	Glo	Speed
7 × 9 Stant	r.p.m. 12,000	m.p.h. 92	r.p.m. 10,000	m.p.h. 99·8
6 × 10 Stant	11,500	89	9,800	105

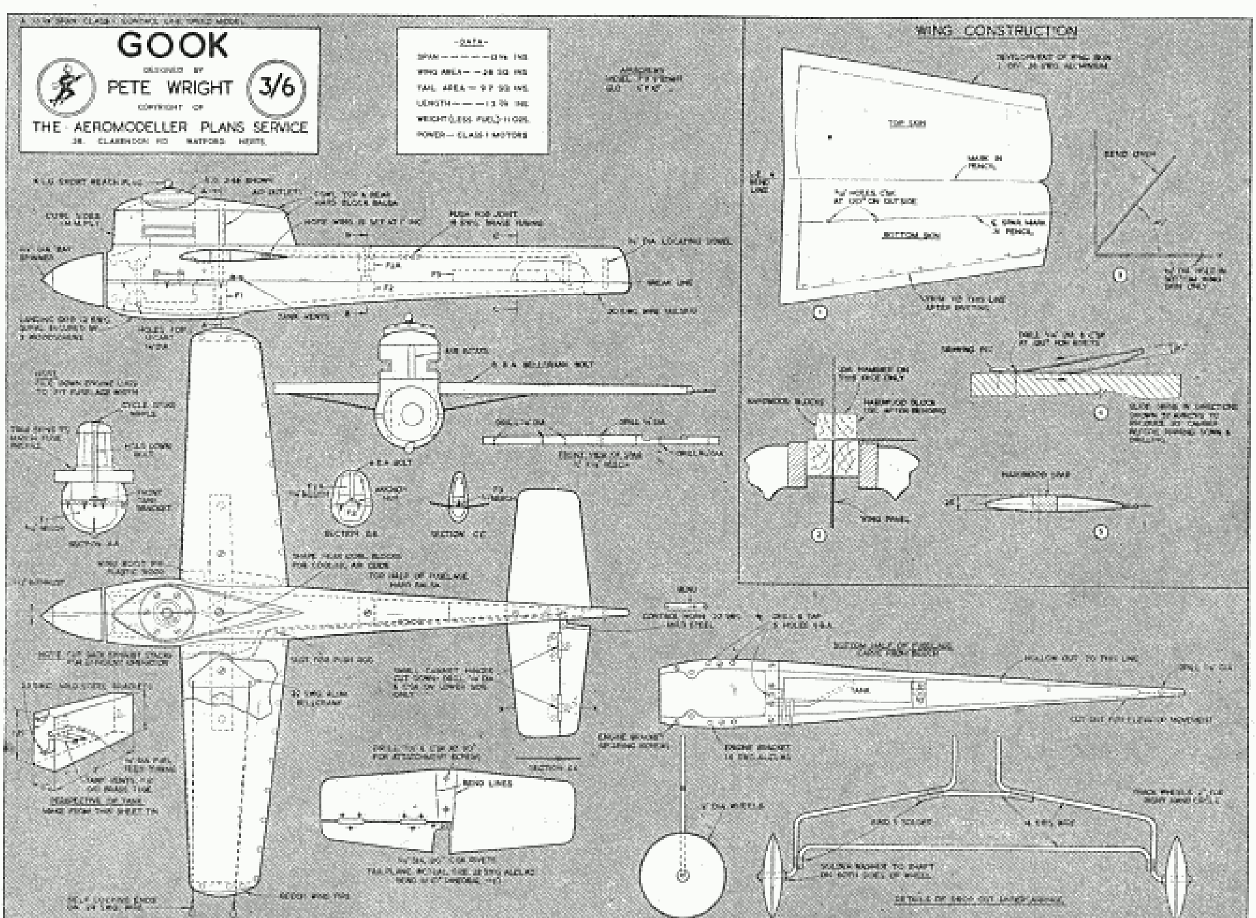
Fuel (Diesel)

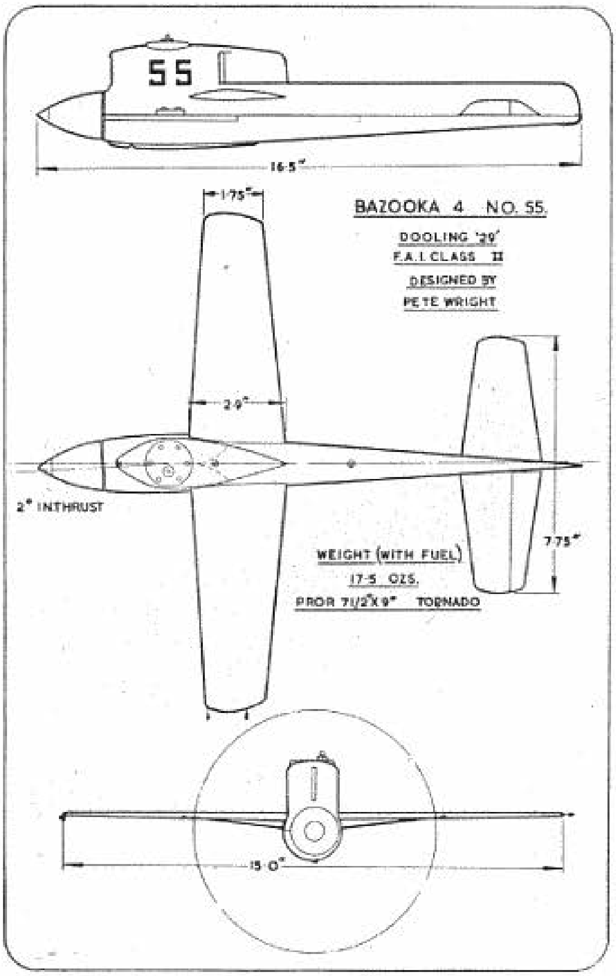
The experiments carried out were very limited due to lack of time, but I did try varying the amount of ether used and achieved the best results with a mixture of 40 per cent. Mercury No. 3 and 60 per cent. ether.

60 per cent. ether is more than I generally use in diesels, but finding the motor was overheating with less and running hard with more, I stuck to it, with no serious consequences over a season's flying.



Gook, with E.D. Racer 2·46 Glowplugged and standard 6×10 Stant prop. Top recorded speed in 1952 was 165·708 k/hr (104 m.p.h.). Note the low tailplane position.





Pete's Class II entry which has done so well for Britain in the International contests, is the Dooling powered Bazooka IV. Top recorded speed in competitions was 198·395 k/hr (124 m.p.h.). Model has same basic construction as the "Gook", overleaf.

Fuel (Glo)

The fuel I am using was developed with the "Dooling 29" in "Bazooka IV". Starting originally with a straight 4–1 methanol/castor fuel, then changing to the recommended Dooling mixture of 40 per cent. Nitro, 40 per cent. Methanol and 20 per cent. oil, I am now using 50 per cent. B.D.H. Nitromethane, 35 per cent. J.A.P. racing Methanol and 15 per cent. Castrol "R". The procedure is: Mix the oil and the methanol together, allow to stand about 14 days to let the gum settle to the bottom of the bottle, syphon off with large bore neoprene, leaving the gum, and then add the nitro. Any increase in the nitro content just produces a hot run so I am concentrating on the percentages of meth. and oil. One thing stands out clearly. The compression ratio of the motor is the deciding factor, so the comp. ratio of the E.D. has been fiddled. (More about that anon).

After three years of speed work I am only just skirting the edges of this problem of fuels, and being no chemist I have to do it the hard way.

Motor

The motor was originally a standard E.D. 2·46 Series II diesel with a Series I rear cover assembly and a split-type carb. Later type rear covers with spray bars can easily be modified by tapping out the venturi on each side 2 B.A. and fitting an E.T.A. needle valve assembly.

You will find that to fit a standard E.D. 2·46 into the "Gook", the engine lug holes will have to be elongated a little, towards the crankcase. I know that most aeromodellers are a little shy of butchering their motors, so an alternative method is to build the fuselage ⅛ in. wider on each side. Other modifications carried out on my E.D. were cutting the exhaust stacks down, as shewn on the drawing, and opening them out as much as possible on the inside with a small file. Removing the rotor disc, I opened out the timing so that it opens 3° earlier and closes 5° later. I also reamed out the venturi larger and increased the taper to give the engine a bigger, faster, charge of air. The rest was confined to removing all corners from the inside of the crankcase with a small scraper and polishing. Also trimming the engine lugs down to conform with the contour of the fuselage.

I only increased the compression ratio so that I could use the same fuel with both the Dooling and the E.D. It is not necessary, and a little trial and error will soon show the best fuel to use with the standard Glo head. Lastly, the Glo head will need a brown paper gasket between it and the cylinder liner.

Props.

Contrary to popular belief, I have found that a high pitch prop. does not necessarily mean a high speed. Of course, I am only referring to motors of up to 5 c.c., having had no experience at all with anything larger.

If a high pitch is used it is quite a problem to get the revs. up to the correct b.h.p. r.p.m. in the air. In actual fact, I have returned the best speeds with 9 and 10-in. pitch props. It is almost impossible to prove definitely, as I have not had the time or a suitable ground on which to carry out extensive tests.

The props. used were 7 × 9 Stants on the diesel and 6 × 9 and 6 × 10 on the Glo. All props. should be balanced. This is very important as the slightest amount of vibration will ruin a racing engine in a very short time, not to mention other troubles, such as the tank unsoldering and the lines wrapping together. I balance all my props. on the cutting edge of a razor blade secured in the vice. Finally, filling, doping and polishing to a smooth, not necessarily glossy, finish.

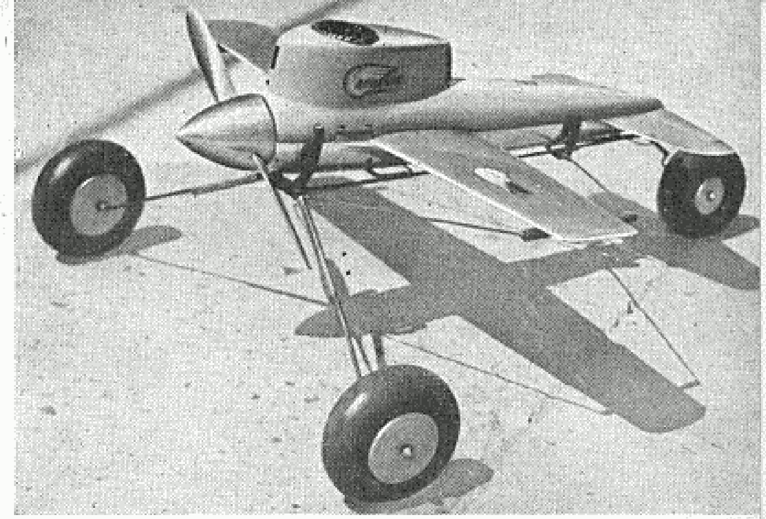
Wings

The main advantage of metal wings is the strength/weight ratio compared with balsa ones, also the lack of internal construction which leaves plenty of room for the controls. I would advise

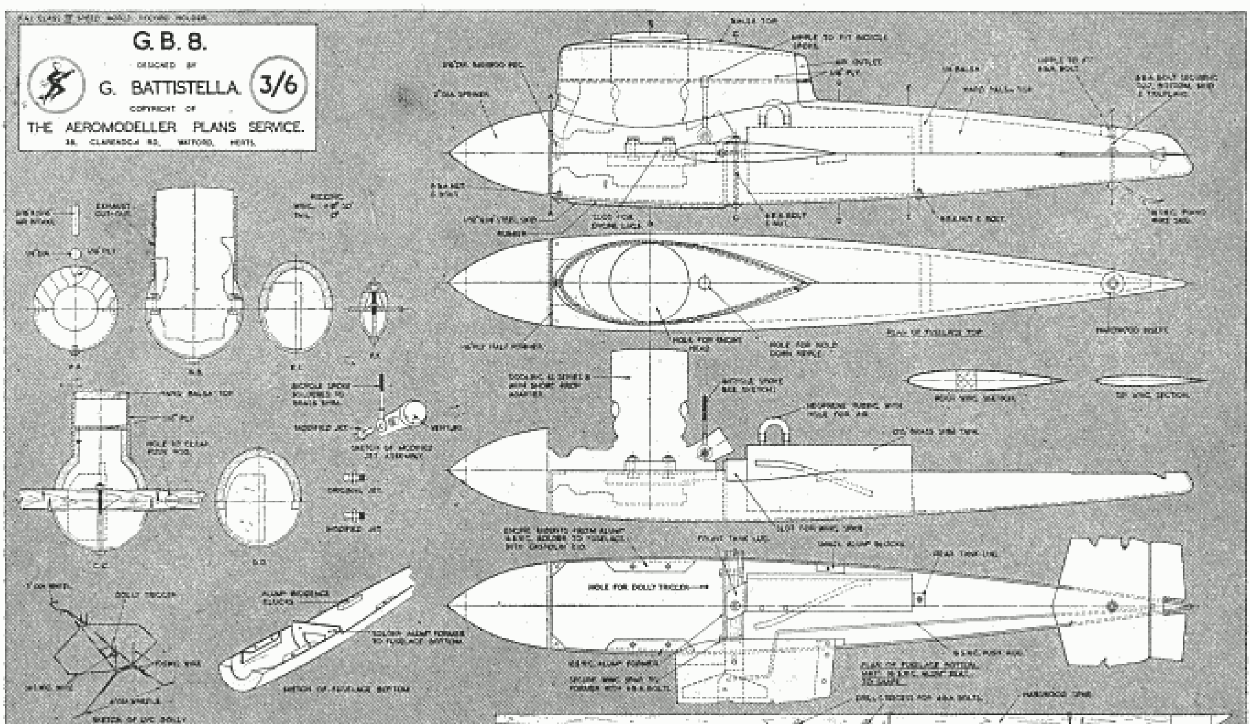
24, 26 or 28 s.w.g. aluminium only, as dural or Allclad is much too heavy and springy.

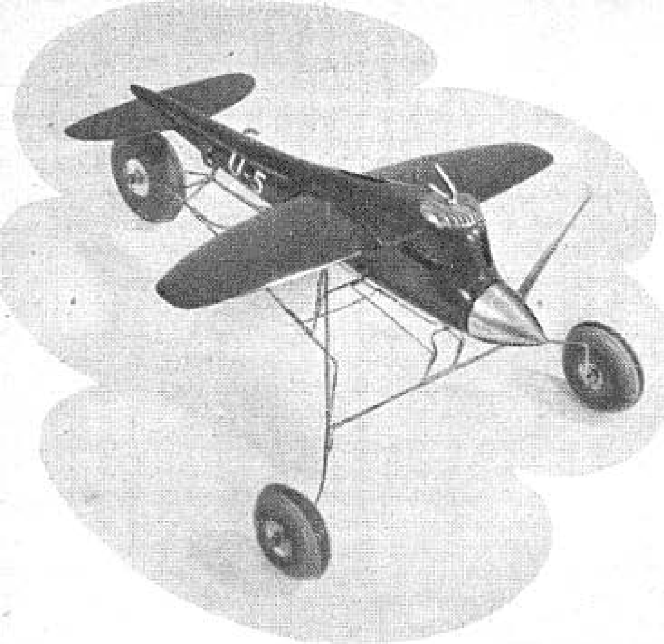
Start by working out in pencil, as in Fig. 1. Drill and countersink in the appropriate places the bottom skin only. Make two wooden blocks approx. $1\frac{1}{2} \times 1\frac{1}{2} \times 12$ ins. and smooth two faces of each with a sandpaper block. Fix them together at each end with ordinary rubber bands with the smooth faces together. Slide the bottom skin in between them until the bend line is just shewing, and then clamp the whole lot tight in the vice. (Fig. 2). Bend the top skin over with your fingers (*never* use a hammer directly on to the metal) until it is laying flat on one of the blocks at 90° (Fig. 2). Use a third small block and a hammer to give a sharp smooth bend at the leading edge. Remove the wing from the vice and wood blocks. Holding the leading edge towards you until about 40° (Fig. 3), then pull the T.E. together and hold in place with cellotape. Pin down on the bench with drawing pins (Fig. 4) and drill the T.E. Remove, de-burr and countersink the top skin. Rivet, using a flat punch to avoid spreading the metal.

Trim the T.E. (Fig. 5) and root-end to fit the fuselage. Don't forget to curve the spar top and bottom to accommodate the camber. Mark the

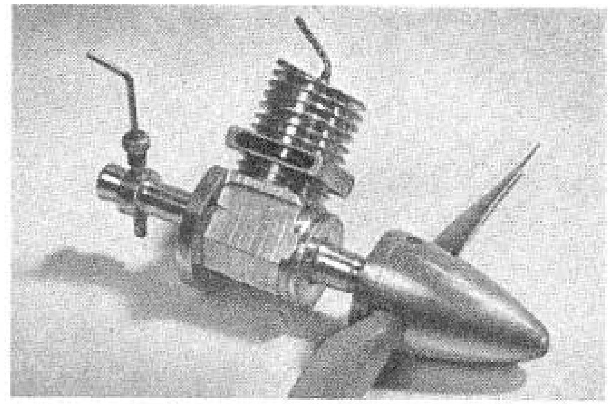


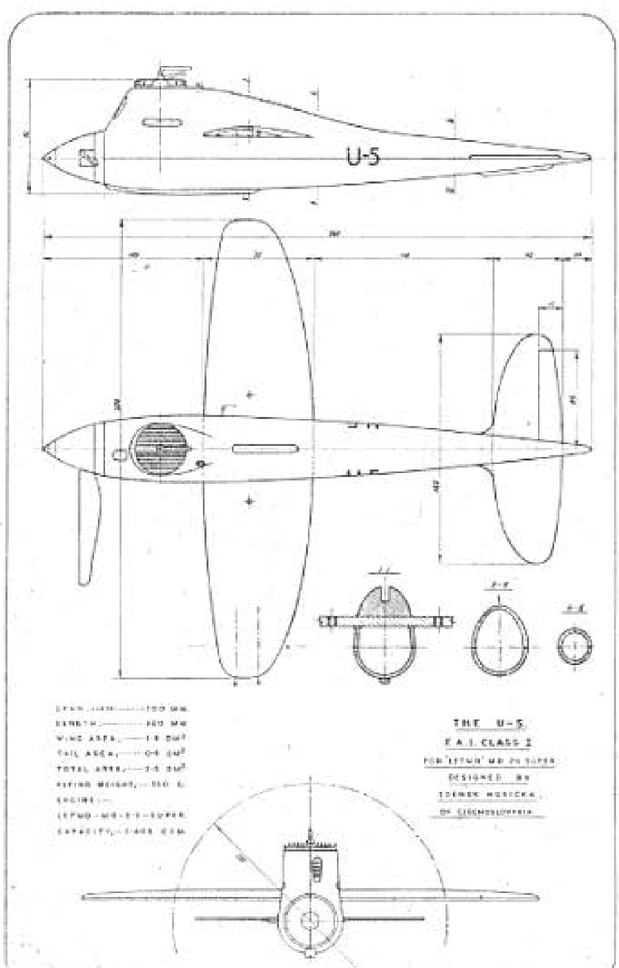
On the 8th June, Guido Battistella, a 25-year old Aeronautical student from Venice in Italy, established the World's record for FAI Class III at 238·410 k/hr (149 m.p.h.) in the International contest at Milan. He almost repeated this achievement a week later at Brussels, where the same G.B.8. model carried off first10 c.c. place with 233·766 k/hr. Seen in the above photo, and detailed in the APS plan below, the G.B.8. introduces a new form of fuselage construction. Lower half of the fuselage is shaped from sheet aluminium, joints are made with "Castolin," and wall thickness is beaten to varying thickness according to required strength. Whilst this will not be a job for every man, we see no objection to a hardwood lower pan à la Wright "Gook," carved to the same external contour.





Among the short list of World Speed record holders, the name of Zdenek Husicka of Brno in Czechoslovakia is one to be respected, and the model and engine shown here are both of his design. On May 3rd '52, the U-5 established the World's record of 156·724 k/hr, (98mph) using a two bladed prop, whilst top recorded speed was 164 k/hr at the Nats. Letmo MD-2·5 Super diesel has two ball races, disc valve, and Electron head. Bore 16mm, Stroke 12mm. Power, 0·25 bhp at 14·000 rpm.





spot C/L on the outside of the top skin with the wing in place, and drill.

Lastly, fit the tops, not forgetting to cut the grooves for the lead-out wires in the port wing.

Rigging

The model should fly slightly nose in. To check flying attitude, fill the tank, suspend the model on its side by the lead-out wires with thread and add weight if necessary to the tail end, until it hangs slightly nose up. Use the starboard tailplane to trim the " Gook " for level flight like a F/F model. The C/G should be on the pivot point of the bellcrank with the tank full.

Flying

The procedure I follow when operating is :— After checking everything, warm the motor by running out a few generous primes with the needle closed. Place the model on the circle with its tail into wind, run out the lines and check them for free and easy movement.

Prime, open the needle, and start the motor. (Test flying will shew the correct needle setting. Do *not* set the needle by the sound of the motor). Do *not* panic, take your time, and when you are good and ready give the assistant the O.K. to let go. The " Gook " has to be released absolutely square to the lines and *not* nose out. Hold the controls neutral and let the model take off by itself. To give up elevator as soon as the model is moving is fatal.

You will find that the "Gook" will fly "in the groove" when the motor is "in", and all you have to do is to hang on to the handle. (If not, use the tail trim as already mentioned). When the engine shows signs of stopping, start to whip very gently to keep up flying speed. Land by decreasing the whipping speed and use the elevator at the very last moment.

DO NOT TEST FLY OVER GRASS, unless it is very short. In that case, *remove the landing skid,* as it digs in, and cartwheels the model when landing.

Well, there are some of the so-called secrets of speed flying—and the best of luck to you !

1952 CONTEST AVERAGE RESULTS

1952 FINAL AVERAGES—RUBBER
(Including all National and International Events)

Position	Name	Club	Contests	Flights* Possible	Flights* Made	Flight Aggregate min. sec.	Actual Flight Average min. sec.	Contest Flight Average min. sec.
1	R. H. WARRING	Zombies	7	20	20	78 : 28	3 : 55	**3 : 55**
2	R. B. CHESTERTON	Northern Heights	5	15	15	50 : 40	3 : 23	**3 : 23**
3	J. GORHAM	Ipswich	6	17	17	55 : 52	3 : 17	**3 : 17**
4	N. G. MARCUS	Croydon	6	18	16	58 : 25	3 : 39	**3 : 15**
5	R. J. NORTH	Croydon	6	18	18	57 : 44	3 : 12	**3 : 12**
6	H. J. KNIGHT	Kentish Nomads	4	12	12	38 : 27	3 : 12	**3 : 12**
7	E. W. EVANS	Northampton	6	18	17	57 : 01	3 : 21	**3 : 10**
8	R. COPLAND	Northern Heights	8	23	23	72 : 17	3 : 09	**3 : 09**
9	J. L. PITCHER	Croydon	5	15	15	44 : 40	2 : 59	**2 : 59**
10	J. ROYLE	Littleover	6	17	17	50 : 19	2 : 58	**2 : 58**
11	T. BROOKS	Grange	5	15	15	44 : 10	2 : 57	**2 : 57**
12	H. TUBBS	Leeds	5	15	15	43 : 38	2 : 54	**2 : 54**
13	A. ALLBONE	Croydon	4	12	12	34 : 36	2 : 53	**2 : 53**
14	B. HAISMAN	Whitefield	4	12	12	34 : 20	2 : 53	**2 : 53**
15	A. BENNETT	Whitefield	9	26	22	72 : 00	3 : 16	**2 : 46**
16	R. ATKINSON	Ipswich	5	14	14	38 : 02	2 : 43	**2 : 43**
17	J. O'DONNELL	Whitefield	9	26	24	67 : 44	2 : 50	**2 : 36**
18	E. BENNETT	Croydon	7	21	19	54 : 07	2 : 51	**2 : 35**

* Includes attempted flights.

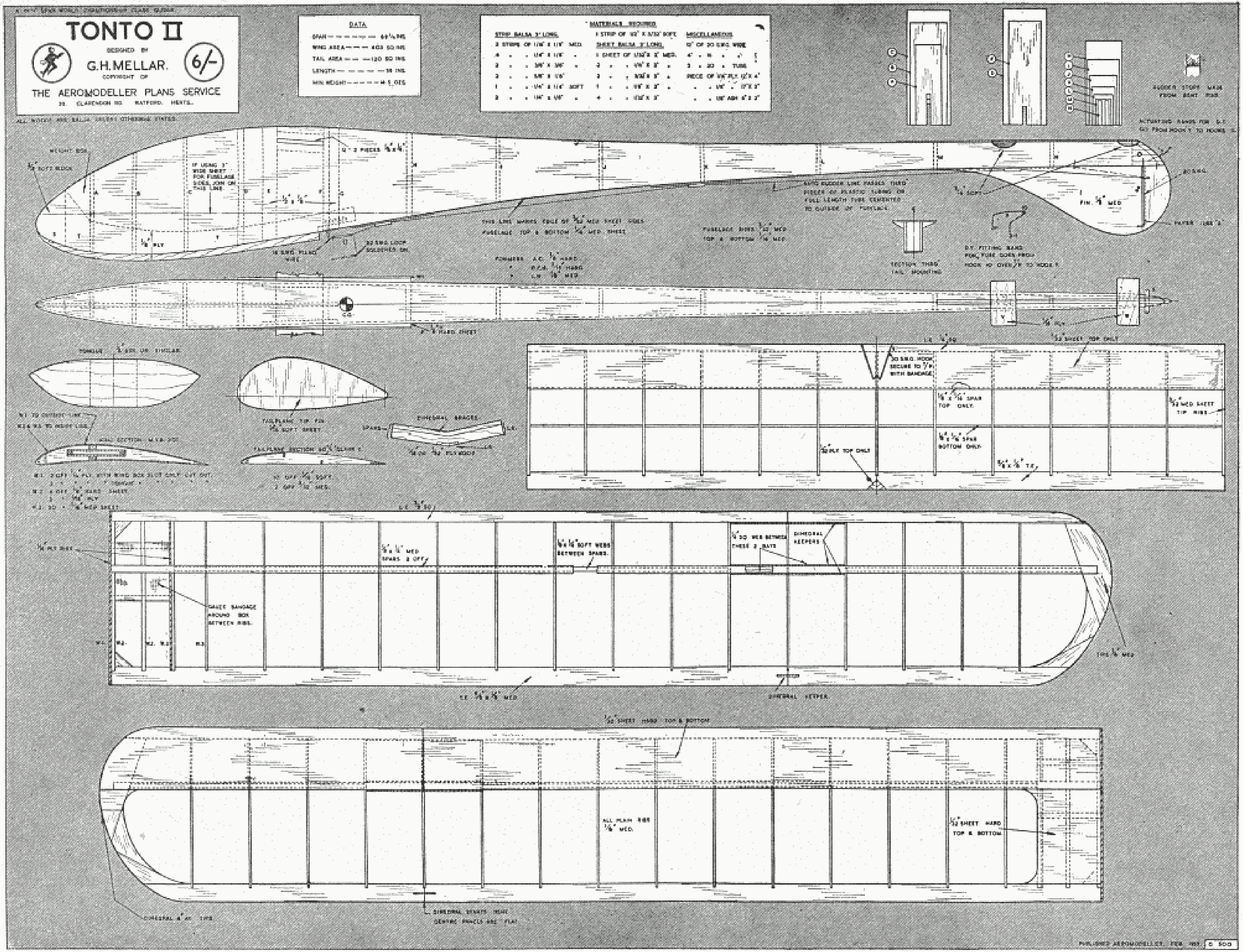
1952 FINAL AVERAGES—POWER
(Including all National and International Events)

Position	Name	Club	Contests	Flights Possible	Flights Made	Flight Aggregate min. sec.	Actual Flight Average min. sec.	Contest Flight Average min. sec.
1	B. WHEELER†	Birmingham	3	9	9	32 : 01	3 : 33	**3 : 33†**
2	R. PERKINS	Croydon	5	15	14	47 : 27	3 : 23	**3 : 10**
3	P. R. BUSKELL	Surbiton	6	17	17	51 : 37	3 : 02	**3 : 02**
4	A. BROOKS	Grange	8	24	23	71 : 55	3 : 10	**3 : 00**
5	W. DALLAWAY	Birmingham	5	14	14	39 : 25	2 : 49	**2 : 49**
6	R. MONKS	Birmingham	7	21	21	59 : 03	2 : 49	**2 : 49**
7	J. BICKERSTAFFE	Accrington	6	17	17	47 : 34	2 : 48	**2 : 48**
8	S. LANFRANCHI	Leeds	6	18	18	46 : 18	2 : 34	**2 : 34**
9	J. GORHAM	Ipswich	6	17	17	43 : 22	2 : 33	**2 : 33**
10	A. BENNETT	Whitefield	5	19	19	35 : 07	2 : 31	**2 : 31**
11	M. BYRD	Loughborough	3	9	9	22 : 28	2 : 30	**2 : 30**
12	R. STANDING	Croydon	3	9	9	22 : 08	2 : 27	**2 : 27**
13	P. WYATT	Ipswich	4	11	11	26 : 30	2 : 25	**2 : 25**
14	E. J. JOHN	Grange	7	21	(17)	51 : 23	3 : 01	**2 : 21**
15	R. J. NORTH	Croydon	4	12	12	22 : 28	2 : 21	**2 : 21**

† Includes proxy entry in Swiss International Power Contest.

1952 FINAL AVERAGES—GLIDER
(Including all National and International Events)

Position	Name	Club	Contests	Flights Possible	Flights Made	Flight Aggregate min. sec.	Actual Flight Average min. sec.	Contest Flight Average min. sec.
1	W. FARRANCE	West Yorks	6	19	19	69 : 44	3 : 40	**3 : 40**
2	T. R. FULLER	Grange	4	12	12	40 : 22	3 : 22	**3 : 22**
3	M. R. THOMAS	Blackpool	6	18	18	59 : 59	3 : 20	**3 : 20**
4	D. SUGDEN	Loughborough	4	12	12	38 : 54	3 : 15	**3 : 15**
5	M. BYRD	Loughborough	6	19	19	61 : 33	3 : 14	**3 : 14**
6	H. O'DONNELL	Whitefield	7	21	21	63 : 09	3 : 00	**3 : 00**
7	R. J. NORTH	Croydon	5	15	15	43 : 59	2 : 56	**2 : 56**
8	J. O'DONNELL	Whitefield	7	20	20	55 : 59	2 : 48	**2 : 48**
9	B. FAULKNER	Cheadle	6	18	18	50 : 18	2 : 48	**2 : 48**
10	P. WILKINSON	Northampton	6	18	17	49 : 12	2 : 54	**2 : 44**
11	G. JACKSON	Littleover	7	20	20	54 : 28	2 : 43	**2 : 43**
12	P. GIGGLE	Brighton	7	20	19	54 : 00	2 : 51	**2 : 42**
13	R. YEABSLEY	Croydon	4	12	12	32 : 16	2 : 41	**2 : 41**
14	P. J. ROYLE	R.A.F. St. Mawgan	4	13	13	39 : 10	2 : 38	**2 : 38**
15	J. LAMBLE	Wayfarers	5	14	13	36 : 32	2 : 49	**2 : 37**
16	P. LAW	W. Middlesex	5	14	14	36 : 10	2 : 35	**2 : 35**
17	L. BISS	Littleover	6	18	18	53 : 40	2 : 34	**2 : 34**

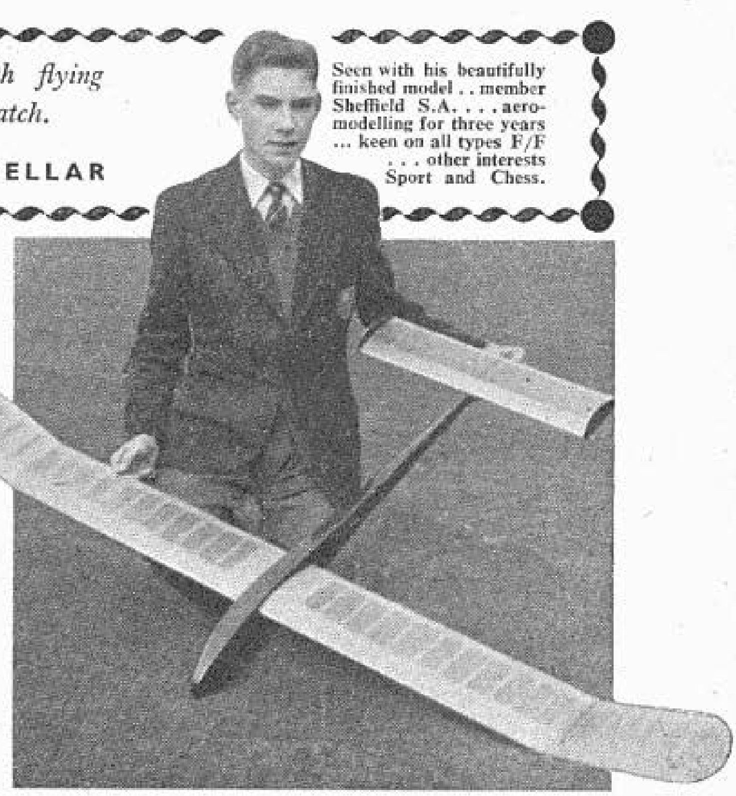


THIS IS 1/5 SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 6/- POST FREE FROM THE AEROMODELLER PLANS SERVICE

TONTO

Concours winner with flying performance to match.

BY GORDON MELLAR



Seen with his beautifully finished model . . member Sheffield S.A. . . . aero-modelling for three years ... keen on all types F/F . . . other interests Sport and Chess.

TONTO was designed in November, 1951, with two definite objects: (1) to have a better appearance than many competition models seen today; (2) to tow up dead straight in any weather.

That the former has been achieved is proved by success in the 1952 Hobbies and Crafts Exhibition in Sheffield and at the 1952 "Yorkshire Evening News" Rally Concours D'Elegance, where it collected two first places.

The rearward towhook, deep, narrow nose, low dihedral and high aspect ratio are refinements which always give an overhead tow. Tonto never turns off when on tow and in strong winds the line can be let out slowly whilst the model ascends, kite-fashion.

Just as easy to build as it is to fly, this A/2 comes within the "quick" building class by virtue of its simple sheet box fuselage and rectangular lines.

Construction

Fuselage. Cut out fuselage sides, cement pieces E. G. and Q. to inside around wing tongue slot. Mark former positions on inside of sides. Cut ⅛-in. slot in centres of A. D. and F. to required depth. Join fuselage sides by D. F. and H. Bind and cement tow hook (U) to ply keel (T). Cement triangular sectioned pieces S onto T. Cement T. into slots D. and F. Then cement fuselage sides onto pieces S. using a spring clip to hold them in place.

Cut out fin and rudder. Hinge rudder by means of paper tube (Z) and "L-shaped" piece of wire, add horn (X). Assemble former (N) and pieces O. on fin. Cement fin in position between fuselage sides. Add remaining formers and wing tongue, then sheet top and bottom. Add tail mounts (V) and (W) and their soft balsa fairings. Bend d/t. hook (Y) and solder small loop of wire onto two hooks for auto-rudder line.

Wing. Make wing boxes to be a tight fit on tongues. Assemble ribs W2 on the boxes. Bind between the ribs with gauze bandage, then cut spar notches in these ribs. Construction is then straightforward.

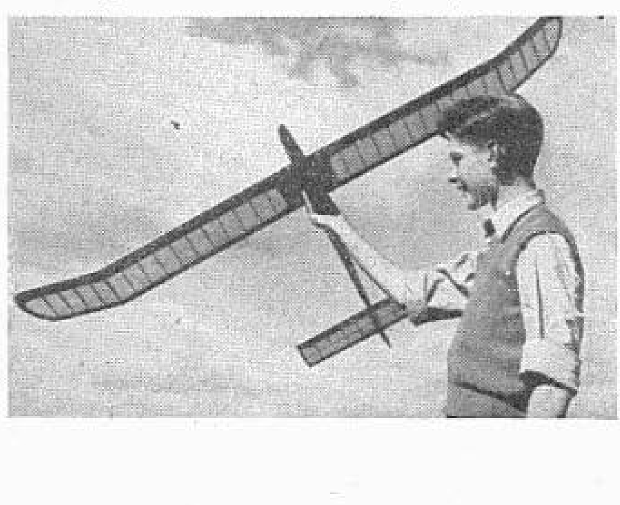
Note. Leading edge sheeting overlaps leading edge. Top spar is built in over plan, webs are fitted in between ribs when wing is removed from board, then bottom spar is added.

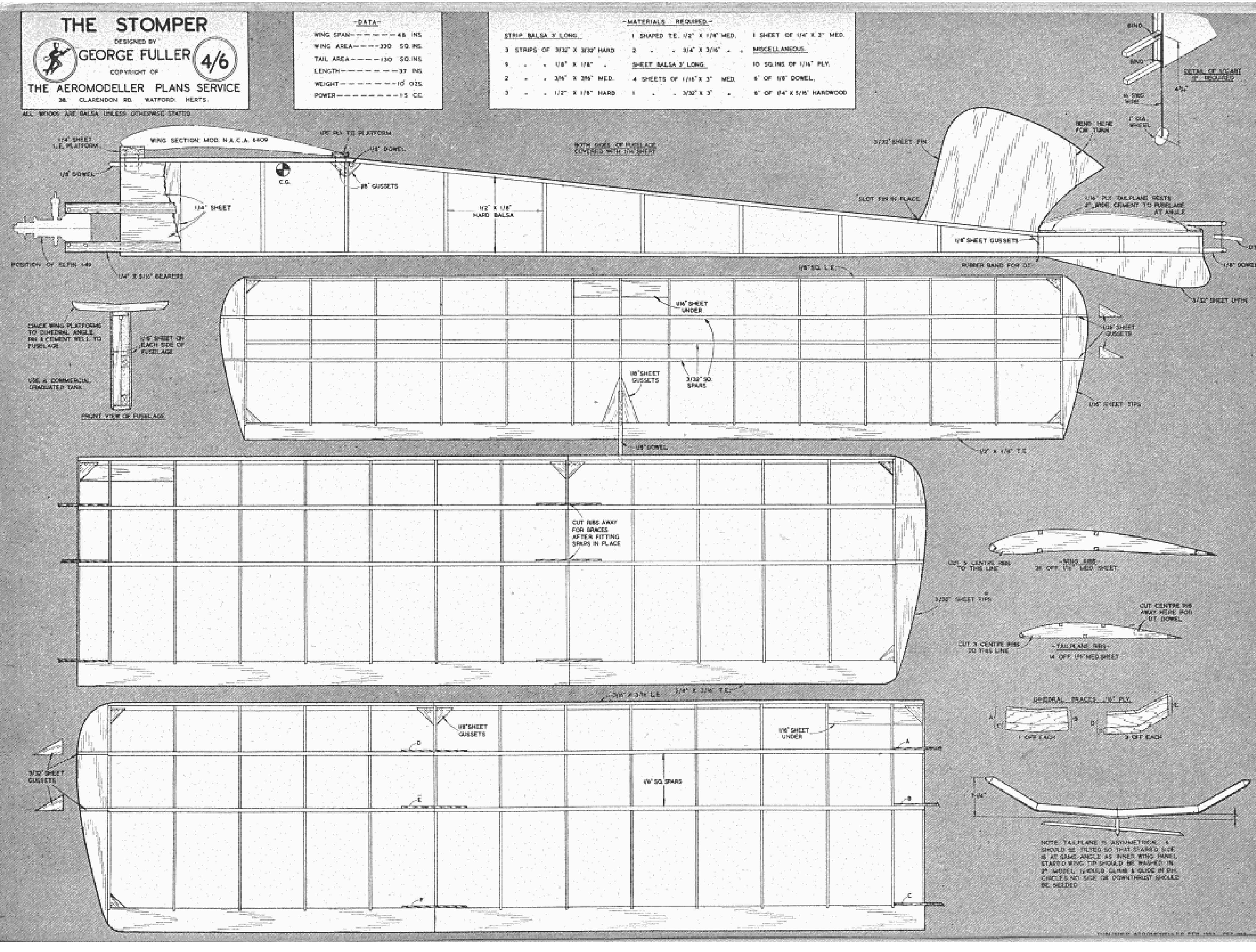
Cut four slightly oversize slotted ply ribs W1. Spot cement together into two pairs, then cement one pair onto each wing. These ribs are sanded to exact wing section, the outside ribs are then broken away and together with an ⅛-in. balsa packing rib are cemented onto fuselage around wing root.

Tailplane. The construction needs no explanation but special care should be taken with d/t. hooks. The balsa fairing is used as a stop, the lower hooks should meet this when the tail is at 45 degrees d/t. angle.

Finishing. Cover the entire model with Lightweight Modelspan. Flying surfaces need two thin coats of dope and fuselage three coats sanding sealer plus two coats colour dope (sanding between each), then finished with Hendon W. & C. polishes.

Flying. Remove all warps. Obtain good flat glide, check that with Auto Rudder "on", a straight flight is obtained and that model circles with Auto Rudder "off". Tow launches may now be attempted—and the rest is up to you!!



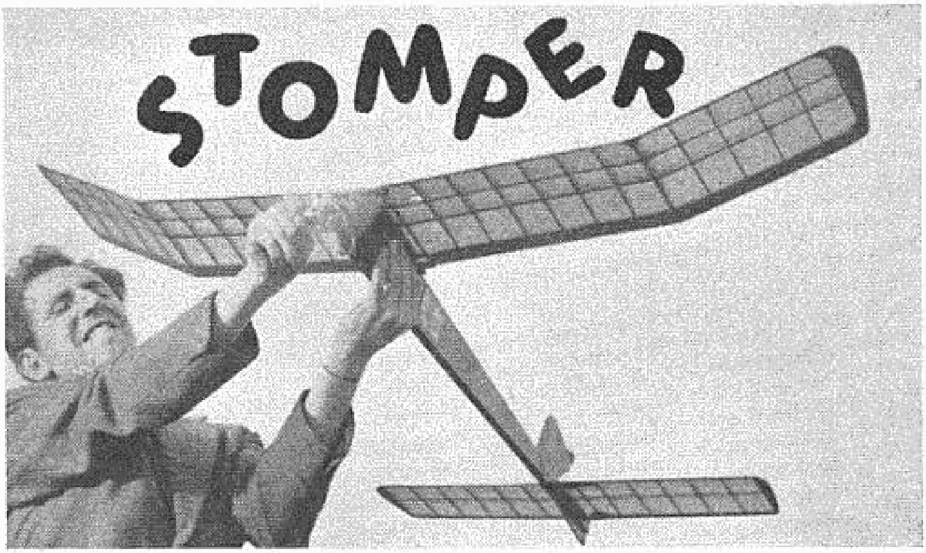

THE STOMPER
DESIGNED BY
GEORGE FULLER
4/6
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
38, CLARENDON RD. WATFORD. HERTS.
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
-DATA-
WING SPAN — 48 INS.
WING AREA — 330 SQ.INS.
TAIL AREA — 130 SQ.INS.
LENGTH — 37 INS.
WEIGHT — 10 OZS.
POWER — 1·5 C.C.
-MATERIALS REQUIRED-
STRIP BALSA 3' LONG.
3 STRIPS OF 3/32" X 3/32" HARD
9 " " 1/8" X 1/8" "
2 " " 3/16" X 3/16" MED.
3 " " 1/2" X 1/8" HARD
1 SHAPED T.E. 1/2" X 1/8" MED.
2 " " 3/4" X 3/16" "
SHEET BALSA 3' LONG.
4 SHEETS OF 1/16" X 3" MED.
1 " " 3/32" X 3" "
1 SHEET OF 1/4" X 3" MED.
MISCELLANEOUS.
10 SQ.INS. OF 1/16" PLY.
6" OF 1/8" DOWEL.
6" OF 1/4" X 5/16" HARDWOOD
1/4" SHEET L.E. PLATFORM
WING SECTION: MOD. N.A.C.A. 6409
1/16" PLY TO PLATFORM
1/8" DOWEL
1/8" GUSSETS
C.G.
1/4" SHEET
1/2" X 1/8" HARD BALSA
BOTH SIDES OF FUSELAGE COVERED WITH 1/16" SHEET
POSITION OF ELFIN 1·49
1/4" X 5/16" BEARERS
3/32" SHEET FIN
BEND HERE FOR TURN
SLOT FIN IN PLACE
1/16" PLY TAILPLANE RESTS 2" WIDE CEMENT TO FUSELAGE AT ANGLE
1/8" SHEET GUSSETS
RUBBER BAND FOR D.T.
D.T.
1/8" DOWEL
3/32" SHEET L/FIN
BIND
DETAIL OF U/CART IF REQUIRED
16 SWG WIRE
1" DIA. WHEEL
4 1/4"
CHACK WING PLATFORMS TO DIHEDRAL ANGLE, PIN & CEMENT WELL TO FUSELAGE
1/16" SHEET ON EACH SIDE OF FUSELAGE
USE A COMMERCIAL GRADUATED TANK
FRONT VIEW OF FUSELAGE
1/8" SQ. L.E.
1/16" SHEET UNDER
3/32" SQ. SPARS
1/8" SHEET GUSSETS
1/16" SHEET GUSSETS
1/16" SHEET TIPS
1/2" X 1/8" T.E.
1/8" DOWEL
CUT RIBS AWAY FOR BRACES AFTER FITTING SPARS IN PLACE
3/32" SHEET TIPS
CUT 5 CENTRE RIBS TO THIS LINE
-WING RIBS-
26 OFF 1/16" MED. SHEET
CUT CENTRE RIB AWAY HERE FOR D.T. DOWEL
CUT 3 CENTRE RIBS TO THIS LINE
-TAILPLANE RIBS-
14 OFF 1/16" MED. SHEET
3/16" X 3/16" L.E.
3/4" X 3/16" T.E.
DIHEDRAL BRACES 1/16" PLY.
1 OFF EACH
2 OFF EACH
1/8" SHEET GUSSETS
1/16" SHEET UNDER
1/8" SQ. SPARS
3/32" SHEET GUSSETS
7 1/4"
NOTE: TAILPLANE IS ASYMMETRICAL & SHOULD BE TILTED SO THAT STARBD SIDE IS AT SAME ANGLE AS INNER WING PANEL. STARB'D WING TIP SHOULD BE WASHED IN. IF MODEL SHOULD CLIMB & GLIDE IN R.H. CIRCLES NO SIDE OR DOWNTHRUST SHOULD BE NEEDED

AN EASY TO BUILD EASY TO FLY CONTEST DESIGN FOR THE 1·5's

By

GEORGE FULLER

Founder member St. Albans M.A.C. . . . aged 23 . . . has been aero-modelling as long as he can remember . . . wife was 1951 Women's Champion . . . also a Jazz and Jive fan.



WHEN George Fuller builds a contest model, the main points he considers are: (1) Simplicity, (2) Cheapness, (3) Ease of Trimming. Stomper was therefore designed with these three factors in mind.

Three Stompers were built in 1952. All have proved to be good flyers and they were placed high in three out of the five contests entered :—

3rd Croydon Gala.
3rd West Essex Gala.
1st South Midland Gala.

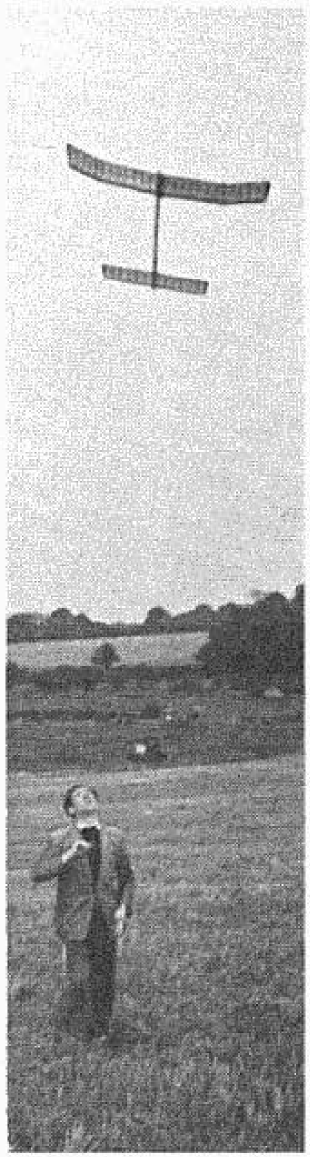
As a good example of "Quickie" construction it is an ideal model for the beginner, and will take any engine of 1 c.c.–1·5 c.c.

Construction

Draw plan of **Fuselage** on 1/16 sheet balsa then pin down to flat board. Add ½ in. × ⅛ in. longerons and spacers. Cement in the ¼ in. sheet thoroughly and add engine bearers. When dry, remove pins. Do not remove from board but add other 1/16 sheet side. Then remove from board, trim off surplus balsa and sandpaper well. Cover with Lightweight Modelspan and give two coats of clear dope plus one of Banana oil.

Wing mounts can then be added, well cemented and pinned to the fuselage, then reinforced with cotton gauze for extra strength. Drill holes and add ¼ in. wing and tail fixing dowels. Then cement the tail mounts in place, making sure they are tilted up on starboard side.

Tailplane is quite straightforward and no difficulty should arise. Utmost care must be taken to see that there are no warps (to prevent this, add a few drops of castor oil to the dope).



Mainplane. Pin trailing edge down on plan, add wing ribs then leading edge. Next, add the two top spars, leave a few minutes for cement to dry then remove from plan and cement the two lower spars in place. Sheet wing tips and the two braces are next, then repeat procedure on other half of wing. When both sides are complete, cut wing at the dihedral break, making sure one half is cut at an angle so that it will fit flush when the tip is raised. Wing halves are then cemented together, add gussets, plywood, etc., sandpaper well, cover in Lightweight Modelspan and dope.

Trimming. Owing to the tailplane being offset and at an angle, the starboard wing must be "washed in" 2°.

Before test gliding, check that the C.G. is in the correct position, set trim tab over slightly right, and then gently hand launch. If glide is flat, with a slight turn to the right, everything is set for power flight.

Have motor revs. as low as possible before letting go. If the Stomper climbs to the right, everything is O.K., if not, adjust trim tab until satisfied.

The Stomper must climb and circle in the glide to the right, no downthrust or side thrust is needed. It should corkscrew up, and whatever the position it is in when the motor cuts, it will roll out without a stall into a very flat "skidding turn" glide. The original is powered with an Elfin 1·49 c.c. and has a still air time of 4·15 secs. on 15 secs. motor run.

PART ONE OF THE MOST AUTHENTIC ARTICLE EVER PUBLISHED ON THIS ULTRA-MODERN SUBJECT

By

John W. Fozard

D.C.Ae., B.Sc. (Hons.), Grad. R.Ae.S.

Aeromodeller for 12 years and Project Engineer in the Design Offices, Hawker Aircraft Ltd.

The DELTA WING

THE first question usually asked when this subject is mentioned is " why the delta plan-form ? " In order to answer this we must look to full size aircraft, especially to those aircraft specifically designed for high speed flight. To obtain high flight speeds it is essential that the drag be reduced to a minimum. The greater part of the drag of an aircraft flying at a high Mach number is wing drag and, at supersonic speeds in particular, most of the wing drag is wave drag, *i.e.*, drag caused by the shock waves formed by the wing in its motion through the air. In order to reduce this wave drag the thickness of the wing must be reduced. On current high speed aircraft the wing thickness/chord ratio (t/c ratio) is of the order of 10 per cent. ; but in the future, because of the necessity to minimise the wing wave drag, we can expect wing t/c ratios of 5 per cent. or less.

Now with current planforms such low t/c ratios would mean very thin wings—thin, that is, in terms of actual inches of depth. As an example, on a modern straight-wing fighter a wing t/c ratio of 5 per cent. would give a depth of only 5 or 6 ins. at the wing root, and even on a swept-wing fighter 5 per cent. t/c ratio would give a depth only a few inches more than this value.

In addition to reducing the t/c ratio it is also essential to maintain a good degree of sweepback on the wing leading edge. It is because of these two fundamental requirements that the delta wing has come into fashion for high-speed aeroplanes.

The delta wing, because of the large chords it gives in association with large angles of leading edge sweepback, means that low values of t/c are possible, and thus both the necessary conditions for low drag at high Mach number are satisfied. Near the root of a delta wing the chord may be anything upwards of 20 feet and hence the t/c ratio can be made very low whilst yet maintaining a reasonable absolute depth.

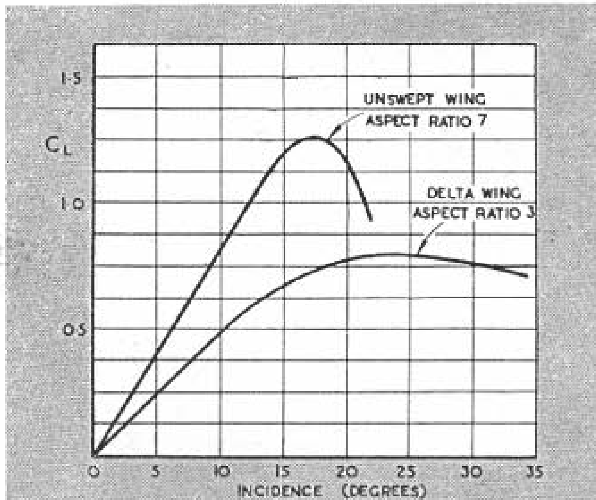


FIG. 1. COMPARISON OF LIFT CURVES OF A NORMAL UNSWEPT WING & A TYPICAL DELTA WING BOTH HAVING THE SAME SYMMETRICAL SECTION.

L. W. Rees, of New Malden in Surrey, has designed " Delta Dee " for his E.D. 3·46 c.c. diesel. A Sport controliner, the model has an average speed of 60 m.p.h.

In the past the use of low t/c ratios on model aircraft has not been very popular, chiefly because of the difficulty of incorporating sufficient strength and stiffness into wings of normal aspect ratio. On a Wakefield size of model, for instance, a 4 per cent. t/c wing would be less than ¼ in. deep over most of the span. By using a delta planform, however, this size of model could have a 4 per cent. t/c wing section and yet present no really difficult constructional problems. It may well be asked—why bother to strive for a low t/c ratio ? The answer lies in the behaviour of the boundary layer which surrounds any body in motion through air.

Semi-scale 31½ ins. Delta for a Jetex 200 unit is by Bernard Slade of East Ham. Originally powered with twin 200's, the model proved too fast for safety but is perfect with the one motor. Length is 29 ins. and sweep angle 46 degrees.

Yet another advantage accrues from the use of the delta wing. For a given overall size of aircraft the delta gives considerably more wing area than the more conventional planforms. Thus the wing loading is reduced and the manœuvrability of the aircraft is enhanced. A further consequence of the lower wing loading is the reduction in spanwise bending movements which enable a lighter, more distributed (and hence more efficient), structure to be used.

If the designer chooses not to exploit the delta planform to its aerodynamic limit he can compromise by using a less extreme value of t/c ratio, and thus give himself a very large amount of useful internal stowage space for engines, intakes, fuel and equipment.

The delta wing of course has its disadvantages. In the main, the price to be paid for the qualities enumerated above is aspect ratio. If for a given span the wing area of an aircraft is trebled, the aspect ratio is reduced to one third of its former value. This is the quality of the delta wing that has to be carefully watched. Low aspect ratio means larger induced drag and lower values of the lift curve slope. Put simply, this latter means that for a given weight the aircraft with a low aspect ratio will have to fly faster at a given incidence or, if the speeds are kept the same, it will have to fly at a larger incidence than an aircraft having the same wing area but a larger aspect ratio. The relative proportions of the lift curves (C_L against incidence) for a typical delta and a wing of normal aspect ratio are shown in Fig. 1. It will be noted from the figure that not only is the slope of the curve less in the case of the delta, but also the stall of the delta wing is much less abrupt and occurs at a higher incidence than the stall of the normal aspect ratio wing.

Application to Models

Having outlined the case for and against the delta wing on the basis of full scale aeronautics, it is now possible to consider the application of this planform to the world of model aircraft. Quite apart from the pure modelling of full size aircraft of this type, the writer believes that the delta has possibilities as a model form in its own right.

During the past year the author and several colleagues have built and flown a number of delta wing models, and any claim to write on this subject is based on his experience and observation of these models plus the application to the subject of his professional training as an aeronautical engineer.

First of all let us consider possible planforms. Strictly the term delta applies only to wings having straight taper, pointed tips, and unswept trailing edges. However, the term can be taken to include planforms which have cut-off tips, curved leading edges, and which incorporate up to about 15° of trailing edge sweep. Some examples of delta planforms are shown in Fig. 2. Planforms which involve cutouts in the trailing edge cannot properly be called " delta ".

In the case of a pure triangular planform such as those shown in Figs. 2A and 2B, the aspect ratio is given very simply as four times the cotangent of the angle of sweepback of the leading edge. Thus for a delta with 45° leading edge sweep the aspect ratio is 4·0 ; and for a delta with 60° leading edge sweepback the aspect ratio is 2·31. Since pointed tips are not looked upon with much favour in the modelling world, a cut-off tip delta of taper ratio (Taper ratio = Root chord ÷ tip chord) about 10 or 12 to 1 will be more applicable. However, it must be remembered that cutting off the tip in this manner reduced the aspect ratio and also, to a lesser extent, the area is reduced. If we cut off the tips of our 45° pure triangular

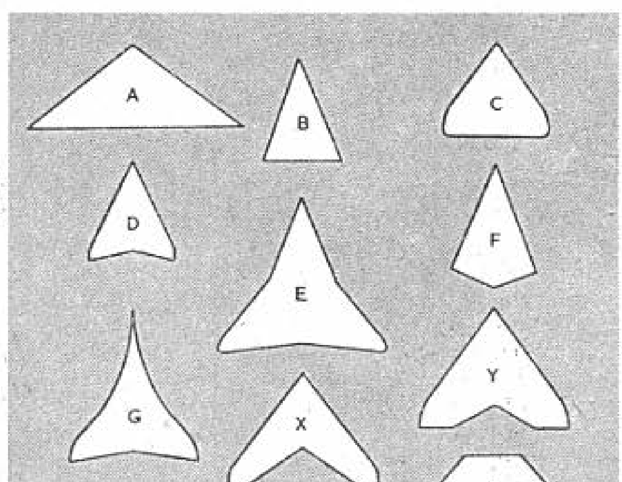
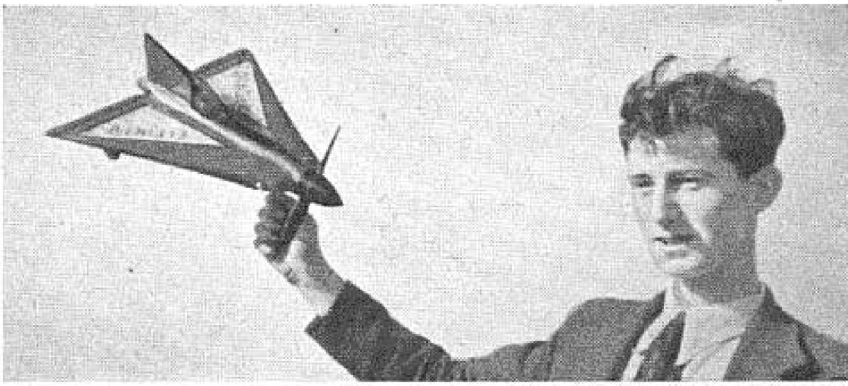


FIG. 2 PLANFORMS
A B C D E F & G ARE DELTAS
X Y & Z ARE NOT DELTAS



A Class A Team Racer with Delta form has distinct advantages. This one by J. R. Moxham of Southampton has an area of 77 sq. ins. and the Elfin 1·8 is buried in the leading edge beneath cowlings beaten from old dope tins !

delta to give a taper ratio of 10 to 1, the aspect ratio is reduced from 4·0 to approximately 3·3 and the wing area is reduced by 10 per cent. The author is of the opinion that for a straight-tapered delta the useable range of leading edge sweepback lies approximately between 40° and 65°. The lower limit is decided from considerations of longitudinal stability and the upper limit is decided by aspect ratio. However, angles of sweep beyond each end of this range can be used, as will be shown later, in a certain type of delta.

With normal wings of t/c ratios between 9 per cent. and 16 per cent. (typical of a large number of model aircraft) the air moving over the top surface of the aerofoil finds itself unable to conform to the relatively sharp curvature of the contour aft of the maximum thickness of the section, and it breaks away in a perfectly smooth manner forming a " backwater " of comparatively still air between the maximum thickness and the trailing edge, with consequent increase of drag and reduction of lift. This phenomenon is known as laminar separation of the boundary layer. It should not be confused with turbulent transition of the boundary layer, which is caused largely by surface roughness.

The delta is less prone to this laminar separation of the boundary layer because of its suitability to low t/c ratio sections, which have more gradual pressure gradients along the aerofoil contour, and also because the larger chords of the delta wing mean that the aerofoil section is working at a higher, and hence more efficient, Reynolds Number.

Stability

From the author's own experience and from evidence gathered from other sources it can be definitely stated that the model delta is positively stable and is not unduly difficult or critical to trim. The longitudinal stability is, as would be expected, a function of c.g. position ; and the available evidence shows that the c.g. requires to be on, or in front of, the mean quarter chord point of the wing. On a delta with no trailing edge sweep and pointed tips (see Figs. 2A and 2B again), the mean quarter chord point is at half the apex chord, *i.e.*, the chord which is the centre line of the wing in plan. Adequate longitudinal stability is ensured if the c.g. is placed between, say, 35 per cent. and 50 per cent. of the apex chord. The best position for any given model can obviously only be found by flight tests, but the above figures will serve as a good general guide to the required c.g. position when the model is still in the drawing and building stage. It is also desirable to incorporate some degree of washout on a model delta. Models with washout have better stall characteristics than those having untwisted wings, and this applies to delta wings equally as it does to a wing of more normal shape. The washout does not have to start from the root of the delta ; it can be gradually built up from about half semi-span outwards ; or it can be incorporated as an elevon at the tip, which gives the tip sections reflex camber at the trailing edge. For delta wings of approximately 10 to 1 taper ratio, 3° to 5° washout between root and tip sections seems to be a good average figure with which to work.

Dihedral appears to be unnecessary—at least, for leading edge sweepback angles greater than about 45°. The sweepback itself contributes enough effective dihedral to render unnecessary the building-in of actual geometric dihedral. Also, it seems desirable to keep the fin area as small as possible (say, not more than about 8 per cent. of the wing area, bearing in mind that the fin will be on a very short moment arm compared with a conventional model) or otherwise to incorporate a long nose, since the delta shows a remarkable affinity for spiral instability—that disastrous tendency to tighten-up in turns which then develop into a steep spiral dive . . . ! In fact, a pure delta wing with no fuselage or fins is positively stable in yaw, as anyone can prove by folding a piece of paper into that much-scorned but none the less fascinating model—the paper dart.

Trimming is easily carried out using stiff-hinged elevons on the trailing edge, which can be relatively very small as they are usually very powerful. Tailplanes are in general unnecessary. A small one of, say, 4 per cent. to 8 per cent. of the wing area could be used as a means of trimming, but its extra drag and weight make its possible advantage doubtful. Such a tailplane would in any case have to be mounted high on the fin, well out of the wing wake.

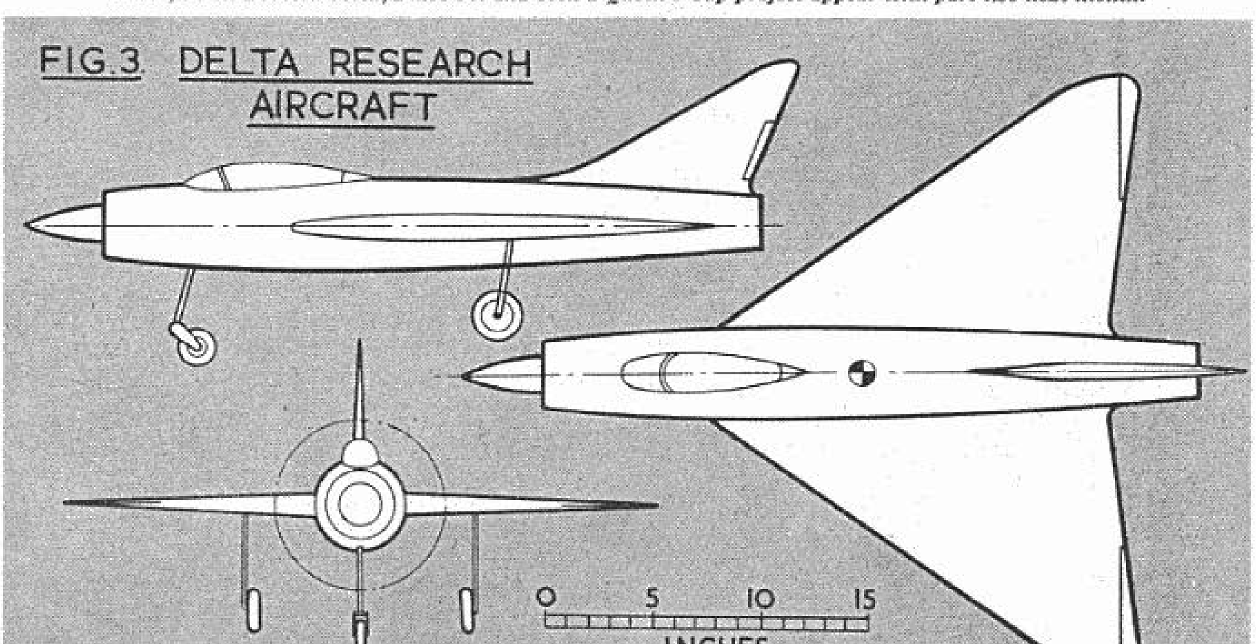
Due to the fact that laminar separation of the boundary layer is largely eliminated, and that wing-body interference is at a minimum, the delta model will fly faster than a similarly-powered conventional model of the same weight and wing area. This higher flight speed can also be attributed in part to an aerodynamic characteristic mentioned earlier—namely the low value of the lift curve slope. In model flying, the normal procedure is to trim by observing the attitude of the model in flight. Having become accustomed to the flying attitudes of normal models, when a delta model is first flown the natural tendency is to trim the model to fly in the same attitude ; *i.e.*, the delta model will be compelled by the trim to fly at an incidence appropriate to a higher aspect ratio wing. Now at such an incidence (normally of the order of 8° to 12°), because of its lower lift curve slope (see Fig. 1), the delta wing can only obtain approximately $\frac{1}{2}$ to $\frac{2}{3}$ of the C_L of the more normal wing, and hence it must fly faster in order to generate enough lift to sustain itself. With the delta this higher flight speed is possible because of the low drag inherent in this planform.

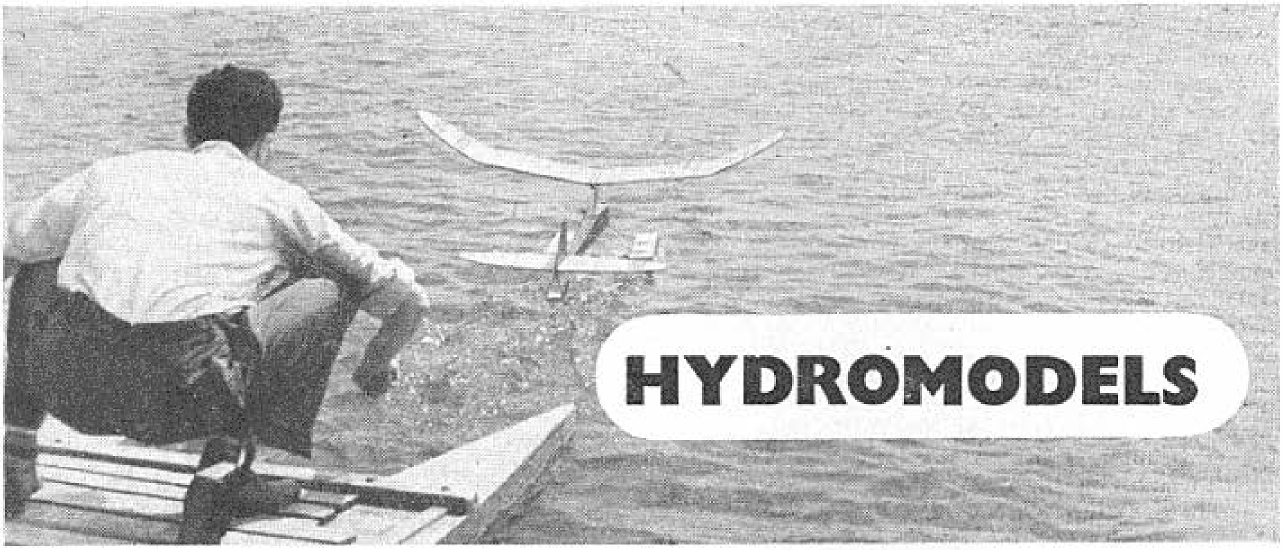
Possible Models

Two types of model can be almost immediately eliminated as being the most inappropriate to the delta planform. They are the glider and the rubber-driven model. The glider can be ruled out because of the low aspect ratio associated with the delta wing ; the rubber model is liable to be unduly handicapped since, in general, the delta will not give a sufficient length of fuselage to accommodate the necessary amount of rubber. This difficulty might be overcome by using several motors of short length geared together, but in any case the high initial torque of such motors might result in very peculiar flights due to the low span of the delta. Such a model, however, would form an interesting project, and (dare it be suggested ?) a delta Wakefield would be a shattering break with the traditional design of this class of model.

Types of propulsion unit having low torques or being entirely torqueless are more suitable for use in the delta. In particular the delta favours those types of motor which can be fully buried—Jetex units of all sizes, pulse-jet engines and ducted fans. Normal airscrew-driven deltas are perfectly feasible but it might be advisable to have a pusher installation in order to eliminate the slipstream-wing interaction. Using a tractor arrangement, balance would be more easily achieved without having to carry ballast, but it must be remembered that the slipstream would affect a considerably larger proportion of the wing area than with conventional models. Fig. 3 shows a tractor installation which has been built by a colleague of the author. It disguises the engine-airscrew installation by making the nose of the fuselage represent a type of intake, applicable to full-scale jet aircraft, known as a centre-body intake. In this case the centre-body is formed by the spinner and the engine is fully buried just behind the lip of the intake proper. The model has not yet been flown as the builder has recently emigrated to Canada, so that results of flight tests will not be available for several months. It might be noted in passing that this particular model would also have been suitable for a ducted-fan power installation, the tractor airscrew only being used because it was more simple to make, more efficient, and lighter than the ducted-fan. *(to be continued).*

Three-view general arrangement below, is of a model which has yet to make flight tests but which promises to be the forerunner of a new trend in free-flight. Span is 28 ins. Overall length, 34·5 ins. Area 300 sq. ins. Weight, 13 ounces. For Allbon Dart 0·5 c.c. diesel. Similar three-view drawings, of a Class B Racer, Single Jetex, Multi Boosted Jetex, Pulse Jet and even a Queen's Cup project appear with part two next month.





PART TWO

Sport Models

In view of the water instability inherent in the single front float lay-out, most medium and low-powered models, and most jobs expected to alight back on water, normally employ the three float lay-out in which two front floats provide the main buoyancy members. Since the distance between the outer sides of these floats is anything up to 40 per cent. of the wing span, a fair amount of lateral stability is assured; by placing the floats in line with (or in front of) the plane of the air-screw, the chances of nosing over during the take-off or when re-alighting are cut to a minimum. On the debit side there is the possibility of additional drag on the glide and the chance that, should a low-powered model start to swing on take-off, it will pirouette round on one float until it digs its nose in. In point of fact, the difference in drag between one large float and two smaller ones is negligible; the increase comes more from the strutting than anything else. Many successful R.O.W. contest models, notably in Russia and eastern states of U.S.A., have used twin front floats, and most power models can easily be converted to use this lay-out without extensive re-trimming being required.

Swinging on take-off is a malady that seldom affects correctly designed and mounted floats unless the model is very low-powered or is trimmed for very tight circles in flight. For medium powered models, raindrop or other stepless float forms are perfectly suitable, but steps become increasingly desirable as power-loadings increase. Models capable of only a slow climb take a long time to reach a hump speed on take-off, and such low-powered models need help in the form of stepped floats in order to commence planing, let alone to unstick. This is especially true when the surface of the water is flat calm—it is interesting to recall that under such conditions the Supermarine S6B required a four mile take-off run, and even then it was necessary to cross the proposed take-off lane in a speedboat immediately beforehand, so that the wash of the boat "kicked" the S6B up on to the step. This aircraft did over 040 m.p.h., and the take-off problems were more complex than ours; nevertheless, it serves to illustrate how strong is the effect of the water's surface tension. The function of a step is to produce turbulence which breaks up the surface tension and allows air to enter between the water and the float skin. "Suction" is thus reduced and the aircraft is able to lift to the planing position and finally to rise off the water altogether. Some float designs have even employed air bleeds to the step to ensure that air reaches the critical point (Fig. 1) If floats of sufficient volume and

Heading: twin front floats on pylon lay-outs are not common. This Italian example is just unsticking after a 3 metre run. Double float struts ensure rigidity.

If you want a BIG model . . . ! West Coast hydro entrant, prepares to release his 1,200 sq. in. outsize model. Note strutting to ensure float rigidity.

reasonable shape are used at the correct angle of incidence, no difficulty should be experienced from the design angle. Use or omission of steps should be decided according to the model's rate of climb.

Float mounting can cause several take-off troubles. Complete rigidity is undesirable because of susceptibility to damage, but there must be no tendency to twist or whip. Toeing in or out or rockiness in pitch will allow the floats to follow the contours of the ripples on the water, prolonging or even preventing the take-off, while one float less rigid than the other will cause the model to circle, with, as often as not, disastrous results. A spreader bar cemented across the float tops will stiffen the whole assembly should any trouble be encountered. In the event of sharp turn due to rudder or motor offset which is necessary for flight, a small aluminium water rudder cemented to the heel of one float may be used ; the effect of a ½-in. square in water is surprising.

Total float volumes can be exactly the same as those employed with the single front float arrangement, although it pays to increase cubic capacity a little, especially for models expected to return to the water. For convenience in building, the single tail float can be identical with the two front ones, *i.e.*, 33 per cent. of the total volume ; otherwise the 75–25 per cent. rule should be followed. Step height is usually 5–10 per cent. of the float length, positioned at the mid-point, but in practice a ⅜ in. step used on any length float works out quite well. Narrow floats may be used with a possible slight reduction in drag and increased fore-and-aft stability on water, but it is probable that a width of 60 per cent. of the length is the best all-round proposition. Float sizes for medium powered models are contained in Fig. 2.

Main items with this lay-out are : (i) Line-up of floats—the model may run a considerable distance before unsticking. (ii) Rigidity of mounting—not too much, not too little. (iii) Float L.E.'s in line with the airscrew or slightly ahead of it. (iv) 10° angle of attack, float L.E.'s out of water when at rest. (v) Water rudders if take-off run is out of straight. (vi) Float track (between centres) at least 20 per cent. of span. (vii) Angle of tail float adjusted so that L.E. is above water at rest.

Rubber Models

Before discussing other lay-outs, it may be as well to mention the application of the three-float gear to rubber models. Basically, the principles are the same, but the large diameter props, high torque, and general need for weight-saving associated with rubber power bring in their own problems. The most obvious difference is the necessity for longer u/c legs, which must be stiff and light ; bamboo is probably best in this respect. Thread or fuse wire bracing is almost essential to prevent the floats from spreading apart or whipping excessively without using too thick or heavy a leg. A wide track is needed to control the high initial torque on take-off, which further aggravates the tendency for the floats to spread apart. Normal position of the front floats is very slightly behind the prop, and float volumes should be calculated exactly as for power floatplanes. The tail float should be about 30 per cent. of the total. Rubber model float forms in general use are shown in Fig. 3 ; note that tissue covering is quite sufficient for all but fairly heavy models.

Most rubber jobs require runs of only 5–10 ft. to unstick—in fact, the New Zealand junior floatplane record was set up from a 2 × 4 ft. puddle on a normal flying field, after a heavy shower. A stiff breeze blowing at the time doubtless shortened the take-off run, but it shows what can be done. John Sheppard, of Papakura, N.Z., who made this flight, is a rabid floatplane fan and sends some very interesting details of his experiences on the water. For rubber models, John uses the normal

Total weight ozs.	Minimum volume cu. ins.	Three floats, each minimum A	B	C
8	28	5	1⅛	2½
10	35	5½	1¼	3
12	42	6	1½	3¼
16	56	6½	1⅝	3½
20	70	7	1⅞	3¾
24	84	7	1½	4

FIG. 1

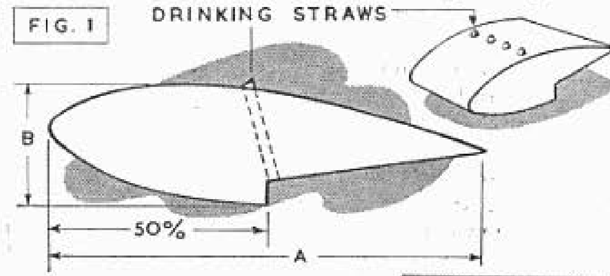
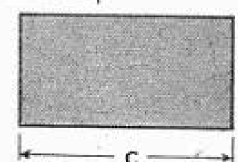


Table above gives float dimensions "A," "B" and "C" for various sizes of model.



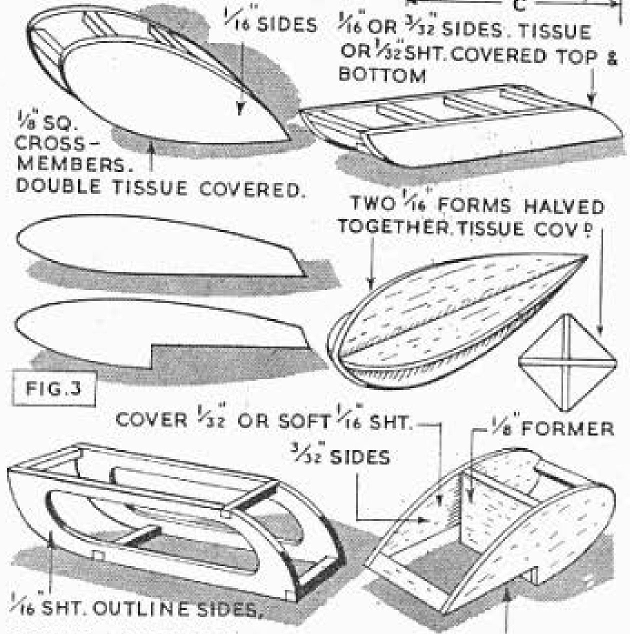


FIG. 3

Concentration is just as evident in water take-offs—trousers dry out quicker than models!

three-float lay-out, with floats of equal size and of a thickened Clark Y profile set to plane at 2° (10° at rest). On a 30-in. spar model, 18 s.w.g. legs proved adequate, with a rubber band in tension in front and a thread at the rear to limit forward movement. A converted "Senator" used a similar system, the floats being merely cemented against the u/c legs. When flying as a lone hand in a boat, this ingenious young man fits an S-hook in the bows and winds from the stern thwart; his description of the flat calm water and windless weather (a power floatplane with a 45 sec. motor run alighting 30 yards away . . .!) brought thoughts of emigration! Double-covering with lightweight Modelspan has solved his soakage problems, but "Don't test over water" is his earnest advice just the same. He has R.O.I.'d his power job off wet grass, and has yet to damage a waterplane by land-testing, experiences coinciding exactly with our own. John has turned in flights of 2 mins. 45 secs. at times with his 30-in. span model, and has noted that on each occasion the incoming tide was just beginning to cover the sandbanks in his river, giving rise to thermals due to the irregular warming of the water. Other observations indicate that the outgoing tide produces similar thermals when the river water spreads into the sea.

Points to watch when producing rubber floatplanes are: (i) Three equal size floats, or a tail float only slightly smaller; (ii) Inability of the floats to change position when set on water; (iii) Wide track up to 50 per cent. of span; (iv) Care in motor preparation, since a bunch causing a stalled descent into water will stop flying for an hour or two while things dry out.

General Notes

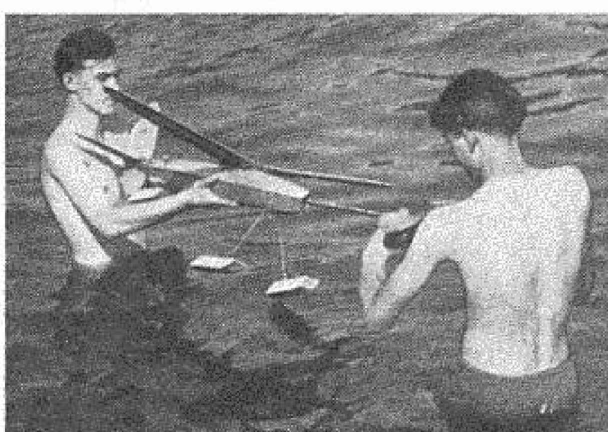
The one thing which must be faced about models used for water flying is that there is no way to keep water out. Silk or tissue covered sheet construction can be made reasonably watertight, but wings, fuselage, etc., inevitably fill when immersed. No doubt complete waterproofing is possible, but only at the expense of tremendous weight. The best system is to dope the frame before covering, to slow up the absorption of water, and to dope tissue covering thoroughly, applying two coats of clear followed by one or two of banana oil or fuel-proofer. Silk or nylon will need seven or eight coats of clear dope to ensure that all pores are filled. A $\frac{1}{16}$ diameter hole drilled or punched in the covering of each bay, near a corner, will speed up drainage in the event of mishap. A tissue or silk reinforcing patch prevents the hole from starting a split. Sheet floats can be fitted with celluloid inspection panels or small drain-plugs; leaks frequently develop and can be fatal if not detected.

A popular misconception is that contact with water is less likely to cause damage than normal prangs. Don't you believe it! We know of hard $\frac{1}{8}$ in. sheet floats, silk-covered, split from end to end by what appeared to be merely kissing the water. Wing panels suffer if the tip digs in, usually at the dihedral joint; this is the most common form of damage experienced.

Retrieving can present peculiar problems if flying is taking place on or near a large body of water. A normal flight on land may entail a walk of six or seven hundred yards, a distance which must be swum, rowed or motor-boated on water. The last is favourite, since both the others involve far more time and exertion than one flight deserves. When, as sometimes happens, a model tips on alighting, speed in recovery means less drying out.

Diesels are, of course, the ideal motors for water-flying. A little damp will put a spark motor out of action, and glow-plug engines require considerably more drying than diesels. Corrosion, even in salt water, is not a serious problem if the motor is wiped clean and oiled after a day's flying. Quickly removable cowlings are advantageous in the event of a ducking; treatment consists of emptying the tank and blowing off and out all visible moisture, followed by refuelling, priming, and flicking until the motor runs again.

To be continued



Water-flying is so much cooler than other forms. Otto Saffek of Czechoslovakia winds his conventional rubber model in an unconventional place.

RADIO CONTROL NOTES By Howard Boys

A SPECIAL EASY TO FOLLOW ARTICLE FOR THE BEGINNER

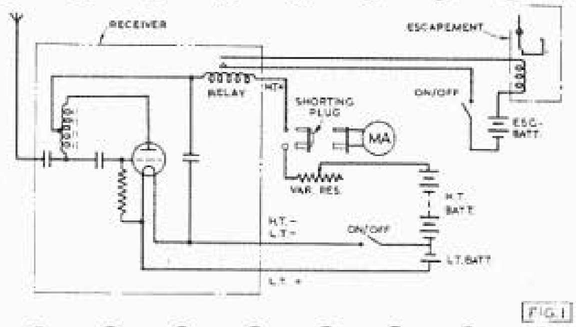


FIG. 1

IT seems time to give the beginners another break, so let us deal with the installation of the equipment in a model.

Fig. 1 is a diagram of the wiring up, and Fig. 2 is a photo of the same thing in actual bits and pieces. The receiver in the diagram is shown so that an intelligent beginner can see the whole set up, and it is not intended to be used for constructing a receiver, so please do not write in asking for more details of this receiver. We must assume that the receiver exists, either home made, or a commercial set. If commercial it will probably have a diagram that should be followed so that batteries are connected up correctly. There are different types of receiver and escapements and actuators, but they are not very popular at present.

The receiver has to be fed with high tension and low tension electricity, and this is obtained from batteries. The high tension is usually 45 volts or more, and hearing-aid batteries will supply this. Low tension will usually be 1½ volts and flashlamp batteries will do. We need some sort of on-off switch and a convenient means of measuring the H.T. current flowing as a check on the working. A polarised two pin plug and socket is as good as anything for this with a 0–5 ma. meter. A polarised plug is one that will only go one way round sot hat when connected to the meter correctly in the first place it will always plug in the right way round so that the positive pole of the meter goes to the positive pole of the battery. With some receivers a variable resistance is needed in the H.T. lead so that this can come between the socket and the H.T. battery. Two receivers not needing this resistance are the Ivy and the Aeromodeller hard valve, though there would be no harm in putting them in, and in fact some people like this extra control. This resistance is usually 5,000 ohms but some receiver circuits call for a higher value.

The receiver may have wires already attached, or it may have terminals to which wires must be soldered. Whichever it is, wires are run as shown,

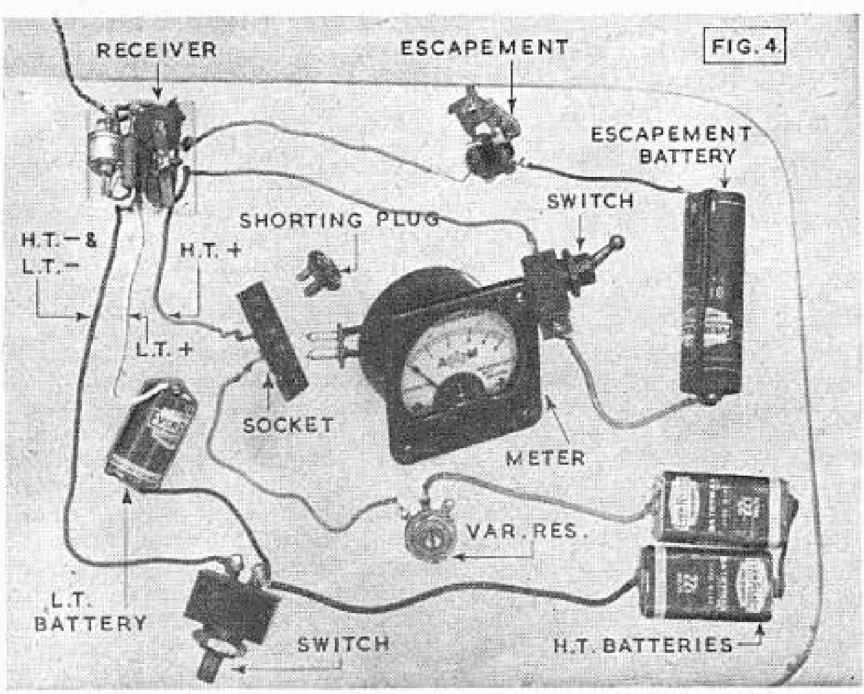


FIG. 4.

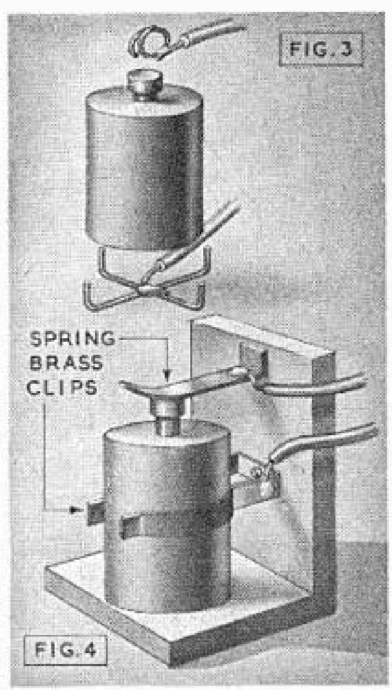


FIG. 3

FIG. 4

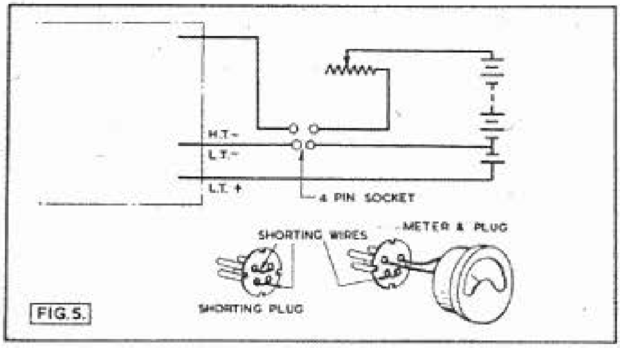


FIG. 5.

the H.T.+ to the socket, then variable resistance and to H.T. battery positive. L.T.+ wire to L.T. battery positive. L.T.— and H.T.— which are usually one but may be two wires, go to the on-off switch, and then to the negatives, of the two batteries.

The wire used should be plastic covered flex, preferably of different colours for easy identification. The following colours are suggested. Red for H.T. positive, yellow L.T. positive, and black for the common negative. Two other colours such as blue and white can be used for the escapement circuit with blue for negative.

The actual method of connecting to the batteries is a matter of personal choice. Many people like to solder short pieces of wire to the L.T. battery, making a twisted but not soldered joint to the main wires so that the battery can be changed easily. The scheme used by the writer is shown in Fig. 3 and the photo. A ring with a bridge piece is made from 20 s.w.g. copper to fit loosely on the battery cap, and is soldered to the positive wire. A cross with the ends turned up is soldered to the negative wire and fits the bottom of the battery. These are then held on with rubber bands. This enables a battery straight from the shop to be used without soldering. Another scheme is shown in Fig. 4 in which clips are used, but note that the paper round the cell must be removed. By the way, strictly speaking, a battery consists of two or more cells, and with the batteries we use the voltage of one cell is 1½. The size of the cell governs the capacity, or lasting power, but makes no difference to the voltage. Connections to the H.T. battery can be soldered to the little brass end caps of the smaller sizes. Thes caps can be slid off the battery for replacement. This is a tip that was sent in by a reader some time ago, but was unfortunately blue pencilled by the Editor due to shortage of space at the time. These small hearing-aid H.T. batteries can be obtained in various voltages, 15, 22½ and 30, and larger types in 45 and 67½. To get the necessary voltage with the small ones will mean connecting two or more in series, that is positive of one to negative of the next and so on. This can safely be tried by those interested with a No. 8 battery. The bottom cell has its brass cap or positive end in contact with the bottom or negative end of the top cell. If it is removed and turned round the other way so that a brass cap sticks out of each end, the voltage of the two cells will be going against each other and balance out so that no current will flow to light a bulb.

To refer to the meter again, the type that measures up to 5 milliamps is suitable, and it is connected to its plug so that the terminal marked + will be connected to the + on the H.T. battery. The socket is placed in a convenient position on the model so that the meter can be plugged in with everything built up. For flying the meter is removed and a shorting plug, that is one with a piece of wire soldered across the two pins, put in the socket. This plug should be attached to the model with a short piece of string so that it will always be handy. It is a good idea to leave this unplugged when the model is not in use, just for safety. The writer normally uses a four pin plug with two of the pins in the H.T.+ lead, and the other two in the common negative lead, and then no on-off switch is required, see Fig. 5. Of course the plug on the meter has to be the same type as that used for shorting.

For escapement operation the battery will usually be 3 or 4½ volts. If two cells are used in one tube such as a No. 8 they should be held firmly together by means of a rubber band, or a piece of wire should be soldered from one to the other to connect them in series. In the usual equipment it does not matter which way round the escapement and battery are connected, but if a

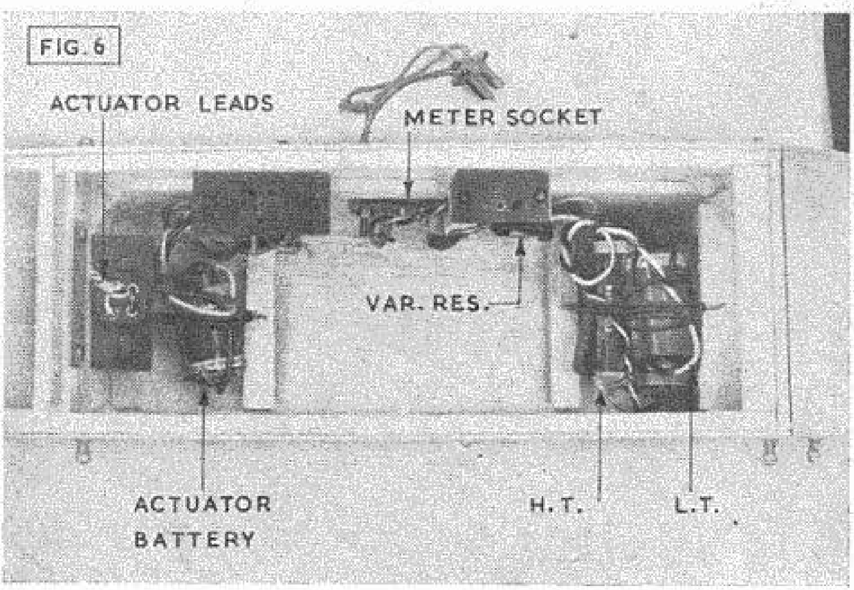
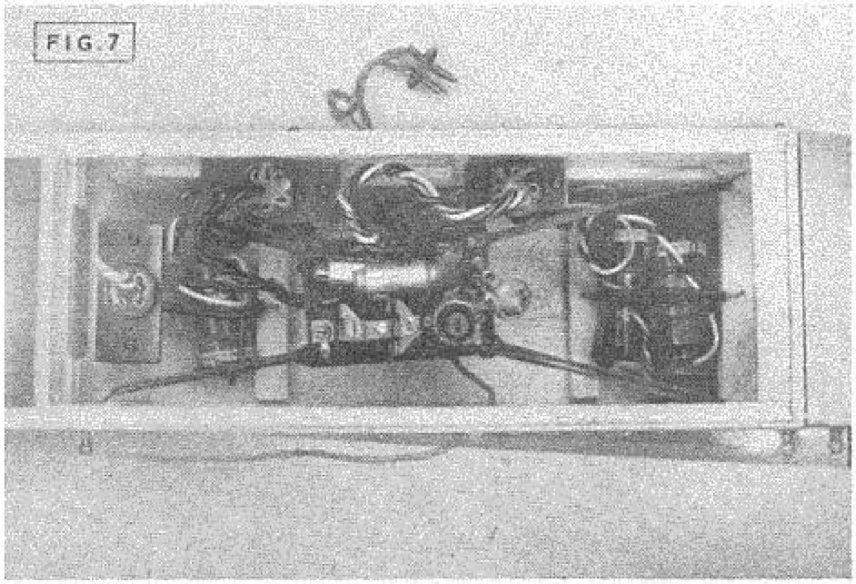
FIG. 6


diagram is given, this should be followed.

All the parts shown in Fig. 1 except the meter, are mounted in the model. The best place for the receiver is as near to the C.G. as possible and it should be slung on fairly tight rubber bands to protect it from vibration and landing shocks. Sponge rubber packed round is a further help. The receiver can be mounted on sponge rubber, but this is not usually so easy. The batteries are best in the bottom of the fuselage, just behind the bulkhead in the nose, but they can be moved about to adjust the C.G. of the complete model. If further back they should be well fixed down as in a heavy landing everything a bit loose will be jerked forward.

FIG. 7



Escapements are usually put well back towards the tail, with an extension shaft and crank to operate the rudder, and a rubber band running forward to an anchorage near the receiver. The actual position and arrangement of this will depend on the model used, and if a good radio model design is chosen, particulars of this will be given.

Models recommended are Queen Bee, A.P.S. 3/- for the very first model (1 c.c. engine) or Sparky, A.P.S. 4/- for advanced flying (1½ c.c. engine.)

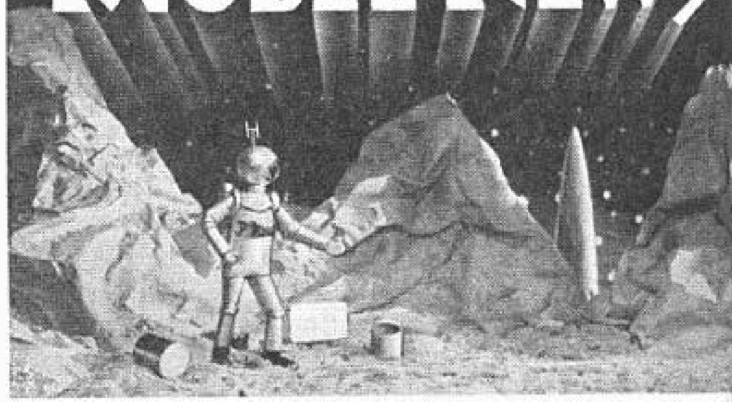
The position of the aerial is not usually important, but the length is critical with some receivers, and this will be stated with the receiver instructions. The aerial can be poked through the side or top of the fuselage and left trailing or fixed to the fin which is neater, and likely to avoid trouble.

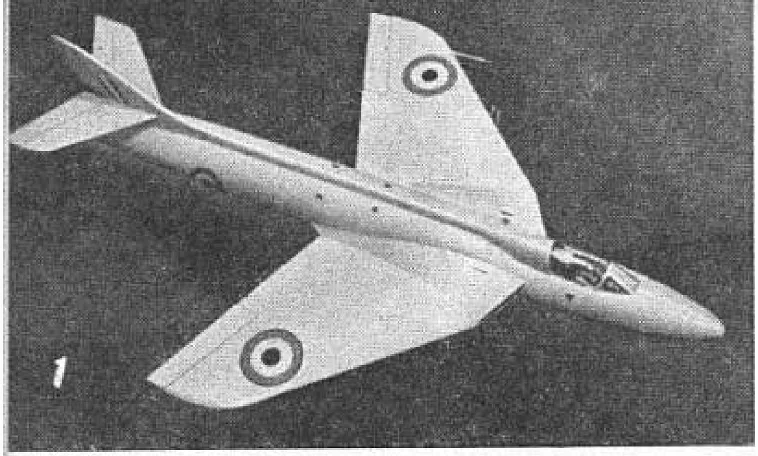
Everything should now be ready for testing the radio, but first have another good look at the wiring to make sure all is correct. Plug in the meter and switch on the radio. The current should rise to a value according to the receiver used. With an XFG1 valve this current should be set to about 1½ milliamps by means of the variable resistance. If the transmitter is now switched on and the button pressed, the current should fall. The receiver is tuned to give the greatest fall with either a tuning condenser or dust iron core of the tuning coil. Final tuning must be carried out on the flying field with the transmitter and receiver three or four hundred yards apart, and the actuator circuit also switched on. With the receiver working, the relay can be checked to see that it operates every time the transmitter button is pressed. It should be adjusted to operate half way between top and bottom currents as measured at normal maximum range. For reliability there should be at least ·75 ma. difference between top and bottom, though there are relays that will safely work reliably on less. In some receivers the current change gets less as the range is increased and in this case the working range will depend on how closely the relay is adjusted. The Ivy behaves like this but is so sensitive that for normal flying this falling off can be ignored with a good transmitter. In fact one of these receivers tested by the writer with his own transmitter was still giving full close up current change at half a mile from the transmitter. For those who are sure to want to know, the writers' transmitter is just about up to full power allowed. The Aeromodeller No. 1 transmitter should give about the same with 135 volts H.T.

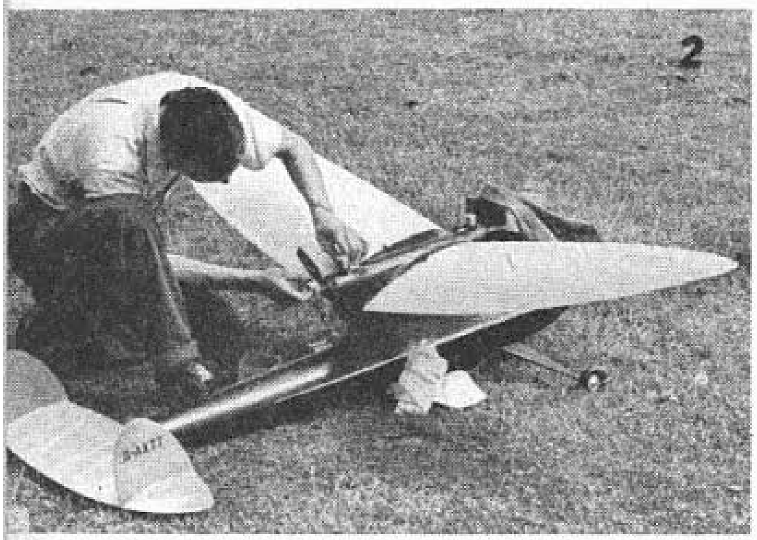
As an example of a wiring layout for a model, Fig. 6 shows this without the receiver for clarity. The receiver is arranged to plug into this with the two 3-pin sockets, one for the battery leads and the other for the actuator, three wires being needed for the particular scheme used. Fig. 7 shows the receiver in place.

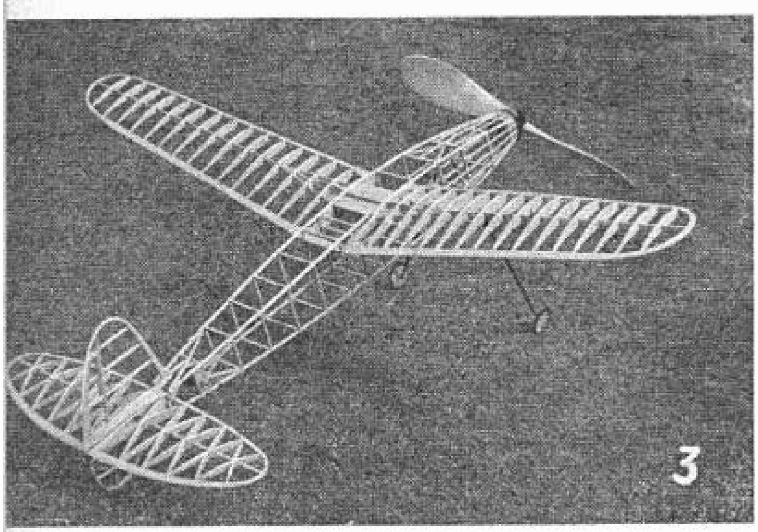
It might be as well to give a few hints on the various batteries available. For L.T. there is the U8 which is half a No. 8, the U11, and U2 for larger models. The weights are approximately ½, 1½ and 3½ ounces. There are others, but these are the most useful. For H.T. the most popular is the B122 of 22½ volts and weighing 1⅓ ounces, the B123 of 30 volts and 1⅝ ounces and the B121 of 15 volts and 1 ounce. There is also a B110 of 22½ volts, weighing 3 ounces, which is more economical if you can stand the weight. If you want extra light weight at more expense there is the B145 for 22½ volts weighing ⅝ ounce.

MODEL NEWS









THAT Rocket article of ours in the Christmas issue appears to have stirred D. R. Hughes into activity in his photographic studio. Note the novel model rocket scene which we have used as our heading this month and which Mr. Hughes informs us, shows Fliar Phil marooned somewhere on the moon!

Starting the rounds this month with No. **1**, we have a model "Hawker Hunter" with a distinct difference. This is a control line model, and inside the sleek fuselage is a Juggernaut Jet. Built to the scale of $\frac{3}{4}$ in. = 1 ft. by M. L. Ennis of Ashtead, Surrey, the model was exhibited at the 1952 Model Engineer Exhibition, where it aroused much comment. Reports of flying tests have yet to come; but we can't help thinking that this is one of the most sensible applications of the model pulse jet that we have seen.

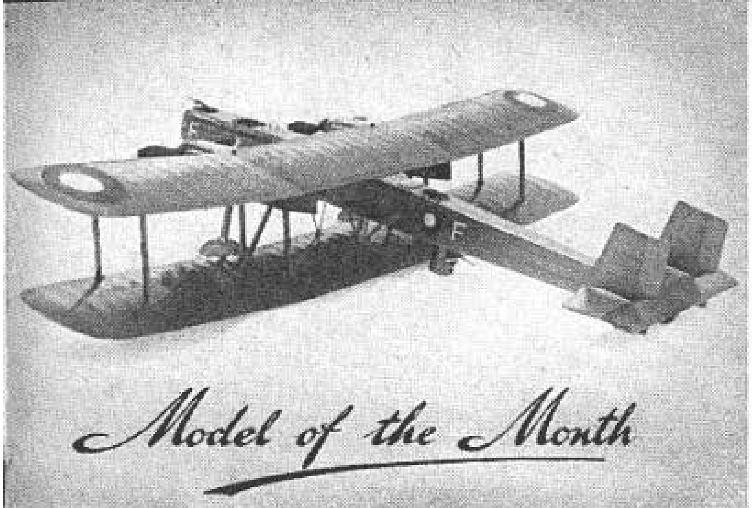
Mr. D. R. Firth and his twin engined "Dragonfly" are featured in No. **2**. Two E.D. Mark II 2 c.c. diesels are arranged push-pull fashion over the wing of this 6 ft. 6 ins. model, which has a total lifting area of over 900 sq. ins. Mr. Firth reports that with tandem layout, no trouble whatsoever can be experienced with unequal engine output and the model is very stable both under power and during the glide.

A familiar shape appears in No. **3**, which many will recognise as a Warring Wakefield. This one was built by reader H. T. Holman from an A.P.S. plan of the "Zombie". Geodetic tailplane is constructed from drawings kindly supplied by the original designer.

An Epsom Downs scene has been caught in No. **4**, where Dennis White is seen with his 5 ft. 7 ins. span De Havilland Tiger Moth. Weighing no less than six pounds, the model is free flight, of course, having pendulum elevator controls and an American "Super Cyclone" 10 c.c. petrol engine.

We gather from photographer D. Hope that this mammoth Tiger was once radio controlled . . . wonder what could have put Mr. White off?

Now we come to the *Model of the Month*, which on this occasion hails from Winchester, where Johnny Ross has constructed a 1/25 scale Handley Page "Heyford" bomber. Perhaps not everyone's idea of the ideal subject for a control line model,



the " Heyford " is one of those multi-part models, having no less than 92 wing ribs and 228 separate pieces of cotton rigging! Two Elfin 1·49 c.c. diesels power the job, the span of which is 42 ins. and weight $2\frac{1}{4}$ lbs., and just to answer the many doubtfuls—yes, it does really fly, and at a speed of 45 m.p.h. For sentimental reasons the model carries the " F " of 57 Bomber Squadron, which we believe was stationed near Winchester.

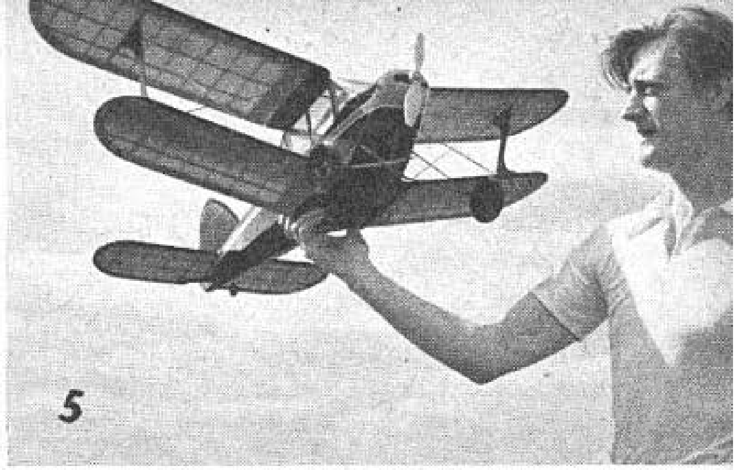
Synchronised cut-outs are arranged so that the two diesels can be stopped together, presumably by means of a third line on the control handle, the tanks being Class A Team Race size to give a reasonable run. Oh! and before we forget . . . the cockpit too, is fully detailed, including a hand-painted dashboard.

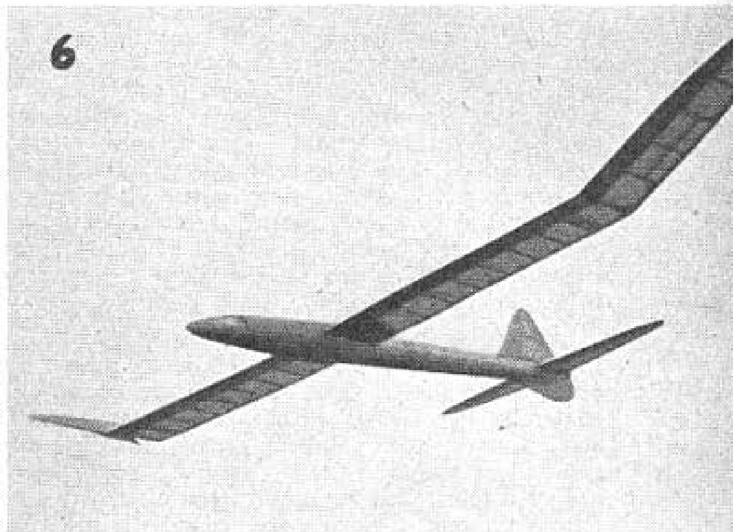
Over at top right in No. **5**, we have an Ed. Stoffel photo showing D. Woolf and his biplane model at London's Fairlop Aerodrome. Ed. reports that any resemblance to a certain high wing cabin monoplane is purely coincidental, and we fancy that he is alluding to the popular A.P.S. Debutante. Anyway, it's a nice looking biplane, Mr. Woolf!

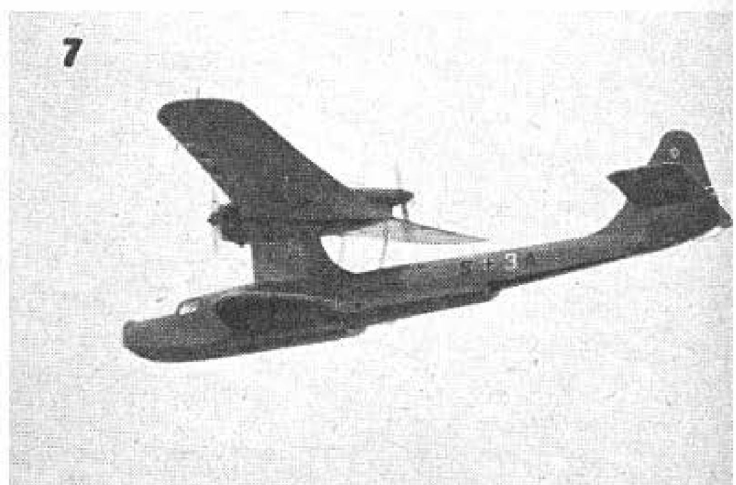
Long and lean is the ten-footer in number **6**, a sailplane entered in the Pilcher contest last season by D. Pope of the Upton Club. High aspect ratio wing and tail have 7·36 sq. foot total area, and complete weight is no less than eighty ounces.

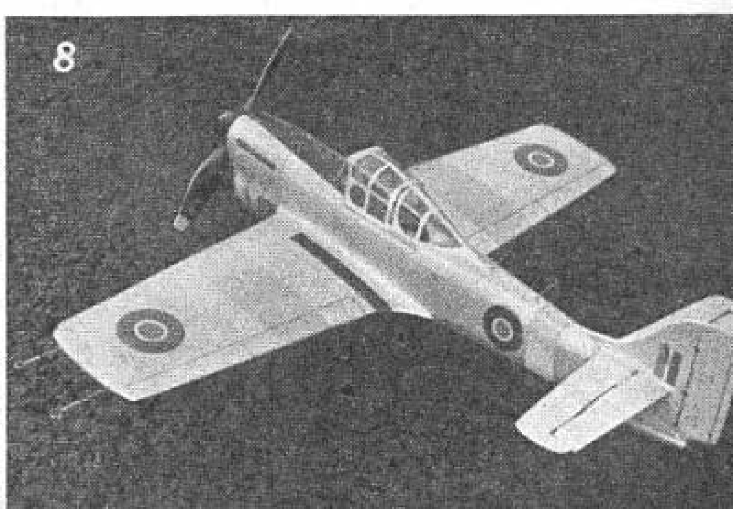
Like the last shot, No. **7** is yet another fine example of Ed. Stoffel's photography. This one is a 33 ins. span Dornier 18, being flown over land at Fairlop. Front engine is a normal tractor Elfin ·5 c.c.; the other prop is a dummy and free-wheel's for realism.

Scale Control Line models seem to be quite the rage this winter, and a very good example of what can be done comes in No. **8**, our last but not least photo of Corporal Savage's Avro " Athena ". This one is actually built to Team Race specifications and is fitted with an Elfin 2·49 c.c. The cabin is fully detailed and includes the two crew members seated side by side. Many readers will know Corporal Savage for his activities as a member of the Croydon Club, and in fact the " Athena " Racer was built and flown whilst Mr. Savage was still in civvy street in the Croydon area.









FEATHERING PROP

BY P. LEREBOURS

AN efficient, fool-proof, free-wheeling featherer which can be made by any modeller, provided that he can solder—is a novelty in itself. When it comes from as isolated a place in the modelling world as Addis Ababa, in Ethiopia, it becomes all the more interesting.

Here is a featherer that is self-contained ; it can be slipped onto any existing shaft and driven by any free-wheeling device. It is no heavier than a normal propeller of the same diameter, and furthermore is cheaper to make, since the balsa blocks for blade carving are of relatively small cross section. The very simplicity of its action is achieved by relying on air pressure to bring the blades to a working position, and the feathering action effected by rubber band tension. Study Figs. 1 and 2 as we run through the general principle and blade action.

Start with the hub ; this is simply a length of brass tube with suitable bore to take the appropriate shaft. Onto this hub are bound and soldered two lengths of pivot wire and a strengthener which will keep the pivots in line and generally strengthen the assembly. Two " stops " are then fabricated for each of the pivot wires by wrapping smaller gauge wire around the pivot, so that they are a reasonably tight fit (at a later stage they are actually soldered in place). Between these " stops ", the blade is free to swing from its working angle to feathered position, while up and down movement is, of course, restricted.

A small groove in the blade leading edge will locate the aluminium tube used for the other half of the hinge, and on the prototype prop, this tube was retained quite satisfactorily by a single layer of that indispensable product, " Sellotape ". All that remains now is to add the rubber band tensioner, which again has been held in place with " Sellotape " on the prototype, but can, as shown in Fig. 5, be sewn in place on the blade, and bound in each case at the other end onto the fixed pivot wire. Stretch this rubber band so that it is in a straight line, and that it retains the blade at feathered position yet allows it to swing to working attitude without undue tension. Ordinary 1/16 square elastic is sufficient for the job.

Apart from a small facing of celluloid to protect the blades from being bruised by the wire stops, you now have the complete unit ready for setting to the correct angles.

It will now be obvious, particularly from study of Fig. 2, that when at rest, or free-wheeling, the

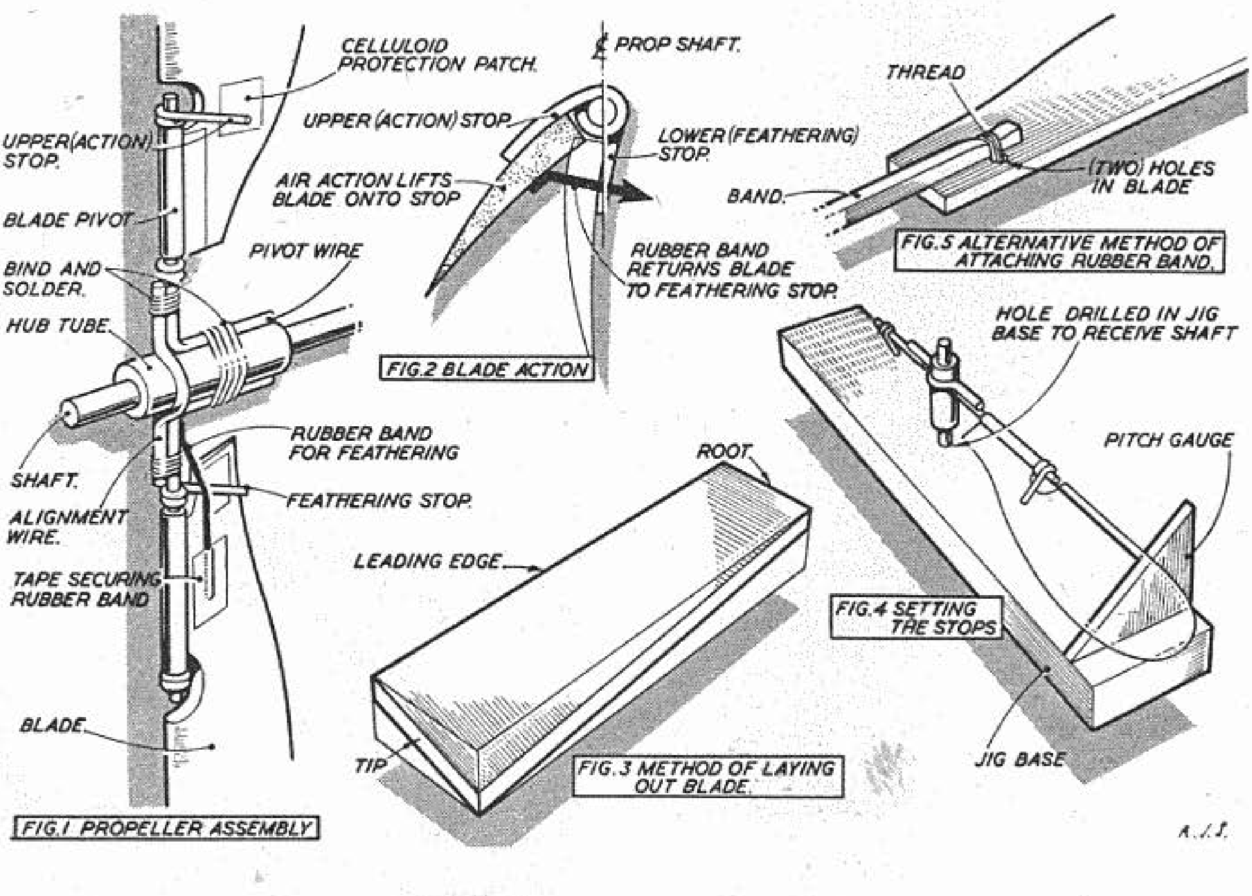


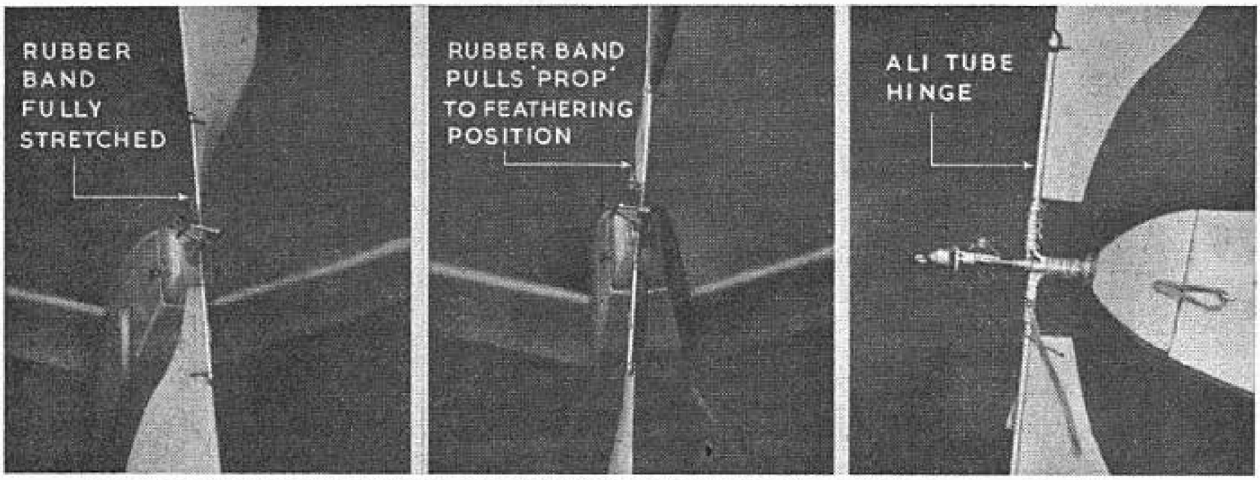
FIG.1 PROPELLER ASSEMBLY

FIG.2 BLADE ACTION

FIG.3 METHOD OF LAYING OUT BLADE

FIG.4 SETTING THE STOPS

FIG.5 ALTERNATIVE METHOD OF ATTACHING RUBBER BAND



***Left:** the blades at 'action stations'. **Centre:** Feathered and free-wheeling. **Right:** side view when feathered.*

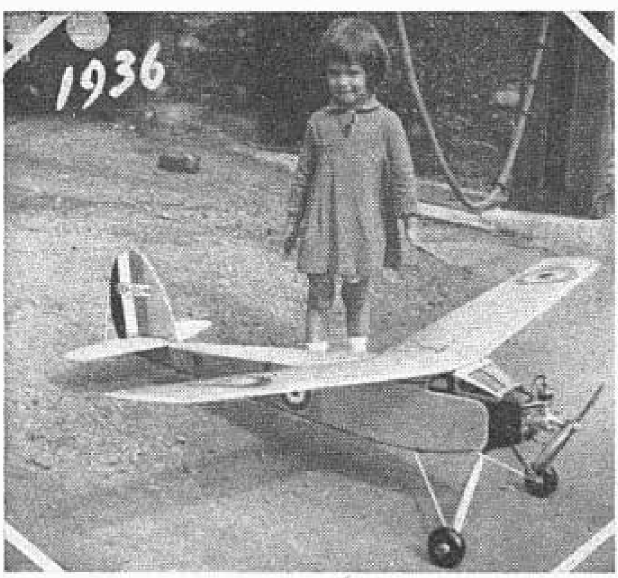
blades are pulled against the lower feathering stops, placed nearest the hub. When the prop is driven by the rubber motor, the position of the blade centre of pressure aft of the hinge causes the blade to pivot until it reaches the upper stop, this being due to the air pressure on the blade.

That the blades actually reach the stop and attain correct pitch when working is easily checked by putting a smear of lipstick on the wire stop, and then observing whether or not this is transferred onto the blade after a full-power motor run.

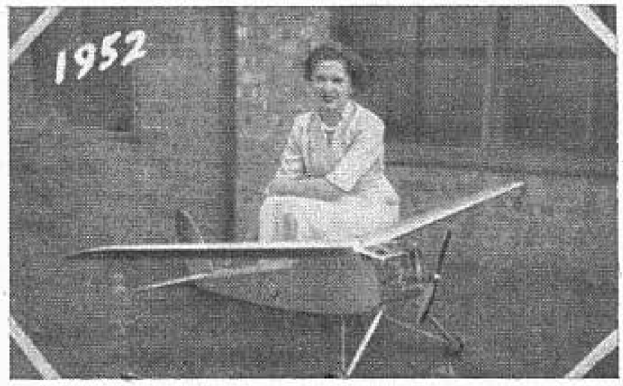
Fig. 3 shows how simple it is to produce the balsa blades. By changing the contour of the blade section from parallel to one edge of the block at the root, to diagonal at the tip, true geometric pitch can be maintained. Then, in Fig. 4, the system for setting the stops is clarified. First assemble the whole unit, with stops in place but not fixed firmly, and no rubber band. Then decide upon the desired pitch angle, and make card templates. Set the blades at correct working pitch by means of the template and push the stop down onto the blade and carefully secure with solder. The lower stops can easily be set by eye when the blades are put to the feathered position, bearing in mind, of course, the axiom that " Featherers must free-wheel " to avoid the unfortunate spiral dive which has so often occurred with fixed featherers using other than perfectly flat blades.

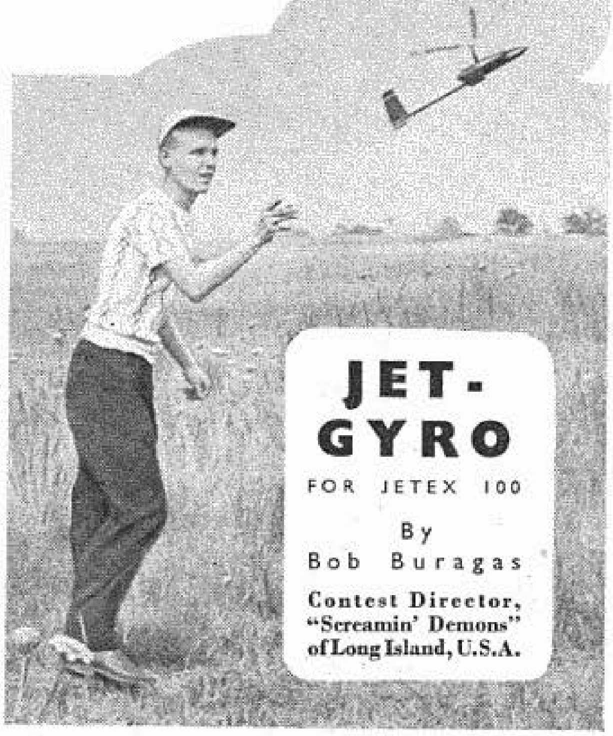
16 YEAR OLD VETERAN POWER MODEL

WHEN we published that picture of Australian Reg Cooper and his 14-year-old model in our issue of last October, we queried whether this was a record for longevity. From F. Rising of Oakham, in Rutland, came photographic proof that he is now operating a petrol driven job he made as long ago as 1935/36, and, moreover, his attractive daughter obliged by posing in both photos, just to prove the point. "Old Faithful", as it is known, was recently retrieved from the loft and refurbished for yet many more years of sport flying.



Even the wheels, 5 c.c. petrol engine and timer were made by Mr. Rising for his own-design 66 ins. power model in 1935/6, modelling was done the hard way then! Recently stripped of its silk covering, fitted with another pair of home-made wheels and sheeted leading edge, 'Old Faithful' now has a second lease of life.





JET-GYRO

FOR JETEX 100

By
Bob Buragas
Contest Director, "Screamin' Demons" of Long Island, U.S.A.

"THE darn thing will never work." This is the challenge which I heard back in November, 1949, during a discussion of model airplane types. And with this began a balsa chopping escapade that led to the first jet powered Autogyro. Success started early in that the first model was flown during December of 1949. It has taken five models, including the mock-up used during the early stages, to build up to the present degree of success.

It had been assumed that the torque free operation of the Jetex would simplify the flight pattern. Early flights showed this to be a fallacy. The gyro vanes develop a tremendous amount of torque and it would be desirable to have powerplant torque as a counteracting agent. In lieu of this, it was necessary to increase the span of one wing panel to account for the lift displacement. Rotor vanes are on piano wire struts which allow them to change coning angle and add to the stability.

Construction

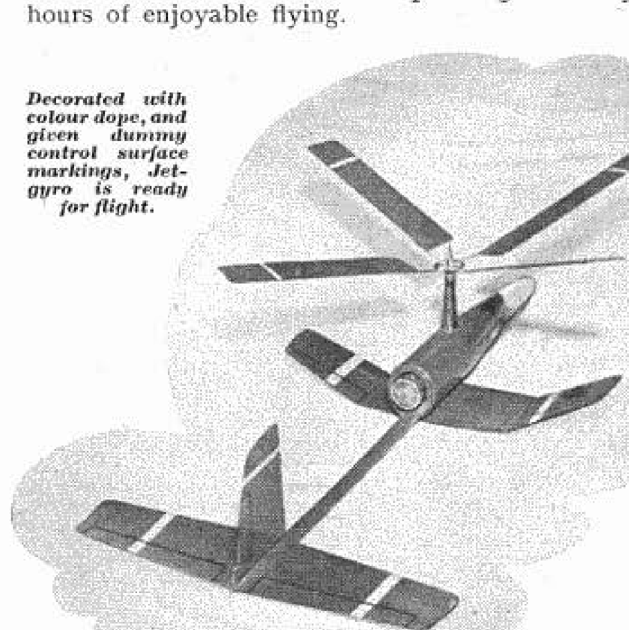
The basic fuselage construction consists of a sheet balsa frame, a pylon and two formers. Note that the motor mounting former, or firewall, is made of $\frac{1}{8}$ plywood and is made to accommodate the motor mounting screw. Mount these parts as shown in the fuselage assembly drawing. Having done this, two soft blocks are added forward of the firewall and then the rear section is planked with $\frac{1}{16} \times \frac{1}{4}$ strip balsa. Minimize weight by thoroughly sanding all of the parts and use light weight stock on the entire superstructure.

Wing and tail panels are cut from soft, quarter-grained sheet. The airfoil is sanded into the wing before it is cut at the dihedral breaks. Note that the tailplane airfoil will be mounted inverted.

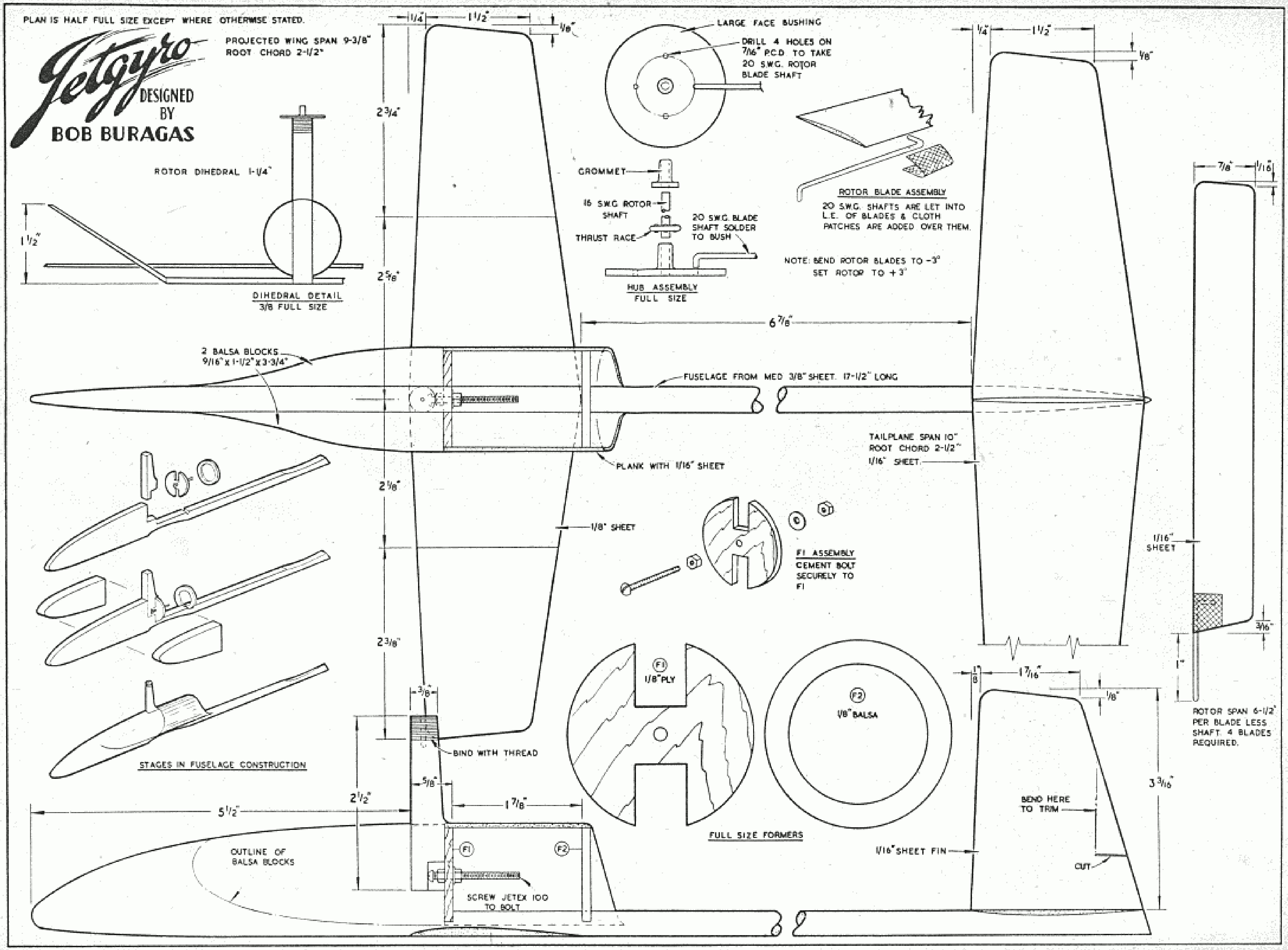
Rotor vanes are cut from $\frac{1}{16}$ sheet stock and are sanded to an airfoil shape. Cloth patches are cemented over the rotor vane struts to reinforce the assembly. A large face bushing was used for the rotor hub but a disc of sheet brass, or other solderable material, may be substituted. Drill four small holes to accommodate the rotor struts and then use a liberal amount of solder to assemble this unit. After assembly add $1\frac{1}{4}$ inches of dihedral to each rotor vane. Use a piano wire shaft and a ball bearing washer to provide free-rotation.

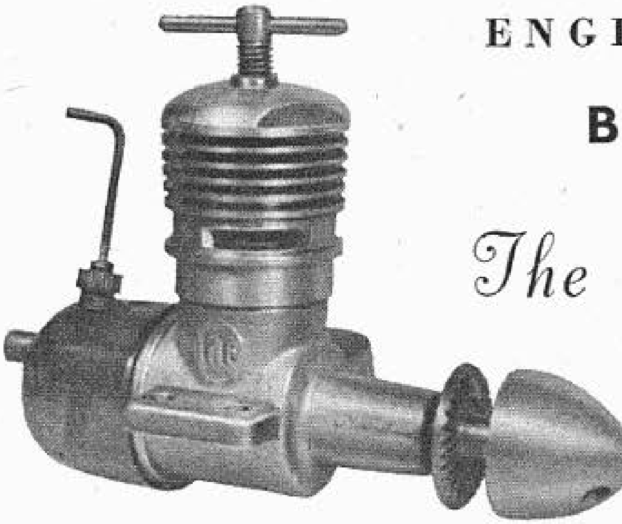
First flight tests should be made during calm weather. It is easier to analyse flight under these conditions. Warp the rudder for a slight right turn and test glide the model over a soft, grassy area. The glide should be a near vertical descent. Trim the balance of the model until this occurs. A stalled condition will appear as a tendency to drift back toward you. Reaching satisfaction on this point you are ready for a power flight. Insert a loaded unit and light the fuse. After letting the thrust build up, start running slowly holding the nose of the model up at a slight angle. This is done to get the vanes rotating. Release the model—do not throw it. With proper trim the model will bank rather tightly and spiral up in a right hand climb. If the model tends to " gallop ", or stall, under power it will be necessary to add weight to the nose. Do not add more turn than is necessary to produce a right climbing turn. At the end of a power run the model will go into a gyro descent with a slight forward glide. Maximum duration occurs when the model is gliding in a near vertical descent. The rotors will whip up to a very high speed in a short space and the descent will be slow.

The rotor blades are set at minus three degrees and are mounted on the pylon at an angle of plus three degrees. If the rotor vanes should stop during flight the model will continue flying. The use of four rotor blades had made this possible. In this condition the flight is very poor but very safe. Every effort has been made to develop a safe, successful model that will be operating for many hours of enjoyable flying.



Decorated with colour dope, and given dummy control surface markings, Jet-gyro is ready for flight.


PLAN IS HALF FULL SIZE EXCEPT WHERE OTHERWISE STATED.
Jetgyro
DESIGNED BY
BOB BURAGAS
PROJECTED WING SPAN 9-3/8"
ROOT CHORD 2-1/2"
ROTOR DIHEDRAL 1-1/4"
DIHEDRAL DETAIL
3/8 FULL SIZE
LARGE FACE BUSHING
DRILL 4 HOLES ON 7/16" P.C.D TO TAKE 20 S.W.G. ROTOR BLADE SHAFT
GROMMET
16 S.W.G ROTOR SHAFT
THRUST RACE
20 S.W.G. BLADE SHAFT SOLDER TO BUSH
HUB ASSEMBLY
FULL SIZE
ROTOR BLADE ASSEMBLY
20 S.W.G. SHAFTS ARE LET INTO L.E. OF BLADES & CLOTH PATCHES ARE ADDED OVER THEM.
NOTE: BEND ROTOR BLADES TO -3° SET ROTOR TO +3°
2 BALSA BLOCKS
9/16" x 1-1/2" x 3-3/4"
FUSELAGE FROM MED 3/8" SHEET. 17-1/2" LONG
PLANK WITH 1/16" SHEET
1/8" SHEET
TAILPLANE SPAN 10"
ROOT CHORD 2-1/2"
1/16" SHEET.
F1 ASSEMBLY
CEMENT BOLT SECURELY TO F1
1/16" SHEET
ROTOR SPAN 6-1/2" PER BLADE LESS SHAFT. 4 BLADES REQUIRED.
STAGES IN FUSELAGE CONSTRUCTION
BIND WITH THREAD
F1
1/8" PLY
F2
1/8" BALSA
FULL SIZE FORMERS
OUTLINE OF BALSA BLOCKS
SCREW JETEX 100 TO BOLT
BEND HERE TO TRIM
1/16" SHEET FIN
CUT
6 7/8"
5 1/2"
3 3/16"



ENGINE ANALYSIS No. 7

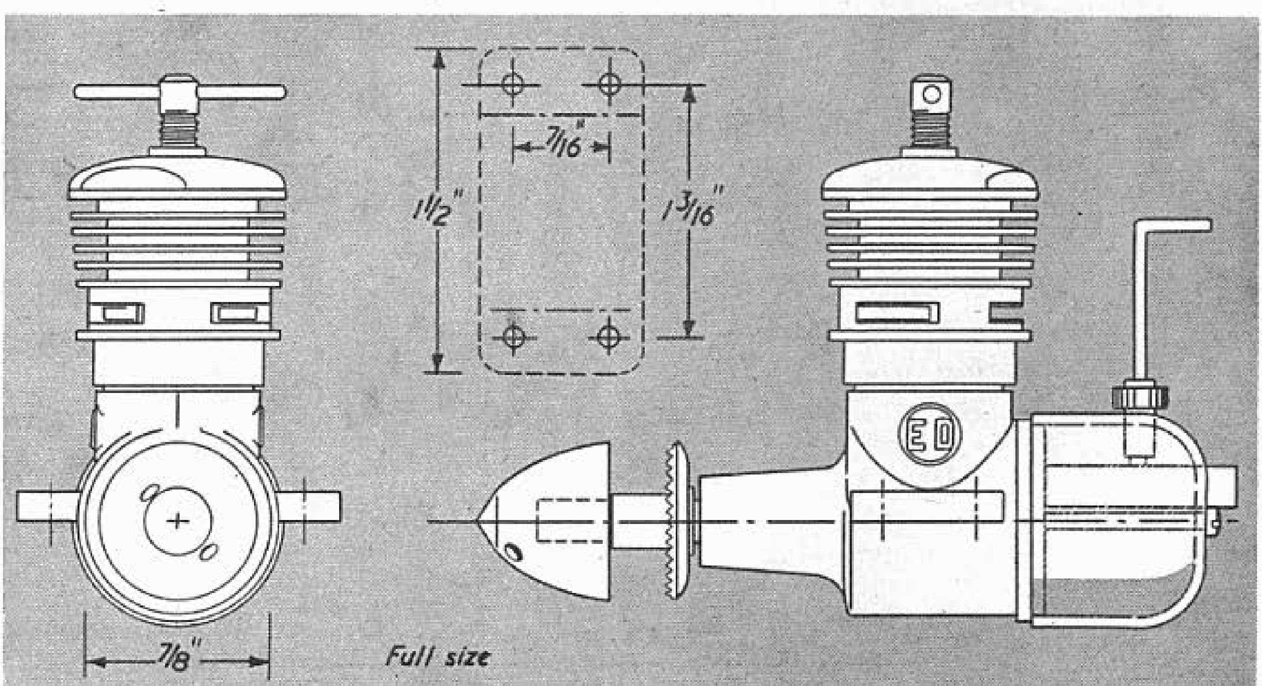
By Ron Warring

The E.D. 1·46

ANY power model enthusiast with three pound notes to spend and the wish to invest his money wisely would be hard put to find a better choice than this latest addition to the range of motors produced by Electronic Developments (Surrey) Ltd., known, of course, throughout the aeromodelling world as " E.D. " Bordering on the unpretentious in appearance, the E.D. 1·46 is a tough, rugged workhorse of an engine—and powerful. It turns a small-diameter high-pitch propeller at almost alarming speeds, yet is just as happy puttering around with a twelve-inch diameter " fan ". Because of its flexibility and consistency it proved to be one of the easiest engines yet handled in this new series of tests.

In appearance the E.D. 1·46 bears a distinct family resemblance to the familiar " Bee ", and retains such features of its smaller forerunner as integral fuel tank mounted around the induction pipe. For those who like their motors " complete", as it were, this is an important feature. No tank to buy or make and fit separately. The whole power plant, " ready to run ", bolts in place on its bearers.

The rear-mounted tank with (rear) crankcase induction has its disadvantages as well, however. You do get the needle valve control well away from the propeller disc, but a fuel cut-out for stopping the motor is not easy to arrange. For accurate timing, in fact, it is probably best to remove the fitted tank and use a small graduated tank connected to the fuel pipe, or a separate tank with cut-out control. If you want to fit a motor shut-off and use the integral tank, then about the most satisfactory type is a pad or flap which closes on the end of the induction tube and chokes the motor. This is quite effective and generally results in the motor stopping in one to three



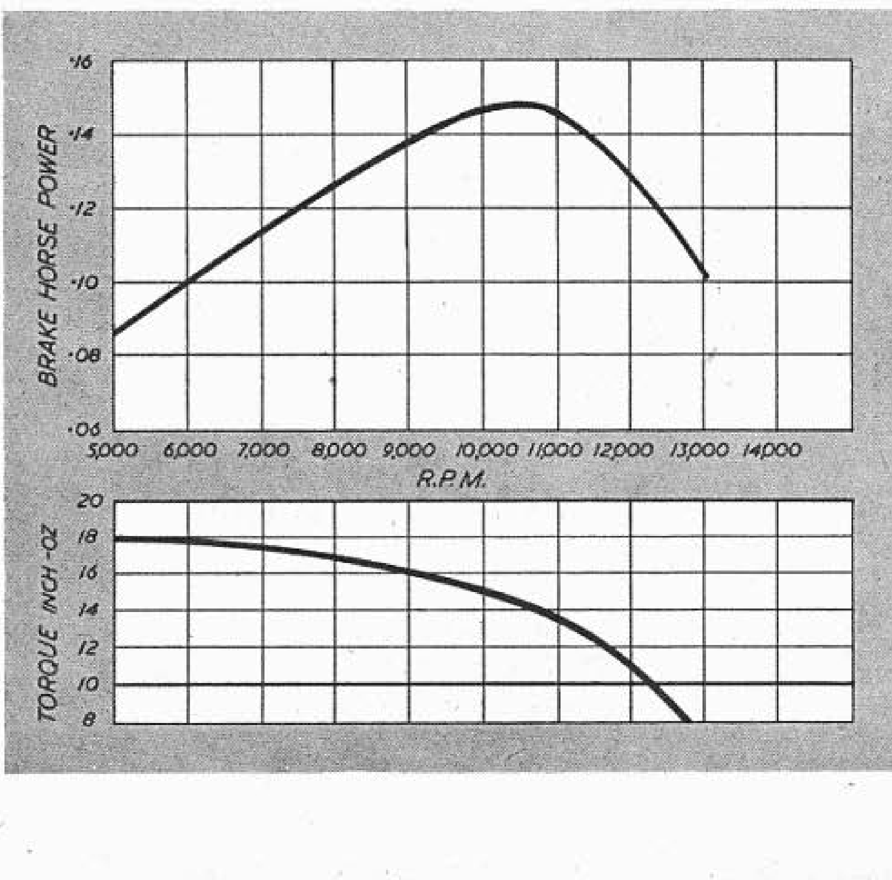
seconds, depending on the size of propeller and r.p.m. Incidentally, such a "choke stop" must be a tight fit. The motor will continue to run if only partially choked. It might also be worthwhile to mention that the engine will run quite satisfactorily with the end of the induction tube only 1/16 in. from a solid bulkhead.

Actually, unless you are fitting a "choke stop" you do not need access to the end of the induction tube. Starting is difficult if you rely on finger choking. The only way to ensure positive starting on test was by priming through the exhaust ports. These are small and priming is not too easy with a standard "Valvespout", so a priming can or syringe with a narrower spout would be a wise addition to the tool kit. Then you can insert the charge of fuel right inside the cylinder without squirting more than half of it all over the outside of the engine.

Running positions found by trial and error without reference to the manufacturer's instructions were 2¼ turns open on the needle valve and compression about ¼ turn more than subsequent reference to the "test card" showed had been used in the factory check out. Starting with a cylinder prime, compression was slackened off about ¼ turn when the engine usually fired in three or four flicks and ran. An increase in compression then smoothed out the running into a steady r.p.m. figure. As speeds were pushed up, more and more compression had to be used to check "missing", and best speeds were then achieved by closing the needle valve slightly. For best running at speeds in excess of 10,000 r.p.m., compression was one half turn more than the setting for smooth running at around 7,000 r.p.m.

When starting, the E.D. 1·46 does not appear to like too much fuel. This clears itself if you go on flicking, but delays the actual starting. Provided the compression setting is within one half a turn of the best running position, however, once the engine has started to run in bursts it will continue in this manner almost indefinitely. In other words, you seem to have all the time in the world to make the necessary compression adjustment without fear of the engine stopping in the meantime. The needle valve can be left strictly alone, if you prefer, once you have found the optimum setting. In any case the engine is quite flexible in this respect. Two turns more open and the engine still ran; closed half a turn it took an appreciable time to starve out. Both controls, too, were found easy to handle and smooth in operation.

Strangely enough, our first impressions of the E.D. 1·46 were not all that favourable. We relied on finger choking for starting for the first few runs and finger choking for stopping. This seemed quite easy, once we had found the correct control settings. Leave both controls where they were, finger choke for three or four turns, and in three or four flicks it was running again. But when we came to repeat the process in an air temperature which was not many degrees above freezing point, the "1·46" just would not behave. We got it going each time after a lot of flicking—and generally found it stopping again within fifteen or twenty seconds.



E.D. 1·46

Displacement: 1·45 c.c. (·0555 cu. in.).

Bore: ·531 in.

Stroke: ·40 in.

Bore: Stroke ratio: 1·33.

Bare Weight: 3½ ounces.

Mounting: beam, $\frac{7}{16}$ in. × 1 $\frac{3}{16}$ in.

Material Specification

Crankcase: aluminium alloy.

Crankcase bearing: Plain.

Cylinder: Hardened Steel.

Cylinder casing (integral head): Dural.

Piston: Cast Iron.

Contra-piston: Steel.

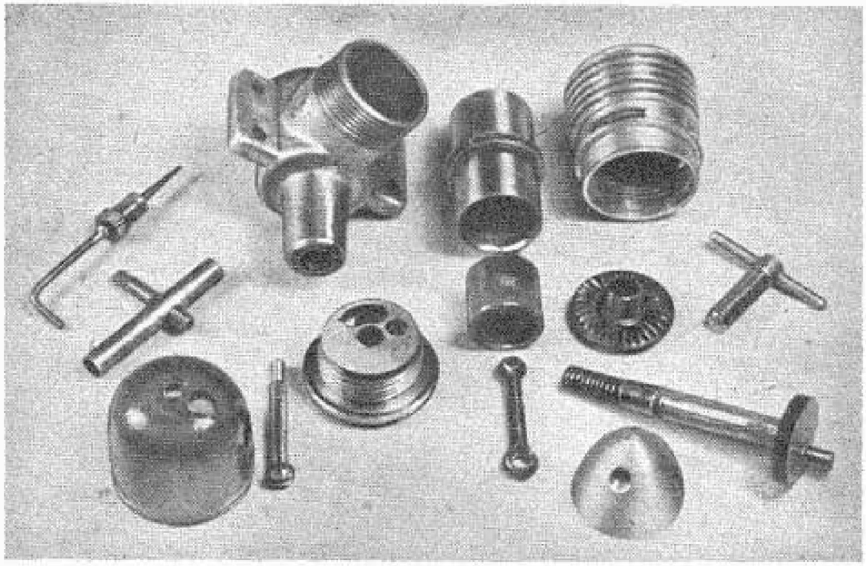
Connecting rod: Hardened Steel.

Manufacturers

Electronic Developments (Surrey) Ltd., 18 Villiers Road, Kingston-on-Thames

Retail price: £3. 0s. 0d. (including purchase tax).

Propeller Dia.	Pitch	R.P.M.
10 ×	6	5,400
10 ×	4	6,600
9 ×	6	6,200
9 ×	5	6,450
9 ×	4	6,900
9 ×	3	8,200
8 ×	6	6,600
8 ×	5	8,100
8 ×	4	9,400
8 ×	3	9,700
8 ×	2	10,450
7 ×	7	8,000
7 ×	6	8,400
7 ×	5	10,350
6 ×	5	11,300
6 ×	3	12,900



Layout emphasises minimum of working parts. The hardened steel cylinder is a loose fit in the "Bee" type crankcase, and is retained in position by the Dural cylinder head. Note disc valve which is mounted on backplate.

Hand starting is not all that pleasant in winter weather, so we put on a large enough prop. to hold the revs. down to about 7,000 maximum, got the motor going with the needle valve open one turn more than running setting—and then fed fuel to the tank continuously as it was used up and kept the engine going for thirty-five minutes non-stop. After that we had no more running troubles, and consistent starting once we had decided that priming through the cylinder was best. All through the remainder of the running-in period—about another twenty runs, each on a full tank—every run was a model of consistency, even when smaller props were used for higher speed runs towards the end.

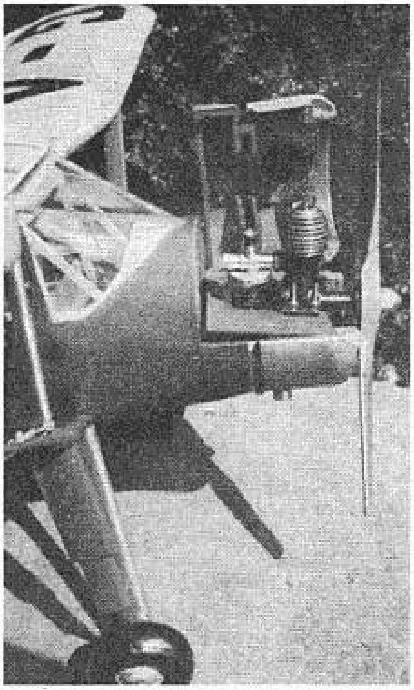
To get the best out of the E.D. 1·46 a minimum running-in period of about three-quarters of an hour would seem to be indicated. If any sign of stiffness then remains, give a number of further runs until the piston-cylinder friction feels "silky" as the propeller is turned over. Then you can expect—and will get—consistent performance.

Finger starting was employed throughout the whole series of tests with no particular difficulties arising. Prime, slacken off compression, flick until the motor fired and started to run, then adjust compression again for maximum revs. Changing from prop to prop, slight re-adjustment of the needle valve gave just that little extra. If the motor "went hard" or fired roughly and stopped, further slackening off of compression, a quick flick, and away you were again. Even the smaller propellers did not "kick" in starting, like they do on so many powerful engines. In other words, the E.D. 1·46 does not burst into life so rapidly as a racing engine and is consequently just that bit easier to handle. As to performance, the power curve and propeller speed figures will show that this is not lacking.

Bad points? Well, a lot of the fuel does escape through the filler hole in the tank. There is quite a bit of vibration when running and probably not more than two thirds of the contents of a full tank does eventually find its way into the engine. The other point—one really a matter of preference—a plain nut is perhaps more satisfactory that a spinner-shaped nut. The milling on the propeller backplate is, however, worthy of praise. It is standard practice to cut some form of "grip" into this surface. That on the "1·46" appears to be about the best yet. A small point, perhaps, but a useful one.

This engine has real power throughout the whole useful range of speeds. There is a rapid and appreciable falling off in torque beyond about 10,000 r.p.m., but it was quite remarkable to find the ease with which it swung high-pitch propellers—a point which should particularly interest control line fans. Used as a sports engine for free flight, we would recommend an operating speed of about 8–9,000 r.p.m. Probably an 8 in. × 5 in. plastic propeller would give just about this. No plastic props. were tried on test, only the family of wooden propellers which are somewhat "faster" than their plastic counterparts (*i.e.*, same diameter and pitch). For duration work, a static r.p.m. figure of 9,000 r.p.m. plus would probably give best results—say a 3-in. pitch and 8- or 9-in. diameter. A low pitch is generally best for power duration flying. Decide on a suitable pitch and then "control" the speed by trimming the diameter, as necessary.

Possibly the test engine was a "good" one in the sense that in a production line, however close the tolerances held and however good the inspection, there is an inevitable variation in the performance of the resulting individual products. It was, however, a standard production model with, as it proved, a most excellent performance rating—bearing out the performance claimed for it by the manufacturers.



Fairchild Argus

POWER CONVERSION

By H. G. Moore and J. Bridgewood

THE late Eddie Riding's very accurate scale model of the Fairchild Argus has been a popular item in the Aeromodeller Plans Service since its introduction in October 1947, for this rather hump-backed cabin design has ideal proportions for satisfactory duration flight. As a rubber model, we have even heard of one fly-away (who would think of fitting a dethermaliser !) so we were not altogether surprised to learn that scale enthusiast J. Bridgewood of Doncaster made a two-minute flight from a 15 sec. power run with his converted version. He uses a Mills ·75 on beam mounts, with 3° downthrust and 1° left thrust ; but hastens to assure us that any of the ·5 c.c. diesels will give ample power output for this 1 in. to 1 ft. scale model. (*Seen at top right.*)

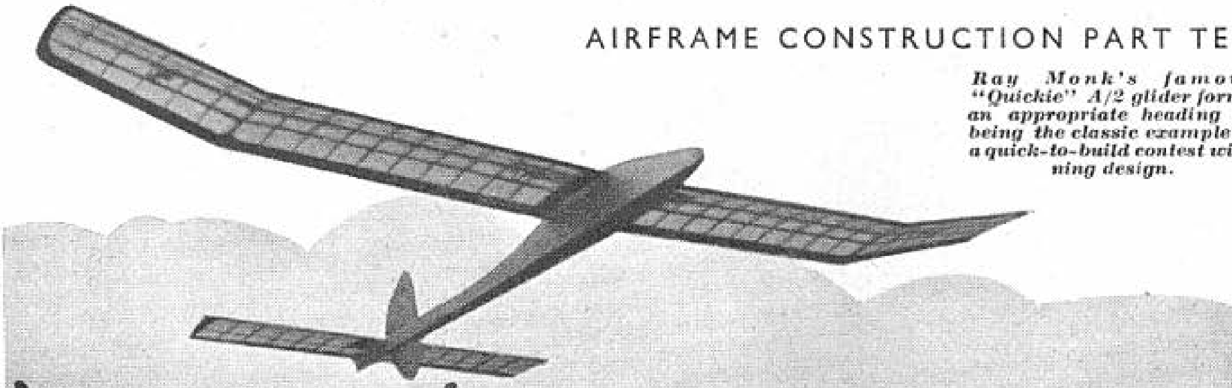
H. G. Moore of Bognor Regis is another modeller who has successfully converted the design, and he sends us details which are well illustrated with a close-up photograph (*top left*). For those who have the plan, or are wanting to build the model from the full-size drawings available with printed illustrated instruction sheet for 3/- post free from the Aeromodeller Plans Service, we give his modifications as follows.

Make up the cowling from the same materials as for the normal rubber version, but finish the basic fuselage frame at F.4 which is now a solid bulkhead. F.1 and 2 are cut in two halves with a horizontal dividing line, and the open square for rubber clearance is not cut-out. F.3 is cut " solid " and a duplicate of its top half is cut to back the detachable half of the cowl. Before assembling the cowl, cut each of the lower halves of F. 1, 2, and 3, $\frac{3}{16}$ in. below the centre line, to allow for the engine platform. Then tack the bulkhead halves together (with $\frac{3}{16}$ in. spacers in 1, 2, and 3) and assemble with a stringer let into each side, on the front of the fuselage at F.4. Wrap $\frac{3}{32}$ sheet around the nose cowl, add the nose ring and $\frac{1}{32}$ sheeting aft of F.4, then cut away along the centre line and on the front face of F.4. The detached top cowl will be as seen in the photo. Insides of F.1, 2, and 3, will have to be cut away for engine clearance, and a hard $\frac{1}{8}$ in. balsa platform let in on top of the lower cowl. This will leave the cowl sides and nose ring $\frac{1}{16}$ proud of the platform, and another sheet, of $\frac{1}{16}$ ply, should be cut to fit this area very accurately. Both the ply and $\frac{1}{8}$ in. balsa are cut to suit the crankcase, and drilled to take the mounting bolts. When drilling these holes and mounting the engine, Mr. Moore advises that as much right sidethrust as the cowl will tolerate should be " built-in ", although it is as well to remember that the other converted model mentioned earlier, was satisfactory with left thrust.

The rear of the ply platform can be packed up for downthrust, $\frac{1}{8}$ in. being required, but it should be noted that this will bring the engine mounting out of its true location, and too much downthrust can make the mounting a loose and undesirable fit. Normally the engine is held in place by sandwiching between the cowl halves, held there by stout rubber bands around the cowling groove. For extra safety, we would peg the ply platform on to the $\frac{1}{8}$ in. balsa, or screw it in place.

All right? Now if you have an engine of the ·5 to ·87 c.c. class, especially one of the newer type point-fives, these modification instructions will help you build a job that is accurate beyond dispute, and as we have already emphasised, is capable of some really pretty flying. Wingspan is 37 inches.

AIRFRAME CONSTRUCTION PART TEN



Ray Monk's famous "Quickie" A/2 glider forms an appropriate heading as being the classic example of a quick-to-build contest winning design.

'QUICKIE' CONSTRUCTION

ONE of the golden rules of aeromodelling could be " Work accurately, take your time ". Sometimes, however, comes the need to produce a model *quickly*. Using conventional construction, some modellers are fast enough builders to complete a model in a day. The story told of modellers who sit down on the Saturday before a contest and complete a glider or rubber model for Sunday's event is a true one, but such models inevitably show signs of hurried work, and more often than not, are not particularly successful.

The term " quickie " construction was first given to a certain class or type of prefabricated kit models, where, with all the parts pre-shaped and pre-cut, building the model was largely a matter of assembly and cementing all the components together. All built-up components, in other words, were replaced with sheet construction, or similar. The term " quickie " is now generally applied to any type of model, kit or " own-design " type, which employs a large proportion of sheet construction and the minimum of built-up components. In this sense the sheet-balsa chuck glider is truly a " quickie ". It is both *easy* and *quick* to build. But sheet construction can be adapted to other types of free flight models which normally call for built-up wings and tails, and even to the fuselage. From the very beginning a considerable number of control line models have employed what is, essentially, " quickie " construction.

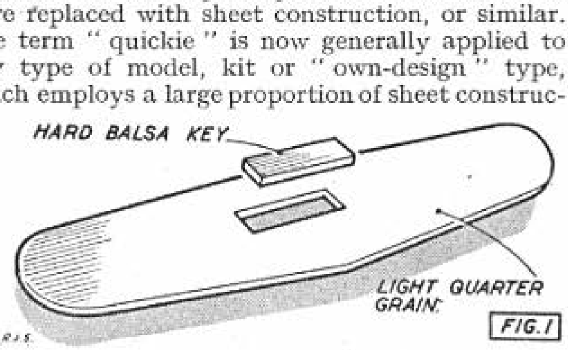


FIG. 1

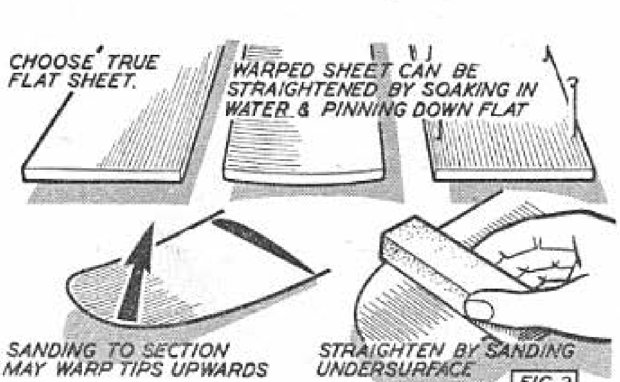


FIG. 2

The tailplane is an easy subject. The use of sheet balsa fins is already commonplace on conventional contest models, particularly power models and gliders. Sheet balsa tailplanes are also quite satisfactory on most sports type models, provided the span does not exceed about ten to twelve inches. Light, but fairly rigid 3/32 or ⅛ in. balsa sheet is used, cut to outline shape and then simply sanded down to a thin aerofoil section.

One of the worst mistakes is to choose sheet wood which is too heavy for the job. A sheet tailplane wants to be as light as possible, so generally you can use the softest wood available. This may mean that the resulting tailplane may tend to be a little weak at the centre and so a key strip of hard balsa let in and cemented in place as in Fig. 1 is advised in such cases.

Another useful tip is to make sure that the sheet from which the tailplane is cut is true and free from warps. Warped sheet will produce a warped tailplane with its consequent effects on the stability of the model. You may even find that when you have cut your tailplane from true sheet and then sanded it to aerofoil section (on the top surface only) it has now warped slightly into a dihedral angle. This is not necessarily harmful but if you want to take it out, sand the underside of the tailplane until it is perfectly flat once more. Fig. 2.

In the first place, a symmetrical tailplane plan shape will be more warp resistant than one which incorporates fancy curves, and if the tailplane tapers in planform towards the tip that will also be an advantage. Cut-outs in the planform both weaken the sheet by reducing the width of end-to-end grain available and increasing the tendency to

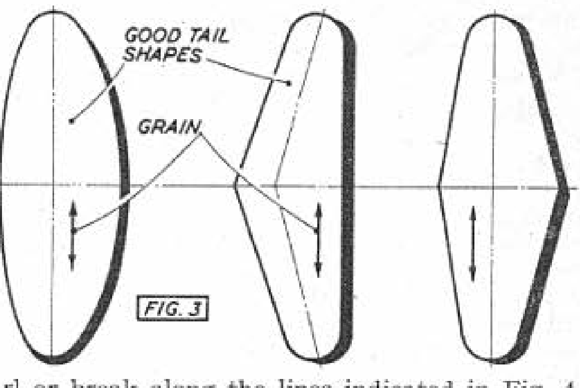


FIG. 3

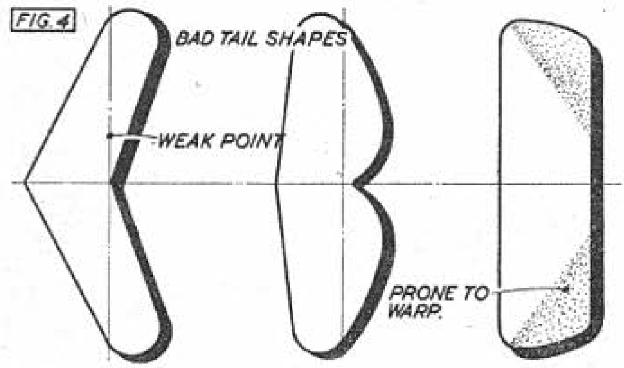


FIG. 4

curl or break along the lines indicated in Fig. 4. Good sheet tailplane shapes are shown in Fig. 3.

To " weatherproof " the sheet tailplane a good waterproof coating is called for. This can be done by using grain filler followed by several coats of clear dope, adding extra weight and also not being a *quick* method. The simplest solution is to cover with lightweight tissue applied by doping the surface of the sheet, allowing the dope to dry, laying the tissue in place and then " painting " in place with thinners, as in Fig. 5. Trim off with a razor blade and give a final coat of clear dope.

Tissue covering also strengthens the sheet against liability to split along the grain—one of the major failings of sheet components. Tissue covering, and the use of keys, as shown in Fig. 6, are both desirable features on large sheet tailplanes. Keys running parallel to the span increase the bending strength of the component.

Where the tailplane is too large for solid sheet construction to be employed, the " quickie " method of Fig. 7 can be tried. Cut from solid sheet the required thickness to give the necessary bending strength would be prohibitive. By using thin sheet ($\frac{1}{16}$ in. thick in most cases) and then cementing spars and ribs directly on top, weight troubles are avoided. The top of the tailplane is tissue covered for quickness; sheet covered for maximum strength and rigidity, although rather more tedious. If you want to save weight, punch holes in the bottom sheet and cover with tissue.

As regards wings, solid sheet construction has been used with success on sports models up to 36 ins. span. Such wings however, are generally on the heavy side. A typical wing panel of this size would be constructed from two 18 in. lengths of $\frac{1}{4}$ in. sheet, one medium hard and the other soft, cemented together as shown in Fig. 8. The outline should, for preference, be tapered or elliptic, not parallel chord. The two wing panels are joined with re-inforcing dihedral keepers of ply or hardwood let into slots and well cemented. A binding of silk or stout tissue cemented over the centre is also advisable for extra strength. The wings can also be tissue covered to get a good finish quickly.

A better method would probably be to use the sheet bottom and built-up ribs and spar type like the tailplane in Fig. 7. For smaller wings, however, thin sheet used for the top surface and then curved to shape over a number of ribs as shown in Fig. 9 has proved quite successful.

With this method the wing outline is cut from 1/32 or $\frac{1}{16}$ in. sheet, depending on the size of the panel. Mark off the rib position and coat with cement and allow to dry. As the cement dries it will contract and tend to curl the sheet into an aerofoil curve. Now cement all the ribs in place and pin the complete panel down over a flat surface, as shown, making sure that the sheet is in intimate contact with each rib. When removed, the sheet will have a permanent camber conforming to the shape of the ribs. A stub spar can be added at the centre, if required, to increase bending strength, although this is not necessary on small wings. There is no need to cover the bottom surface of the wings with tissue.

Sheet fuselage construction is not always as satisfactory as built-up construction, especially on small rubber models intended to have good

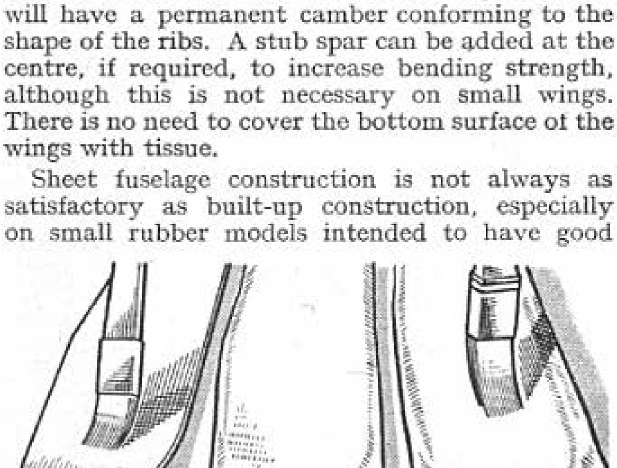


FIG. 5

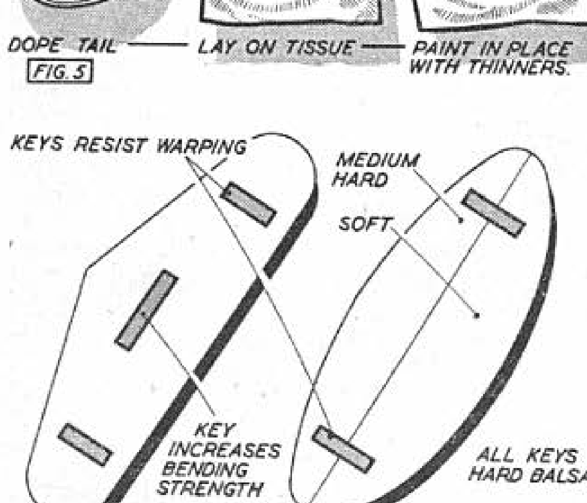


FIG. 6

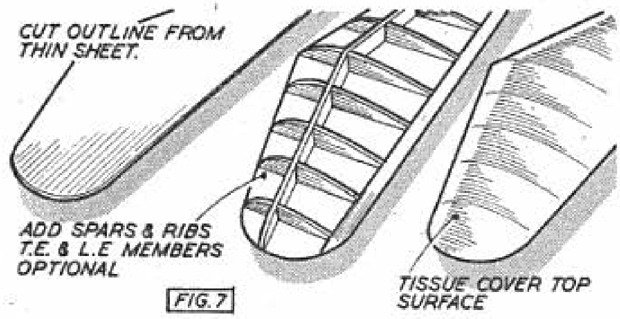


FIG. 7

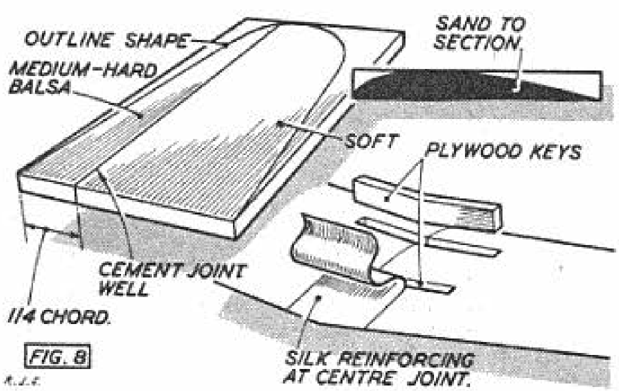


FIG. 8

flight performance, and may not be all that much quicker in the long run.

You can, of course, make up a simple fuselage suitable for a glider or a power model using sheet or block and strip wood, utilising a pod and boom shape. Fig. 10 shows a typical example of such a fuselage which is quick and easy to make. However, particular care must be taken in selecting the material to use for the boom. This needs to be good quality, hard and straight grain strip, but at the same time must not be excessively heavy. Hence balsa is specified instead of hardwood.

The sort of strip work suitable for a boom on such a fuselage should be chosen carefully from as wide a selection of strip as possible. Make sure that it is not "dead" wood which will snap if flexed but when bent into a slight curve and released springs back sharply into its original straight length. The whole length, of course, must be absolutely true and free from twist or faults. Generally the strength of any solid member of this type can be increased somewhat if the edges are lightly rounded off as shown in the diagram. Do not remove too much wood in this operation. Just a light sanding which takes off the sharp edge.

The sheet, built-up box is, nevertheless, a good basis for the construction of power model fuselages of rather more complicated types. For fuselages up to about 24 ins. in length a $\frac{1}{16}$ sheet box, and 3/32 sheet for greater lengths enables the main fuselage assembly, including the motor mount, to be completed in the minimum of time. The wing mount, cabin top or top and bottom fairings, as necessary, can then be added. Some typical examples of this practice are outlined in Fig. 11.

The basic sheet box itself can be square or rectangular in section, parallel throughout its length, or tapered to conform to a certain finished outline.

From power models, let us go back to rubber models again and see if we can apply "quickie" construction to one component we have not mentioned so far, but one which does cause a lot of not-so-expert builders (and a good many quite experienced modellers) a considerable amount of trouble—the propeller. Despite many opinions which have been expressed to the contrary it is doubtful if there is a very marked difference between the efficiency of a "reasonable" propeller and one which is carved meticulously to correct pitch throughout its diameter and with a properly shaped section with just the right amount of undercamber. The small difference in performance which may exist certainly justifies the extra effort as far as contest rubber models are concerned, but for sport flying a straightforward propeller will probably do as well. We can make this as simple as possible by cutting the blades from sheet wood and ignoring the normal variation in blade angle from root to tip produced with a propeller carved from a block.

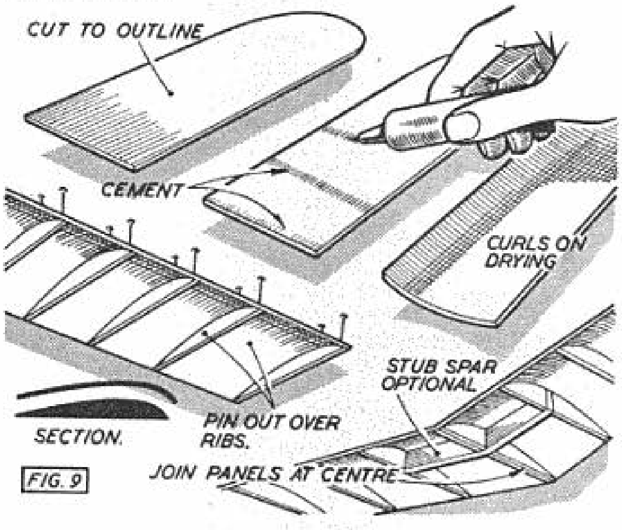


FIG. 9

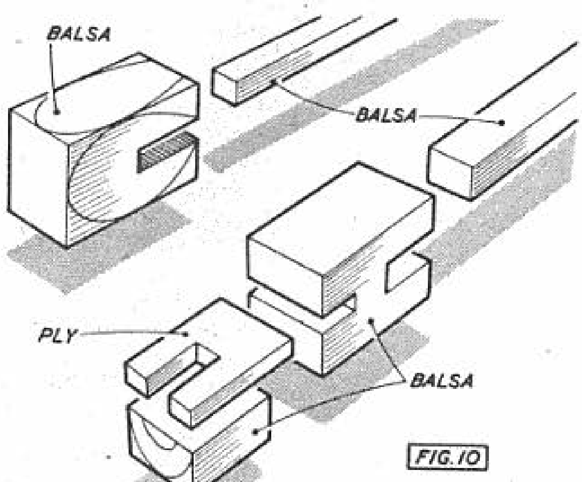


FIG. 10

The two blades of such a simple propeller are identical, both in outline shape and the manner in which they are sanded to a suitable aerofoil section, like, a solid balsa wing. The main problem then is to provide a suitable hub to assemble the two blades.

The simplest type of hub is just a short length of *hard* balsa which should be between ½ and ¾ in. wide and thickness calculated to give the required pitch angle when the blades are slotted in diagonally, as shown in Fig. 12. Actually a pitch angle of about 35° will be about right for most propellers of this type, calling for the depth of the hub to be toughly 0·7 times the selected width—say ⅜ in. for a ½ in. wide hub and ½ in. for a ¾ in. wide hub.

A good cement joint is essential and the hub itself should be bushed to take the propeller shaft, if the propeller is to be of the freewheeling type. The whole assembly can be smoothed down and the hub blended into the blades after finishing. The completed propeller should also be balanced by sanding away wood from the heaviest blade as necessary.

Actually it is only a short step from this type of propeller construction to the adjustable pitch type used on many modern contest Wakefields. Here the blades are usually carved from block, or thick sheet, to the required blade " twist " and then assembled in a cylindrical hub made either from gumstrip, or laminated plastic tubing. The same sort of propeller can be made, using sheet blades, if the root ends are built up by additional pieces of sheet cemented in place and then carved down to a circular section to fit the hub tube, as in Fig. 13. This will give a propeller where the pitch can be adjusted at will to get the best performance. Another advantage is that if a blade is broken in a crash simply withdraw the damaged stub and replace with a new blade. Repairs are simple, in any case. Just cement the two broken parts together again with a reinforcing length of thin bamboo, as in the sketch.

Quick Building Aids

Apart from " quickie construction " itself, there are a number of other ways in which time can be saved in building, even with ordinary construction, if you *plan* your model building and go about it the right way. Using the right tools, and in particular using a *sharp* blade in your modelling knife, is just one example. It is wonderful the difference a keen cutting edge will make at times !

Then there is the question of materials. Make sure that you have enough stock on hand *before* you start building. It is no good finding out half way through the evening that you are stuck for one length of certain strip size and everything is held up until you can get round to the local model shop to buy one. It may sound wasteful but if possible, you should try to build up a stock of useful wood sizes rather in excess of your anticipated needs. That allows for breakages and other accidents and allows a wider selection of materials for certain vital parts.

Probably the majority of models are built in " temporary " workrooms. The building board is laid out on the kitchen table for a few hours in the evening, or perhaps even on the bed. That means getting all the materials together before you can start the evening's work and then clearing them all away again at the end of the building session. Unless you plan your building evenings carefully you will find that you may be spending as much time looking for the necessary materials and equipment and packing them up again as you do in actual construction. Improvise a combined materials box and tool box to move around with the drawing board so that you can reduce wasted time to a minimum. No serious modeller ever has enough time to build *all* the models he would like to. Make sure that most of the time you do have available is spent in useful work and not non-productive " routine ".

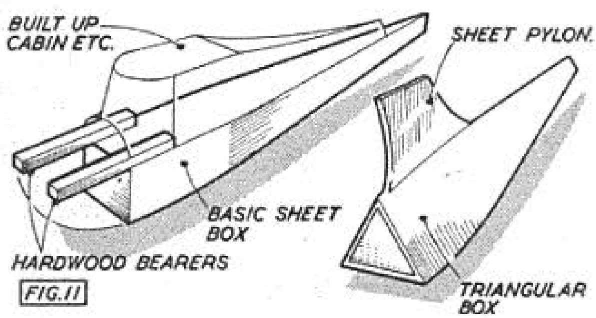


FIG. 11

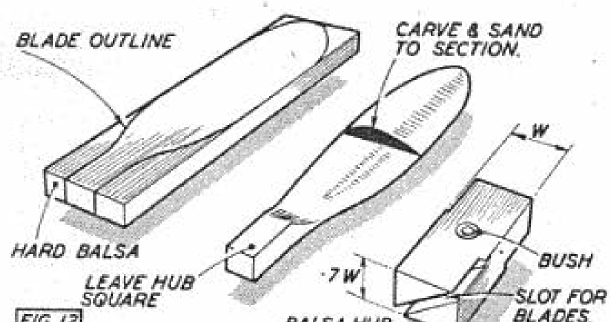


FIG. 12

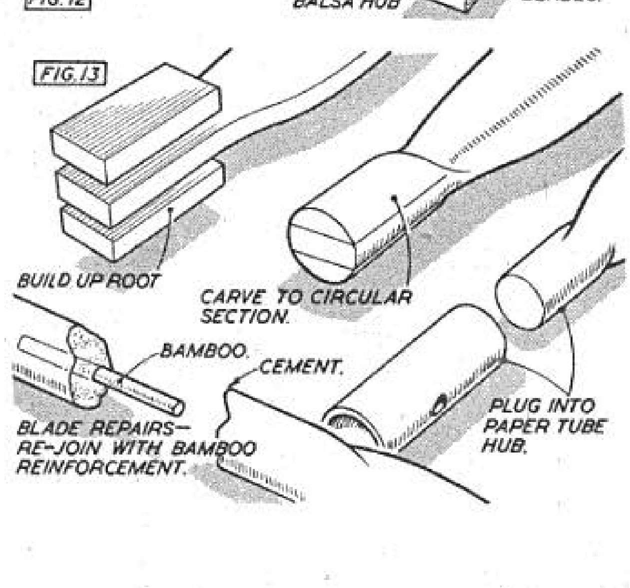
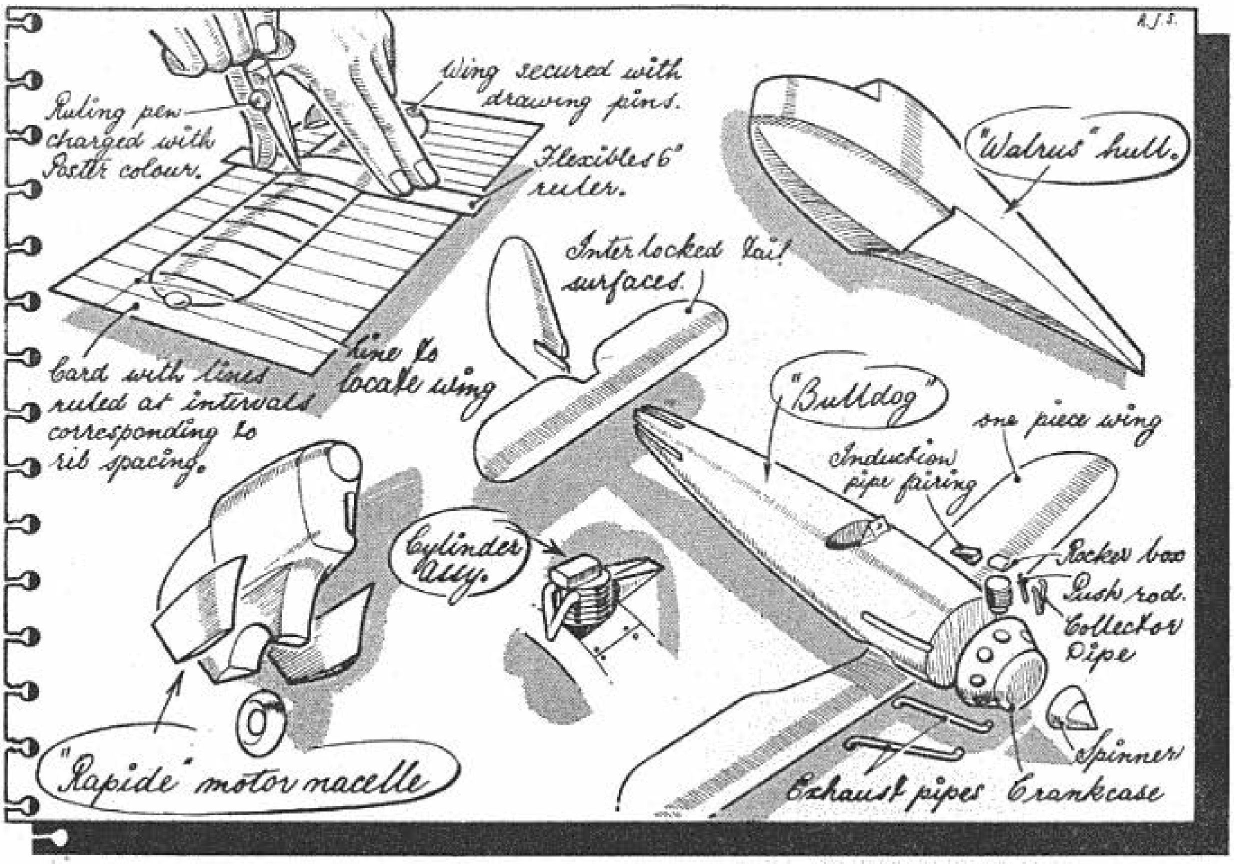


FIG. 13

SIDELIGHT ON SOLIDS

By PETER GRAY



NOWADAYS the solid scale model seems to have rather "fallen by the wayside"—though the recent re-appearance of solid kits may presage renewed enthusiasm—so it was considered that a few notes on some of the writer's collection of 40 odd models might be of interest. Photographs and descriptions of models of both wars seem to have been fairly numerous in the past, so some interesting aircraft of the "between wars" period are presented; plans for all of which have at one time or another appeared in AEROMODELLER, "Aircraft of the Fighting Powers" or A.P.S. Much improvisation and adaptation had to be incorporated in the accessories of these models as no source of commercial supply could be traced suitable for aircraft of this period.

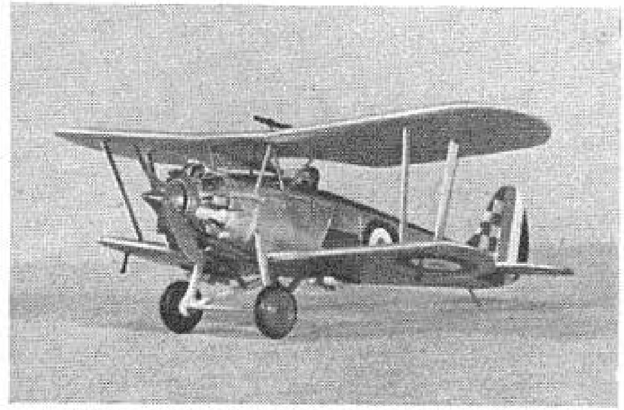
Tools. Nothing more elaborate than the following was used in the way of tools :—Fret saw with metal cutting blades (used for wood as well as metal), Mercury knife handle (small) and blades, sharp penknife, soldering iron and several grades of sandpaper. "Drills" used were 2 to 3 inch lengths of piano wire of 16, 18, 20 and 22 s.w.g. sizes, with one end filed to a four square point, the other end bound and glued with paper—to afford a better grip—and manipulated back and forth between the fingers.

Methods. No unorthodox methods were used —reference to J. H. Elwell's "Solid Scale Model Aircraft" and J. E. Doylend's Series "Aircraft in Miniature" in Vol. 12 of AEROMODELLER was helpful. Usually the lower wings were made in one piece and let into the fuselage—this method making for easier alignment of both wings when viewed from above—where practicable, rudder and tailplane were interlocked with slots and corresponding slots cut in fuselage to accommodate these members in correct location and alignment. Stiff cardboard templates were used to give correct gap and stagger during assembly; a tracing being made from the side elevation of the appropriate wing locations, then the wing cross sections cut out with a sharp razor blade.

Ribbing. The method of "ribbing" the fabric covered flying surfaces was introduced to the writer by C. B. Maycock, co-author of Vol. 6 of "Aircraft of the Fighting Powers", and was considered the most effective seen so far for this scale of model. It was simply a line of poster colour applied with a draughtsman's ruling pen—a little experimenting was necessary before correct consistency was obtained, i.e., thin enough to flow easily, yet thick enough to stand fairly "proud" when dry. The best way of locating the ribs accurately was found to be by ruling parallel lines of the required spacing but several inches in length, on a piece of white cardboard, then through the middle of these a line at right angles against which to locate the wing. The wing was held in position on the ruled card by pinning by each wing tip to a flat board with drawing pins; the ribs were then ruled on quite easily with the use of a flexible (celluloid) ruler located against the extreme ends of the ruled lines. When one surface was completed a coat of clear dope was given to " fix " the ribs, then the opposite surface was done and duly " fixed ". If the surface to be " ribbed " has been brought to a shiny finish in the grain filling and sanding process it was a great help to rub the surface over with a thin film of poster colour applied with the finger tip, just sufficient to " wet " the surface so that the colour would " take " from the pen instead of flowing into a series of dashes, as it would on a shiny surface. With wings it was found best to make the necessary cuts used to incorporate the dihedral before " ribbing ", and to put the angle in after, as it made for easier ruling when the wing was still flat. After a little experience with this method it was possible to include even nose ribs in wings that called for such.

Finish. Before application of final colour scheme, parts were treated with grain filler and sanded to a smooth surface—in the case of birch or spruce, two or three coats of clear dope were usually sufficient; obechi and balsa were treated with clear dope mixed with french chalk or talcum powder. The writer's method was to paint all components before assembly with a final touch up on completion. Ordinary cellulose dope was used with the addition of a third to a half thinners, with up to six coats for silver and light shades and up to four coats for darker colours. Straight edges to coloured insignia, etc., were achieved by putting in the outlines with a ruling pen and well thinned dope. Where this was too awkward, i.e., on a curved fuselage surface, recourse was made to plain waterslide transfer sheet suitably coloured, cut to size and fixed in place. One has to be careful here that the transfer sheet is also cellulose, or it will blister when coloured dope is applied. Mention of matt dope will be found in the text describing the models; this is not easy to come by these days, but 'O My Model Railway Finish,' although somewhat slower drying, gives quite a good effect.

The Bristol " Bulldog ". This famous fighter of the late '20s and early '30s had long been a model the writer had wished to build but fought shy of, due to the rather tricky engine detail; however, it was eventually started by tackling this component first. A piece of ½-in. sq. birch was cut to the necessary length, drilled through the centre (18 s.w.g.), inscribed with a circle of the correct rear diameter and cut to a cylinder of this size; it was then tapered to give the correct diameter at the front. Next a ridge was cut round the forward position to indicate the nose exhaust collector pipe and finally sanded to a smooth surface; thus was completed the " crankcase ". The cylinders were next fabricated from ⅛-in. birch dowel screwed through a steel nut of slightly less diameter to give a finned effect, cut to length with one end at a carefully " guestimated " angle corresponding to the angle of the crankcase, then glued to same in pre-marked locations with a slow-drying adhesive such as " Croid ". When dry, the crankcase was painted aluminium and the " pots " matt black and then a push rod and two exhaust collector pipes were added to each cylinder—the former from 10 amp. fuse wire, the latter from 24 s.w.g. enamelled copper wire—a small hole for the retention of each being made in the crankcase with a needle and the wire inserted with a touch of glue. The fuse wire was left in its natural tinned colour, and the exhaust collector pipes and nose collector ring painted matt grey. Finally rocker boxes were represented by small scraps of birch painted aluminium, and the long exhaust (outlet) pipes, extending back to the undercarriage, inserted and painted matt grey. The small streamlined fairings behind each cylinder were cut from scraps of birch and fixed in place after the engine was glued to the fuselage, as they overlap the joint. The remainder of the model follows routine methods of construction, but a note on materials may be of interest. The fuselage was carved from hard balsa, wings were of ⅛-in. sheet spruce, interplane struts and undercarriage " V "s were cut from 20 s.w.g. aluminium sheet (with metal cutting fret saw); empennage was 1/20 in. birch, 3-ply. Wheels in this particular instance were a luxury left over from pre-war days (" Skyburd ", turned brass, 1d. a pair—happy days!)—camera gun on top wing and tubular Aldis sight were just lengths of 18 s.w.g. piano wire supported by approx. 34 s.w.g. copper wire taken round a couple of turns and the other end inserted in fuselage or wing with a spot of glue to secure. Holt flare brackets were simply pins with the heads doctored up a bit with a file; the pilot (F/Lt. Lucifer) was concocted from a safety match and a scrap of plasticine. Airscrew carved from ⅛-in. birch in orthodox manner, a little extra care



A colourful subject for scale modelling, the Bristol Bulldog is not an over difficult subject to tackle—once the engine detail is overcome.

being needed for the tapered boss; spinner to follow contour was shaped on the end of ⅛-in. birch dowel, drilled to take pin first, then carefully separated from remainder of dowel with razor blade—easy does it! Model was finished in authentic aluminium dope with matt black (anti-glare) turtle back. The insignia decided upon was the green stripe of No. 3 Fighter Squadron, first outlined with ruling pen as aforementioned, the same procedure was used for "dicing" the tail surfaces, which indicate the S/Ldr.'s aircraft. Apart from wheels, the only detail not hand-made was the roundel transfers. Plans for the Bulldog appear in both AEROMODELLER (March, 1945), and A. H. Lukin's "Book of Bristol Aircraft" (Harborough).

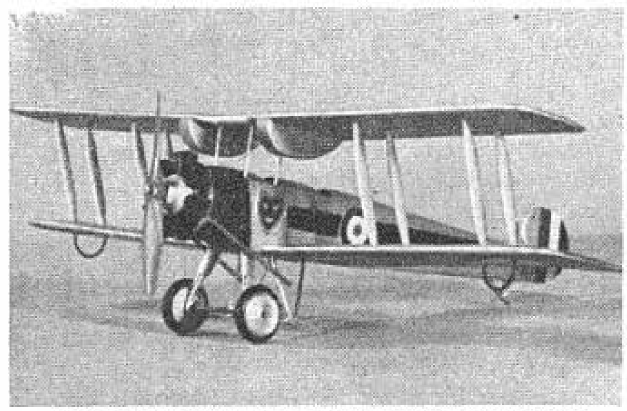
The De H 89 Rapide. This aircraft was of special significance to the writer, as he flew in one of the first production jobs—belonging to Olley Air Services—on a "joy-ride" over London from Croydon in 1935. As in the Bulldog, balsa was used for the fuselage and 3/32-in. sheet spruce for the wings. Although no centre-section structure was involved, the engine units and attachment made it a little more complicated. These were carved from obechi, and the lower (or trouser) part cut well under size in thickness, a semicircular cut-out made for the wheel, then a piece of thin sheet added each side, sandwich fashion, to make a bearing for the wheel and to bring the "trouser" up to the required cross section thickness. The engine units were mounted on the lower wing by making a cut-out in the leading and trailing edges and a complementary cut-out in the top part of the nacelle, then adjusted for fit and location, glued, then finally the portion of the nacelle cut-out remaining filled with plastic wood and sanded to profile. Wheels were made from a disc cut from 7/16-in. birch dowel, sanded to shape, and cartridge paper centre discs added. Wings were made in one piece, let into the fuselage and the joints faired over with plastic wood. The cabin windows and pilot's screens were painted, a base of very thin aluminium dope was used over which were painted irregular diagonal streaks of thicker colour; the effect being quite realistic and presenting a neat appearance. Fuselage, rudder and motor nacelles were finished with turquoise blue dope relieved by a black edged aluminium streak. The black lines

The famous De Havilland Rapide, now a fast disappearing feeder airliner for short stage flights, makes an attractive biplane twin.

were put in first with ruling pen (except over the nose curves, where they had to be done free hand with a brush) and then the aluminium centre filled in by brush. The wings and tailplane were plain aluminium and the registration letters black.

Plans for Rapide appeared in AEROMODELLER, August, 1947, and A.F.P., Vol. 2.

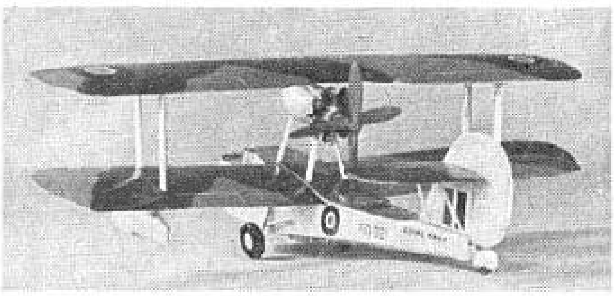
The Avro 504N with the A/Siddeley Lynx motor (sometimes known as the Lynx Avro) filled the gap in service trainers between the war-time 504K and the Tutor of the early thirties. This model is presented by virtue of its interesting (we hope!) oleo undercarriage detail. This component was constructed from short lengths of 22 s.w.g. brass wire—being cut to size, bent, and sweated together whilst plugged in position in the actual fuselage, which in this instance was birch and permitted these tactics, which balsa would not have done. The only other addition to the previous descriptions was the inclusion of fuselage "stringers", which it was thought worth while to include as there were comparatively few—3 on each side and 5 on the rear top decking. These were represented with nylon thread (from an old stocking—better be sure it's an old one!) fixed in position at the fore end with a touch of clear dope, stretched taut, then doped over the whole length and finally trimmed to correct length with a razor blade. The model was finished in the silver dope of the period, with the nose panelling in black. The insignia was that of the Oxford University Air Sqdn., com-



Not for the amateur, the Avro 504N, with complicated engine and undercarriage detail. Peter Gray's model is beautifully reproduced to 1/72nd scale.

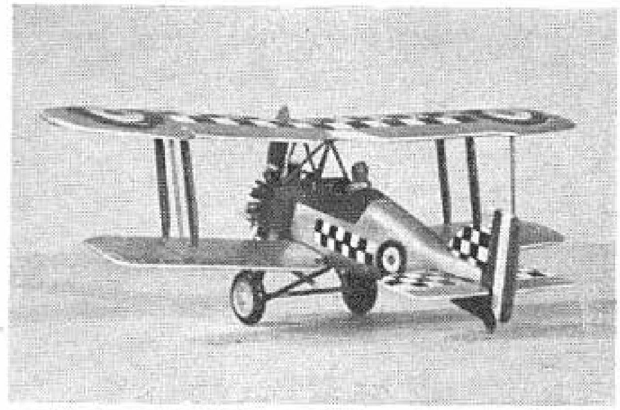
prising a stripe along the fuselage sides and top wing surface of Oxford blue. The shield was carried on the fuselage, but had to be slightly modified, as it was too small to include complete detail; it depicted the three gold crowns on blue background, outlined with gold.

The Supermarine Walrus—known in the Service as the "Shagbat"—was constructed practically throughout of obechi, and again featured an uncowled engine (the man must be mad, building all these "radial" types when there are relatively easier "in-line" types of similar vintage!). The underside of the hull was a bit awkward; the portion forward of the step consisting of an inset "V" bottom with flat sides to it instead of the normal hollow curve, and a certain amount of extra care was necessary to achieve the correct contour. Aft of the step the plain "V" bottom was straightforward enough as were the straight "tumblehome" sides. The cabin was carved integral with the hull and painted in two shades of silver to represent the perspex, as was the Rapide. The nose and aft gun hatches were represented in the "battened down" attitude and were simply discs of 1/20-in. ply with a hinge line scored across the centre and a small "skylight" painted on the rear one. Wings were cut from ⅛-in. sheet obechi, the only departures from normal routine being that the lower wings were made in two halves as was also the tailplane. The inter-



The Supermarine Walrus or "Shagbat" as it was known, was also one of the noisiest single engine types in service. Hull requires extra careful attention when carving.

plane and engine mounting struts were cut from sheet aluminium and the engine nacelle carved from an oddment of ½-in. sq. birch, first shaped to a cylinder of the required diameter, then rounded fore and tapered aft to the correct outline. The engine itself was constructed in a similar manner to those previously described but was somewhat simpler, as no exhaust pipes were necessary. The four-bladed airscrew is merely two ordinary airscrews glued together at right angles and not half lap jointed—this was truly representative of full scale practice where two airscrews were simply bolted on the same shaft at right angles. The undercarriage was bent up and sweated together from 20 s.w.g. brass wire, with a small cartridge paper fairing added—the wheels, in this instance, being of the more modern low pressure variety, were easily purchased. Achieving absolute symmetry of both wing tip floats was a somewhat tedious process. The model was finished in the camouflage scheme introduced towards the end of the war, i.e., dark slate and medium sea grey upper surfaces with white under and vertical surfaces. There were no roundels under the wings and those on the upper wing were of the variety that included the narrow white ring. The Serial No. and words "ROYAL NAVY" were added with a mapping pen. The "ribbing" on the wings was terminated short of the leading edge to represent the sheeted leading edge of the real aircraft. Details of the Walrus appear in Vol. 1 of A.F.P., and a separate plan can be obtained from A.P.S.



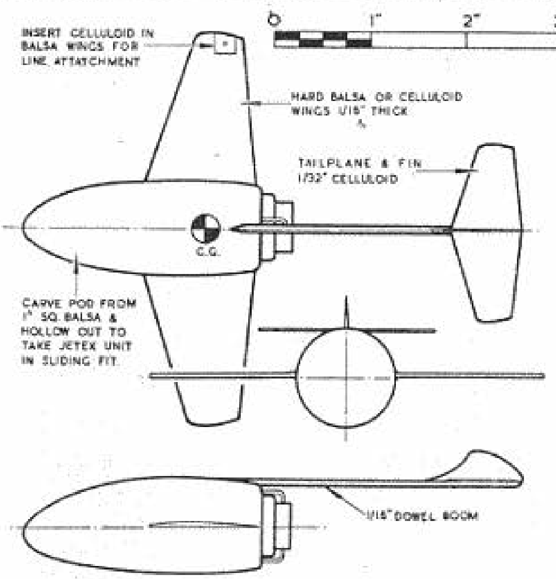
Checkered, and looking every bit the aerobatic fighter it was when in Squadron service with No. 43, the Gloster Gamecock has a rather complicated engine.

The Gloster Gamecock. This model was built from G. A. Cull's article in AEROMODELLER, June, 1951. The Jupiter engine was made up and coloured in the same way as that for the Bulldog, although the absence of any fairing round the nose made for easier mounting of the cylinders, as the crankcase was cut from a piece of ⅛-in. sheet and then shaped into a regular polygon of nine sides. Cylinders were then mounted; next, the crankcase front—shaped from a piece of dowel and incorporating the exhaust collector ring—and finally the two small exhaust pipes to each cylinder, the push rods and rocker boxes added. Again the fuselage was shaped from a small piece of hard balsa and the interlocking tail surfaces from 1/20-in. 3-ply. 3/32 in. spruce sheet was used for the wings, the ailerons marked and completely cut out, the edges rounded with sandpaper and glued back into place. This was done with the ailerons on all the models and gives a much better effect than merely scoring the outline. The undercarriage was bent up from 20 s.w.g. iron wire and the shock absorber fairings cut from cartridge paper and glued in position. Interplane struts in this instance were shaped from 1/20 in. sheet celluloid and the aileron link struts from 22 s.w.g. piano wire. Another improvisation, for the wheels this time, was the use of 7/16 in. dia. linen buttons, given several coats of banana oil to "fill the grain" as it were, and painted matt black, then a paper centre disc added to the inside of each and a shallow cone to the outside. The model was finished in the standard R.A.F. scheme of the period, all the fabric parts being silver doped, the plywood panels on the forward fuselage sides and top decking were finished battleship grey. The squadron insignia chosen was the black and white checks of 43 Fighter Squadron. Transfers were made up by painting the black squares on strips of white transfer paper after first outlining with a ruling pen. The fuselage squares were 3/32 in. square and rather tedious, but worth the trouble. The checked fin and tailplane again indicate the S/Ldr.'s aircraft, and these were painted straight off, white first, then the black squares added after ruling outline.

200 m.p.h. AT KNEE LEVEL ?

Push aside the clubroom chairs and hitch your Jetex speedsters to a heavily-weighted pylon.

By W. TINKER



TYPICAL LAYOUT FOR JETEX 50 R.T.P. SPEED MODEL

THE only published references I have so far seen on Jetex indoor speed flying have given the impression that 200 m.p.h. is a speed that only the most brazen line-shooter would give himself credit for ! Is this true ? Let us discuss this further, as I can produce several people who swear to have witnessed a flight of a Jetex 50 at over 130 m.p.h.

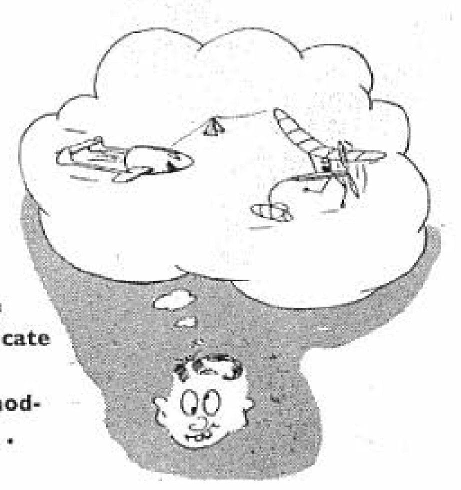
As far as our club is concerned the introduction of Jetex speed models came about after a concentrated winter of indoor flying. The sight of so many light-weight microfilm models slowly and painstakingly circling the pole, whilst the minutes ticked away, must have upset the delicate balance of a certain aeromodelling mind. Much to the horror of the owners of the filmies this maniac produced at the next club meeting a miniature red machine, reminiscent of a Vampire, of only four inches span, which housed in its rather bulky fuselage a brand new, gleaming Jetex 50. This aroused a certain amount of interest from the Outdoor Fraternity and most certainly misgivings from the Indoor Fraternity. However, much to most people's relief the model's flight plan consisted of a dive to the floor from the hand launch, followed by an amusing few seconds of ground slides. The maniac was almost returned to sanity when, on the last charge in the packet, the usual dive was followed by an inverted ground slide.

28 miles per hour !

In less time than it takes to tell that slide terminated in sustained stable flight that lasted long enough for the jubilant timekeepers to record something. The maniac immediately lost all traces of sanity, grabbed a pencil and paper and became engrossed in a vast and complicated calculation which involved π and a lot of cancelling. Eventually, with a triumphant look in his eye he announced that Aeromodelling History had been made and that the first (as far as we knew) indoor speed flight by Jetex 50 had been accomplished at the magnificent speed of 28 m.p.h.—and what's more, the model had done it inverted!

30 miles per hour !

A Record indeed ! Moreover the maniac seemed to slip deeper in his delirium after he had muttered " 30 m.p.h. or Bust ! " three or four hundred times.



. . . must have upset the delicate balance of a certain aeromodelling mind . . .

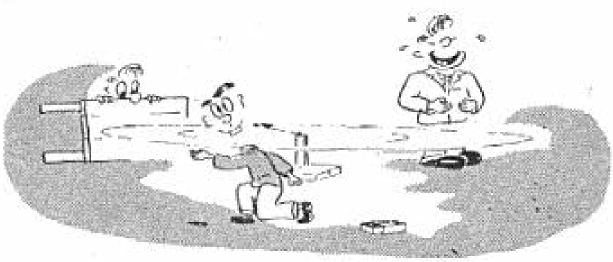
Apparently the low-wing layout, coupled with the clip mounted jet giving a relatively high thrust line, had produced a nose down couple that refused to be corrected except when in inverted flight. This difficulty was overcome on the next model by the use of a mid wing and high-mounted tailplane. The clip was discarded as being weight and drag-producing and for the same reason the twin booms were merged to one. The result was a short tubular fuselage holding the motor, with two short span equal taper wings mounted in the mid position and one solitary boom, sprouting from the top of the fuselage, holding the tailplane, and what fin there was, above the jet exhaust.

41 miles per hour !

"Thirty m.p.h. or Bust!" was conveyed with reverence to the following club night and surprised everyone, including the owner, by recording 41 m.p.h. I do not think that it was this fact alone that made the Indoor Boys give up entirely. Perhaps the other three speed jobs had something to do with it?

60 miles per hour !

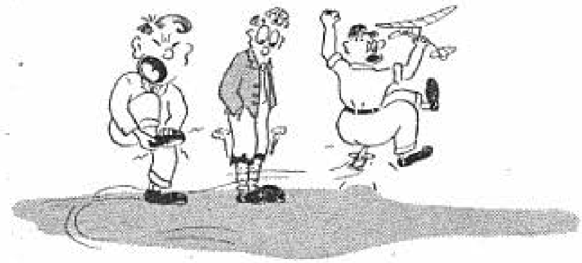
From then on it was a miscellany of speedsters. The local model shop did an unaccustomed business in Jetex 50's and they appeared in jobs with sweptback wings, straight wings, tapered wings—and even one wing—with and without tails. The speed was increased slowly each week until 60 m.p.h. was reached.



. . . you haven't even time to duck !

89·98 miles per hour !

The R.T.P. pole had been weighted at the base with half-a-dozen folding chairs but this didn't stop the three-inch whip at the top during flights. Accordingly a new pole was constructed of 1½ inch timber and fitted with a red indicator lamp rigged to flash on at the completion of each lap; 33 gauge steel wire being standardised as the line. The record of 60 m.p.h. stayed until one night the jet in the record holder was "supercharged". Consequently a new record—89·98 m.p.h. recorded by three watches incidentally. By now, timing was becoming a problem. At speeds of over sixty the model was just disappearing into a blur during the flight, and at the ninety end of the scale that blur caught up with itself to make one complete Saturn-like ring around the pole. The indicator lamp was useless at this period for the filament did not have time to cool off before it was being heated again!



. . . an amusing few seconds of ground slides . . .

Instead of a flashing light we had a continuous glow of varying intensity. It was under these very unsatisfactory conditions that a new tailless job with aluminium wings was flown. It was voted the fastest ever, and a check from the three cross-eyed and bewildered time-keepers revealed a possible speed of over 130 m.p.h.!!

130 miles per hour ! !

It is still a wonder to me that anyone could count up to ten in the time available, let alone state with any certainty that they were counting laps. On a fifteen foot diameter circle 130 m.p.h. represents ten laps in under two and a half seconds. So you see, we have only to knock less than one second off our time. Unfortunately, it's easier said than done!

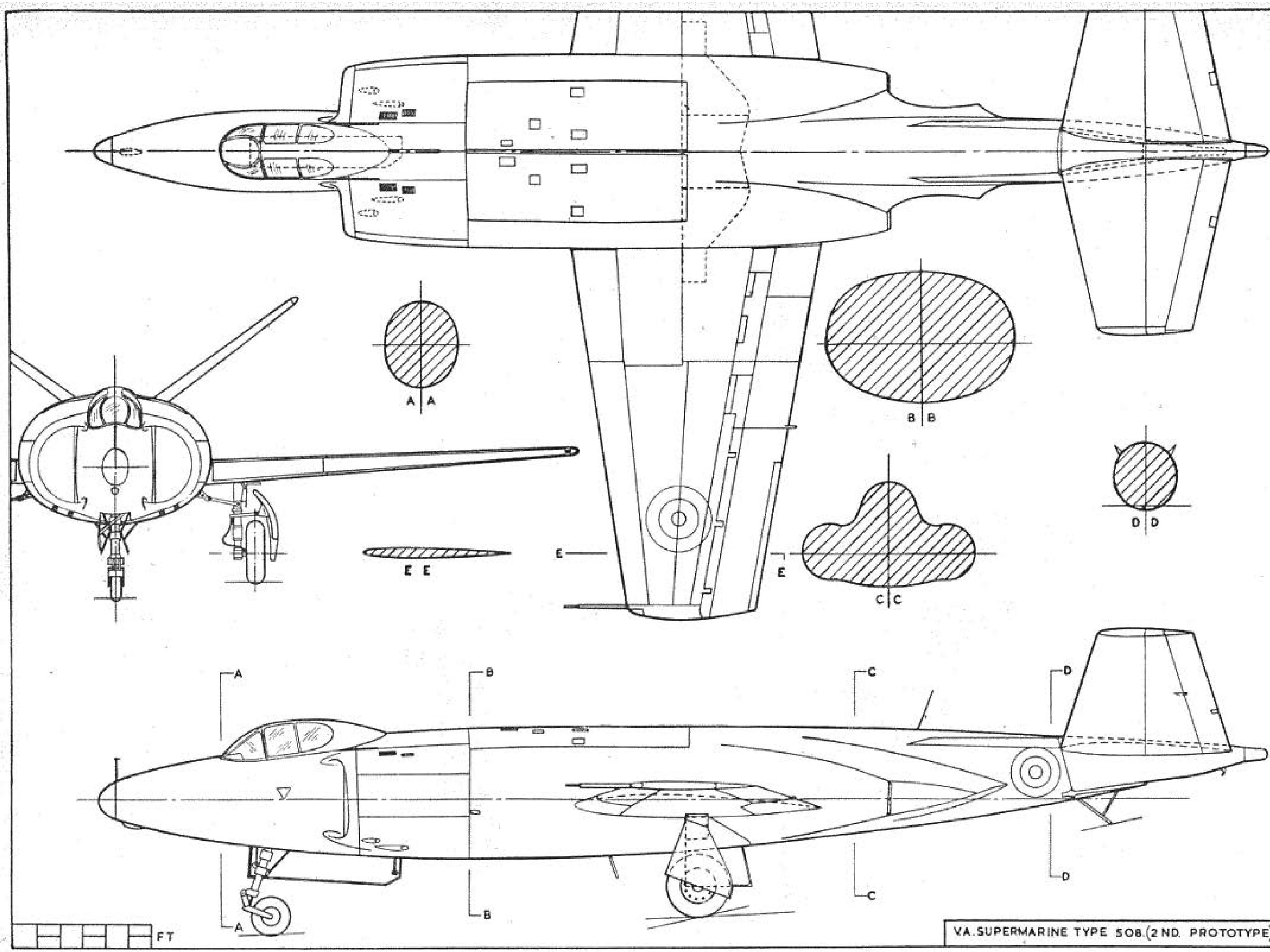
With JETMASTER

After an invitation demonstration of these speedsters was given to Joe Mansour of Wilmot Mansour & Co. Ltd., during which speeds of up to 106 m.p.h. were recorded, a set of Jetmaster units was received for further experiments. These bigger units produce a slightly larger and heavier model, and during the initial flghts, this was painfully obvious! However, within three weeks, a 5 ins. span, 5½ ins. long, hardwood and aluminium special was knocking up 117 R.O.G. A four wheel dolly is more stable for take-off with the short radius that is used.

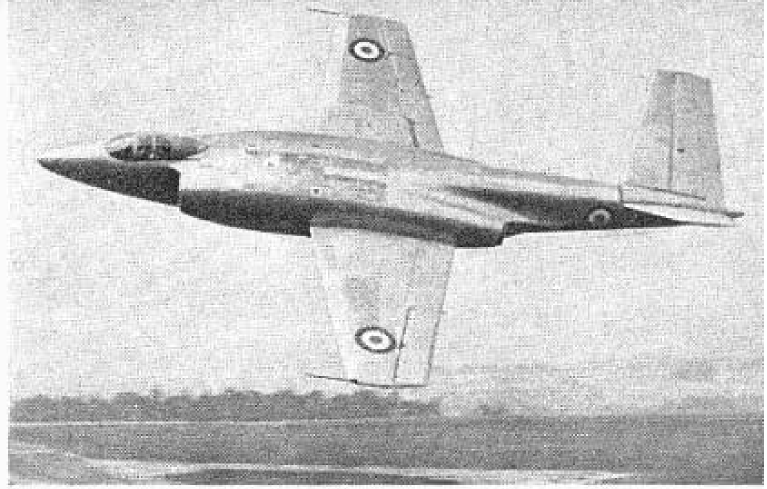
A point that I would like to stress is that most of our models accelerate towards the end of the power run, so that individual lap records may be far in excess of 200 m.p.h. Who knows?

From this it will be very obvious that some form of automatic flight recorder will have to be used before speeds of over the 90's can be quoted accurately. Drawings are being made for a tape recorder that will enable the average speed over ten laps to be computed and also give a minute and permanent study of each lap.

I am of the opinion that 200 m.p.h. has been exceeded by a model powered by a Jetex 50 unit—the only trouble is proving it. And to anyone who is encouraged to try this lark for himself, one word of advice. If you are right handed, fly clockwise and launch from OUTSIDE the circle . . . launching inside at 200 m.p.h. you haven't even time to duck!



THIS IS A 1/72 SCALE REPRODUCTION OF THE 1/48 SCALE DRAWING WHICH IS AVAILABLE PRICE 1/- POST FREE FROM THE AEROMODELLER PLANS SERVICE



AEROPLANES IN OUTLINE — No. 7.

The Supermarine 508

BY G. A. CULL

THE Supermarine 508 was something of a surprise when it first appeared in 1951 and has remained nameless and in the background ever since. The configuration of this most powerful of naval aircraft is, however, more unusual and here the Supermarine Works at Hursley Park have made an impressive fact of a design which combines a number of unusual features.

Basically a carrier-borne interceptor, the 508 is a large single-seater, though no larger than its pair of Rolls Royce Avons dictate. These two axial-flow jet engines produce thrust in excess of 13,000 lb. which, with a comparatively sparse airframe, results in a rate of climb comparable to that of the record holding Sapphire Meteor. It is, therefore, apparent that this purely naval machine does not comply with the old " tradition " that the performance of the Navy's machines must inevitably fall short of their land based contemporaries and opponents. The " butterfly " tail is the most striking design departure and is applied to a military aircraft for the first time in this country. Both halves of the tail surfaces are sharply dihedralled and serve as fin and rudder as well as tailplane and elevators. Variable tail incidence is effected by pivoting the whole of the tail-end and the application of the butterfly tail to a high speed machine is significant. Obvious advantages of this are the reduction in both skin friction and interference drag.

With the 508's great power and consequent high speed potentialities, the small unswept wing appears out of keeping although giving good take-off characteristics for carrier operation. The very thin wings feature large full-span high lift leading edge flaps as well as more usual split flaps, and despite the very high wing loading, these give the 508 a low approach speed quite unexpected for a modern fighter. The main undercarriage wheels fold into the fuselage and the wing, which is too thin to accommodate wheels, power-folds upwards outboard of the undercarriage legs. For deck landings an A-frame hook is fitted below the tail aft of the retracting tail skid. Armament details are still secret but four large gun ports are visible, two beneath each intake.

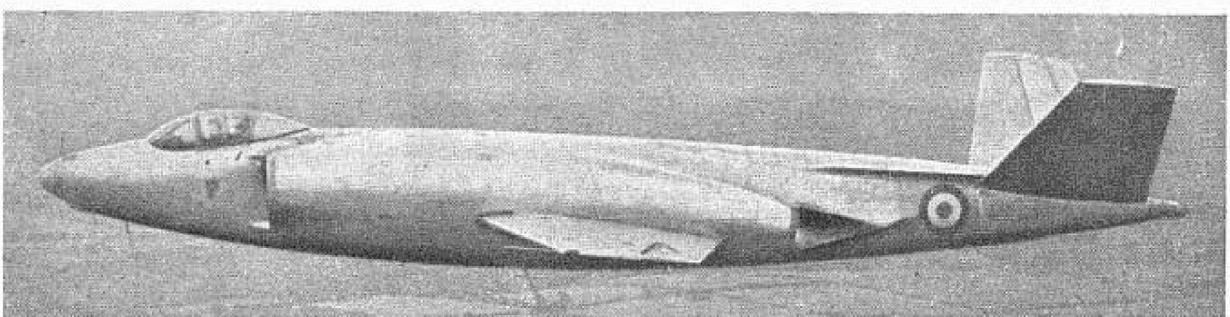
Two prototypes of the 508 have appeared and the first of these, VX133, was flown for the first time at Boscombe Down on August 31st, 1951 with Lieut. Comdr. Mike Lithgow in charge. At the following S.B.A.C. Show the astounding rate of climb was demonstrated, as was the effectiveness of the new tail in a first rate aerobatic display. Deck landings were first made on H.M.S. Eagle on May 18th, 1952, and since then the second prototype, VX 136, has flown. This machine may be distinguished from the first by the narrow fairings extending forwards from the tailplane leading edge roots along the non-moving rear fuselage.

Although not due for production in its present form, the 508 has great development possibilities and a swept-wing successor is likely. This naval dark horse may well prove to be the forerunner of a new carrier-fighter to eclipse the top-flight shore based interceptors, in the same way that the Supermarine types 510 and 535 have led to the production Swift. In common with all other new fighters no details are yet released for publication.

Colour. Both prototypes are left in natural alloy finish with usual roundels above and below wings and on fuselage sides. Serial number in glossy black below wings and in small characters below tailplane leading edge. VX 136 has " Royal Navy " directly under tail serial in same size letters.

Specification. Span 41 ft. 0 in. Length 50 ft. 0 in.

Tail fairings, longer tail cone (ballast weight) and plastic nose cap distinguish the 2nd 508 (bottom) from the first prototype above. (Photo's by courtesy of Vickers Armstrongs (above) and "Flight" (below).)



SCOTTISH PAGE

BILL SHANKS, secretary of **LANARK M.F.C.** sends this report on some contest flying at Lanark, where dethermalisers are being ditched in favour of de-icers. "On Sunday, 23rd November, '52, the first of a series of winter contests took place at Lanark. This contest was a challenge match, participants being members of Glasgow M.A.C., Glasgow Barnstormers M.A.C. and Lanark M.F.C. The weather was excellent, with a light wind and bright sunshine, although the cold was keenly felt by timekeepers and non competitors early in the contest.

Due to the light veering wind, many models had narrow escapes, the less fortunate being Ian Cochrane (Barnstormers) whose glider was marooned on the island in the nearby loch, J. Battey (G.M.A.C.) whose power job alighted on the loch, and J. Nicol (Lanark) who had to retire at the second round due to his double size 'Sunnanvind' colliding with a tree.

Despite these hazards, flying was of a high standard, and to complete the day, a few sport models appeared, ranging from small Jetex models to large R/C jobs. The two R/C models' equipment was inoperative due to a vital piece of gear having been left at home, despite this, both models flew steadily throughout the afternoon. At the close of the day's flying, all agreed that the friendly contest had been very successful, and it was hoped that it would be repeated later. The results of the contest in the three classes which were unrestricted are given below.

Power :	1st	E. H. Hardman	Lanark M.F.C.	4 : 14
	2nd	J. Clark	Glasgow M.A.C.	4 : 11
	3rd	L. Blair	Glasgow M.A.C.	3 : 45
Glider :	1st	W. Meechan	Glasgow M.A.C.	6 : 51
	2nd	W. McConachie	Glasgow M.A.C.	5 : 16
	3rd	I. Cochrane	Barnstormers M.A.C.	5 : 02
Rubber :	1st	W. McConachie	Glasgow M.A.C.	3 : 26
	2nd	R. F. K. Taylor	Glasgow M.A.C.	2 : 49
	3rd	P. Kimantas	Barnstormers M.A.C.	2 : 13

Club Scores :

1st	Glasgow M.A.C.	31 points
2nd	Lanark M.F.C.	16 points
3rd	Barnstormers M.A.C.	9 points

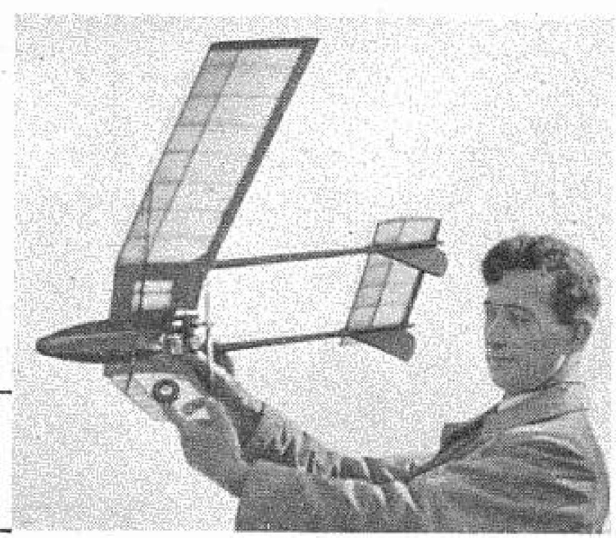
Some more inside gen. on the above contest, comes from G.M.A.C.'s top glider flyer, Bill Meechan who tells me that his winning sailplane is the third version of his geodetic A/2 design. This design has had mention before on 'Scottish Page' and certainly can fly. Bill comments that he finished the latest one at 2.30 a.m. on the Sunday morning of the Lanark contest. He points out too, that the Lanark rescue canoe couldn't operate since it wasn't fitted with a very necessary ice-breaker, so models landing on the loch and its island had to stay put for a time."

Some lines now from Bob Burns, **STEWARTON M.A.C.** "Stewarton reports all seniors busy with classes, etc., but the juniors are having fun at a building class run in the school, 16 having enrolled. They are very ambitious, scale models predominate, and some of the Club Clippers. These last are a new idea, sports models for half c.c. engines, al designed to fit Wakefield rules as to weight, wing area, cross section, etc., and they are flown with $1\frac{1}{4}$ c.c. fuel tanks, for duration. Spin out the fuel as you like, or go for a short burst of power. These models are so attractive that we predict the idea will spread. They stay low enough to avoid major thermals, and you put in a dozen or two dozen flights without crossing more than a couple of fields.

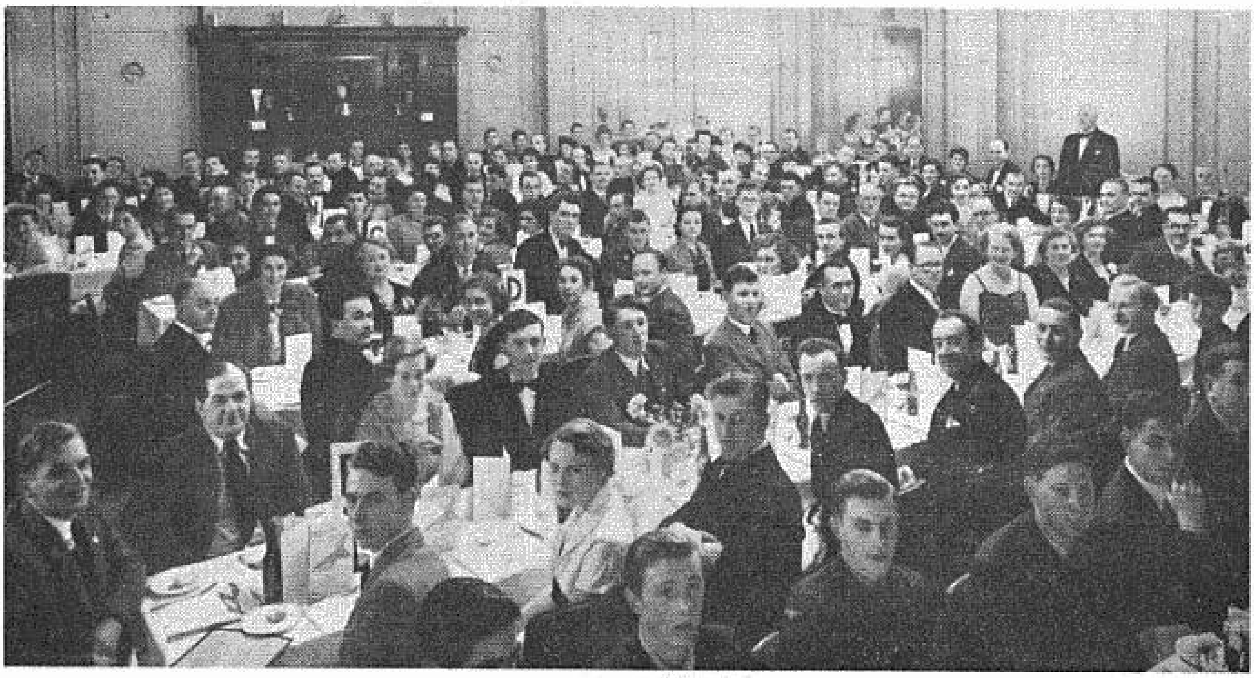
The models are all shapes, semi-scale mainly, some remind us of Cyril Shaw's 'Envoy', but it all depends what you like to see flying, the rules allow you to do anything. One by Bob Templeton, is a new scale 'Navion', but shoulder wing. A good few are just old Wakefield surfaces with new fuselages, but they all fly well, and all the owners are enthusiastic."

Alastair McNeil, P.R.O. **IRVINE & DISTRICT M.A.C.** reports that his club now has long awaited premises. John Lindsay of I.D.M.A.C. has successfully concluded his M.A. degree studies, and is now concocting a super new A/2 sailplane. John Boyd, of the same club is experimenting on a new type of high performance power model. This features swept wings and pusher engine. John maintains that with a little more development his design is a potential winner.

MAC.



At right, John Boyd of the Irvine & District M.A.C. with his high performance pusher. Power is a Mills ·75. Note the swept-back wings and underslung rudders.



★ CLUB NEWS ★

FROM time to time we hear of Challenge Contests conducted on a " super decentralised " basis with overseas clubs, the usual procedure being to decide on a date, then both groups to fly off specified contests, the results being collated on usual National comp. lines. Such long distance co-operation is a good thing, and certainly makes for closer working with chaps abroad with similar interests, and your Clubman is all for an extension of such get-togethers.

It gives me pleasure therefore in announcing that the " Polar Buzz Bugs " club, operating from 2300 Gall Avenue East, North St. Paul, Minnesota, U.S.A., have issued a friendly challenge to any club in the British Empire to a proxy contest (Anglo-American). If any club is interested, will they get in touch without delay with the club sec., Leon C. Gray, at the above address.

North Western Area

One highlight of my past month's activities was attendance at the N.W. Area's A.G.M. and the dinner that followed. Manchester is, of course, my old stamping ground, and the success of the Area during the 1952 season gave a special brand of pleasure—exemplified by the lavish array of silverware at the prizegiving. A well attended meeting decided on 1953 economies, new rules and certain new aspects of the annual Rally, the general opinion from the Committee being that a little more attention should be made to the spectator angle at the D.D. Rally, who, after all, pay for the privilege of seeing the modellers at " work ", their odd bobs being well used by said modellers at other times of the year ! This Area gave the new rules a working out whilst most others were thinking about them, and is of the following opinion :—

(1) The majority of glider types vote for a 200-ft. line, and not 150 ft. as used—presumably to make matters more interesting. It was noted that many models suffered from ground turbulence, even the National Champion having trouble.

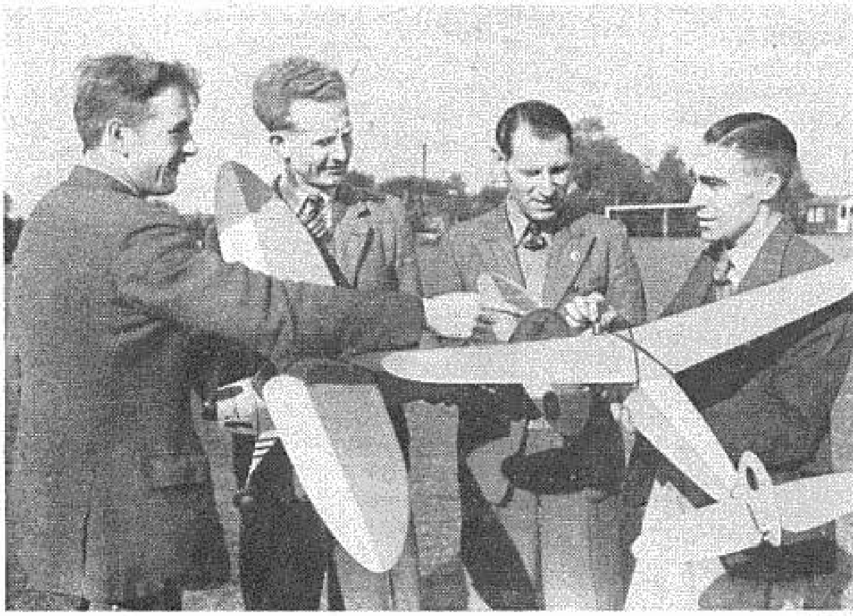
(2) Rubber presents processing difficulties, each check taking approx. three minutes. No alternative suggestion seems reasonable, and thus they are at a stalemate. (Could not a spot check be used ?)

(3) Power models at 10 sec. motor run appear just right. All agreed that, in principle, the idea is good, and even Dekka Bennett did not manage to lose a model !

There's Pete Buskell, bottom left, P. E. Norman next to him, elsewhere, Pete Wyatt, Tommy Ives, Barry Wheeler . . . in fact all the big names, and quite a number of also-rans in this view of the happy gathering at the S.M.A.E. Annual Dinner and Dance . . . How many can you recognise?

AERO-MODELLING TYPES—

" The Control-line Beginner "



"That's how to do it"—the camera catches a bunch of Wellington, Shropshire Clubmen, at one of their regular Sunday morning get-togethers.

Because of the loss of Stanley Park aerodrome, the **BLACKPOOL & FYLDE M.A.S.** declined considerably at the end of last season. However, enthusiasm is at a new high level following much heated argument after a "certain club's" success at Woodford. The club championship was deservedly won by F. Marsden with just over 300 points, C. J. Davey a close second, and T. W. Smith third. A small space has been alloted to the club in a hobbies exhibition next February—the general feeling being that each member could fill the space himself! Despite the flying field problem, a very ambitious building programme is under way, accent being on Smith's "Fried Fritter" design, which, as most N.W. Area modellers know, won the power event at the Bolton Rally, and came very near to winning at both Sherburn and Woodford.

CHEADLE & D.M.A.S. congratulate their Area stablemates, Whitefield, on an exceptional year. Field trouble is with this group also, their old Wythenshawe "urban paradise" having been neatly bisected by a row of houses. It appears that Cheadle's tradition as a power club passed away with that field, as only Bill Archer and Art Bailey remain of that fabulous Arden 199 phase of N.W. Area history. About 12 "B" certs. are held by club members, and Brimelow, Evans, Faulkner and Anderton are attempting various phases for their "C's" during the close season. Garth Evans is overall 1952 club champ., having won both the glider and rubber sections, G. Brimelow securing top power place.

Using gliders, the 1952 **THAME M.A.C.** contest for the "Partridge Trophy" was flown in gusty weather on 150-ft. lines. Harry Robinson won with his "Marauder", closely followed by C. Ball. Members turned up in force, and a very enjoyable day was spent by all.

Though a number of successes were gained at away comps., the **CROSBY M.A.C.** had to suffer a number of postponements for their own club comps., M. E. Walker won both Power and Glider classes, other events going to J. S. McKechnie (Precision) and R. S. Rutherford (Stunt), McKechnie being the club champ. Main club interest at the moment is team-racing, with hot free flight and stunt a close second.

WHITEFIELD M.A.C. are to hold four club contests this winter, two being under the proposed 1953 "restricted" rules. Whatever the rules are finally, this club intends to have some experience with them before the 1953 contest season starts! Current activities have included a reasonable amount of flying. A couple of 22-inch Wakefield props have appeared—one managing to combine high climb with at least a 2 : 15 power run. Indoor r.t.p. flying has been carried out with the aim of enlivening club meetings, Dekka Bennett clocking **1 : 28** with a tissue-covered flying-plank, pusher tailless.

Midland Area

A well attended meeting of the **LEICESTER M.A.C.** showed a revival of interest in the official aspect of the club, and it has been decided to run another competition on similar lines to last year's "Ace" contest. The kit type will be decided by popular vote. Flying at Rearsby is carried on by one or two stalwarts, and all in all, a better season seems imminent.

The **FORESTERS (Nottm.) M.F.C.** held their 3rd Annual Dinner and Dance recently, about 50 people demolishing a five course meal. Fun, games, square dancing, etc., followed, the more nervous types retiring to (or under) the bar. Sensation at the A.G.M. resulted when the minutes of the previous A.G.M. were intoned. There in blue-black and off-white was a resolution decreeing that the next Annual G. would be held in March, 1953—and there they were in November. Completely undeterred, the committee were voted in, with the mixture mainly as before. The most important addition is that of Hon. Rodent Operative, the club being alarmed at the rapid disintegration of furniture in the

1953 CONTEST CALENDAR

January 18th	**DEVIZES M.A.C.** Control-line rally.
April 11th	**IRISH OPEN CONTROL-LINE CHAMPIONSHIPS.** College Park, Dublin.
September 6th	**YORKSHIRE EVENING NEWS RALLY.** (Sherburn-in-Elmet).

Clubs are invited to send in details of Special Galas or Open Days for inclusion in this regular Calendar.

AEROMODELLING TYPES—
"The Club Know-all."

club hut (not to mention models) due to the peculiar diet of said rats!

Western Area

Despite failure so far to get the authorities to reconsider their power flying ban on Durdham Downs, the **BRISTOL & WEST M.A.C.** fly rubber jobs and gliders in increasing numbers. G. A. T. Woolls first sailplane (a Quickie) performs extremely well, clocking some 2 : 30 from 150 ft. of line in misty conditions with 9 inches of snow on the ground. Much building is going on, including a Bilgri Wakefield by A. C. Brown.

Northern Area

At the recent **WORKSOP AEROMODELLERS'** Annual General Meeting, it was agreed that 1952 had been a year of sound progress, despite contest successes being fewer than the previous year. Pit work in team races has always been somewhat sketchy, but they are well on the way to rectifying this by encouraging relative novices to enter big contests Bridget McCann has been the star performer, with a place in the prizes at every contest, and has been flying the "ex-Upton ex-Russell" Class B with which she won the class at the 1951 Sherburn meet. She would have repeated her success in '52 but for the masterly performance of the Butcher-Cameron team. At the moment, apart from pleasure flying, preparations are under way for an exhibition to be held in February and a possible Rally in March.

BRADFORD M.A.C. can look back on its most successful season for many years. A new system of club comps. whereby members can use any type of free flight model in all six contests has resulted in a greatly increased entry into each event, and has done much to promote active interest in competition flying. The two best aggregates at the end of the season determine the winner in each category, each man receiving a trophy. Silvio Lanfranchi was the 1952 Power winner, with S. Eckersley and A. P. Miller taking honours in Glider and Rubber respectively. The club succeeded in reaching the semi-final of the Area knock-out, flown at Baildon on August 24th against the West Yorks. club, but were defeated by a narrow margin.

The **HUDDERSFIELD D.M.A.C.** hold a junior night every Tuesday, when, under the watchful eye of "Sparks" Earnshaw they get busy mass-producing Lulu's. This programme is proving very popular, all materials being provided free by the club. The usual junior's lament, "I ain't got no money" has been replaced by "What do we build next?". All club records have been scrapped to make way for a new set under the new line length and power run rules.

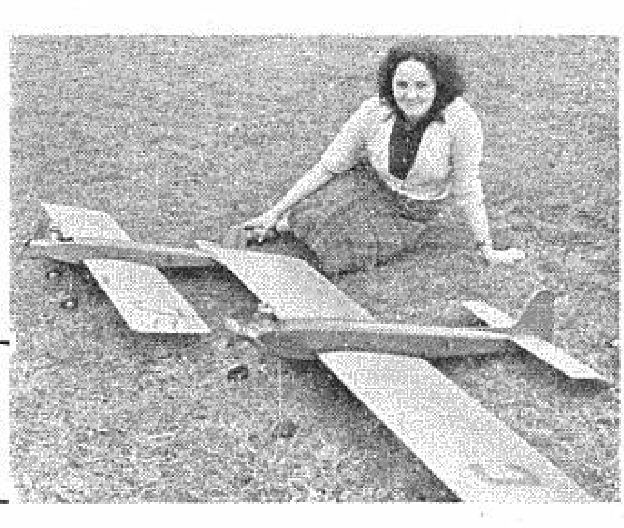
After a not-so-good 1952 season, the **HALIFAX M.A.C.** is looking forward to a better year, and Wakefields are taking prominence, with North flying a 50-in. fuselage stick type with a 22-in. narrow-bladed folder and 5 ozs. of rubber. Average time on half turns is 2 : 30 so far. Grant has a 50-in. diamond job with a 19-in. folder, 3¼ ozs. airframe and 5 ozs. of rubber. Flight pattern of both models is right-handed climb, left-hand glide. Club designs for glider, power and rubber are being tried out with hopes of getting new members either contest minded—or should we say retrieving?

Word comes that the 1953 Y.E. News meet will be held again at Sherburn on the 6th September. The word "National," which has been included in the title in previous years, has been dropped to avoid confusion with S.M.A.E. National contests.

Southern Area

As predicted, the new Frog midgets have been taken up with gusto by many clubs, and one, the **WINCHESTER M.A.S.** reports on a lively meeting with these little jobs. After much preliminary trimming and queueing for the line, the Speed section got under way, Ralph Bullock (remember him from pre-war Wakefields?) turning in a very fast 2½ laps in 4 seconds, fastest of the night. Next came Brian Oulton with 6·1 seconds, showing the considerable variation in the speeds to be obtained. Duration was a hectic scramble, with Ray Lewis finally setting top time of 14 : 2, with most of the entry plodding round for six to seven seconds. After the comp. had finished, Ray turned in a flight of 22·4 seconds, just to show he hadn't been trying!

Bridget McCann of Worksop Aeromodellers needs no introduction to the stunt contest boys. Bridget could put either of these two club jobs through the book with ease. Smaller is 58 ins., has McCoy 60 and flies at 80 m.p.h. Larger has a Hornet and does 65 m.p.h. on 100 ft. lines!



South Eastern Area

A new club to be formed in this Area is the **RYE AEROMODELLERS CLUB,** a helpful factor being the interest shown in the early stages by the Education authorities, who offered the facilities of the Further Education Centre. This means that the club is provided with a meeting room for a nominal charge of 3/6 a night, and they may hire the main hall for any money-raising event. Twenty-one members were enrolled on opening night, and we wish them every success.

North Eastern Area

Sunday, December 7th, saw a challenge by the **TYNEMOUTH M.A.C.** taken up by the newly-formed Novocastria club, the meeting taking place on Newcastle Town Moor. After a good contest, Tynemouth came out on top, a good time being had by all. Results:—

GLIDER	T. Stoker	(Tynemouth)	3 : 34
	B. Freeman	(Novocastria)	3 : 16
	R. Emmerson	(Tynemouth)	3 : 03
RUBBER	R. Pollard	(Tynemouth)	4 : 09
	W. Armstrong	(Novocastria)	2 : 39
	S. Fairless	(Novocastria)	2 : 27
POWER	R. Pollard	(Tynemouth)	27·3 ratio
	K. Mole	(Tynemouth)	26·4 ,,
	G. Ford	(Novocastria)	24·6 ,,

London Area

The Battersea & D.A.M. have ceased activities, the six or seven keen members remaining joining up with the **WIMBLEDON POWER M.A.C.** This merger should help to keep some organised flying on the local map, and a ground is available for C/L flying up to 2 p.m. on Sundays, a 40/- fine being imposed for any motor running after that time. This may seem stiff, but at least they know where they stand with the local Council!

The **CHINGFORD M.F.C.** held two "scramble" contests last back end, eventual winners being P. Smith (Power) and G. Sharp, who won both rubber and glider classes. J. (The Hat) Hall has at last broken the Class III speed record with 107 m.p.h., though the engine was not running full out. Their tame R/C type is still trying—one member even claiming to have seen his model airborne. The majority of the club members remain sceptical!

Well, there's not much this month is there, and what there is comes from one or two of the more progressive Areas. Still, I suppose even Press Secs. have to have an off season. Last but not least is a request I have from D. D. Harris of 49, Esplanade, South Perth, W. Australia, who is 15 years old, mainly interested in scale and sport free flight, and who would like to correspond with someone over here.

So, till next month, keep 'em building ready for the big flying season ahead.

The CLUBMAN.

NEW CLUBS

RYE AEROMODELLERS.
D. A. J. Speed, 14, Cinque Ports St., Rye, Sussex.

SECRETARIAL CHANGES

HALIFAX M.A.C.
E. North, 28a, Waterhouse St., Halifax, Yorks.

SUNDERLAND & D.M.A.C.
B. Sparkes, 39, Harvey St., Hebburn, Co. Durham.

TOTTENHAM M.F.C.
A. G. Ramsdale, 46, Selby Rd., London, N.17.

NEWPORT (210 A.T.C.) M.A.C.
M. T. Allen, 45, Margaret Ave., Newport, Mon.

E. LAW & SON (TIMBER) LTD.

272-274 High Street, Sutton, Surrey

For the **LARGEST** selection of the **HIGHEST** quality and the **LOWEST** priced

BALSA WOOD OBTAINABLE *ANYWHERE*

Some popular sizes.

Note the Price!!!

Sheet in 36 in. Lengths		Strip in 36 in. Lengths	
$\frac{1}{32}\times3$"	9d. each	$\frac{1}{16}$" sq.	1/- doz.
$\frac{1}{16}\times3$"	9d. „	$\frac{1}{16}\times\frac{1}{8}$"	1/- „
$\frac{3}{32}\times3$"	10½d. „	$\frac{3}{32}$" sq.	1/- „
$\frac{1}{8}\times3$"	1/- „	$\frac{1}{8}$" sq.	1/- „
$\frac{3}{16}\times3$"	1/2 „	$\frac{3}{16}$" sq.	2/- „
$\frac{1}{4}\times3$"	1/3 „	$\frac{1}{4}$" sq.	2/6 „

Our 1952 Price List, containing full details of *BALSA, OBECHE, and SPRUCE* sizes, *also DOPES, CEMENTS*, etc., is now ready. Send 6d. stamp for your copy.

Postage on RETAIL orders: Up to 10/-, 1/6; 10/- to 20/-, 1/9; over 20/-, POST FREE.

TRADE SUPPLIED AT FULL DISCOUNTS, WRITE FOR LISTS.

DEALERS OVERSEAS

this unique method of "Balanced Buying"

Saves Time, Saves Money, Saves Trouble

Trade Buyers overseas, let me be your buying agent. We export the best products of Britain's Model Aircraft Industry (under official licence) and can advise and recommend too. It means that the lines you order from me are "balanced" and complementary to each other, which cuts out unnecessary duplication and avoids gaps in buying. It also brings everything to you on one account. We invite enquiries and place the whole of Arthur Mullett's personal and long-specialised experience at your disposal. Send for lists.

- Specialist Export—Buying Service
- The Best British Kits, Engines, Accessories, Etc.
- Everything on One Account
- We handle all Formalities

ARTHUR MULLETT

BUYING AND EXPORT DEPT.

BRIGHTON, SUSSEX, ENGLAND

RAWLPLUG PRODUCTS

INDISPENSABLE IN THE WORKSHOP HANDY IN THE HOME

THE RAWLPLUG POPULAR OUTFIT

Larger sizes are obtainable.

Whatever your fixing problems, there's a Rawlplug Device that will solve it for you—easily and quickly. Rawlplugs make neat and absolutely firm fixings in any material from brick or tile to stone or slate, with a size for every screw from No. 3 up to ⅜" coach screws. Rawlplug Tools are easy to use and ensure a perfect hole without damage to surrounding surfaces. Other Rawlplug Devices include Rawlbolts for heavy duty fixings, Rawlanchors and Toggle Bolts for thin or hollow materials and Rawlclips for instant fixing of conduits and cables to girders—a device in fact for every need.

DUROFIX

The indispensable adhesive for instant use on crockery, glass, wood, metal, celluloid and the thousand and one things handled by the hobbies enthusiast. Instant drying, insulating, waterproof and heatproof. Durofix is grand for repairs to electrical, sports and leather goods. Durofix Thinner and Remover is sold in handy 2 oz. bottles.

DUROGLUE

UNDILUTED ANIMAL GLUE OF INCOMPARABLE STRENGTH

Ready for instant use for the many purposes for which an extra strong glue is needed. Wood, cloth, fabric, felt, leather and any greaseless surface can be stuck with Duroglue.

DUROLASTIC

ELASTIC SEALING COMPOUND

Forms permanently elastic waterproof joints with great adhesive qualities to any dry surface. Resists vibration or shock and will not break away with expansion or contraction. Non-crumbling, non-staining, does not exude oil. Can be painted after a few hours. Ideal for boatbuilders. In easy-to-use tubes.

B410D

PLASTIC WOOD

APPLIED LIKE PUTTY, DRIES LIKE WOOD

Can be cut, planed, polished and painted like wood. Will take nails and screws like wood. It does not blister, crack or decay. Rawlplug Plastic Wood is actually the best quality product of its kind on the market. Plastic Wood Softener and Remover is sold in handy 2 oz. bottles.

THE RAWLPLUG COMPANY LIMITED
CROMWELL ROAD · LONDON S.W.7

Modellers can be assured of personal service coupled with expert knowledge of aeromodelling requirements at any of the following shops.

LONDON — Tel.: Hop 3482
MODEL AIRCRAFT SUPPLIES LTD.
171, NEW KENT ROAD, S.E.1
The oldest established model aircraft shop in London
Service with satisfaction from **Harry York**

BIRMINGHAM — Tel.: Northern 5569
THE MODEL MECCA
204-206, WITTON ROAD, BIRMINGHAM 6
For M.A. Kits and Accessories, Trix "OO" and L.M.S. Co. "O" gauge. 5 and 5a buses pass the door. Write, phone or call

FALKIRK — Tel.: 1754
"MODELCRAFTS"
112, HIGH STREET
Specialists in all Aeromodel, Hobbies and all Model-making requirements

LONDON — Tel.: Sloane 4914
REPLICA, LTD.
159, SLOANE STREET, S.W.1
The exclusive model show rooms combining a large range of the latest toys

BOLTON — Tel.: 7097
ROLAND SCOTT
The Model Specialist
147, DERBY STREET
The obvious shop for all Model Aircraft Requirements

HARROW — Tel.: Pinner 6459
THE MODEL STADIUM
5, VILLAGE WAY EAST, RAYNERS LANE, HARROW MIDDLESEX
The only hire purchase specialists offering no deposit terms to established customers

LONDON — Tel.: AMHerst 2928
ROBSON'S
HACKNEY'S MODEL SHOP
149/151, MORNING LANE, E.9

CARDIFF — Tel.: 29065
BUD MORGAN
The Model Aircraft Specialist
22/22a, CASTLE ARCADE
The Mail Order Service
Send for latest Price List

HONG KONG — Tel.: 57662
RADAR COMPANY
New shipment of Model Aeroplanes, Engines, Boats and Car Kits, Cement and Balsa wood. Also Models' Accessories and Automobile Supplies and Tyres. Please call at
40-D, SHAN TUNG STREET, MONGKOK, KOWLOON

LONDON — Tel.: Lee Green 5401
CHAS. STEVENSON & SON
235/241, HIGH STREET, LEWISHAM, S.E.13
Lewisham's model shop

CROYDON — Tel.: 3728
HESET MODEL SUPPLIES
61, BRIGHTON ROAD, SOUTH CROYDON, SURREY
A 100 per cent. modelling shop, run by a modeller for modellers

ILFORD — Tel.: Hainault 2007
PAGE'S OF BARKINGSIDE
3, BROADWAY PARADE
FENCEPIECE ROAD
Everything for the model maker. 3 mins. walk from Fairlop Airdrome

MANCHESTER — Tel.: BLA. 6159
MODEL SUPPLY STORES
17, BRAZENNOSE STREET MANCHESTER 2
Manchester's Main 'Mecca' for every make of KIT, ENGINE & ACCESSORIES, Solarbo BALSA, etc. Northern SKYLEADA Factor.

CROYDON
WOODSIDE MODEL AIRCRAFT SUPPLIES
72 SHIRLEY ROAD, CROYDON, SURREY
Send S.A.E. now for details of our Free Coronation Year Offer

LONDON — Tel.: Lar. 3928
BATEMAN'S SOLID KITS
151, HIGH STREET, WALTHAMSTOW, E.17
Avro 707B—METEOR II NF.—VAMPIRE—Canberra B. Mk. II — Comet — Saunders Roe A.1. Flying Boat — Jet Fighter

ORPINGTON — Tel.: Orp. 7903
CRAY MODEL CRAFT
155, HIGH STREET, ORPINGTON, KENT
(Opposite Woolworth's)

DARTFORD
MODERN MODELS
12, THE MARKET, LOWFIELD STREET, DARTFORD, KENT
Don't despair until you've tried us by Post, or call. Send S.A.E. for our list

LONDON — Tel.: Mill Hill 2877
H. A. BLUNT, LTD.
133, THE BROADWAY, N.W.7
All the leading makers' kits, engines and accessories

SHEFFIELD
RAY'S MODEL STORES
157, INFIRMARY ROAD, 3
Prompt postal service. Send S.A.E. for list

GIG EIFFLAENDER 36-HOUR REBORING SERVICE ends starting trouble. BARRELS TRUED, PISTONS FITTED and TEST-RUN :- BEES and ELFINS 12/6, all other makes and sizes 16/9, except Half c.c. 18/9 C.W.O. ALL CLASSES REPAIRS, estimates free. C.O.D. add 1/3. 30 DAYS' GUARANTEE WITH ALL JOBS.

SEND NOW to— GIG EIFFLAENDER, FIELDBANK, CHESTER ROAD, MACCLESFIELD

TRUCUT PRECISION AIRSCREWS

CLASSIFIED ADVERTISEMENTS

PRESS DATE for March, 1953 issue January 22nd, 1953

ADVERTISEMENT RATES :

Private Minimum 18 words 6s., and 4d. per word for each subsequent word.

Trade Minimum 18 words 12s., and 8d. per word for each subsequent word.

Box numbers are permissible—to count as 6 words when costing the advertisement.

COPY and Box No. replies should be sent to the Classified Advertisement Department, The "Aeromodeller," 38, Clarendon Road, Watford, Herts.

TRADE

American magazines, one year's supply, post free. "Model Airplane News," 25/–; "Popular Mechanics," 32/–; "Flying" 35/–. For full list send stamp to Willen Ltd. (Dept. 1), 101, Fleet Street, London, E.C.4.

North East Engine Depot, Victoria Street, Goole. Engine part exchange. You will be delighted with our service. Modellers like dealing with us.

Engine Repairs and Rebores 60 DAY GUARANTEE any engine. Rebore prices: 1 c.c. to 2 c.c., 10/6; 2 c.c. to 5 c.c. 12/6. W. Birtles, 18, Royston Avenue, Paddington, Warrington.

Atlantic Models, 335, Bradford Street, Birmingham, 5, announce new list available for the Trade. Aircraft, Marquetry, Galleons, Engines, Railways, Accessories for all Models.

FOR SALE

Elfin 1·8, 37/6. 2 Mills 1·3, need attention, 17/6 each. E.D. III Receiver, 45/–. E.C.C. 950 A Receiver, 55/–. Mills powered "Wren", 50/–. Wanted, Elfin 1·49. Pickering, 214, Halifax Road, Rochdale, Lancs.

60 Aeromodellers, 33 "Model Airplane News", 24 "Air Trails" £3 or offers. A Proctor, 64, Ardwick Street, Burnley, Lancashire.

McCoy 60, Series 20, 180/–; McCoy 19, 80/–; Eta 29, 80/–; Ohlsson 23, 70/–; Frog 500 G.P., 50/–; Amco 3·5, 60/–; Elfin 1·8, 40/–; Elfin 1·49, 40/–; Midge ·5, 30/–. All as new. G. Williams, 9, Elmwood Crescent, Luton.

New Fox 35 in box. £8 or near. Frog 500, £2. Box No. 382.

Frog 150 (not run in), £2. Also E.D. Bee, 35/–. D. Proudlock, 189, Stockton Road, West Hartlepool, Co. Durham.

E.D. Mk. III Receiver and Escapement, Mercury Cossor R/C unit complete; any reasonable offer accepted for Part or Parcel. Box No. 381.

Frog 175 Petrol, 30/–; Amco 3·5, 40/–; E.D. Comp., New, 50/–; Eta 29, Series 1, 60/–; E.D. Mk. IV, New, 70/–; Dooling 29, 120/–. Box No. 380.

Elfin 1·49, 47/6; Amco 3·5, 50/–; both as new. E.D. Mk. III T/X. good condition, £1. Box No. 379.

Ivy Hard Valve receiver, 65/–; E.D. Actuator, 15/–; both absolutely brand new and unused. "Rosery", Byers Lane, Godstone, Surrey.

Micron 10 c.c. petrol racing engine. As new. Best offer over £5. Dupree, Narkunda, Hadlow Road, Tonbridge.

D.C. 350, £2. 10s. 0d. or nearest. E.D. 246, £3. 10s. 0d. or nearest. Bench tested. 56, Rook Hill Road, Chequer Field Estate, Pontefract.

E.C.C. International Transmitter. 950A Receiver and Escapement. Milliameter. All unused. Uncovered Sparky wired up. Elfin 1·49, £11. Arber, 144, Bedford Road, Liverpool, 20.

Allbon Dart £2.15.0. Elfin 1·49 £1.15.0. E.D. 2·46 £3.5.0. B.B. Amco £4.10.0. Yulon '30' with accumulator £2.5.0. All engines as new—barely run in—bargains. R. Atkinson, 55, Randsway, Ipswich.

AEROMODELLERS TERMS . . .

THE

BEST HIRE-PURCHASE TERMS

on Engines, Kits, Hobbies Fret machines, Trix and Gaiety Locos., and X-acto Tool Chests.

NO DEPOSIT SCHEME for all customers who have completed a purchase in a satisfactory manner.

The MODEL STADIUM

HIRE PURCHASE SPECIALISTS

5, Village Way East, Rayner's Lane, Harrow, Middlesex

(2 mins. Rayner's Lane Station) *Tel. PINner 6459*

S.A.E. for enquiries please. Engines run for Personal Callers.

SUTTON *Tel.: Vigilant 8291*

Surrey's Hobby Centre

E.L.S. MODEL SUPPLIES

272, HIGH STREET, SUTTON, SURREY

Stockists of all aeromodelling accessories. Also railways, ships, cars, etc. by return postal service

SWINDON *Tel.: 4778*

HOBBY'S CORNER

10, RODBOURNE ROAD

All the leading makes of M.A. kits and accessories **in stock**

Dublo—Trix—Graham Farish Trains

TEDDINGTON *Tel.: Molesey 4349*

TEDDINGTON MODEL SUPPLIES

86, BROAD STREET, TEDDINGTON, MIDDLESEX

For aircraft, boats, radio control, resin bonded plywood obechi for boat builders

All advertisement enquiries to . . . .

THE "AEROMODELLER", 38, CLARENDON ROAD, WATFORD, HERTS. Telephone: WATFORD 5445.

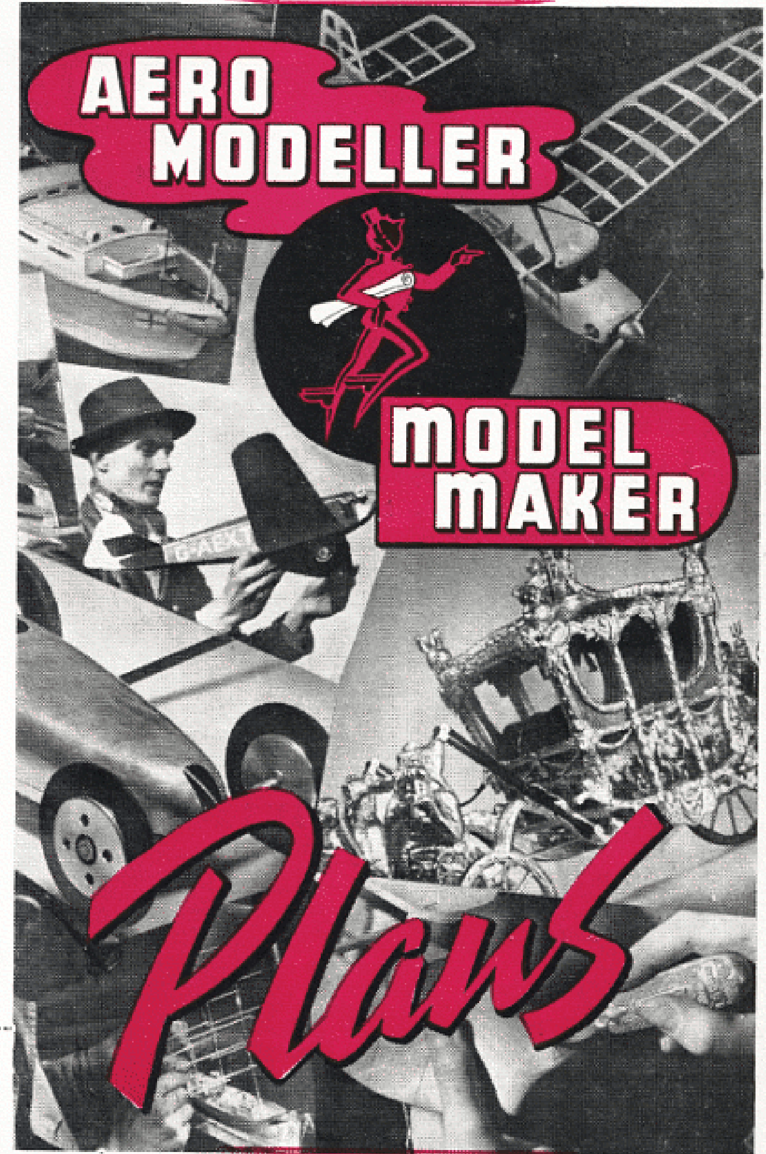
THE MOST COMPREHENSIVE RANGE OF MODEL PLANS OFFERED IN THE WORLD

This is not an advertising slogan, but a fact! No other plan service in the world, so far as we know, offers so wide a variety of flying model aircraft plans, such a selection of three-view drawings of full-size aircraft, nor the immense variety of model cars, boats, yachts and other plans of interest to the model maker. Furthermore, nearly every design is illustrated with photo-blocks of the actual model so that our customers know exactly what they are getting.

THE SEAL OF SATISFACTION

ONCE again it has become necessary to revise our famous Plans Catalogue, and issue a completely new edition. Since last Spring over 15,000 copies have been distributed—the response of enthusiastic customers to our request for payment of part-cost at 6d. has justified our view that they would rather pay a few coppers for a worthwhile catalogue than take a cheaper "give-away" edition. This new list embodies for the first time the whole of our Plans Service—that is to say it now includes our equally famous selection of model racing yachts, power boats, launches, cabin cruisers, A.S.R.L.s, engines cars—simple and super-racing, the widest car prototype range available anywhere, lineside features, workshop accessories and the like. In the aircraft section we have included all our recent flying plans, and in the scale plan section have completely revised our cataloguing of types, with the addition of many new scales and varieties. With the fast growing interest in "solids" we anticipate this will be a favourite section, and its hundreds of aircraft—new and old—provide the gen for many exhibition models.

Send for this NEW Catalogue in its gay coloured photo cover right away—you will find its 76 pages a real education!



76-pages—but in spite of increased size still only 6d.

To: AEROMODELLER PLANS SERVICE,
38 Clarendon Road, Watford, Herts.
Please send me a copy of your New Plans Catalogue, for which I enclose 6d. (in stamps/postal order).

Name...

Address..

Made and printed in Great Britain by Alabaster, Passmore & Sons, Ltd., London and Maidstone, for the Proprietors, The Model Aeronautical Press, Ltd., 38, Clarendon Road, Watford, Herts. Published by the Argus Press, Ltd., 42-44 Hopton Street, London, S.E.1, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canada Magazine Post.