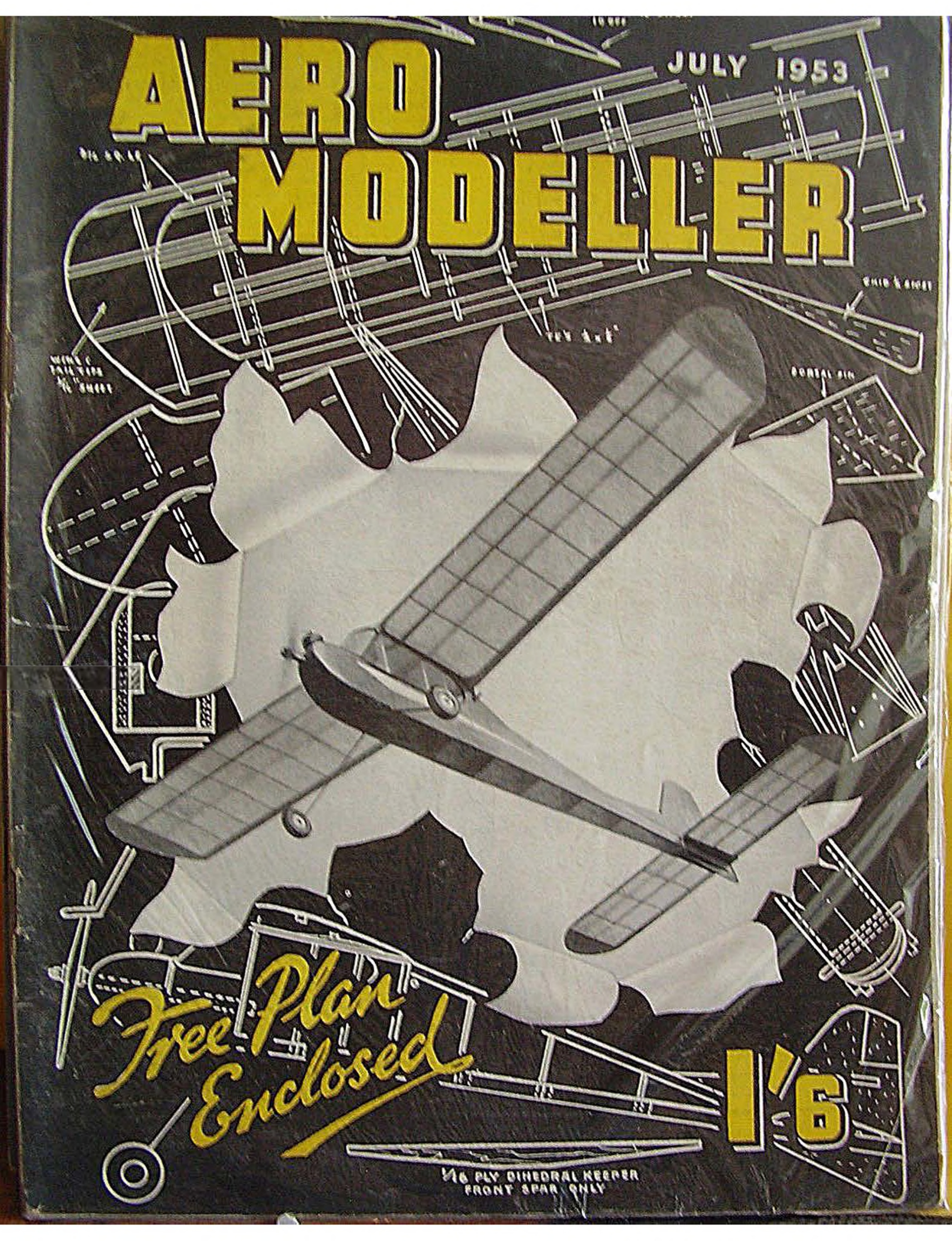
AERO MODELLER

JULY 1953



Free Plan Enclosed

1'6

1/16 PLY DIHEDRAL KEEPER FRONT SPAR ONLY

Digital Edition Magazines.

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

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

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

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

AeroFred Gallery Free Plans.

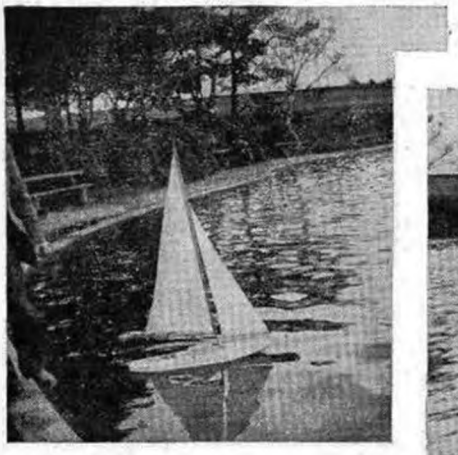
http://aerofred.com/index.php

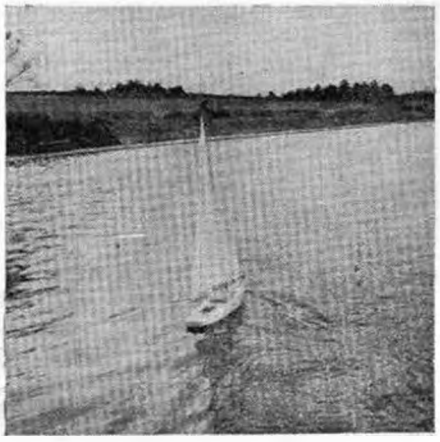
Hip Pocket Aeronautics Gallery Free Plans.

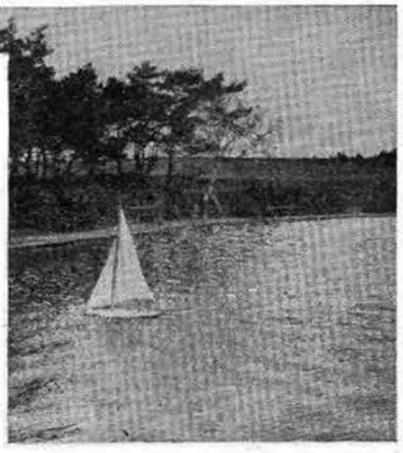
http://www.hippocketaeronautics.com/hpa_plans/index.php

Diligence Work by Hlsat.

Now for Radio E.D Yachts!



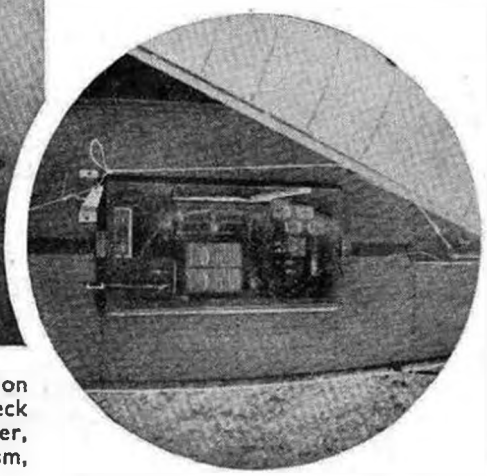




36-in. UNRESTRICTED CLASS MODEL YACHT

This model is effectively rudder controlled only by the E.D. " Boomerang " ready-wired Radio-Control Unit, the E.D. Mk. II Miniature R/C Unit or the E.D. Mk. III Miniature R/C Unit.

The rudder control is operated by the E.D. Mk. I Clockwork Escapement. Radio, Servo and batteries are housed in hatches in the deck.



The Radio and Servo installation (inset) in the drop-in box on the deck showing the E.D. Mk. IV receiver, rudder mechanism, sail mechanism, and batteries.

" A " CLASS MODEL YACHT

This model is fully radio-controlled by rudder and sail with the E.D. Mk. IV Tuned Reed and 3-Channel Radio-Control Unit. For more than one operation (i.e., rudder and sail) the reed unit is, of course, essential.

This magnificent model was built, installed and operated with great success by Mr. George Honnest Redlich, the R.C.M.S. Fleetwood Winner, and Percival Marshall, Hove Winner.

E.D. RADIO CONTROL UNIT PRICES

E.D. Mk. III " Miniature" (Transmitter, Receiver and Escapement) **£10 . 15 . 0**

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E.D. Mk. IV Tuned Reed 3-Channel Unit, comprising Transmitter Control Box and Receiver, less Escapement **£23 . 15 . 0**

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E.D. III and aerial **92/6+16/5 P.T.**
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E.D. IV, control box and aerial **160/0+30/0 P.T.**
E.C.C. Transmitter Unit **50/0+9/4½ P.T.**
E.C.C. 1061 **70/0+13/2 P.T.**

RECEIVERS

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E.D. IV **240/0+45/0 P.T.**
E.C.C. 951A **70/0+13/2 P.T.**
E.D. Boomerang Receiver Pack (incl. escapement) **109/6+17/2 P.T.**
E.D. Boomerang Receiving Set only **89/0+13/5 P.T.**

COMPONENTS

E.D. escapement, compact and normal type **18/6+3/1 P.T.**
E.D. polarized relay **30/0**
E.C.C. 5A relay **25/0**
E.D. Standard relay **22/6**
E.D. Reed Unit (high or low frequency, state which) **60/0**
Hivac Valve **15/0+2/6 P.T.**
Milliameter, 0·5 M/A **15/0**
E.D. IV Control Box **44/0+8/3 P.T.**

GLIDER KITS

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

GLIDER WINCH

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

IT'S THE SERVICE THAT COUNTS
THESE CUSTOMERS WERE SATISFIED
WHY NOT YOU?

Dear Sirs,
Please find enclosed . . . I must congratulate you on your speedy and efficient service which is unique in the model trade.
April 29th, 1953. — *L.A.C. S., R.A.F., M.E.A.F. 15.*

Dear Sirs,
May I thank you for your prompt attention in supplying me with the kit of the Frog 45 . . .
April 25th, 1953. — *L.A.C. B., R.A.F., M.E.A.F. 15.*

Dear Sirs,
Would you please send me an Elfin 1.49 c.c. diesel engine . . .
I would like to state how impressed I am with your quick dispatch of goods, as well as the excellent condition in which they arrive. One of my friends . .
April 16th, 1953. — *B. A. W., Germiston, Transvaal, South Africa.*

Dear Sirs,
You have been recommended to me by a friend for your wonderful return post service, I would therefore like to order one Mills P.75 c.c. engine . . .
April 23rd, 1953. — *A. K. G., Ashburton, South Devon.*

ENGINES

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

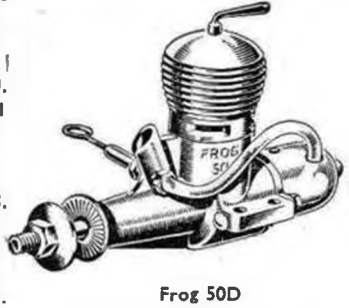
	P.T.
Amco B.B. 3·5 ...	92/0+17/3
Allbon Dart, 1·5 c.c. II	54/0+10/2
Allbon Spitfire ...	54/0+10/2
Allbon Javelin ...	55/0+10/4
D.C. 350	66/0+12/5
E.D. ·46	45/0+ 7/3
E.D. Bee I c.c. ...	47/6+ 7/3
E.D. 2·46 Racer...	72/6+ 6/0
E.D. Mk. IV 3·46 c.c.	72/6+ 6/0
E.D. 1·46 ...	52/6+ 4/6
E.D. 2·46 Watercld.	98/6+10/9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


*E.D. 3·46 c.c.

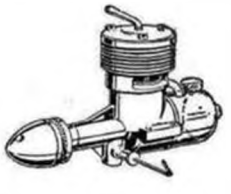

Mills ·75 c.c.


Elfin ·5 c.c.


*E.D. 2·46 Racer


Frog 50D


Allbon Spitfire


D.C. 350D

* Can be supplied in watercooled versions or existing engine converted. Conversion charge **43/6** Post Free.

FREE-FLIGHT KITS

	P.T.
Veron	
Streaker, 37" ...	19/9+3/5½
Cardinal, 35" ...	14/6+2/5
Lavochkin, 37" ...	25/0+4/2
Sabre, 34"	25/0+4/2
Frog	
Cirrus, 48"	21/0+3/6
Fox, 40"	17/2+2/10
Firefly, 36"	18/5+3/1
Janus, 44"	14/4+2/4½
Vixen, 36"	12/4+2/1
Powavan, 48" ...	22/1+3/8
Zephyr, 33"	10/3+1/8½
Keil Kraft	
Skylon, 38"	10/3+1/9
Slicker 42, 42" ...	17/6+2/11
Outlaw, 50"	22/6+3/9
Bandit, 44"	18/6+3/1
Ladybird, 41" ...	18/6+3/1
Pirate, 34"	12/0+2/0
Cessna 170, 36" ...	18/6+3/1
Luscombe Silvaire, 40"	18/6+3/1
Piper Super Cruiser, 40"	18/6+3/1
Southerner Mite, 32"	10/6+1/9
Skyleada	
Point Five, 31" ...	7/10+1/3
S.E.5A, 27"	14/4+2/4½
Doughty	
Eliminator, 48" ...	19/6

RUBBER POWERED KITS by all leading makers. **SOLIDS** by Veron, Keilkraft and Bateman.
VENNER ACCUMULATORS.
FLYWHEELS for E.D., Allbon and D.C. Engines.
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New K.K. LEAFLET available.

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

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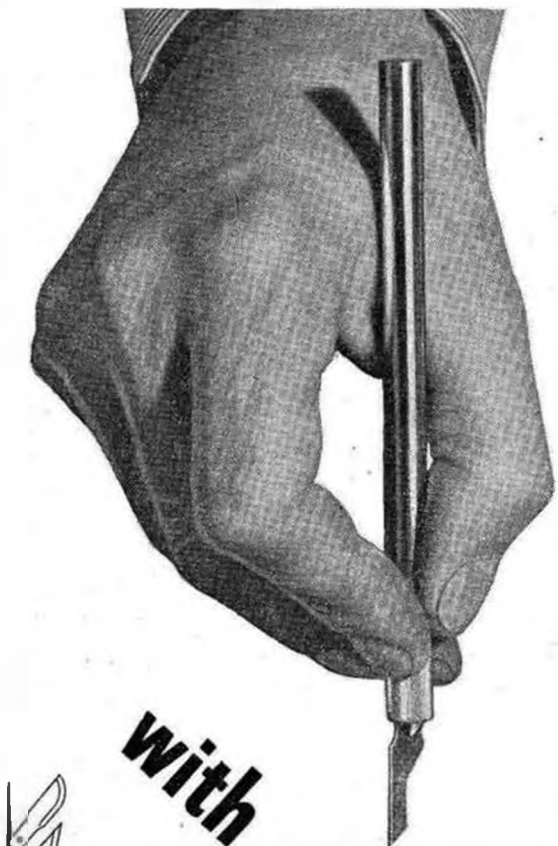

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Send for MY NEW LATEST PRICE LISTS SHOWING NEW PRICES REDUCED BY PURCHASE TAX, sent POST FREE BY RETURN. Lists include :—KEIL KRAFT, VERON, FROG, SKYLEADA, MERCURY, JETEX, E.D., DOPES, FUELS, CEMENT, BALSA WOOD, KITS, ENGINES, ACCESSORIES. All orders post free over £1, under add 1/- postage. OVERSEAS ORDERS FREE FROM PURCHASE TAX, deduct approx. 20%. C.O.D. ORDERS WELCOMED.

THE "SPRAYMASTER". YOUR BOAT FOR 1953. PRICE only 36/-

Length 24", Beam 8½", Freeboard 2½". Kit contains full-size plan, all parts cut to size, with bulkheads ready slotted for keel and stringers, finest knot-free resin-bonded ply throughout. Only tools needed are modelling knife, sandpaper block, small file and hammer. The following engines are suitable for the Spraymaster : E.D. BEE, E.D. 1·46 c.c., ALLBON SPITFIRE 1 c.c., or ELECTRIC MOTOR.

Propeller shaft and stern tube for SPRAYMASTER 5/-.
Propeller 5/6, Flywheel 9/-.

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FROG SENIOR SERIES rubber-powered sports models, all at 4/6 each.
RAVEN 18" low wing speedster.
REDWING 18" span high wing.
LINNET 18" racer, twin rudders.
For the Frog 50 motor—"MIRAGE". ¼A team racer complete with 3-bladed propeller, price 10/6.
"TARQUIN" 36" span power duration for the Frog 50 motor, 12/-.

RADIO CONTROL

NEW "BOOMERANG", the radio control set with five lives—see E.D. advert. for full particulars. Price £11 . 19 . 6 complete.
E.C.C. 951a HARD VALVE RECEIVER. 27 M/C band. Now £4 . 3 . 2.
E.C.C. 1061 TRANSMITTER £4 . 3 . 2.

ENGINES

Allbon Spitfire, 1 c.c. ...	64/2
Allbon Dart, ·5 c.c., Mk. 2	63/-
Allbon Javelin, 1·49 c.c., Mk. 2	64/2
E.D. Baby, ·46 c.c.	52/3
E.D. Bee, 1 c.c.	54/8
E.D. Racer, 2·46 c.c. ...	78/5
Frog 50	42/9
Frog 150	47/-
Frog 500, glow plug ...	71/6
Elfin, ·5 c.c.	64/2
D.C. 350	78/6
D.C. 350, glowplug ...	78/6
Amco 3·5 c.c. BB	111/-
Mills ·75 c.c.	58/4

New ELMIC MINI-DIESEL TIMER and CUT-OUT COMBINED, 8/9

NEW SOLID KITS

Veron D.H. 110	4/1
Javelin	4/1
Seahawk	2/8

Send for Veron's up-to-date complete list of Solids. Full range of Silverwing, KeilKraft, Bateman solids in stock.

FULL RANGE OF X-ACTO TOOL CHESTS and BALSA KNIVES IN STOCK. "BURLINGTON" complete Tool Chest 84/-. No. 82 Tool Chest 30/-. No. 78 Wood Carving Set 37/6. No. 77 Wood Carving Set 23/-. PLANE 5/6. SPOKESHAVE 3/6. SANDING BLOCK 3/6. STRIPPER 5/-. Send for full illustrated X-ACTO PRICE LIST FREE.

JETEX TAILORED KITS

Hawker Hunter	18/1
Voodoo	7/5
Voodoo, complete with type B. Jetex 50 Motor and Fuel, etc.	14/3
M7 kit only	4/9
M7 kit (complete with Jetex 50b Motor)	10/6
Skyleader "Comet" for Jetmaster Motor	8/6

CONTROL LINE KITS

Frog Vandiver II, 27" ...	14/-
Vantage Class B	20/-
Vanfire, 40" Stunt	28/-
KeilKraft Ranger	12/3
Pacer	17/6
Phantom	21/7
Veron Beebug	14/-
Panther	29/2
Focke Wulf 190	24/6
Wyvern	27/5
Midget Mustang	26/3
Minibuster	17/6
Skyleada Auster	8/9
Hornet	10/4

SECOND HAND ENGINES

E.D. Bee 35/-, E.D. Baby 37/6. Frog 50 35/-, Elfin 1·49 c.c. 40/-, Elfin 2·49 c.c. 45/-, Amco 3·5 45/-, E.D. Racer 55/-, Frog 500 45/-, D.C. 350 45/-, Frog 150 35/-, E.D. 3·46 45/-, McCoy 36 75/-, Arden 199 70/-, O.K. Cub 37/6.
Send for my second hand engine list—free.

FREE FLIGHT POWER KITS

KeilKraft, Skylon 38" ...	12/3
Pirate, 34"	14/-
Bandit	21/7
Ladybird, 41"	21/7
Outlaw	26/3
Southerner Mite, 32" ...	12/3
Slicker Mite, 32"	11/1
Skyleada, Point Five ...	9/3
SE.5a Flying Scale, 27" ...	16/10
KeilKraft Cessna 170, 36" ...	21/7
Luscombe Silvaire, 40" ...	21/7
Piper Super Cruiser, 40" ...	21/7
Frog Zephyr, 33"	10/-
Firefly	16/6
Powavan, 48"	16/6
Cirrus, 48"	16/6
Veron Cardinal, 37" ...	16/6
Lavochkin 17, 37"	29/2
Skyskooter, 48"	29/2
Mercury Flying Scale Stinson	33/-
Aeronca Sedan, 65½" ...	66/-
Monocoupe	26/3
Monocoupe, 64"	66/-
Skyjeep, 45"	33/-
D.H. Tiger Moth, 33" ...	33/-

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Gnome, 32"	...	7/–
Martin, 40"	...	8/10
Grebe, 49" ...	...	14/4
Norseman, 58" A/2		28/–
Marauder, 65"	...	16/11

F/Flight Power

Mallard, 48"	...	21/4
Jnr. Mallard, 34"	...	17/6

Rubber

Mentor, 36"	...	10/6

Arrangements for the resumed manufacture of all Mercury quality kits are now complete and the full range is again available. **WATCH FUTURE ADVERTISEMENTS FOR DETAILS OF NEW MODELS.**

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New Jnr. Monitor...	22/6
Monitor	21/4
Mk. I. T. Racer ...	26/10
Mk. II. T. Racer ...	22/2
Midge Class 'A' Speed	6/2

The Aeronca Sedan for F/F and Radio Control.

The D.H. Tiger Moth

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Tiger Moth, 33"	...	33/3
Aeronca Sedan, 65"		66/6
Monocoupe, 64"	...	66/6
Monocoupe, 40"	...	26/7
Stinson 105	...	33/3
Chrislea Skyjeep	...	33/3

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In 8 oz. bottles.

No. 1 Comp. Petrol ...	2/3	No. 6 All-in-one Diesel	2/6
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No. 3 Comp. Diesel ...	3/–		
No. 4 Comp. G. Plug	2/6	No. 8 Castor Diesel ...	3/–
No. 5 Racing G. Plug ...	3/–	Ether	3/–

CELLON MODEL FINISHES

are now available in the new miniature pack, price **9d.**

STANT AIRSCREWS (the finest made)

All diameters 6" to 10". All pitches 4" to 12". In three distinct patterns. Standard, Speed, Team Racing.

ALL ONE PRICE ... ... **2/– each**

Skyleada 3/6 Series,

Flying Scale

Rubber-powered: Auster, Comper Swift, Grasshopper, D.H. Puss Moth, Tiger Moth. For Jetex 50: Avro 698, Avro 707, Gloster Javelin, Mig 15.

Solid Balsa Gliders

Midge, 14", 1/4. Wizard, 24", 3/6. Three-footer, 36", 5/8.

Skyrova Junior Series 2/3

Auster, Barracuda, Firefly, Grasshopper, Messenger, Mustang, Tempest, Tiger Moth, Typhoon.

Skyleada 16 in. F/Scale 2/8

Ascender, Boomerang, Curtis Owl, Hellcat, Helldiver, Hurricane, Miles M18, Mustang, Spitfire, Tempest, Thunderbolt, Typhoon.

Rubber Duration

Falcon, 22", 3/11. Fledgling, 26", 5/–. Cavalier, 30", 6/–.

Free Flight Power

Point Five Cabin, 31"	...	9/–
SE5a Flying Scale, 27"	...	16/8
Comet Scale	... ...	8/11

Control-Line

Auster Scale, 27"	...	8/7
Curtis Hawk Scale Biplane	... ...	18/–
Hornet Class "A" Team Racer, 20"	... ...	10/6

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D.H. COMET KIT ... 8/11

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AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

VOLUME XVIII
NUMBER 210
JULY 1953

"Covers the World of Aeromodelling"

Editor :
C. S. RUSHBROOKE

Assistant Editor :
H. G. HUNDLEBY

Public Relations Officer :
D. J. LAIDLAW DICKSON

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Contents

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

God Save the Queen !

AS this is read, the Coronation of our young Queen will be a pleasant and moving memory, introducing what is universally believed to be a new era in the prestige of the British Commonwealth of Nations. For our part, representing as we do a young, healthy hobby that is pre-eminent in this air age, we respectfully add our felicitations to the thousands afforded our youthful Queen, and look hopefully to the future in the certain knowledge that, with the assistance of her air-minded consort, the youth of this country and their modern activities will receive Royal support at all times.

We are probably unique in not having produced a special Coronation number to commemorate this great occasion, but in our opinion the general celebrations have been more than adequately covered in the national press, but we feel our readers will join us in the offering of the loyal tribute expressed above in all sincerity.

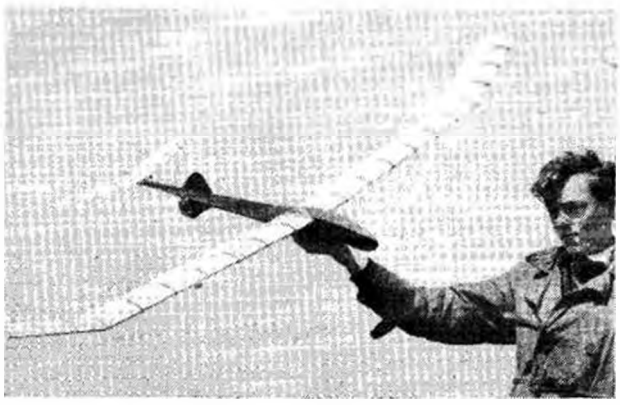
As intimated in our June issue, we have great pleasure in presenting a special DESIGN CONTEST with this number, and already we are assured of keen support from many enthusiasts who see in this innovation a new lead to the hobby. Past experience shows that the most rapid advances take place in those contests limited to a specific formula, as witness the Wakefield type rubber-driven model, and the Nordic A/2 glider, which achieved phenomenal popularity as soon as it was adopted as the World Championship specification.

The standard of flying with the PAAload type of machine as witnessed at the British Nationals (to be fully reported in our next issue) was extremely high, with K. Glynn of Brixton scoring a maximum of three three-minute flights, using a 15 second motor run on each occasion. Close behind came two well-known designers in Ray Monks and George Fuller, and it is evident from all we have heard that this class of contest is rapidly reaching a degree of popularity comparable with the other formulæ events.

We were naturally asked why we had made our contest for engines of maximum capacity of 1 c.c., instead of the present S.M.A.E. class of 3·5 c.c.—or even the new classes to be tried out later this year of 2·5 c.c. and 1·5 c.c. The answer is simple enough ; 1 cubic centimetre is the nearest equivalent to the most popular American class of ¼A (·05 cubic inches), and as it is the wish of ourselves and our American collaborators, Pan American World Airways, to stimulate international competition, it seems logical to aim at the class which statistics prove has the greatest support, and at the same time brings the event within the reach of the majority. It is a well-known fact that far more modellers own engines up to 1 c.c. than any other capacity, and furthermore, the smaller size engine will make for a model of reasonable proportions that will at the same time be easily transportable.

We look forward with keen anticipation to the entries for this first section of our PAAload Contest, for we are increasingly aware of the great part that aeromodelling can play in the continuing supremacy of Great Britain in the air. Aeromodelling is truly the proving ground for our future aviation engineers.

Heard at the



PAA Load

A most spectacular leap into popularity in recent years has been made by the Pan American World Airways-sponsored "PAA-Load" event in the U.S.A.

In this country, only one class has so far been flown, and, being for large models, has met with mixed response. The AEROMODELLER, in conjunction with Pan American World Airways, therefore has great pleasure in inaugurating a completely new small (1 c.c.) class (equivalent to the popular American ½A (·05 cu. in.) class), and in order to bring this to the attention of as wide a field as possible, is introducing the new specification by means of a special DESIGN COMPETITION. We emphasize that the size is 1 c.c. and *not* 2 c.c. as given in error in last month's issue.

On pages 416–419 will be found Vic Smeed's approach to these rules, and inserted in this issue are full size plans for his "PAAge-boy" design. Other designers will presumably have different ideas about getting maximum performance from the fairly open specification, and in conjunction with the Design Competition, a FLYING CONTEST will be arranged in 1954 to give opportunities of comparing various approaches. In this contest, any model fitting the specification may be flown, but the abilities of "PAAge-boy" leads us to expect many entries using this design, to any of which placing in the first twelve a year's subscription will be awarded.

The Christmas 1953 issue of the AEROMODELLER will contain plans of the winning model in the Design Competition, and three-view drawings of runners-up, together with design analyses and photographs. There are three prizes of Bulova Watches (presented by Pan American World Airways) to be won, plus cash and subscriptions, so study the rules, and get out the drawing board. Closing date is *September 30th*, and you have to design, build, photograph, and flight-qualify your model by then.

Kidlington Kapers

Despite the handicaps of light-plane flying and winch-launching of gliders, many fine flights were witnessed at Kidlington Aerodrome, Oxford, for the Trials to select a British A/2 team, and the AEROMODELLER Radio Control Trophy.

Unfortunately, the fine sunny day had the drawback of a wind in the worst direction for retrieving, and many models were lost or badly damaged in the thickly wooded grounds of Blenheim Palace and adjoining areas. Inevitably, thermal flights were balanced by many affected by downdraughts, and we commiserate with the one or two unlucky fliers with double max.'s—but no model with which to get in a third round.

With one or two exceptions, models were of a stereotype form, but outstanding were the machine using a length of alloy tube as a "fuselage", and the very unusual design flown by 1950 team member Bootman of Scunthorpe. The model—depicted on this page—has an extra long fuselage carrying a well sweptback tailplane, and fin midway along the length. Perhaps the most striking feature is the use of numerous wing fences on the mainplane. Bootland was unlucky in losing this model on the first flight with a maximum, for he scored another max. in the third round, but was eliminated by a poor second round time with a reserve model just before his No. 1 job was returned for a third round effort.

Loughborough College again came to the fore with two members in the team, plus Maurice Hanson of Solihull (1950 team member) and Tony Brooks of the Grange club. (It is significant that three of the team attend aeronautical colleges!) G. C. M. Byrd is brother to Max ditto, who was a member of last year's team competing in Austria, and Geoff Linford was until recently secretary of the Loughborough club.

Official Gen

Owing to general confusion regarding line lengths and maximum durations, the "S.M.A.E. Cup" contest held on March 22nd has been declared null and void, the times submitted being used solely as a basis for determining the A/2 Trials qualifiers. The trophy may be competed for later in the season as an additional item in the calendar.

Two other "extras" will comprise 1½ c.c. and 2½ c.c. Payload classes, using the 4 and 8 oz. payloads respectively. These events will be run as additional contests at the British Championships on the 30th August.

As an experiment, commencing with the British Nationals, late entries for centralised events can be accepted on the field at double entry fees.

An attempt is to be made to standardise on a central flying ground for all future Trials meetings, and the new Midland Area field at Long Marston (near Stratford-on-Avon) will be tried out on

Hangar Doors

August 30th. The advantages of such a system are obvious, for Team aspirants will be able to familiarise themselves with the features of such a ground, and, what is even more important, be enabled to get thoroughly used to retrieving geography—an aspect almost as important nowadays as getting maximum durations.

British Speed Team

As we close for press we are just able to include a picture on page 429 of the British Team for the 10 c.c. World Speed Championships in Milan. At the eliminators at Waterbeach R.A.F., Cambridge, R. Davenport of E. London, put up the phenomenal speed of 158·7 m.p.h., which exceeds the present International Record by over 4 m.p.h. Timms of Harrow qualified at 139·8 m.p.h. and R. Skinner of Harrow at 138·9 m.p.h. Only other man to qualify was C. H. Crowe, also of Harrow Club, who is an American national and therefore ineligible for a British team. By the time this issue is on sale these boys will be in Milan together with our own Harry Hundleby who is acting as team leader. We are sure that readers everywhere join with us in wishing them every success in their attempt to retain the World Control Line Championship which Great Britain has held since 1951.

More All-Rounders

Within the last few weeks, no less than three chaps have qualified for the top International honours by gaining their class " C " cum International endorsements to Merit Certificates.

Alan Wrigley (Whitefield) completed his efforts on the 23rd March, and May 10th saw both A. W. M. Cooke (Henley) and Kenneth Mole (Tynemouth) put the finishing touches to their fight for the hallmark of the aeromodelling all-rounder. Both Cooke and Mole evidently made a special effort, for the former made his qualifying glider flights on the 24th April, power on the 9th May, and rubber the very next day.

Mole also made his glider flights in April (6th), followed by power on May 3rd and rubber on the 10th of the same month.

Great Britain now holds no less than nine top grades, more we understand than any other country in the world. We have no doubt that many more fellows could qualify if they just made the effort.

International Radio

Southend has been selected for the venue this year of the I.R.C.M.S. International R/C Models Contests, the events occupying the week-end July 25/26th. Saturday will be devoted to boats (three classes, power, yachts, and " escapement only ") at Southchurch Park, and Sunday, at Southend Airport, will see power aircraft and gliders competing in separate classes.

Manœuvres called for by powered aircraft are fairly standard ; on the first flight scoring is for take-off, twice round a figure-eight course (pylons 400 yds. apart) and spot landing, and on the second, level turns right and left, level figure-eight, spin (probably meaning spiral dive) in either direction, loop, reduced engine speed or cut-off, increased engine speed, up to four special manœuvres, and spot landing. Fifteen minutes total is allowed, with five minutes maximum between. Gliders are allowed fifteen minutes and as many flights as possible from a 100m. line in that time, time in air scoring, as well as any manœuvres as in second power flight above. Full details from R. Ing, 36, Sunny Gardens Road, Hendon, London, N.W.4

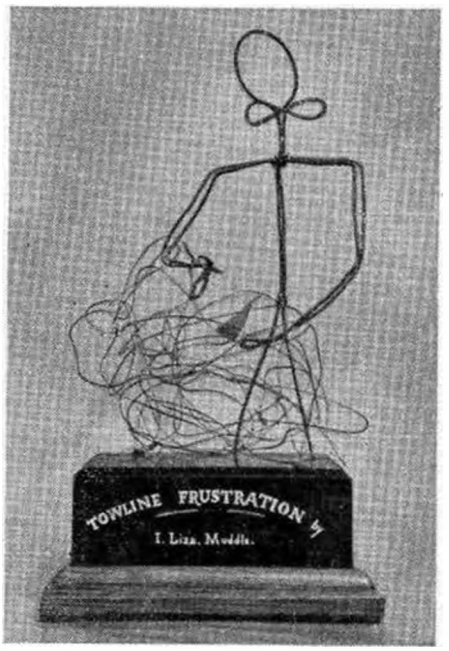
Towline Frustration

The work of two Southern Cross A.C. members : R. H. C. (Bob) Smith and F. C. (Fred) Smith ; the former by trade is a French polisher, whilst the latter being a commercial artist ; incidentally, they are in no way related.

The inspiration occurred during casual conversation about that controversial " Unknown Political Prisoner " wire sculpture and it was decided that this should be the aeromodellers' version. Construction of the figure is approximately 16 s.w.g. wire and the " line " of 36 s.w.g. The plinth is polished oak, and the height 9 ins.

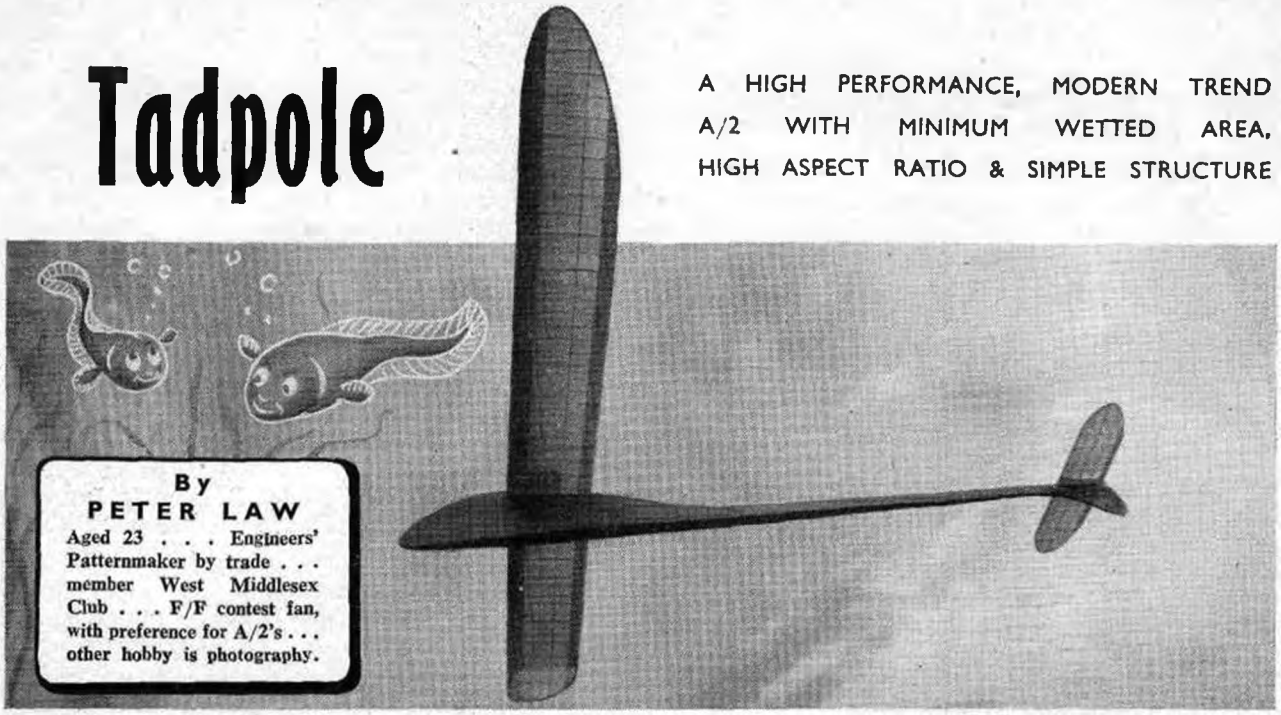
And its fate ?—raffled as a mystery parcel in aid of club funds, raising the sum of 6s. 8d.

Whilst speaking of this active Southern Cross Club, we do wish to correct the false impression given in last month's " Hangar Doors " when we stated that Grahame Gate's successful entry in the Royal Aero Design Competition was a collaborative effort with a Mr. Woodhams. We now learn that these were two quite separate unrelated entries, which, of course means more credit therefore to Grahame for his outstanding solo entry.



Tadpole

A HIGH PERFORMANCE, MODERN TREND A/2 WITH MINIMUM WETTED AREA, HIGH ASPECT RATIO & SIMPLE STRUCTURE



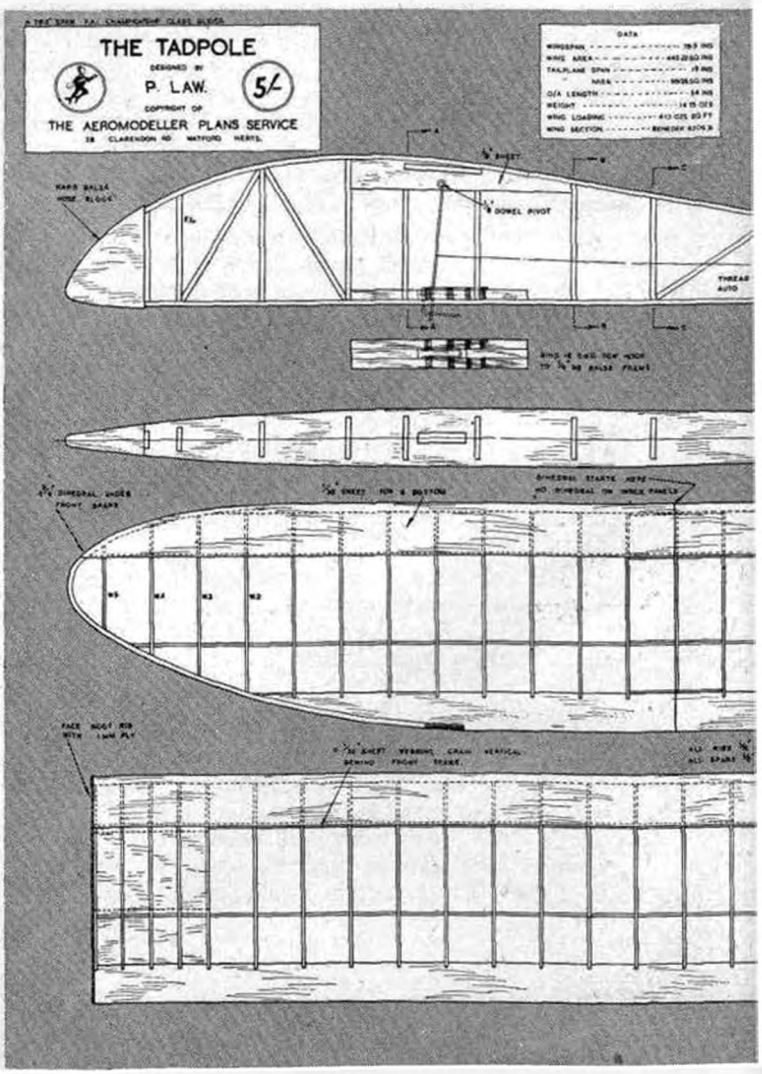
By
PETER LAW
Aged 23 . . . Engineers' Patternmaker by trade . . . member West Middlesex Club . . . F/F contest fan, with preference for A/2's . . . other hobby is photography.

FIRST designed early in 1952, the original "Tadpole" was never flown in a contest until the '52 A/2 Finals at Digby, when, due to over-careful pruning of the D.T. fuse, it returned a 14 : 26 total for sixth place. A second version, flown by R. Law, placed fifth in the Thurston, at the '52 Nationals, and a third was flown by D. Ridley in the Trials at Kidlington this year, the designer's own job having been lost earlier on in the eliminators. A still air *average* time of 4 : 20 on a 328 ft. line has been attained by each of the three models to date, and top-of-the-line tows in any conditions have proved standard practice, factors which put this semi-pod and boom job into the top bracket.

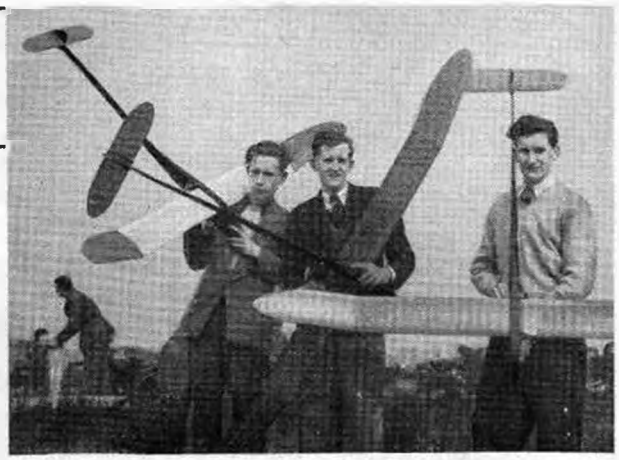
The relatively high aspect ratio of 13:1 for optimum efficiency, demands that for general portability, the wing halves should be detachable. Tongue and box fitting was selected, both for its "knock-off-ability" and sure method of obtaining identical incidence for each wing panel. Tongues which appear to loosen up in warm weather can easily be dampened and so expand to make a desirable tight fit into the wing boxes.

Construction commences by building two sides over the plan ; these are removed, sheeted before separation, to prevent distortion, and joined at the wing tongue, checking squareness. When dry, install tongue, auto-rudder trigger, and towhook, cementing securely. Cut out base sheet and cement on spacers before assembling to fuselage. Position auto-rudder cord before drawing spine together to complete after fuselage. Add remaining nose spacers and weight-box and finish sheet covering. Build fin on plan and cement to fuselage, fit nose-block, and dope tissue in place, after which tail platform can be added and auto-rudder connected.

Pin wing l.e. and t.e. on plan, blocking t.e. up 1/16 in., and add tip laminations. Place lower spars, packing as required, and cement in all ribs. Add top spar and l.e. sheeting. Fit spar webs before removing from plan, to avoid warps, and add underside sheeting after removal. Make wing boxes, binding with thread and liberally cementing,



West Middlesex Club have adopted the Tadpole as a standard model for A/2 events and three of these sleek models are seen here in the hands of D. Ridley, designer Peter Law and brother R. Law. Extra long tail moment enables a 445 sq. ins. wing and small 68 sq. ins. tail to be used.

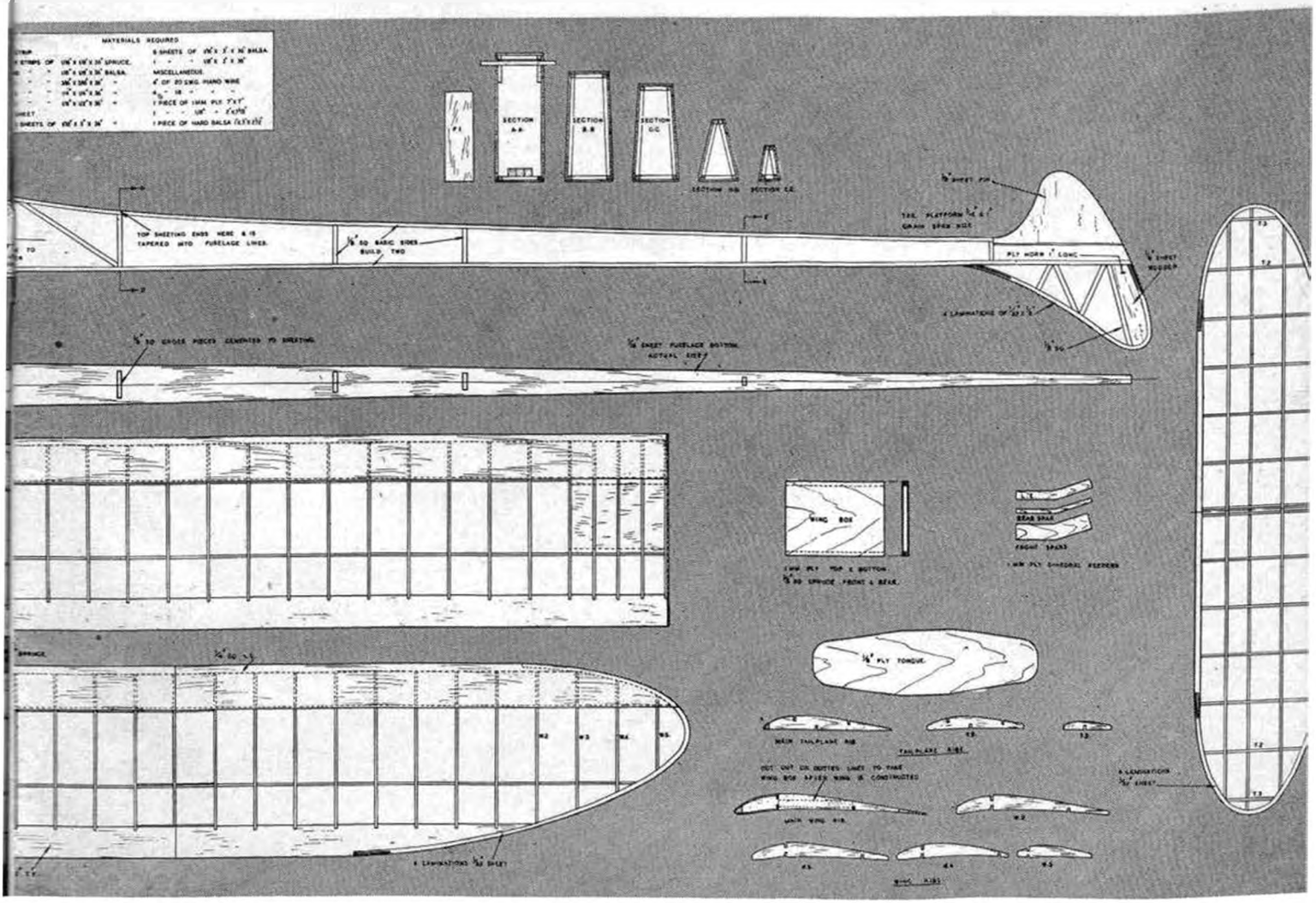


then cut ribs entirely away at box positions. Pin both wings to board about 2 in. apart, slip boxes on to tongue-sized piece of wood, and cement boxes securely to spars, checking that the temporary tongue is parallel with the board. Replace upper and lower portions of ribs and add ply end ribs. Cover wings with lightweight Modelspan.

Pin down tailplane l.e. and t.e. and add tip laminations. Place lower spars and insert all ribs, followed by top spars. Cover tail and upper fin and cement fin between centre ribs after doping and thorough drying.

Flying. Weight should be added to the nose until the model balances at the indicated C.G. Hand launch gently—the model flies rather slowly for an A/2. The original models have never required more than 1/32 in. packing under the tailplane l.e. or t.e., and if more than this is called for, increase or decrease the amount of ballast in the nose box. When a long flat glide is obtained, tow up to about 100 ft. and adjust rudder for circles of about 150 ft. Aim at a 4 : 20 minimum and never tow up without using the dethermaliser, which should be allowed to tip to about 70 degrees ; in common with other long fuselage designs a normal angle of tip will result in looping. Don't be afraid to tow up in a wind—the wings will stand any amount of pull and overhead tows should be possible every time.

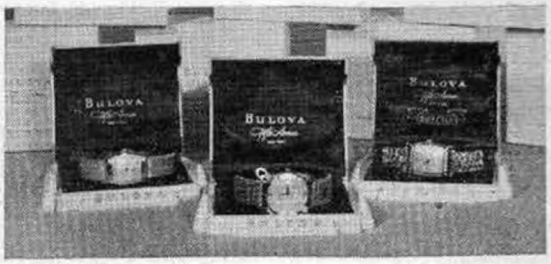
Full size copies of the 1/6th scale plan below can be obtained from the Aeromodeller Plans service, price 5/- post free.



"AEROMODELLER" PAYLOAD DESIGN CONTEST

NO ENTRY FEE!

SPECIAL JUNIOR PRIZE!



YOUR CHANCE!

ANYONE CAN ENTER!

MAGNIFICENT WATCHES FOR BEST ENTRIES!

DESIGN CONTEST RULES

1. Models shall conform to the published 1 c.c. Payload Specification.
2. No person shall enter more than one design.
3. Entrants shall submit :—
   (*a*) Full size working drawings.
   (*b*) At least 3 photographs of the model—one uncovered and two covered.
   (*c*) A certificate of performance signed by a club official or adult not related to the entrant. (Minimum qualifying performance, 60 second flight on maximum motor run of 20 seconds.)
   (*d*) A brief, non-technical design history, giving reasons for choice of layout, airfoil(s), type of construction adopted, etc., etc.
4. Entries must be accompanied by the completed entry form (page 448) and a stamped addressed envelope of dimensions sufficient to contain all submitted documents, each of which must bear the entrant's name and address.
5. Judging will be on the basis of general design, detail design, appearance, and originality.
6. Prizes of Bulova Watches (presented by Pan American World Airways) will be awarded to the two entrants who, in the opinion of the Judges, submit the best entries. A further Bulova Watch will be awarded to the sender of the best Junior (under 18) entry. Third prize will be £5, fourth £3, and fifth £1.
7. Entries are open to all countries. Overseas entries should be airmailed to arrive not later than the closing date of the competition.
8. Closing date of the Contest is 30th September, 1953. Entries received after that date will be disallowed.
9. Purchase of the copyright of any winning design becomes the option of the Model Aeronautical Press Ltd.
10. Results will be announced in the issue of the AEROMODELLER for December, 1953 (published November) together with plans of the winning design.
11. The Editor's decision is final, and no correspondence in connection with the contest can be entered into.

MODEL SPECIFICATION

1. The model shall be free-flight category, employing an internal combustion (piston) engine(s) of a total piston displacement not exceeding 1·00 cubic centimetres.

2. All models shall Rise Off Ground, and have a freely turning wheel or wheels permanently affixed. When a single wheel is used, skids or similar devices shall be installed so that while at rest the model is in a normal attitude with no part other than the take-off gear touching the runway. Take-off gear may be retractable.

3. The model shall carry in flight one occupant having a body at least 1½ inches wide × 2¼ inches high × ¾ inches thick, surmounted by a head at least ¾ × ¾ × ¾ inches, constructed of any material but weighing at least four (4) ounces. (See sketch on page 417.) Occupant shall not influence the operation of the model, except for weight and balance purposes.

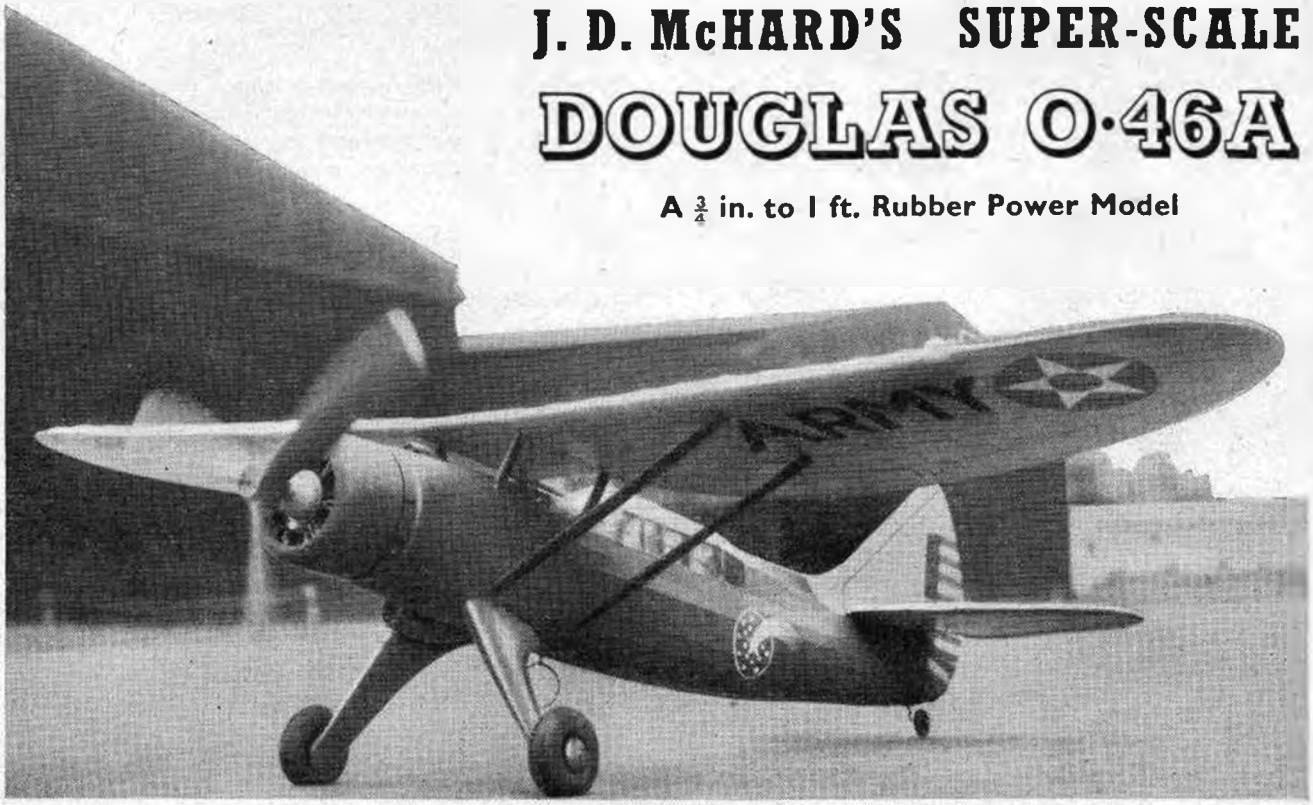
4. The occupant must be carried in an upright position relative to level flight, facing forward (see sketch), and within an enclosed compartment providing visibility through transparent areas at least ¾ inch in height to the front and both sides of the head. The occupant must be readily removable from the compartment *with the model assembled*, for checking of weight and measurements.

5. Minimum model weight (less payload) shall be 6½ ounces per cubic centimetre of piston displacement.

Organised for the promotion of model design by the **"AEROMODELLER"** *in conjunction with* **"PAN AMERICAN WORLD AIRWAYS".**

J. D. McHARD'S SUPER-SCALE DOUGLAS O·46A

A ¾ in. to 1 ft. Rubber Power Model



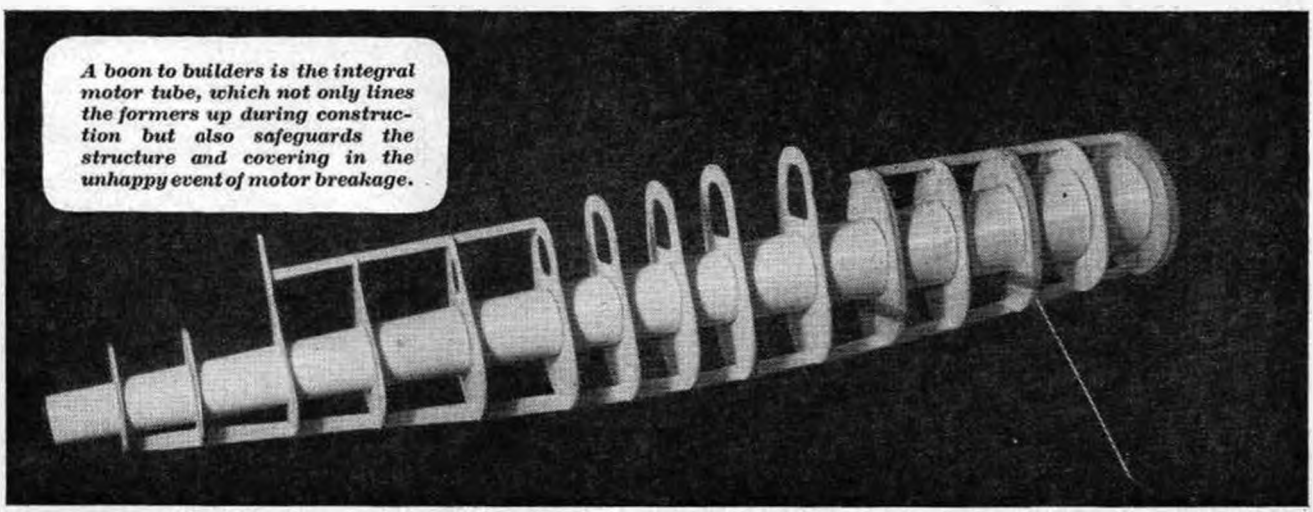
Winner at the 1953 SHEFFIELD S.A.M. Exhibition.

RUBBER powered flying scale models are rare birds these days, but there is a certain satisfaction in knowing that the motor *will* start first time and having started, will flap the prop over silently. Then to see the model soar effortlessly into the air with no exhaust and diesel oil ruining that smart paint job!

The O.46a was selected as a prototype for several reasons. The fuselage is long, giving a reasonable distance between motor hooks. The tailplane is of such a size as to need little enlargement to produce a stable machine. The position of the wing is perfect for satisfactory performance and the fixings are very adaptable to "knock-off" mountings.

The machine was originally in service with the U.S. Army Air Corps from 1936 until the beginning of the recent war. It became affectionately known as the "Flying Razor", chiefly because of its very narrow fuselage. As the service designation indicates it was an "observation ship" and it fulfilled roughly the same role as the Meteor 9 does to-day, though at a more leisurely pace!

The odd device on the fuselage side is the insignia of the 22nd Observation Squadron, Brooks Field, Texas, used during World War One by the



A boon to builders is the integral motor tube, which not only lines the formers up during construction but also safeguards the structure and covering in the unhappy event of motor breakage.

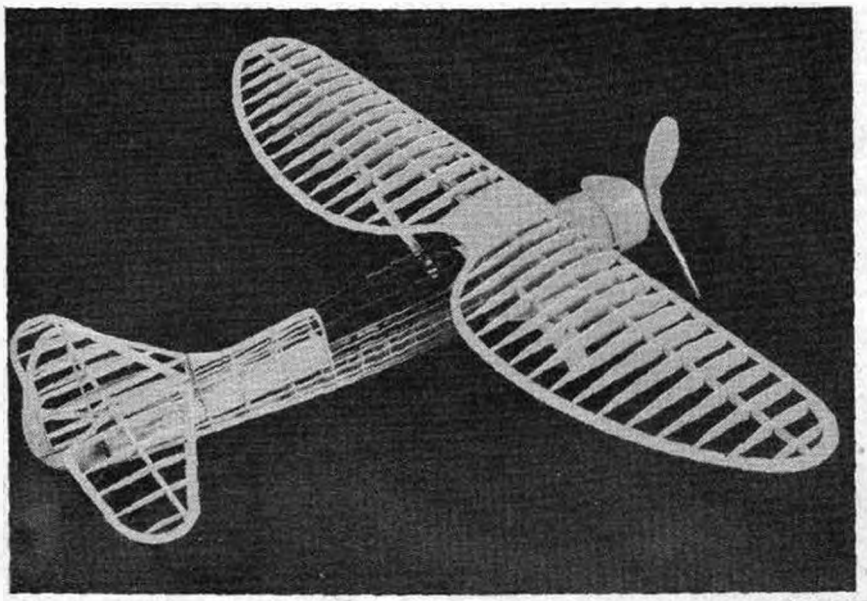
One reason for the increasing interest in Service clubs? W.R.A.F. member "Kay" of Wellesbourne Mountford club releases the O·46a for a trial flip with the three-blade airscrew fitted.

135th squadron flying S.P.A.D.s! The background is blue, surrounded by a yellow outer band. Stars are white and the comet tail starts as red and merges into yellow and then white at the extreme tip. (On the original model the colours of the tail are reversed, but this boob remained undiscovered until after the photos were taken!)

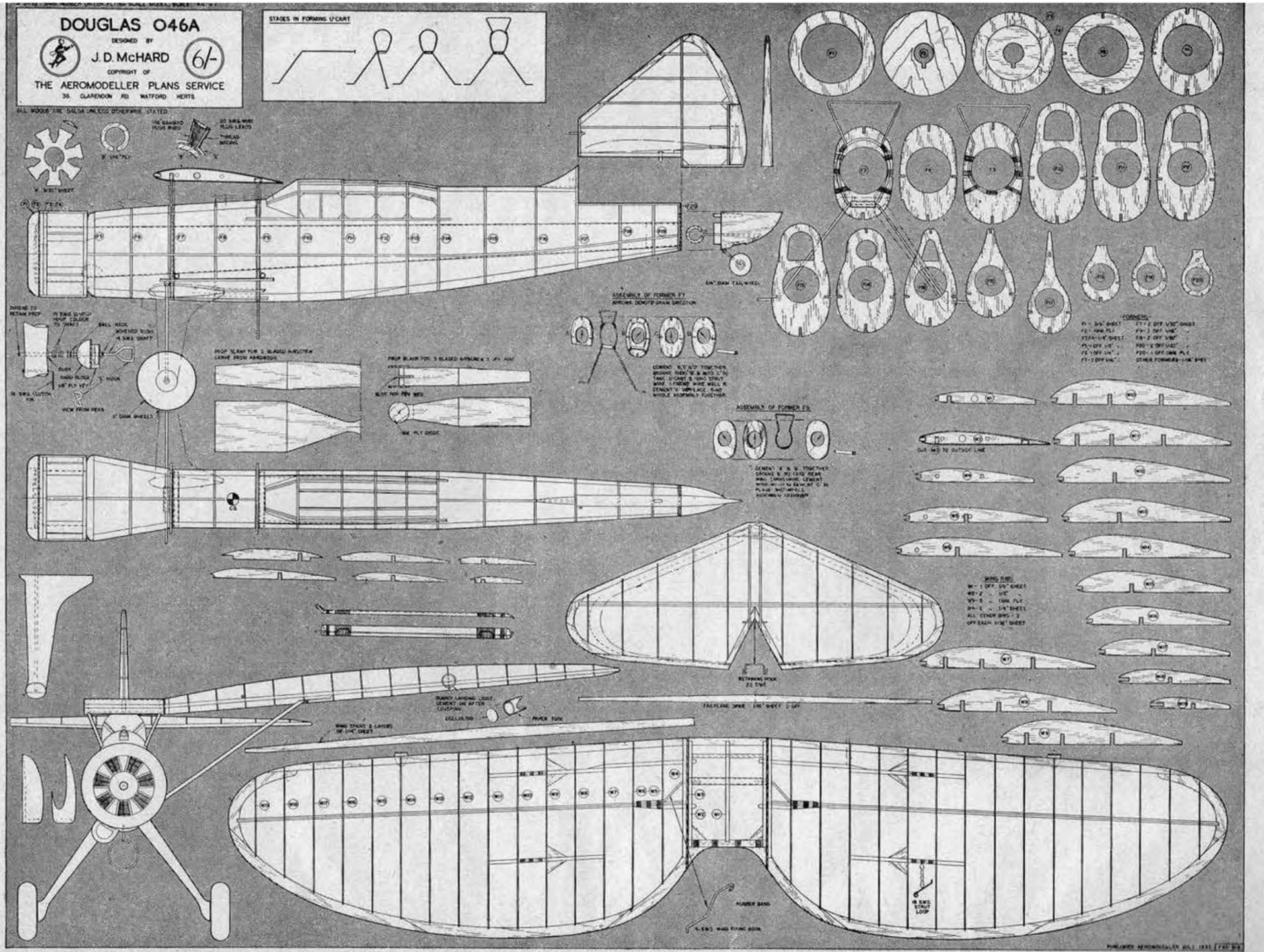
A motor tube is used on the model, to act as a building jig and also strengthen the finished fuselage. It minimises the risk of writing off the fuselage when the motor breaks! Formers have sharp inner edges and rubber whips around as it unwinds; by using a motor tube the life of the rubber motor can be prolonged considerably, particularly with such a narrow fuselage as the O.46a. This and many other novel constructional features of the McHard model are fully detailed in the building instructions which are issued with each full-size A.P.S. plan. Readers will note the close wing rib spacing and almost scale stringer positions on the fuselage which have been used to produce a model capable of winning flying contests as well as exhibition prizes.

Correct colouring is with fuselage and struts in dark blue and the wings and tailplane in orange-yellow. To keep the weight down to a minimum for best flying performance, it is advisable to use coloured Modelspan, rather than colour dope. However, the original O.46 model manages consistent 90 second flights in spite of its all-up weight of 7½ oz., of which no less than 1½ oz. can be attributed to use of colour dope and fitting sundry oddments to improve the scale detail and appearance.

The rubber motor consists of eight 30 in. loops of 3/16th flat strip, pre-tensioned by the "White" method, and this gives quite a realistic snappy climb after take-off. 3° downthrust was required on the original and a little sidethrust may be found necessary. To bring the centre of gravity forward to the right place, it is best to add ballast beneath the cowling surface so that it will be discreetly hidden. The propeller shaft is so arranged that three or two-blade airscrews can be interchanged in experiment to find the best performance.



There are thousands of model-builders who prefer their models to have a little more than the bare minimum of structure. There are also those who delight in the multi-stringer and former type of fuselage which has always held a fascination of its own. Couple this with top-notch performance and true scale appearance and you'd have to look a long way to find a nicer job than this "Flying Razor."



FULL SIZE COPIES OF THE 1/5th SCALE PLAN CAN BE OBTAINED FROM THE AEROMODELLER PLANS SERVICE, PRICE 6/– POST FREE.

● A TWIN MOTOR CONTROL-LINE

DOUGLAS A.26A INVADER

FOR 1·5's OR 2·5's

by Don Deeley

Aged 29 . . . draughtsman by profession . . . ex-R.A.F. . . . space restriction makes him prefer control-line, though keen on freeflight . . . *married, with one* 6 year old aeromodelling offspring.

IN response to the heavy demand from the many readers who now find themselves in possession of more than one 1 c.c. to 2·5 c.c. diesel, we now have pleasure in introducing this tried and proven design to Plans Service. Don Deeley selected the A26a Invader as a " natural " for twin engined control-line. Fitted with a pair of Elfin 1·49's, his prototype has covered many miles at scale appearance speed of 45–50 m.p.h., and we have no doubt that two smaller or larger engines would provide equal entertainment at a slight variance in speed. It would also accommodate two engines of unequal capacity, though in this case, the larger engine should be fitted in the inboard nacelle.

Construction is both robust and simple. All-up weight at 40 ozs. is enough to require extra tough control-line wires, yet at the same time does not provide an over-heavy wing loading to spoil its excellent three point landings and general manœuvrability. Start building with the wing, taking care to bind and cement the ply gussets to the spars, except where fuselage and nacelle formers locate. Then cement formers F4 and F5 to the spars, and fit the bottom keel. Bellcrank assembly, formers F1 to F10, the nosewheel and planking between F1 and F6, F7 and F10 follow in that order. Now cut away keels and fit balsa between F6 and F7. Make up tail assembly minus fin and rudder and fit, then build nacelles onto wing spars and attach undercarriage legs. Plank all over and sand to shape, giving a coat of sanding sealer. Wings are sheet covered and fin and rudder added, the tail end being streamlined off by a balsa fairing block.

Ballast by fitting engines and tanks and adding lead nose weight. Remove the engines for final cowling detail, etc., and attach moulded canopies, gun turrets and scale detail, before colouring all over with silver and black anti-glare panels.

Perhaps the greatest deterrent to the " twin " is engine starting; however, Don Deeley reports no trouble whatsoever if the following procedure is adopted. Start the outer engine first, warm it up, stop it, fill up the tank again and prime ready to start. Then switch to the inner, start up, set it right, then back to the still warm outer engine, which should soon burst into song.

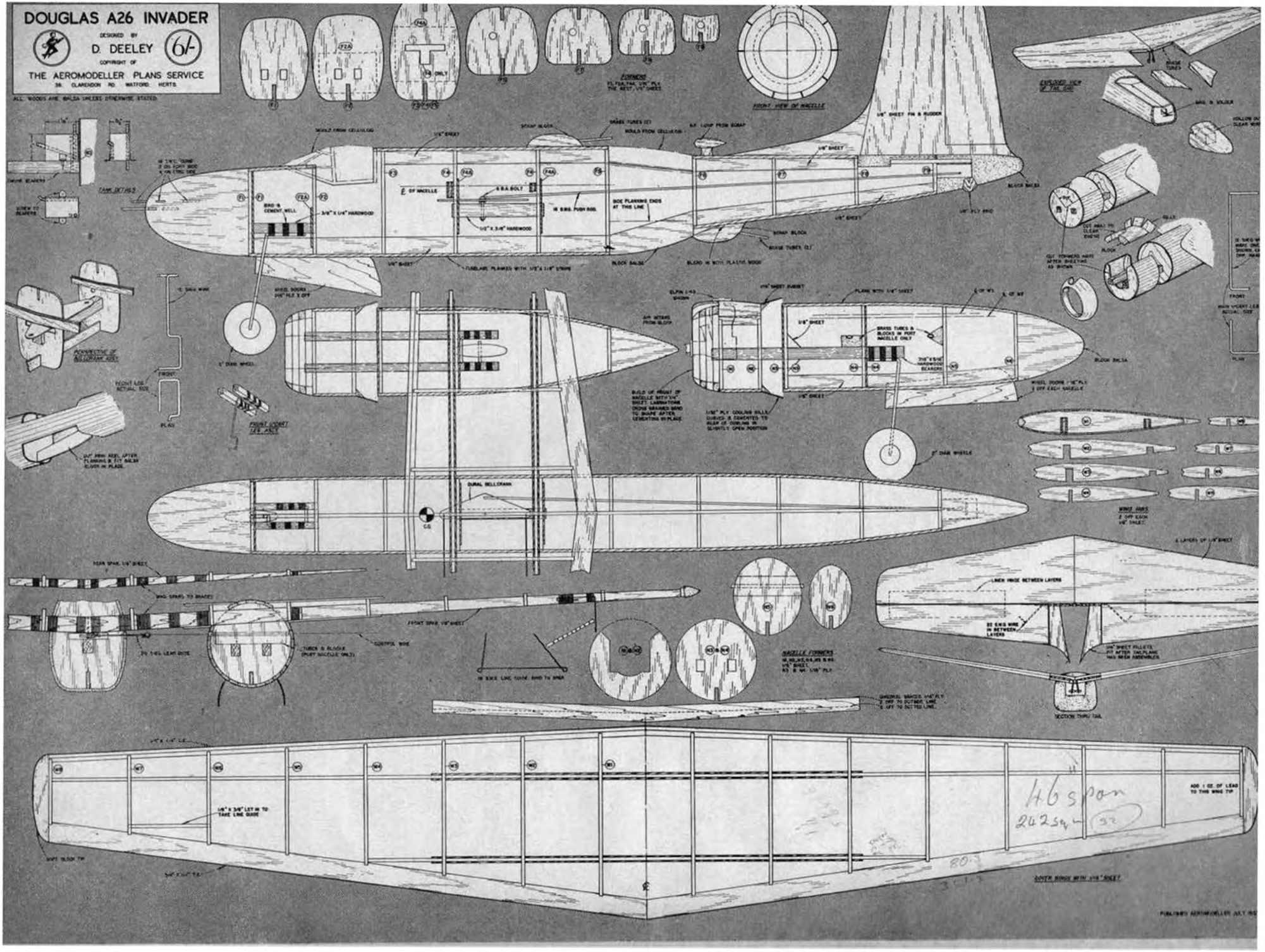
Full size copies of the 1/5th scale plan opposite can be obtained from the Aeromodeller Plans Service, price 6/- post free.

DOUGLAS A26 INVADER

DESIGNED BY
D. DEELEY
6/-

THE AEROMODELLER PLANS SERVICE
38, CLARENDON RD. WATFORD. HERTS.

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.



PUBLISHED AEROMODELLER JULY 1952

The Truth about RUSSIAN ENGINES

PREPARED FROM AUTHENTIC SOURCES BY D. J. LAIDLAW-DICKSON

General. We have been fortunate enough to obtain fairly extensive data on the whole range of Soviet model engines, both spark ignition and diesel, that have been developed in the postwar years. For obvious reasons it has, as yet, proved impossible to obtain specimens of actual engines for test, though we hope at least to be able to test some modern engines from the Soviet Zone of Germany. These latter, of course, cannot be directly compared with those actually in use in the Soviet itself, as they are largely German inspired.

In view of the remarkable number of F.A.I. world records held by Russian aircraft we expected to find some special qualities in their designs which our own lacked. But this has not proved the case. Their research has followed conventional lines, and produced some very interesting, and one or two outstanding motors, but nothing that could not be anticipated from their wide official facilities for research and development.

Russian development has followed two patterns. First, the collective work of the Central Model Laboratory, assisted by DOSAV (Society for the Encouragement of Sporting Aviation), which has concentrated on prototypes suitable for quantity production, such as the AMM.4, AMM.5 and K.16. A number of other collective efforts have also been produced for more limited series production including simple designs suitable for construction in technical schools and clubs. On the other hand individual experiment has also been permitted, and led to some of the more revolutionary departures from normal practice. These "lone hands" however, appear to have had official support, and some assistance from DOSAV funds and the C.M.L.

Work on diesels did not begin until 1946, and C.M.L. made a whole series of prototypes ranging from 0·3 c.c. to 7·5 c.c. DOSAV selected the most promising designs and now manufacture them directly in large numbers. Best design was the K.16, which is highly praised for a normal life of 15 flying hours.

Spark Ignition Engines

MZ.2, designed by M. Zjurina. This was the first engine to be designed that proved a suitable power unit for record breaking flights. It was a product of the years 1940–42, and C.M.L. made in all approximately one hundred of them. Even to-day, over ten years since the last was made, a number are still in active service. One contest flyer, Jergenij Suchov, is still winning contests with his!

Fuel admission is by rotary valve through the hollow crankshaft. A deflector type piston is fitted with exhaust at right angles. It was a "square" engine with stroke and bore of 18 mm.

F.3, designed by A. Filippicev. Filippicev and Petuchov seem to be the most prolific of Soviet designers, being responsible for both spark ignition and diesel engines, with and without DOSAV support. The F.3, though under half the capacity of the MZ.2, enjoyed approximately the same performance. This is achieved by low weight and high revs. It is particularly suited for free flight models.

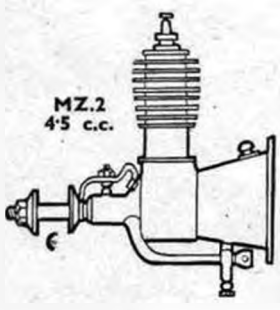
Rotary disc induction is employed, with intake port through crankcase backplate, with disc fitted to rear of crankshaft. Cylinder is of steel fixed to crankcase with two screws.

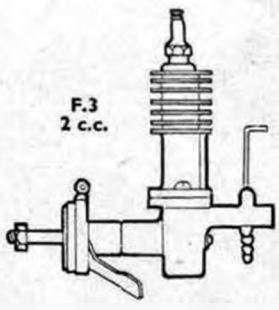
F.5, designed by A. Filippicev. Another Filippicev production, which was taken up by C.M.L. for quantity production. Construction and design were therefore kept as simple as possible. Crankcase is square, with front and backplate attached by screws going through lugs at each corner, which can be extended to bolt engine in place on the model. Deflectorless piston is installed, and once again backplate rotary disc fuel admission is used.

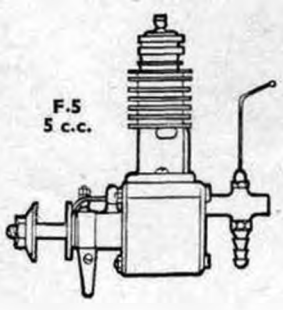
This engine was used by Serge Malik for his record distance flight of 58km.

MB.1, designed by V. Petuchov. This motor by Petuchov introduces a crankshaft built integrally with cam, has deflector type piston, and is the first to use 6 mm. (¼ in.) diameter plugs. Air intake is at the front on the crankcase and the whole engine looks—apart from the plug—very like a typical diesel layout. Another innovation — for Russia — is the beam mounting.

MB.2, designed by V. Petuchov. Most interesting feature of this engine is the introduction of an adjustable air intake. Piston is fabricated of steel and light alloy, and has a deflector. Head is attached with four screws. Beam mounting is again employed, though in this instance as a separate lug, rather than an extension of the cylinder bolting down plate. The







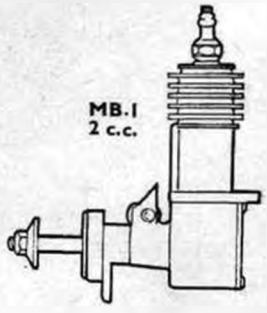
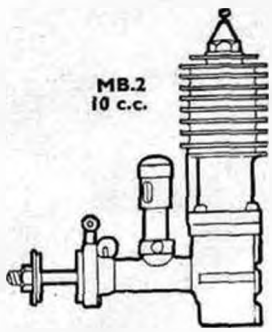


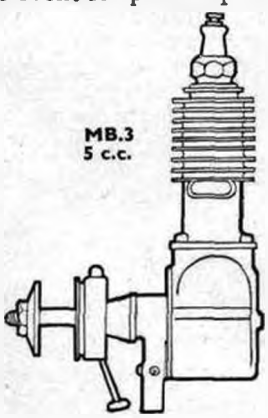
TABLE I. SPARK IGNITION ENGINES.

Motor	Bore in mm.	Stroke in mm.	Capacity (c.c.)	Weight in g.	B.H.P.	R.P.M.	Power/Wt. Ratio	Induction	Timing in Degrees									Port X-Section in mm.			X-Section Areas Ports in % Piston			Comp. Ratio
									Intake			Exhaust			Transfer									
									Beg'g.	End	Total	Beg'g.	End	Total	Beg'g.	End	Total	Intake	Exhaust	Transfer	Intake	Exhaust	Transfer	
MZ.2	18	18	4·5	150	·11	4,500	2·45	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F.3	14	13	2	72	·1	7,500	3	D	190	355	165	105	255	150	120	240	120	12·6	27	27	8·5	17·5	17·5	7 : 1
F.5	19	18	5	200	·1	4,500	2	D	180	360	180	108	252	144	120	240	120	19·5	36	28	7	12·7	10	5 : 1
MB.1	14	13	2	75	·1	7,000	3·21	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MB.2	23	24	10	350	·4	6,600	2·4	C	255	395	140	107·5	252·5	145	120	240	120	—	—	—	—	—	—	—
MB.3	18	20	5	150	·16	5,500	2·62	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MB.5	23·03	23·9	10	350	1·28 [1·72	13,100 11,000	4·4 2·94	C	—	—	200	—	—	140	—	—	119	80	185	125	19·3	44·6	30	8·2 : 1
AMM.5	22	25	9·5	300	·15	4,500 5,000	1·58	H	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

D=Disc. C=Crankshaft. H=Cylinder.

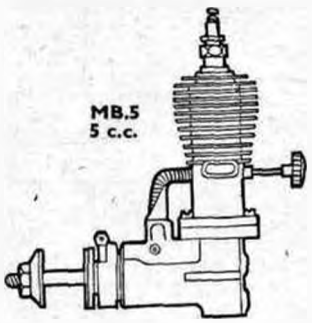


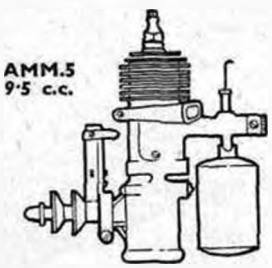
design was used on the winning model at the 1947 Russian Nationals in the event for power up to 10 c.c.



MB.3, designed by V. Petuchov. Differs from MB.2 in the location of air and fuel intake. The adjustable air intake has been dropped. Other new features include enlargement of the channel for fuel admission, and the fitting of exhaust stubs extending 10 mm.

MB.5, designed by O. Gajeveskov. Considered by Russian experts the most outstanding of its size when first built. Fuel intake channels of increased size to prevent starvation at high revs. Deflector piston. A speed of 169 k.p.h. (106 m.p.h.) is claimed for a model with this power unit, at 11,000 r.p.m. It was subsequently developed further and 1·28 b.h.p. is claimed at 13,000 r.p.m. This is so far ahead of any other Soviet design that it must be viewed with considerable scepticism. The MB.2 develops only 0·4 b.h.p.





AMM.5. Designed as a group project, and no individual credit given. Mass produced by DOSAV and the most widely used of all Russian spark ignition motors. It has behind it the evolution of the whole AMM series, and is the latest product of that group, from which minor defects have been progressively cleaned up.

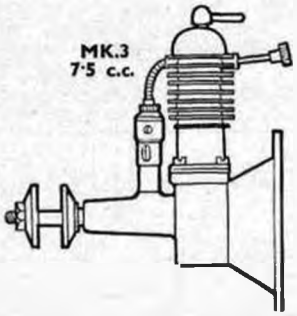
Strangely enough it reverts to the old Brown Junior method of fuel admission with feed direct into the cylinder. Naturally enough this leads to distinct limitations, mainly due to low r.p.m. but has the advantage of extreme simplicity.

An ugly divided crankcase of triangular shape, with extending screws through lugs at each corner holding the two parts together and bolting the engine to its former, must have been chosen for ease in production. Adjustable air intake is again featured.

This completes the list of the principal Soviet spark ignition engines. A table of characteristics is provided for comparison.

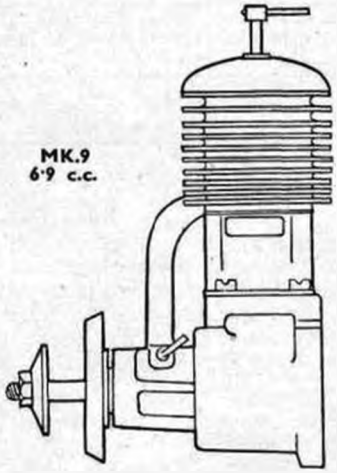
Diesel Engines

MK.3, designed by V. Petuchov. This engine has the typical appearance of a Petuchov design. Crankcase is extended at rear to form tank, and has the usual radial mounting so general amongst Soviet engines. Crankshaft induction, and the usual adjustable air intake. Flexible bowden control to needle valve appears for the first time. Steel cylinder is turned in one piece with the head, and bolts down on

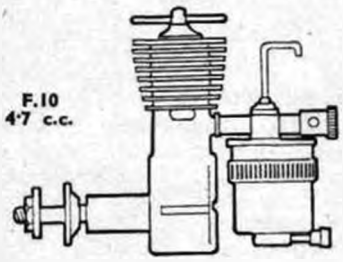


crankcase of light alloy in the usual way.

Serge Malik fitted this engine to the model which achieved the world's record flight of 210 km.

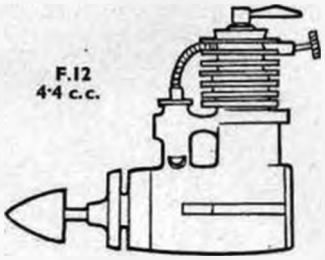


MK.9, designed by Petuchov. MK.9 is considered the best performer in general use by Soviet modellers. The original motor produced 0·55 b.h.p. at 10,500 r.p.m. Construction is quite orthodox, with crankshaft induction, one piece casting of crankcase, and cylinder bolted down with four screws. Strengthening webs to the casting give additional strength. Flying a model of his own fitted with this engine the designer won the distance event at the 1949 Soviet Nationals with a flight of 128 km.



F.10, designed by A. Filippicev. Is particularly interesting as the first Soviet designed diesel to be publicly demonstrated on the occasion of the 1947 Soviet Nationals, where it was awarded a prize for construction. It is one of the few engines with crankcase and cylinder body cast in one piece—and diecast at that! Direct fuel admission into the cylinder, adjustable air intake. Beam mounting. It is claimed to resemble the Czech Atom engine, but resemblance is largely wishful thinking, as those who have handled the elegant little Atom will agree. In any event, the Atom was produced as a well tried commercial design in 1946 with features well ahead of that period. Only resemblance in fact is the employment of diecasting, which appears to be a novelty to Russian modellers.

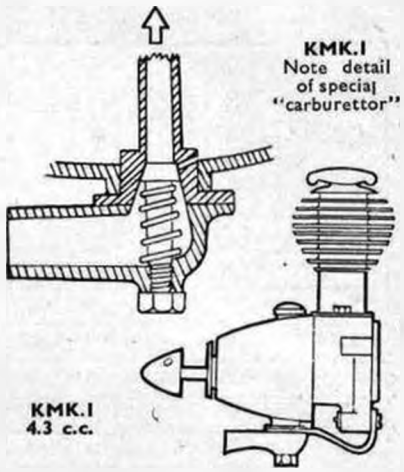
F.12, designed by A. Filippicev. A squat little engine which again is diecast in one main casting, with steel cylinder liner. Carburettor body assembly is mounted on front part of crankcase but feeds direct into cylinder. F.12 was designed as a suitable power unit for scale models, and had the distinction of flying the first publicly demonstrated Soviet Radio Control Model at their 17th Nationals. This model—the RUMS.5, was



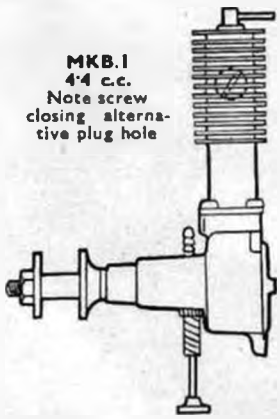
built in the C.M.L. of DOSAV and weighed 4½ kg. (about 10 lbs. plus) with a wingloading of 35 g/dm² (11·4 oz.sq. ft.). It was flown r.o.g. and took off steadily to perform well, before being brought in under r.c to the original starting place. Details of radio control equipment are not yet to hand.

Fuel consumption of the F.12 is given as 300 g. (10½ ozs.) per hour, which seems very reasonable for a 4·4 c.c. diesel.

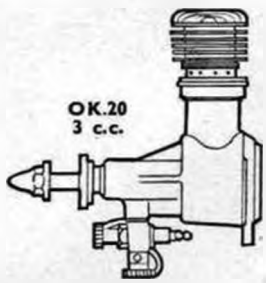
KMK.1, designed by I. Kulakovsk. Kulakovsk introduces a change in design with the KMK.1, which has a neat tank faired round the front of the crankcase, with filler at the top, and fuel intake at the bottom, feeding direct into a hollow crankshaft rotary valve. Particular attention was paid to cooling with larger fins than usual. Adjustment of fuel requires use of a spanner on the hexagon nut controlling a peculiar flat type of valve.



MKB.1, designed by V. Petuchov. An ugly experimental design reminiscent of early Italian efforts with long stroke and small bore.

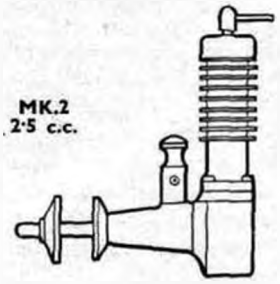


By addition of the appropriate electrics can be used as spark ignition engine, a screw in the side being removed to take the plug. Apart from novelty there seems no point in the innovation, and no performance figures are available.



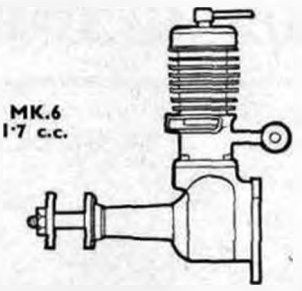
OK.20, designed by O. Kosevov. This original design is somewhat similar to the French Ouragan, which featured adjustable compression by the movement of an eccentrically located crankshaft. Kosevov has a different approach, with adjustment of the whole cylinder, which screws down into the crankcase body. The cylinder

liner has twelve holes evenly spaced round it, and similar holes are found in the cylinder body, so adjusted that in spite of screwing it up or down there remains adequate exhaust porting. Mixture is via hollow crankshaft.

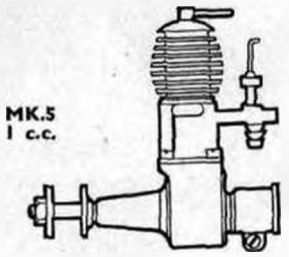


MK.2, designed by V. Petuchov. Extreme simplicity is the keynote of MK.2, and it has much of the appearance of a normal type of British engine. The Soviet fondness for an air-adjusting screw cap is again evident. In 1948 it was used to power a scale JA.3 at the Nationals, which won the event with a flight of 28 km., establishing a class record. In 1949 a similar engine in a model made by J. Sokolov won the Soviet Ministry of Flying Prize.

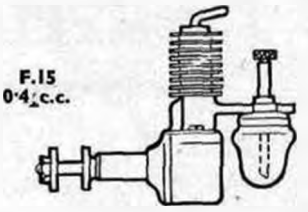
MK.6, designed by V. Petuchov. A tidy small capacity engine, with direct fuel admission. Typical three-screw radial mounting. Air intake of very small cross-section.



MK.5, designed by V. Petuchov. This is the smallest design by Petuchov, and follows general design of MK.6. Special feature is the very odd method of fixing to engine mount by means of a projection from the crankcase casting, which is then apparently fixed with some kind of Jubilee clip.



F.15, designed by A. Filippicev. Has the distinction of being the smallest product of C.M.L. —DOSAV, having a capacity of 0·4 c.c. (It is not the smallest Soviet engine, however, which was built in the Moscow Model Laboratories by S. Baskinym with a capacity of 0·3 c.c., bore 6·5 mm., stroke 10 mm.)



K.16. The K.16 is a co-operative production of DOSAV and is manufactured in considerable numbers. It was designed to be suitable for boats or cars in addition to aircraft. High power has been sacrificed to dependability and length of running life. Hollow crankshaft runs in bronze bearings, head is detachable (unlike most engines which appear to be blind bored).

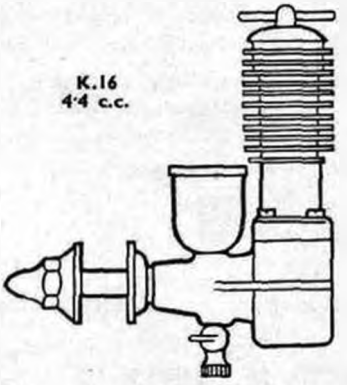


TABLE II. DIESEL ENGINES.

Motor	Bore in mm.	Stroke in mm.	Capacity (c.c.)	Weight in g.	B.H.P.	R.P.M.	Power/Wt. Ratio	Induction	Timing in Degrees									Port X-Section in mm.			X-Section Areas Ports in % Piston			Comp. Ratio
									Intake			Exhaust			Transfer									
									Beg'g.	End	Total	Beg'g.	End	Total	Beg'g.	End	Total	Intake	Exhaust	Transfer	Intake	Exhaust	Transfer	
MK.3	20	24	7·5	280	·26	5,200	3	C	240	380	140	112	248	136	120	240	120	26·5	60	47	8·4	19	15	
MK.9	20	22	6·9	—	·62	10,500	3·84	C	247	405	158	107·5	252·5	145	117·5	242·5	125	55	80	68	17·5	25·5	21·6	
F.10	17	20·8	4·7	196	·16	4,500	3·4	H	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
F.12	16	22	4·4	300	·2	5,500	3·7	HF	315	405	90	105	255	150	115	245	130	18	79	18	9	39·5	9	
KMK.1	16·5	20	4·3	350	·16	5,000	3·35	B	288	405	117	122	244	116	133	227	94	—	—	—	—	—	—	
MKB.1	—	—	4·4	—	—	4,000	—	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
OK.20	15	17	3	200	·12	5,000	3·6	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
MK.2	—	—	2·5	—	·13	6,000	3·9	C	250	395	145	120	240	120	122	238	116	—	—	—	—	—	—	All Variable Compression
MK.6	12	15	1·7	72	—	—	—	H	305	415	110	115	245	130	130	230	100	8	27	14·6	7·5	24	13	
MK.5	10	12·5	1	58	—	7,500	—	H	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
F.15	8	8	·4	29	—	—	—	H	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
K.16	16	22	4·4	280	·15	4,500	3·4	C	240	380	140	112	248	136	124	230	112	20	81	29	10	40·5	14·5	

C=Crankshaft. H=Cylinder. HF=Front Cylinder. B=Base of Crankcase

BRITISH A/2 GLIDER TEAM

G. C. M. BYRD

Age: 18. *Occupation:* Student of Mechanical Engineering.
Club: Loughborough College M.A.C.

Geoff. is brother to Max Byrd, who was in the 1952 British Team that flew in Austria. Is currently Secretary to the College club.

Flew two models of fairly similar design at the Trials—lost both, and scored a treble maximum, thus gaining top place in the contest.

Spent a considerable time during last winter developing his models, his best Trials model being finished only three days before the contest.

MODEL SPECIFICATION

430 sq. in. mainplane of 60 in. span, uses the College-developed CMGPA 53 section, set at 3 degs. positive in high wing position, 30 degrees dihedral on tips only.

Tailplane has 85½ sq. in. area with span of 19 in. using Clark Y aerofoil set at zero degrees.

45 in. fuselage is of sheet box type carrying fixed underfin, with 5·4 sq. in. maximum cross section.

Model finished in heavy Modelspan with three coats of dope.

G. W. LINFORD

Age: 21. *Occupation:* Civil Engineering Student.
Club: Loughborough College M.A.C.

Hailing from Cannock, Staffs., Linford was until recently Secretary of the College club, and has been a consistent flier in the Midland Area for some time.

Model, very similar to Byrd's, is one of a series developed with success by various members of the College over the past two years. Emphasis is on strength to withstand English weather, and the vast amount of testing done on the College airfield. Trials flight times were 4 : 49, 5 : 00 and 4 : 27, total of 14 : 16, giving him second place at the meeting at Kidlington.

Anticipating call-up for National Service, but hopes to obtain deferment for the Yugoslav meeting.

MODEL SPECIFICATION

Same span as Byrd's, but has only 410 sq. in. of area. Uses same aerofoil at same setting, but C.G. is slightly further back.

Larger (23 in.) tailplane has 115 sq. in. area, thin Clark Y set at zero.

46 in. fuselage is sheet box, utilising auto-rudder developed by D. C. Smith (see A.P.S. design " Ursa "). Heavy yellow Modelspan on wing, light on tail, coated three of dope, with black and yellow scheme.

M. L. HANSON

Age: 26. *Occupation:* Fitter.
Club: Solihull M.A.C.

Born in London, Hanson has been Secretary of the Solihull club for some years, and is well known for his successes in the Midland Area and in national events.

Member of the first British A/2 Team competing in Sweden in 1950, where he placed 24th, and has been a strong contender in Trials events ever since.

Admits to having practically given up aeromodelling in recent months, but decided to " have a bash " again at his favourite A/2. Trials durations were 5 : 00, 5 : 00 and 3 : 25. Incorrect setting of d/t fuse by helper probably robbed him of a treble max.

Always a " kidder ", Maurice leads many rivals up the garden by his apparent couldn't-care-less manner.

MODEL SPECIFICATION

Model, reminiscent of Ray Monk's " Quickie ", has mainplane of 410 sq. in., using aerofoil of Hanson's own design, set at 5 degs. positive, and average tip dihedral.

23½in. tailplane uses 104 sq. in. of area and lifting section set at zero incidence.

Slab-sided fuselage is 46 in. long, with cross section of 5½ sq. in., and incorporates both upper and lower fins.

Again, model finished in heavy Modelspan and three coats of dope, to a red decor.

A. J. BROOKS

Age: 20. *Occupation:* Student at R.A.E., Farnborough.
Club: Grange M.A.C.

Better known until this year as a definite threat in any power contest, Tony Brooks has suddenly broken into the glider and Wakefield sphere with definite promise.

Third member of the Team to be attending an aeronautical college, his name regularly appears in both National and Southern Area awards lists, and his models are always exemplary.

Trials times were progressively better with 3 : 29, 4 : 32 and a 5 minute, max. giving him the edge over Johnny O'Donnell by some 7 seconds.

Winner of the Sir John Shelley Cup in 1952 at Gosport, and receives a lot of encouragement from Brooks Senior.

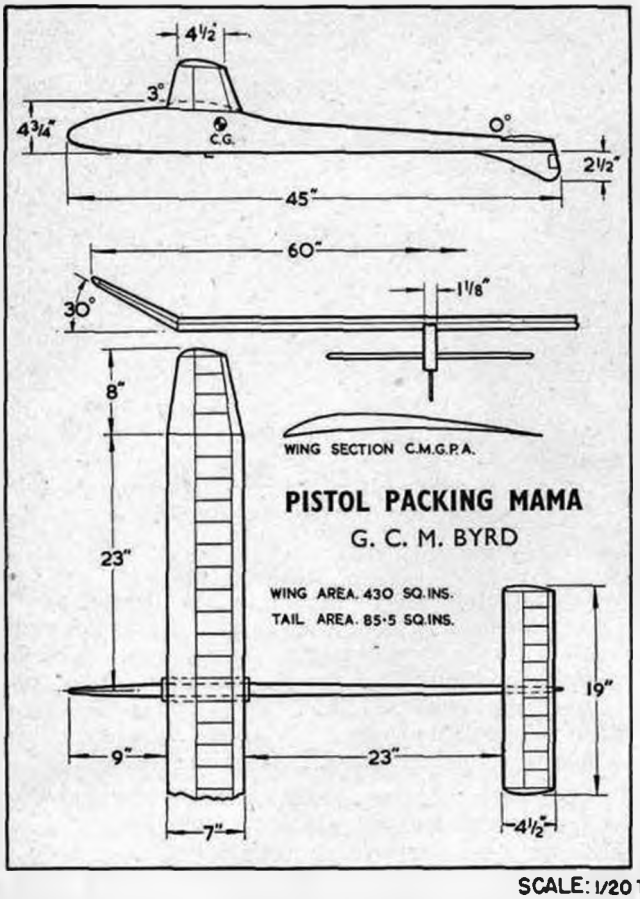
MODEL SPECIFICATION

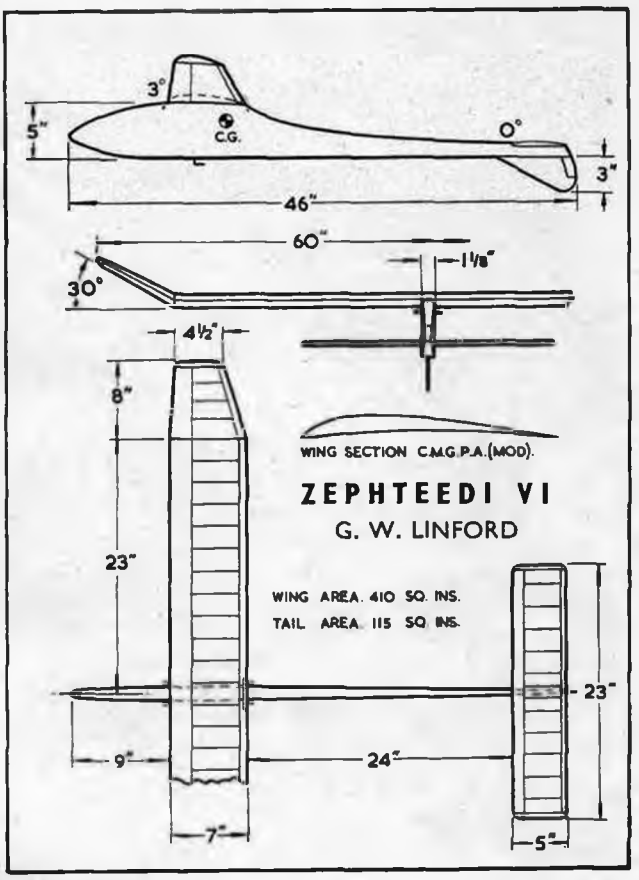
At 64 in. span, is the largest model of the four, and uses 430 sq. in. of area. Aerofoil is the MVA-301, giving a fairly forward C.G.

The 19½ in. tailplane has 90 sq. in. area, and is again of thinned Clark Y set at zero degrees.

47 in. fuselage is sheet box construction with 5·35 sq. in. of cross section area, and features special internal fixing for the wing panels. Short nose carries some 5 ozs. of ballast.

Model is double-covered with lightweight Modelspan, coated 4·5 coats of dope, with black and red finish. (Model was closest to the minimum weight of 14½ ozs. and required a special check.)





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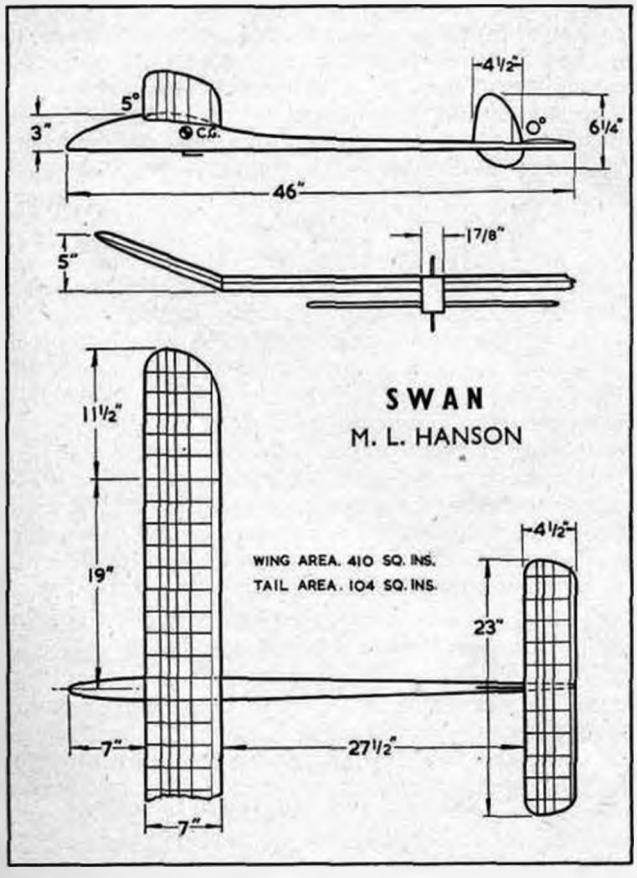
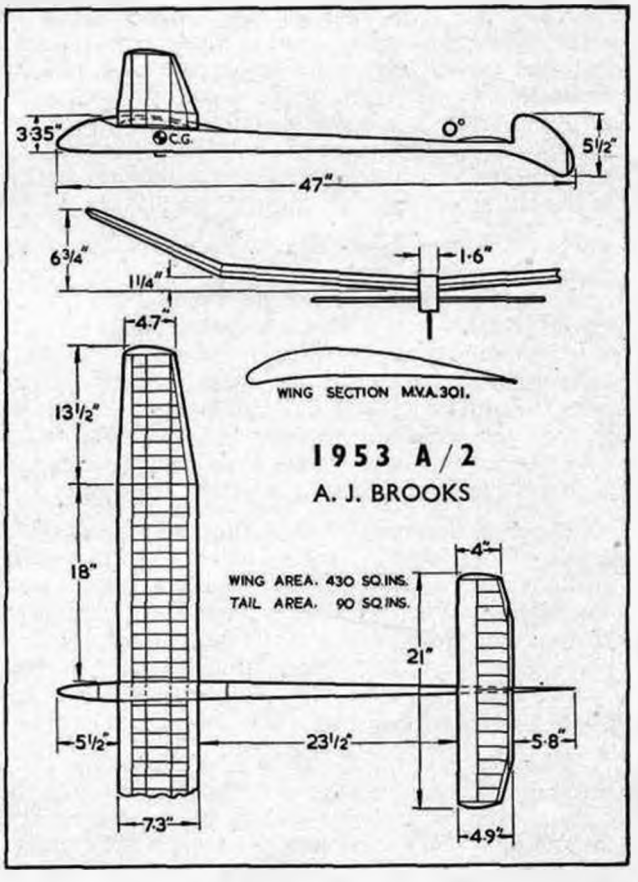
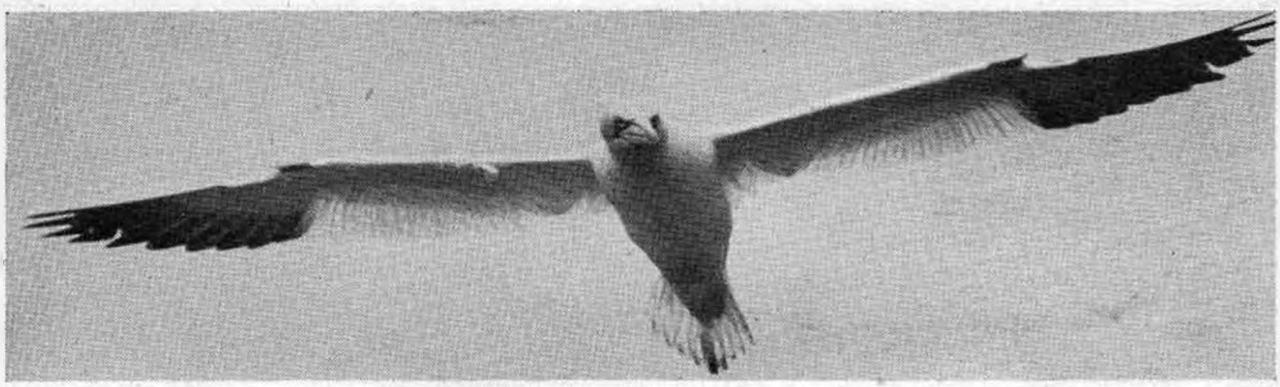






Bird Flight

By John Barlee, F.R.P.S.

by courtesy of "Shell Aviation News".

BIRD flight presents complex problems to those who are used to dealing with the aerodynamics of ordinary aircraft. All observations must be qualitative not quantitative, for all measurements are variable from bird to bird. The bird adds further difficulties by altering most of its measurements at will to suit different flight conditions Thus wing-area, aspect-ratio, sweep-back, dihedral and many such factors which we usually regard as fixed are far otherwise in a bird.

We hear a lot about the marvels of modern aircraft, but we tend to forget that except for speed and ceiling birds are superior in all aspects of flight. Let me give a couple of examples: A pair of swallows I found nesting in a loft had to enter through a slit in the wall which was far narrower than their wing-span. Yet all day they flew in and out without apparent difficulty, sometimes meeting in the slit when going in opposite directions.

The goldeneye, a species of diving duck, can fly exceedingly fast, can swim on the surface of the water and can dive and swim below in search of food. Not content with such versatility it nests in holes in trees. Now a duck is a type of bird definitely not designed for tree-climbing or for perching on twigs. The goldeneye gets over this by flying directly into its nesting hole and stopping when it gets inside. How it manages this feat without damage to itself remains a mystery.

Many of the details of design incorporated in modern aircraft have been used by birds for millions of years. Slots, retractable undercarriages, and variable sweep-back are examples. If designers would study birds more carefully they might discover many other refinements.

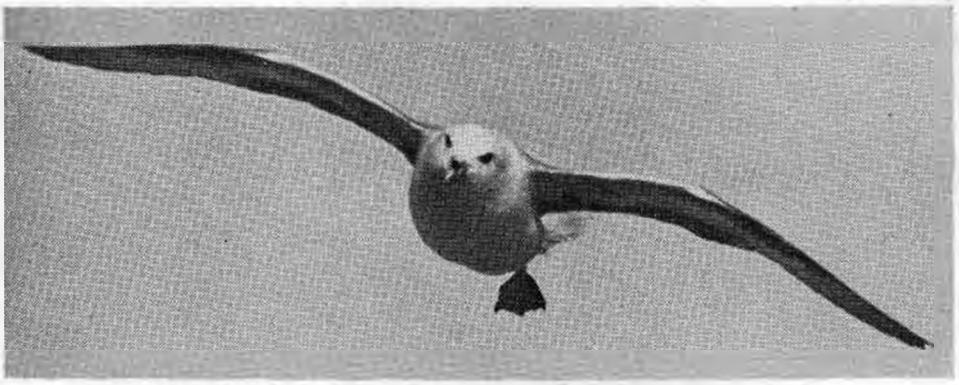
Evolution of Flight

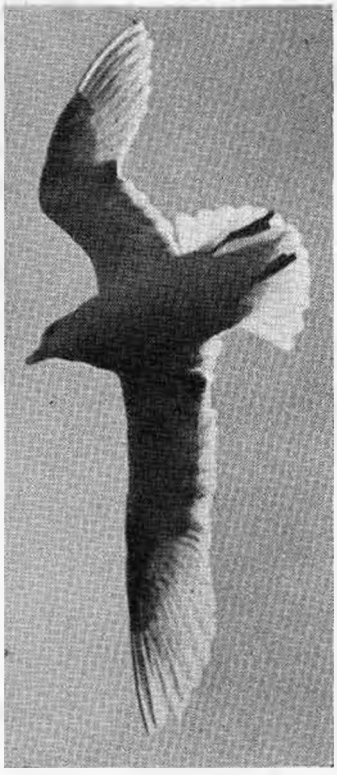
Passive or gliding flight has been attained by a number of groups of animals. Such animals as the "flying-fox" climb to a height in a tree and launching forth, glide for a distance. A fold of skin, widely stretched between the fore-limb and hind-limb on each side, is used as the sustaining surface. Such animals glide only and do not flap. In true flight power is applied during flight, and long sustained flights can be made. This type of flight has been achieved by pterodactyls, bats and birds, but before we consider these, look at the flying fish.

The special interest of the flying fish is that the wings are not the means of propulsion, and here we have the nearest approach in nature to flight on the principles used by man. Although vibration of the wings has been observed there is no true flapping and the flight is no more than a prolonged glide of up to a hundred yards, the fish sometimes reaching a height sufficient to land it on the deck of a ship. The sustaining surfaces are the specially large pectoral fins which have a curved aerofoil section. The wing-loading is greater than in any bird.

The fish takes off in the following manner. Emerging from the water at its swimming speed, estimated at 15–20 m.p.h., the pectoral fins are at once extended and the fish then taxies along with all except its rapidly-vibrating tail above the surface. During the next second the fish accelerates to about 40 m.p.h. and takes off on its glide. During the taxying the rapid vibration of the tail may set up a quivering of the "wings" and this quivering is what has so often been described as flapping. Speed begins to drop once the fish is airborne and after a few seconds it falls back into the water, though by dropping its tail below the surface it can taxi up to take-off speed again, and so embark upon a second glide.

The sustaining surface of the bat resembles that of the prehistoric pterodactyl and is composed of skin held out by the elongated finger bones and attached also to the hind legs. The use of the hind limb in stretching the wings leads to undercarriage difficulties and the creature is unable to rise from a flat surface. Unlike the pterodactyl, however, temperature control in the bat is fairly well developed although it is abandoned when the





Heading opposite shows a Gannet in a slow glide; note the arrangement of the wing feathers. Black primaries form the tips, the alula can be seen halfway along the leading edge. Above and right: Fig. 1, Fulmars in turns, one with a foot down for drag, the other with shortened wing.

animal is hibernating. Lack of heat conservation was a disadvantage in the pterodactyl, for a cold-blooded animal cannot produce such sustained power as a warm-blooded one, and falls far behind it in intelligence.

Still we must not sneer at the bat for it is able to land head-downwards clinging by its hind-legs to a crevice in the roof of a completely dark cave. This feat is achieved by the use of an echo-sounding system, for the eyes are not well developed. As the bat flies it emits through its nose a succession of short pulses of ultra-sonic sound of a frequency of 50,000 cycles/sec. Echoes are received by the bat's highly developed ears, and enable the bat to locate obstacles accurately.

Birds

It is considered likely that birds evolved from reptiles which ran rapidly on their hind-legs, waving their fore-legs to aid balance. Large scales, developed along the trailing edge of the fore-limb, may eventually have evolved into feathers, though it is equally possible that feathers were evolved first as an aid to heat conservation, and were later put into use as an aid to flight. Which came first, feathers or flight?—this question is still unanswered. The presence of a flattened fore-limb enabled the ancestral bird first to glide from branches or to taxi with occasional jumps and short glides, and later to develop true flight. Flight was certainly evolved as a means of escape from enemies, and where birds found themselves without enemies they have often lost the power of flight.

The development of temperature-control by feathers put birds far ahead of the lower animals. The high rate of metabolism thus achieved gives birds a high power-weight ratio, and is shown by the birds' high temperature, up to 111°F. in the Swift, the large amount of food they have to eat every day, and the rate at which they digest and assimilate it, and their amazing reactions.

The blood system which distributes food and oxygen to the muscles is extremely efficient. The heart may be as much as 10% of the total weight of the bird, the heart-beat is extremely rapid, and the blood contains a very high percentage of haemoglobin. The lungs, which absorb the oxygen, have seven accessory air-sacs leading from them. These sacs expand and contract and help to sweep out air, so preventing dead pockets from being formed in the lungs. At rest the rate of breathing of a pigeon is 29 per minute, walking it is 180 per minute, and flying 450 per minute.

Feathers have other advantages.

1. They enable the wing to be quite independent of the legs and so have allowed the latter to evolve separately. Thus the feet can act as paddles for swimming, or as weapons for attack, as well as an efficient undercarriage.

2. Feathers are fully replaceable, and are in fact replaced every year.

3. The feathered wing is easy to fold.

The Wing

The centre section, which moves least during flapping, has a good aerofoil section and provides most lift. The wing-tips are more flexible and during the wing beat they twist and so drive air downwards and backwards, giving some lift and all the forward thrust.

The birds' wing is a normal vertebrate fore-limb, much modified. The bones are the same as in the human arm—an upper arm bone, the humerus; two fore-arm bones, the radius and ulna; and a carpo-metacarpus formed from the wrist and hand bones, many of which have disappeared in the bird, most of those which remain having fused together. The long bones of the wing are very light in weight but are immensely strong, being tubular in construction.

A typical example of this is the series of cross-sections of the gannet's humerus illustrated in Fig. 2. It can be seen that in the central region the

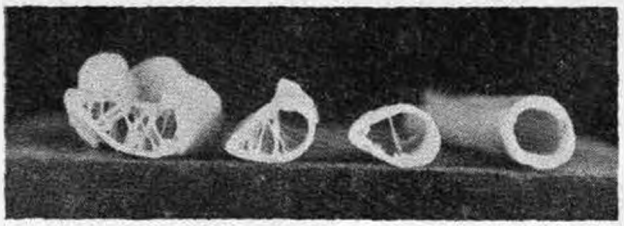
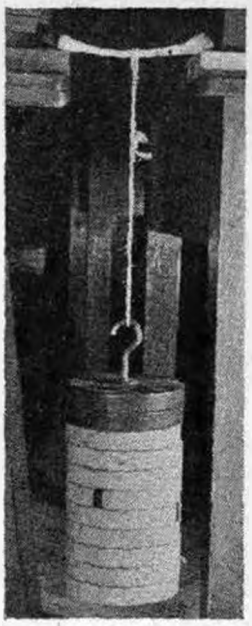


Fig. 2, left: Cross sections of bones structure reveal formation of internal struts of a Gannet's upper arm bone. Fig. 3, at right, shows same bone on breaking strain test. 9 inch bone weighing only 3/4 ounces is seen supporting no less than 112 lbs!



section is roughly circular while towards the end where the section is no longer circular struts are developed. The Chief Designer of Short Brothers and Harland has written to the author: "The bones you sent me are really amazing and most interesting, particularly the way in which the internal struts and cellular construction only occur where the cross section has had to depart from the circle. It is a beautiful piece of structural design and I only wish we could do half as well."

The bird has the advantage in that the bone is laid down by the bone-forming tissue only where the latter is in a state of strain. Thus every strain is counteracted by an increase of strength exactly where it is needed.

The strength of the apparently fragile bones of a bird is emphasized by the test carried out with the wing bone of a gannet similar to the sectioned specimen referred to above. This humerus or upper arm bone was nine inches long and just under half-an-inch in diameter at the centre. It weighed just over two-thirds of an ounce. It was supported on two wooden blocks and a weight-carrier load (2 lb.) was hung by a cord from the middle. 10 lb. weights were added till the bone was supporting 1 cwt. (112 lb.), as can seen in Fig. 3. The weight was then increased to 127 lb. but shortly afterwards the bone suddenly collapsed before a photograph could be taken.

The feathers can be divided into large flight feathers and small contour feathers. The latter overlap each other and fill in the spaces which otherwise might appear between the quills of the flight feathers; they also form a smooth surface for the leading edge of the wing and for the body of the bird. The tail feathers also are overlapped by contour feathers in the same way. The main flight feathers are anchored to the wing bones but are free to twist and move a certain amount.

Wing-flapping is produced by the breast muscles which are fixed at one end to the keel of the breast bone and at the other to the humerus. The main muscle pulls the wing down, and a smaller one, used chiefly during take-off, raises the wing. The latter muscle lies under the main breast muscle and is paler in appearance, being not so richly supplied with blood. The breast muscles may form as much as 25% of the total weight of the bird. The keel on the breast bone is not found in birds such as penguins, which have lost the power of flight. Many other muscles in the wing itself are used for spreading and folding, for holding the wing rigid, to rotate the humerus and to alter the relative positions of the various parts during flight.

When the wing is fully spread it can be seen that the flight feathers are divided into three groups. These can be seen particularly well in the heading photograph on page 410 of the gannet. The black primaries form the wing-tip, and spring from the carpo-metacarpus; the secondaries, which arise from the radius and ulna, form most of the rest of the wing; the tertiaries, which spring from the humerus, are near the body.

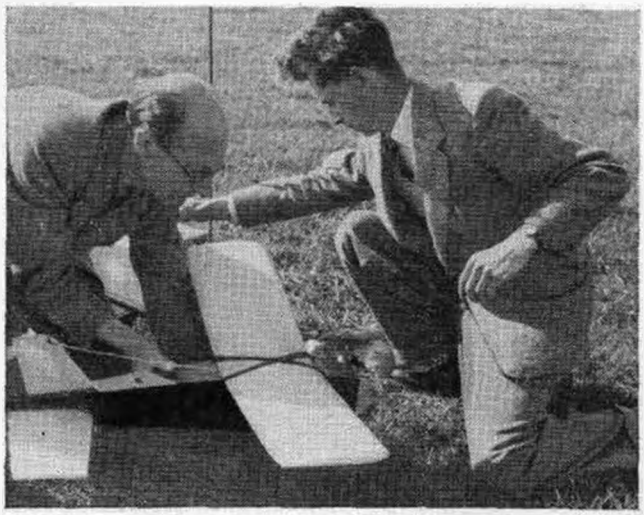
In addition to these the thumb of the "hand", which is separate from the rest of the carpo-metacarpus, bears a small tuft of feathers known as the alula or "bastard-plume". This can be seen very easily on the leading edge of the wing, just about halfway along. The alula is sucked up when the wing is stalled and forms a leading edge slot. It is doing so in this photograph; the lifting of the contour feathers just under the leading edge of the right wing shows that stalling is taking place.

When the primary feathers are fully spread wing-tip slots may appear between them, as illustrated. These slots are poorly developed in high-aspect-ratio gliding birds such as the fulmar but are extremely well developed in low-aspect-ratio soaring birds such as the vulture and the raven. The slots form a most efficient anti-stalling device, and so help the wing to give enough lift at low speeds.

As the bird flies faster the wing tips are swept back, closing the wing-tip slots which are now not needed, decreasing the wing area and so reducing drag. When the bird wishes to turn or land the wing tips are swept forward again, and at the same time the tail feathers can be spread fully to give extra supporting area. The action of the tail as a control surface is considerable and large tails are usually found on woodland birds which must manoeuvre sharply when flying through trees, e.g. sparrowhawk, pheasant and pigeon. When manœuvring the tail can be shut, spread, depressed, elevated, tilted or curved.

Steering is carried out by the joint action of wings and tail sometimes assisted by the lowering of a foot. A turning bird can often be seen with one wing more fully extended than the other, as in Fig. 1, or at a greater angle of attack than the other.

[*To be continued.*



Left. The winner, Ted Sills of Bedford, assisted by Dick Harlow, starts his special Sparky. 7½ ins. have been removed from each wing tip giving a loading of 24¾ ozs. per square foot. Radio is Sills' own pulse type receiver and the motor an Elfin 1·49cc.

AEROMODELLER
RADIO CONTROL TROPHY

Described by HARRY HUNDLEBY

HELD at Kidlington Aerodrome, Oxford, on Sunday, May 3rd, at the same time as the A/2 Glider trials, this was the opening sally of the radio control enthusiasts for the 1953 season.

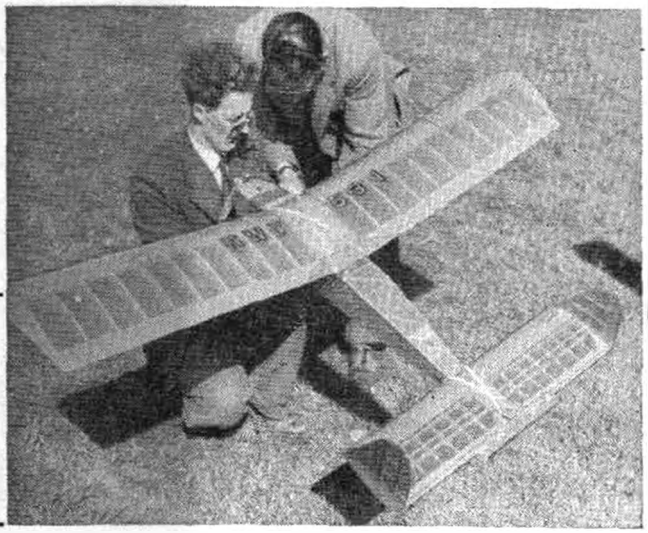
The weather was fine but windy and it became immediately apparent that models lacking penetration were going to have a hard time of it. First surprise and disappointment occurred when Sid Allen failed to start owing to a baulky motor, but several excellent attempts were made at this two-part contest, Rhodes of Harrow, in particular, putting up a very good show. Other excellent efforts by Sallis of Cambridge and Cowell of Knowle made it apparent that we are going to see a greatly improved standard of contest radio flying this season. One of the prettiest sights we have yet seen was a beautiful R.O.G. by a most impressive KeilKraft Falcon, the large wheels making a grass take-off no problem at all.

Star turn of the day was undoubtedly Ted Sill's "sawn-off" Sparky, which flew up-wind at an astonishing rate, setting many of the competitors thinking on the merits of a high wing loading. The model was most manœuvrable and romped through both the course flying and the best part of the stunt schedule to win by a comfortable margin of 58 points.

"AEROMODELLER" R/C TROPHY (3/5/1953)

1.	E. Sills	Bedford	441	points
2.	C. Sallis	Cambridge	283	,,
3.	E. Cowell	Knowle	243	,,
4.	M. Rhodes	Harrow	239	,,
5.	S. Sutherland	West Essex	231	,,
6.	H. Boys	Northampton	208	,,

(21 entries)



Top right. Howard Boys with his 35 inch span Mills 1·3 powered "rudder waggler." He used his well known pulse-operated, progressive radio equipment which enabled him to make a beautifully controlled R.O.G.

Centre. Robertson of West Herts hand launching. Model is unusual in featuring polyhedral, most R/C jobs employing straight dihedral. Right, S/Ldr Bill Verney of R.A.F. St. Athen standing, assisted by Cpl. Barker kneeling, prepares his superbly finished twin fin design. Motor is an E.D. 2·46 and E.D. Reed equipment is used with both rudder and elevator controls.

THE WEATHER AND MODEL FLYING

HINTS ON THE NATURAL ELEMENTS BY J. VAN HATTUM

THERE is no doubt that there is a close tie between our hobby and the weather ; aeromodellers have learnt to become amateur weather-prophets and they glance anxiously at the sky on the day before an important contest. But how much does he know about the actual meteorological conditions his model flies in ? Is he getting the very best out of his model and does he set it on its way in the most favourable manner ?

Here I propose to give a few tips which do not pretend to be more than what the novice needs. For extensive information I would advise the reader to borrow a meteorological textbook.

First, we have the sky, usually—at least in that part of the world in which we live—filled wholly or partly with clouds. Now look at Fig. 1 and study the types of clouds shown. This is only a diagrammatic illustration ; real cloud-study requires a large collection of colour pictures, mainly because the different types of clouds may appear as combinations and become difficult to identify. Very high up we have the well-known feathery clouds and mare's tails. All are of the cirrus family and many enable us to predict a change of weather. Lower down—but still pretty high up—come the alto-cumuli and alto-stratus. Cumuli have that familiar cauliflower appearance : nice woolly heads and a real solid look. Still lower down we get the cumuli again; these sometimes run out into an anvil-shaped head and become less well defined and hazy, when they are called "cumulo-nimbus". This hazy type of cloud ("Nimbus") can come in layers ; a grey flattish mass which often produces rain. Do not mistake this for the real grey blanket of cloud that shows hardly any details (that is, shadows !) for this is known as a stratus, simply meaning layer.

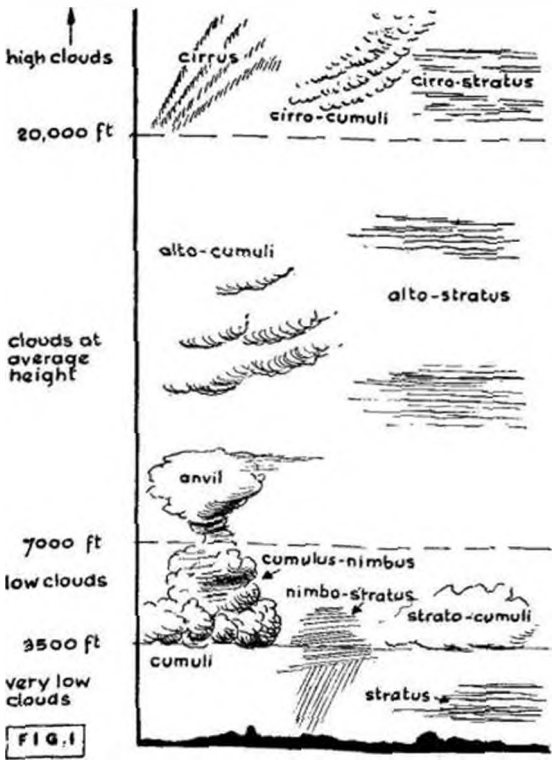


FIG. 1

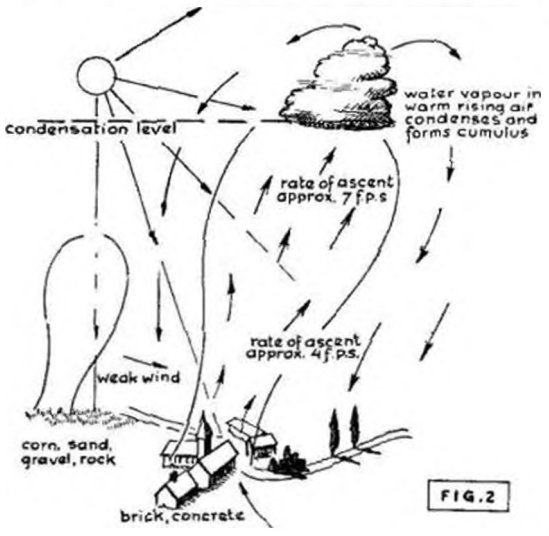


FIG. 2

The aeromodeller is mostly interested in the clouds low down and most of all in the cumulus for that is the one that is connected with thermal lift.

Never say that the cumulus produces lift or that it produces thermals, for it really follows as a consequence of the rising air ; it does not cause it.

Let us look at Fig. 2. Here we see the sun shining on the countryside. Now we should know that the sun's rays hardly warm the air but they do warm the earth and the objects on it. Consequently the air is heated via the earth. It will be seen that all objects that absorb a lot of heat before they have risen appreciably in temperature will be slow to give off heat and hence will not heat the air for some time. On the other hand, those that the sun's rays warm quickly will soon become warm enough to heat the air in contact with them. You can find that out easily by comparing the temperatures of the hot pavement and the " cool " grass. And now we are getting somewhere, for that is just what

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THERE is no doubt that there is a close tie between our hobby and the weather ; aero-modellers have learnt to become amateur weather-prophets and they glance anxiously at the sky on the day before an important contest. But how much does he know about the actual meteorological conditions his model flies in ? Is he getting the very best out of his model and does he set it on its way in the most favourable manner ?

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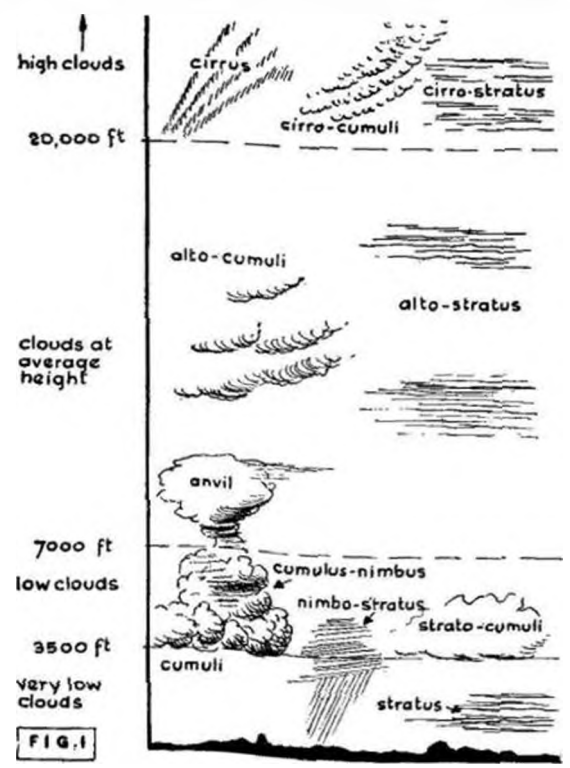
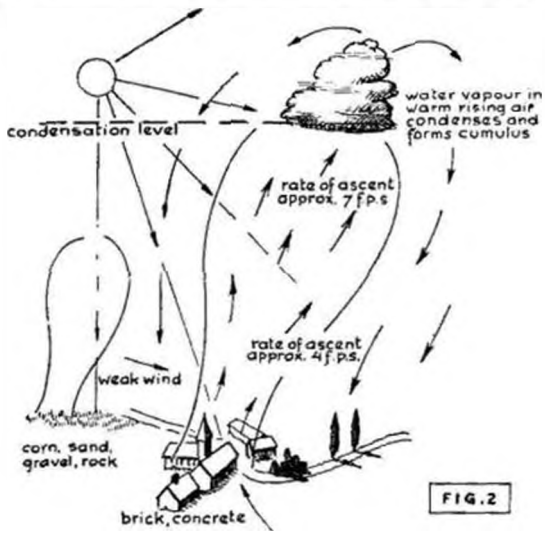


FIG. 1



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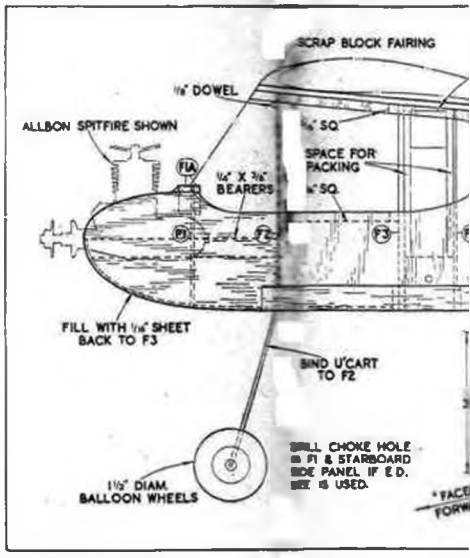
PAACEBOY



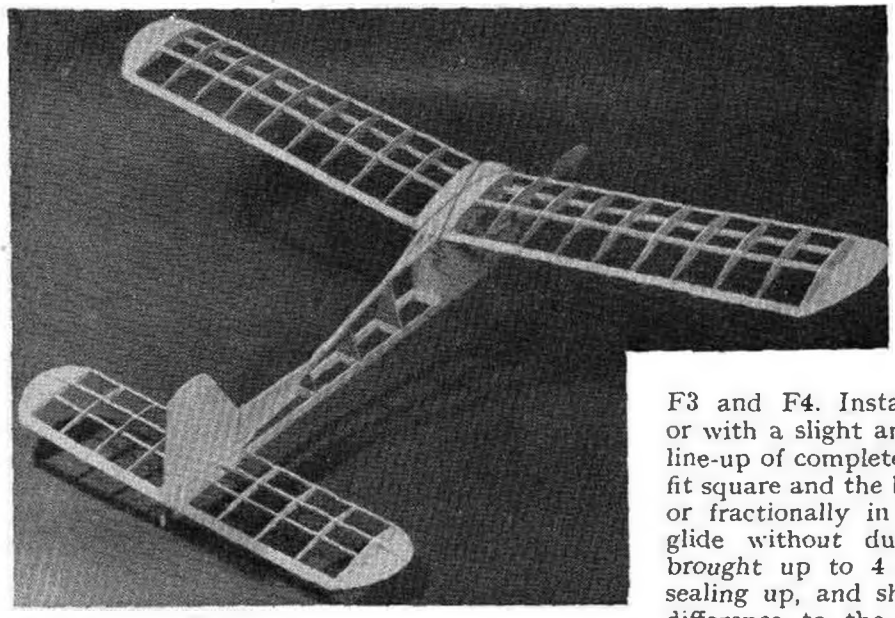
A 42 INCH SPAN PAYLOAD OR SPORT MODEL FOR 1 c.c. DESIGNED BY VIC SMEED CAN BE BUILT FOR 12/6 PLUS THE COST OF YOUR ENGINE!

THE idea underlying Pan American World Airways' sponsorship of a free-flight payload event is that a separate and unrelated freight shall be moved, the aircraft taking off in one place and landing in another. This is what a full-size aircraft is expected to do, and the contest thus encourages models which resemble full-size jobs in many respects. We have chosen to interpret this as covering appearance too, so that our first consideration in this design was that it should be semi-scale.

Now, the carrying of a payload weighing four ounces in a model merely means, apart from certain minimum dimensional requirements in the fuselage, an increase in minimum required weight. The model using a 1 c.c. motor must weigh at least 6½ ozs., or 10½ ozs. in flying trim with dummy.

From here on one's approach depends on one's ideas of wing-loading, power/wing area relationship, and strength. It is doubtful whether adequate strength could be built into an airframe of 3¾ ozs. (i.e. less 2¾ ozs. which is the usual weight of a 1 c.c. diesel) since the dummy's inertia can be quite considerable, and a total weight of at least 7½ ozs. including motor is probably as low as would be practicable for all-weather flying. A small model could be built, having a wing area of, say, 1 sq. ft. and a consequent loaded wing loading of 11½ ozs./sq. ft., which would have a fast climb and glide and a fair rate of sink, although, of course, it would have reached a region of stronger thermals (which accelerate as they rise) in the 20 sec. power run allowed. F.A.I. minimum loadings for a model of this weight (with dummy) would mean a model of approximately 300 sq. ins. wing area (33% tail) which would normally be powered with a 1½ c.c. motor. However, the glide of such a model would be far superior due to the increased R.N. as well as the lower wing loading, and this would probably compensate for the reduced rate of climb. Slower flight and better glide also render trimming easier and increase the chances of staying in a thermal.

Turning to dummy-less flight, it occurred to us that a model could be made to minimum F.A.I. loadings and still have a good performance with the dummy added. The idea of a dual-purpose model of this nature appealed. Minimum weight of 7·06 ozs./c.c. fits in well with our practicable minimum, and maximum total area would need to be, for this weight, about 250 sq. ins. However, we like lowish wing loadings if possible, and a loading of 8 ozs./sq. ft. would seem as much as would give the type of glide we like, with the dummy in place; juggling a few figures suggested a wing area of around 250 sq. ins. with a 33% tail would be a successful compromise. F.A.I. weight would have to be in the region of 9¼ ozs., which is not unreasonable for a model and motor of these sizes; final built weight came out at 9¾ ozs., giving wing loadings of roughly 5·6 ozs./sq. ft. empty and 7·8 ozs./sq. ft. loaded. It was apparent from first glide tests that these loadings gave a floating, "thermal-conscious" glide in conjunction with the wing section used; initial power flights showed a near-vertical climb empty, and a fast-climbing right-hand spiral loaded. Properly trimmed, with an efficient prop, the



of ⅛ in. sheet, the dummy to the dimensions given (N.B.—These are *minimum* measurements) and the box so that it fits accurately into the fuselage. The box floor forms part of the fuselage undersurface, but the whole box must slide in and out for removing the dummy. It is dowelled in place for flight.

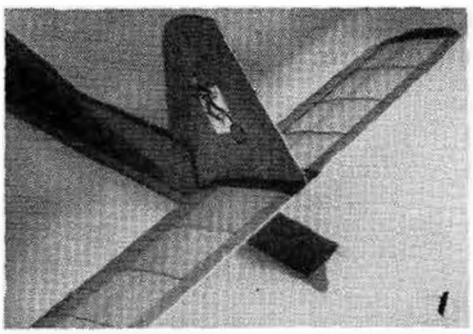
The tailplane is conventional and should be built flat on the plan (Fig. 2). The ⅛ in. sheet fin has an ⅛ × ½ in. stiffener inset across the grain and is provided with a small trim tab. It should be cemented in a slot cut in the tailplane centre-section sheeting and should just engage the dorsal fin slot when the tail is in the normal flying position (Fig. 3).

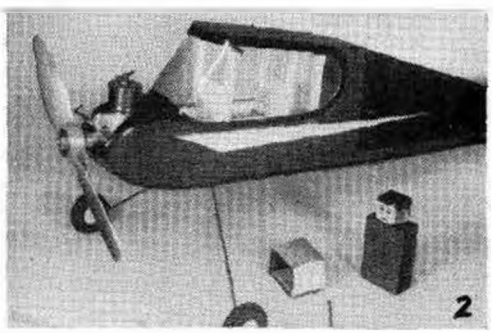
The front mainspar of the wing is assembled to its correct dihedral (use a straight table or paper edge to check) with dihedral brace, and allowed to set before commencing wing construction (Fig. 2). When dry, pin down and build one wing half at a time (Fig. 3), packing spars as required and completing centre-section and tips last. A small fairing should be built up on the c/s l.e., using scrap ⅛ in. laminations.

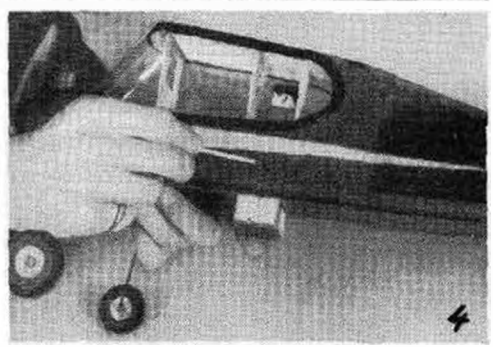
Sand model all over, bringing cowling to a rounded shape, and re-cement all joints. Thoroughly fuelproof inside cowling and next bay back. Cover with lightweight Modelspan and give one or two coats of clear dope, then add cabin celluloid and colour trim if required. F2 may be backed with a 3/16 in. sq. upright each side to assist cabin covering; note that the side windows clear F3 and F4. Install motor either dead straight or with a slight amount of left thrust, and check line-up of completed machine; everything should fit square and the balance point should be beneath or fractionally in front of the rear spar. Test glide without dummy. The latter should be brought up to 4 ozs. by filling with lead and sealing up, and should, when inserted, make no difference to the balance point. ¼ in. play is allowed between F3 and F4 and the dummy should be packed in with scraps of sheet in the position giving the correct balance point. Test glides should remain exactly the same though a little faster. Initial power flights may be made with or without the dummy, but should use reduced power. A tendency to turn right under power is evident, and on the prototype best trim was obtained by using *left* thrust and rudder in small quantities.

MATERIALS

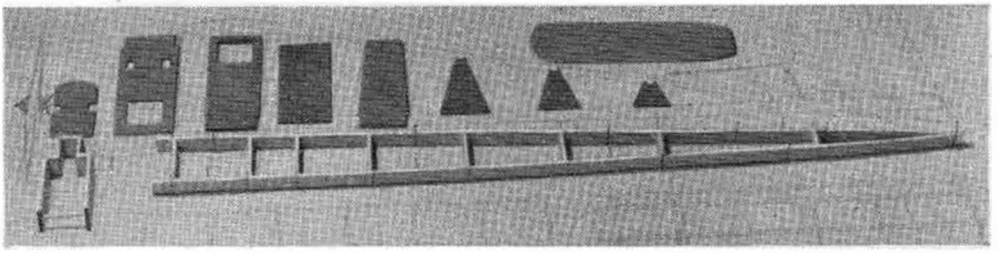
2 ½ × ¼ × 36 in. med. soft.
1 ½ × ½ × 36 in. med.
1 ⅛ × 3 × 36 in. soft.
2 1/16 × 3 × 36 in. soft.
3 × 8 × 1/16 in. ply.
3 × 12 × ⅛ in. soft balsa.
6 × 10 in. celluloid.
6 ins. ⅛ in. dowel.
3 3/16 × 3/16 × 36 in. med.
1 ⅛ × 3/16 × 36 med.
3 ⅛ × ¼ × 36 in. med. t.e.
4 ⅛ × ½ × 36 in. med.
8½ × ½ × ⅛ in. bearer.
15 ins. 14 s.w.g. piano wire.
3 sheets Modelspan.
Dope, cement, wheels, bolts.



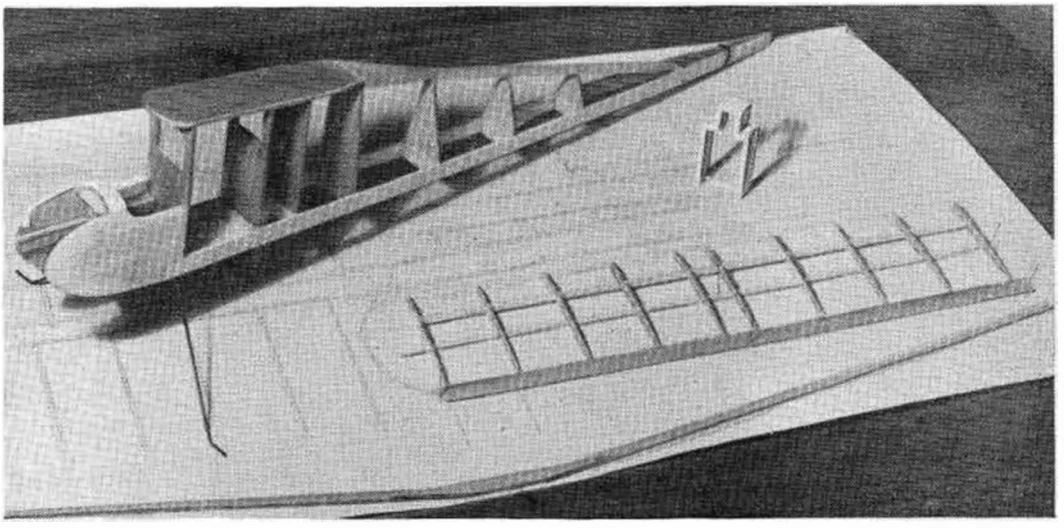




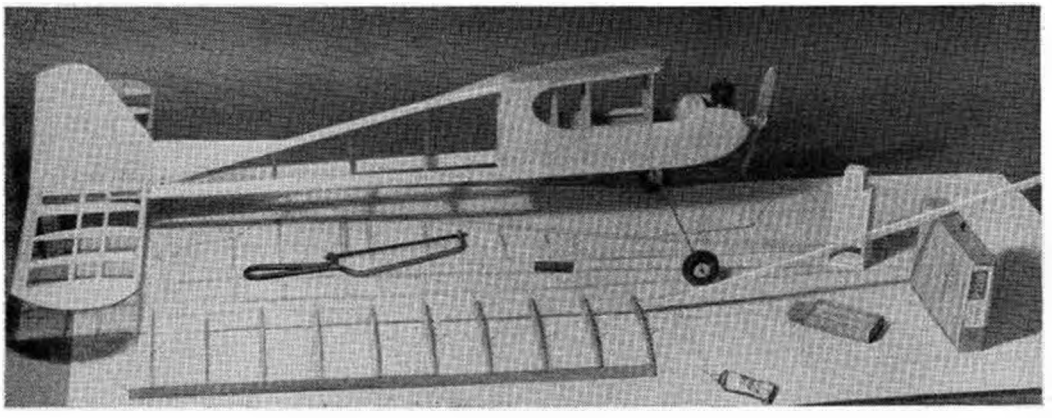
1. Dethermaliser operation is simple, foolproof. 2. Components for dummy installation with method used to insert or extract (3 & 4).



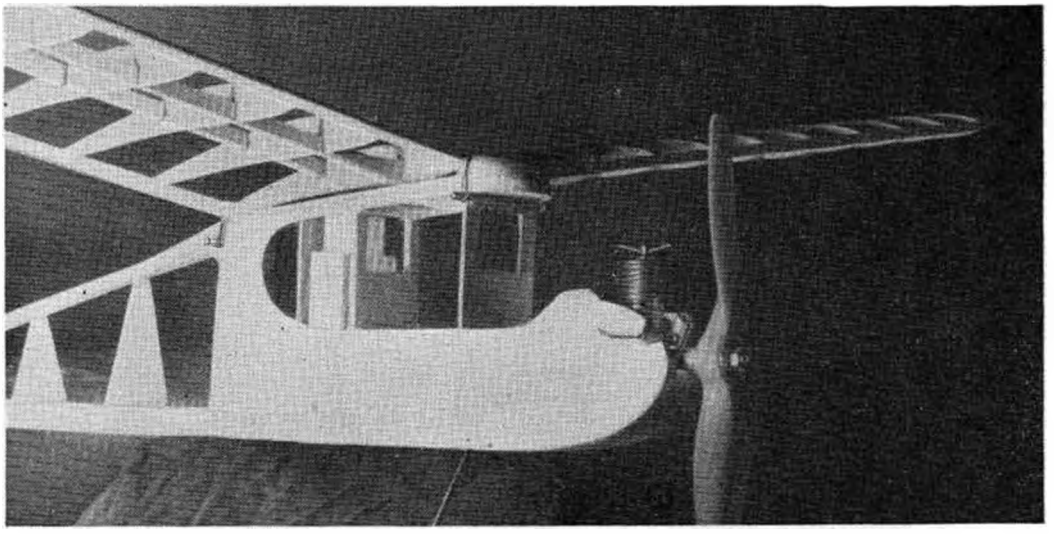
1. ½×½ crutch is first pinned down: formers can be cut while cement dries. Note that formers subject to stress extend through to bottom of crutch.



2. Fuselage formers etc., are assembled to crutch, cabin roof and cowl side panels added. Undercarriage must be bound to F2 before cementing this former in. Tailplane is built in normal manner flat on plan. In foreground can be seen the wing mainspar pinned out with dihedral brace and drying off ready to commence wing construction.

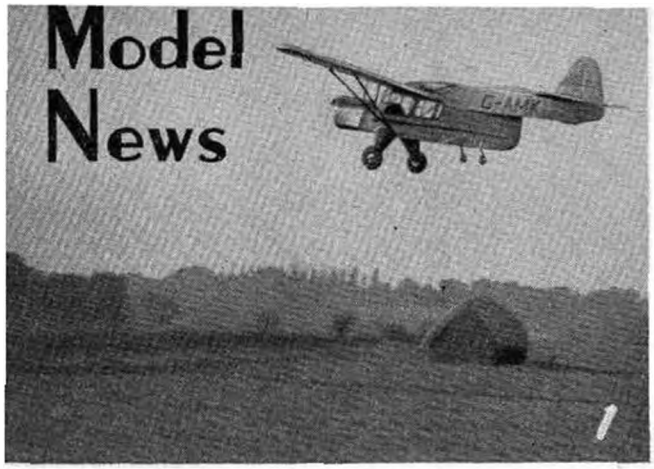


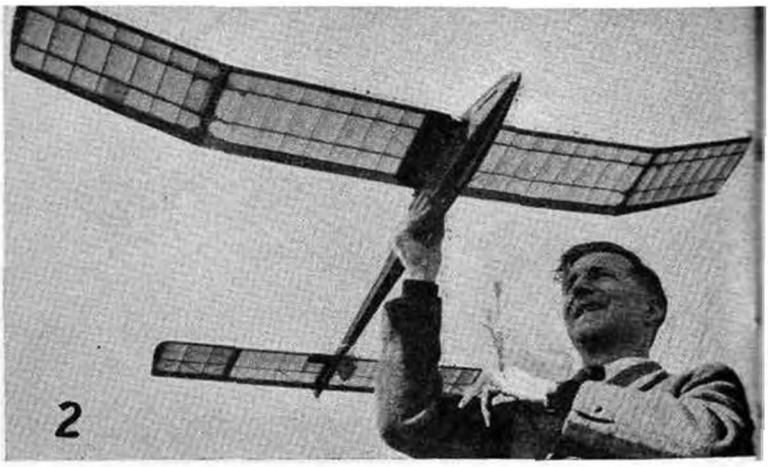
3. One panel of wing is here pinned down and must be completed before other panel is started. Fuselage has been completed by adding side sheeting, dorsal fin, tailplane seating, and other details. Tailplane is also finished and fin added.



4. Close-up of nose and cabin structure shows little finishing details (cowling, centre-section fairing, etc.) that add much to appearance and all help performance. Cut-outs in F2 and F3 are necessary to comply with rules, but could be omitted by sport fliers if desired.

Model News

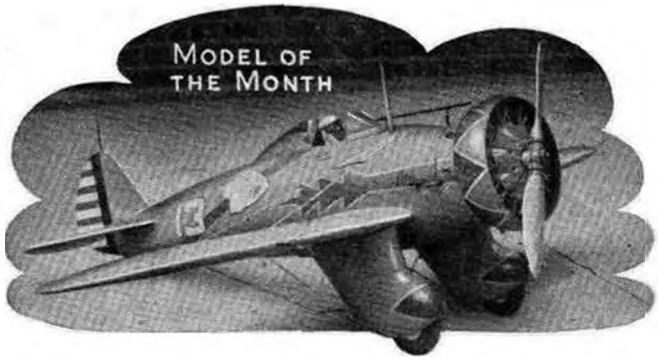




WE have had the pleasure of publishing previous photographs of Caesare Milani's scale control-liners in this feature, and when Caesare came along to the editorial offices in person, plus his latest effort, we could not help but snatch up a camera and record this " Model of the Month ". Complete to the last rivet mark, rocker box and flying wire is this magnificent Boeing P.26a with ETA 29. Decorated in authentic bright blue and chrome yellow with detailed Indian's head insignia, the model has fully sprung wheels inside the smart spats. Caesare reports, " she flies beautifully ", and take it from us, it looks that way, too.

Caught airborne in No. **1**, our heading picture is an Auster B.4 Ambulance Freighter by W. Scott of Tunbridge Wells. 54 ins. span and fitted with Mills 1·3 c.c. diesel. This model was built from scaled up silhouettes, and bears a creditable air of realism in this view. Next door in No. **2** is a familiar shape with slight differences. It's a " Quickie " (by the way, full size plans are now available price 6/– through APS), but Warrant Officer Thairs at Chatham made this one 60 ins. span with 7 ins. chord, and has already had one flyaway with it off 100-ft. line. Considering Mr. Thairs started modelling last September, we rate this as a grand effort.

Another Serviceman, Cpl. Godfrey of R.A.F., Old Sarum, Salisbury, sent the Veron Midget Mustang shot No. **3** which he built for show at his local model shop. Coloured red and yellow with gold numerals, this looks like a good piece of building, matched by equally good photography. The same applies to photo **4** where we see N. Taylor's Mayfly bipe bearing the Blackheath monogram. Using a Mills 1·3, this 25-oz. model once took it into its head to disappear over and behind the Epsom racecourse grandstand, but was eventually recovered by its sixteen-year-old owner. Bet he was worried!



Shades of Saucers—this one in photo **5** is the biggest yet and almost dwarfs J. Tindall and A. Thornton of Godalming, who probably have to co-operate when hand launching. Actual diameter is 48 ins., and being a free-flighter with Frog 500, we imagine its flying speed will be quite high. Section is Clark Y with reflex added, and a small, also circular tailplane is mounted Gloster Javelin fashion to aid stability. Good luck, Mr. Tindall, with the flight tests.

Wearing his A/2 team blazer, Mick King, secretary of Belfairs M.A.C., is seen in No. **6** with what might well be the first flying model of the Handley Page Victor bomber. Photographer A. F. Longstaffe reports that this model performed very consistently at the Belfair's 7th Annual Exhibition, power being by two Jetex 50 units.

From Major P. D. B. Hawker in Cumberland comes the neat mid-wing radio controlled model in picture **7**, and we gather that this is his first attempt at model design. Span is 6 ft., weight 72 ozs., and power, D.C.350 diesel. Rudder control only is used, and a " joystick " control arrangement employed at the transmitter, presumably for progressive control. Keen eyes will note that no external elastic bands are used, yet all components, including the power department, knock-off in the unhappy event of a crash. Another novel feature, worthy of special note, is an automatic switch which cuts off all batteries on landing.

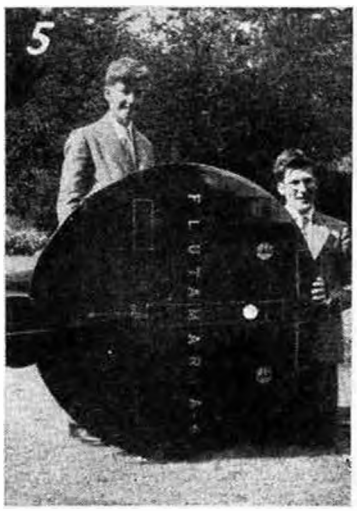
Seen at Chobham Common during the recent Croydon Gala, was the beautiful 1/12 scale Gloster Gladiator for free-flight by R. C. Dunn of the St. Albans Club. The first flight test resulted in a spectacular " bunt ", but after trimming the pendulum elevators and sorting out the high power output from the Elfin 1·49, we can expect to hear of more normal flying in future. Colouring is for 72 Squadron and, like the model, is authentic to the last detail.


3

4

Another scale fighter, this time control-line, and also fully detailed, is the North American Mustang in 9 by D. A. W Helsdown of Tottenham. Converted from plans of Howard Boys' rubber driven Mustang, this model took three months of evening work, and is fitted with an Elfin 1·8 c.c. diesel, mounted sidewinder fashion with the cylinder protruding through the starboard cowling. Span is 28 ins., and all-up weight 24 ozs.

And so to this month's tail-ender, a model without a tail, and a wing that is distinctly different. It's that man Peter Shepherd of Epsom, and as usual, he is right up-to-date with a crescent shape wing. This one, he tells us, glides fast and flat, but to date of writing, we have no news of power tests. It should create no small stir if it ever makes a fly-away over a populated area, there'll be talk of flying scythes instead of the proverbial saucer.



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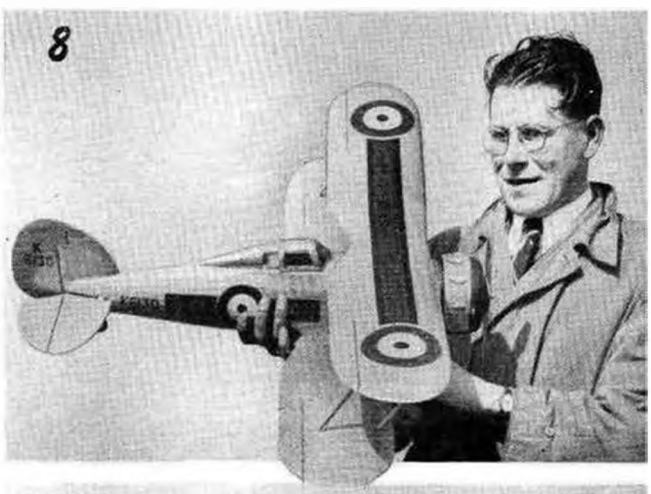
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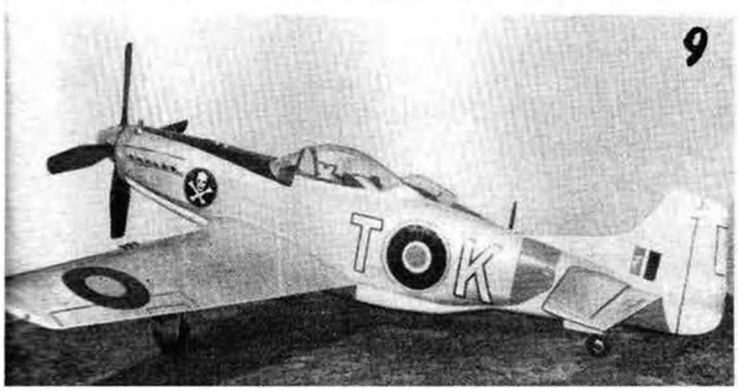


9


10

OK Cub

ENGINE ANALYSIS

The O.K. CUB ·149 c. ins.

OK Cub

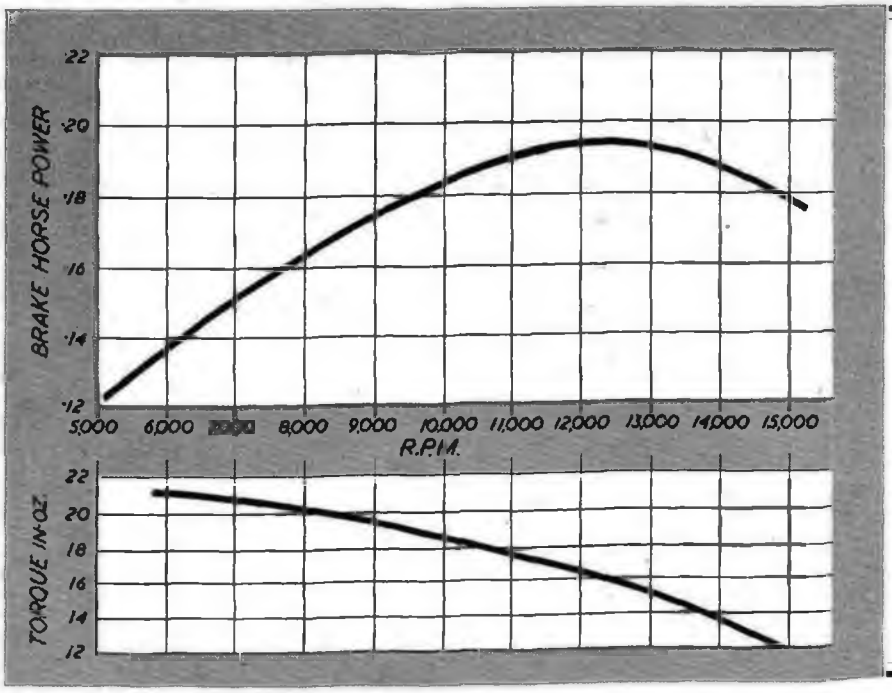
No. 12
NEW SERIES

BY
RON WARING

HOW well the Americans can produce miniature aero motors. Just as we had begun to get almost complacent about the finish and design details of contemporary British production jobs, along comes the new O.K. " Cub " which, placed alongside its English cousins, makes many of them look quite drab and ordinary by comparison. No unnecessary parts, quite beautiful die castings with a polished finish and even the usual " square edges " rounded off to give just that little extra sales appeal. That and real production-engineering " know how " is the backbone of all the leading American engines.

On the performance and handling side, however, we have not the same flattering comments to make. In fact, after a couple of hours running and testing we are still undecided on this aspect. Being the first glow plug engine of this size which has turned up for a long time we expected it to have different handling characteristics—which it did. The main impression, however, was that it was far more critical on fuel supply, so that things had to be " right " to keep it motoring, rather than the liberties which can be taken in this respect with many good diesels.

To be perfectly fair, we swapped the American glow plug for a British one—chiefly because few American glow plugs will stand up to a 2 volt accumulator for any time and one of the secrets of successful starting with a glow-motor, especially when new, is a nice hot, but not too hot, plug. Accordingly we used a standard K.L.G. plug, the



O.K. 'CUB' ·149

Displacement : 2·456 c.c. (·149 cu. ins.).
Bore : ·600 in.
Stroke : ·530 in.
Bore/Stroke ratio : 1·13.
Bare Weight : 2¾ ounces.
Mountings : Beam or radial.

Material Specification

Crankcase : pressure die cast, light alloy.
Crankcase bearing : Plain.
Cylinder : Steel
Cylinder head : Light alloy.
Piston : Plain.
Connecting rod : Drop forged light alloy.

Manufacturers :

Herkimer Tool and Model Works, Inc., Herkimer, New York, U.S.A.
Retail price (in U.S.A. $8·95.)

virtual equivalent of the American standard, but which will take a 2 volt supply indefinitely without burning out. Also we used a standard British fuel, not necessarily the best for this American motor. But switching from Mercury No. 7 to Mercury No. 5, handling characteristics were roughly the same.

For the first few runs, starting was very easy, employing finger choking only. Priming through the exhaust was tried and rejected as swamping the plug too readily. This engine does not need an excessive charge of fuel to fire and run. On subsequent runs, with the same setting and same fuel, the " Cub " frequently petered out soon after starting. It would stop dead when the glow plug was switched off. So we left the plug switched on all the time and got long, satisfactory runs. Later with the same procedure for starting, switching the plug off as soon as the " Cub " was running, worked " as per the book ". In other words, the " Cub " would now run properly. And so we began to wonder a little where this was all leading. At the end of the test period we would still not say that we entirely " knew " the " Cub " and would guarantee its trouble-free operation on the flying field, if necessary.

One thing we will certainly grant the " Cub ". That is, it really seems to like high speed running. Unlike a diesel of the same capacity, too, it gives the impression of being less dangerous or potentially dangerous at speed in excess of 13,000 r.p.m. Diesels flat out in this speed region frequently seem in imminent danger of blowing up, although they never do !

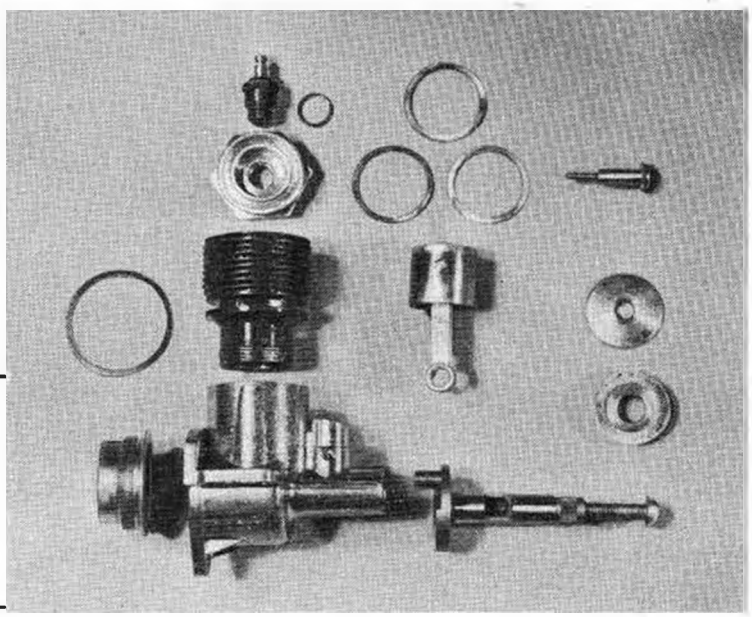
The apparently critical fuel supply remains a bit of a mystery since the needle valve was essentially non-critical. This could be altered over two or three turns without much affecting the running. Provided it was open far enough you did not need to worry about fine adjustment. When tried the effect on performance was negligible. An air bubble in the fuel line, however, might be sufficient to stop the engine, so a sound tank design and hook-up would be essential in a model. Another interesting feature was the almost instantaneous response to cut-out action. Squeeze the fuel line near the needle valve and the engine stopped dead in less than a second —again an interesting comparison with many diesels. Yet fuel consumption is very low for a glow motor of this capacity.

Studying the only control, the needle

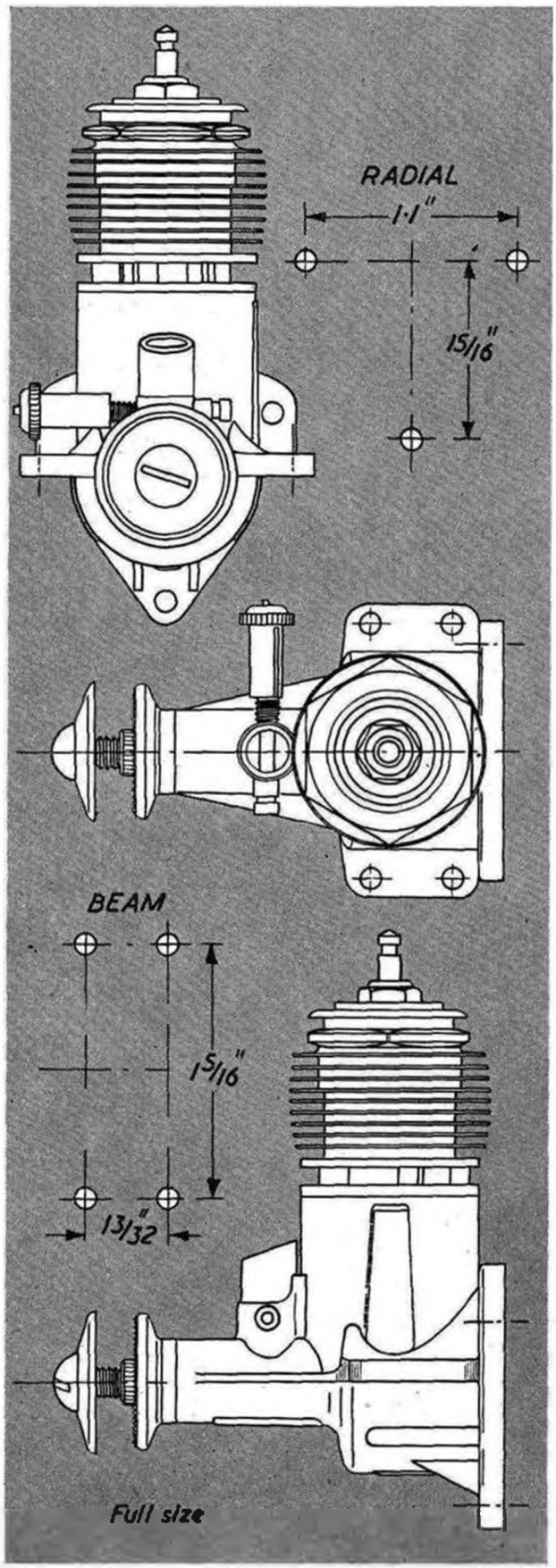
" You'll know my husband, he is tall, dark and reeks of Glo-fuel ! "

valve, we admired its neat appearance, but cursed the stupidity of locating a small knurled knob close to the propeller disc. It *could* be adjusted with the motor running, but not with any confidence in the safety of the operation. Otherwise there was little to find fault with in the design and construction of the " Cub ". The method of fitting the propeller on a machine screw locating in the front of the stub crankshaft (protruding just beyond the propeller backplate) was unusual, and, at first sight, awkward. Yet it was soon found that it was just as easy to change propellers with this type of fitting and, after all, a screwdriver for the stub shaft is probably handier to carry in the pocket than a spanner for handling a conventional prop. nut.

The interior design of the " Cub " does not lend itself to careless handling. In other words, this is an engine which one should not normally dismantle or, if absolutely necessary to take apart, this should be done with care. The steel cylinder



Crankcase casting is one of the outstanding features of this motor, being beautifully finished and amazingly light. Spray bar is not dismantled in this view as it is a drive fit in the crankcase and it was thought best not to disturb same. Note the milled crankshaft for driving washer and the screw-in prop securing bolt that permits different width props to be fitted.



screws into the light alloy crankcase casting and an appreciable area of these threads is cut away to pass the gases from the bottom of the crankcase. Careless handling or excessive tightening down may well distort the bottom of the cylinder. For the same reason excessive force should not be used in tightening or removing the plug from the head, which itself screws into the top of the cylinder. The use of copper gaskets throughout makes excessive tightening unnecessary. The head is sensibly shaped, incidentally, so that the glow plug can be grasped with a suitable spanner, or even pliers, without fear of damaging or marking the rest of the assembly.

An interesting external feature is the cast-in mounting lugs. Lugs for beam mounting are incorporated in the normal way, but a flange cast onto the back of the crankcase provides three attachment holes for alternative radial mounting. This is done without adding any apparent bulk, or weight, to the motor. Bare weight (without propeller) is only 2¾ ounces, which is exceptional for a high performance motor of this size.

The performance curves shown on the graph do not necessarily represent the optimum power output of the "Cub". Possibly with different fuels, better results could have been obtained. In common with other small capacity glow motors, however, the "Cub" appears to develop revs. at the expense of torque. In other words, it is capable of high speeds, but not such high torque values as might be expected from a first rate diesel of the same capacity. The peak of the power curve occurs at around 12,500 r.p.m. although the top of this curve is quite flattish so that if a propeller size is selected to give, say, 12,000 static r.p.m., there will be little appreciable loss of torque in the air when the engine r.p.m. will go up due to the decrease in load on the propeller.

The O.K. "Cub" is the first American production engine designed to F.A.I. limits for International competition (up to 2·5 c.c. maximum displacement) and, as such, its performance will be compared directly with British diesels of similar capacity. In spite of its good looks and brilliant engineering features, however, it is not necessarily a superior engine as regards performance.

Fuel: Mercury No. 5 and Mercury No. 7

NOTE: For overseas readers the formula for MERCURY NO. 7 FUEL is:—

METHANOL	55%
CASTOR OIL	25%
NITROMETHANE	20%

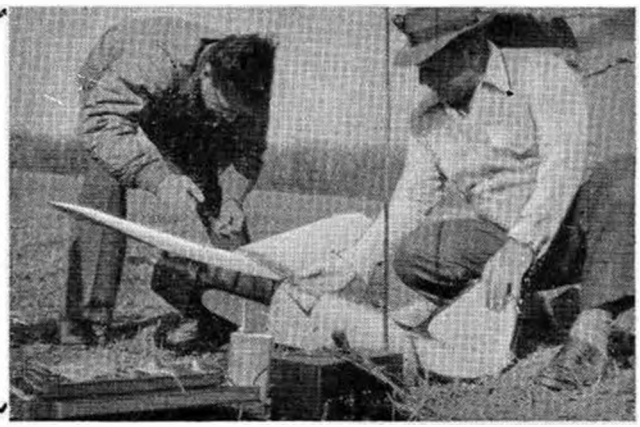
Propeller Tests

Propeller Dia. × Pitch	R.P.M.
10 × 6	
10 × 4	7,850
9 × 6	7,700
8 × 8	7,200
8 × 6	7,750
8 × 5	9,450
8 × 4	11,600
8 × 3	12,100
7 × 6	10,900
7 × 5	11,550
7 × 4	12,900
7 × 3	13,850
5 × 5	15,250

Standard, Constant Geometric Pitch, Carved Wood Propellers.

RADIO CONTROL NOTES

By Howard Boys



Photo, right, shows Mr. L. Chioma (left) of Baltimore, U.S.A., with his Berkeley Buccaneer in which he uses a 5 valve superhet receiver described in this issue.

LET us start this month with a little news of the Low Speed Aerodynamics Research Association, since their main activity during the last few years has been on Radio Control. They have been quietly working away at a very ambitious equipment, and have produced something outstanding. Mr. Dennis Allen (not West Essex) was responsible for the radio design, and Mr. N. K. Walker, the director of research, was responsible for the basic conception, and with full confidence in Mr. Allen, pushed the project forward despite the strain on the Association's finances.

The equipment provides four proportional controls, which can be used for rudder, elevator, ailerons, and engine. Each of these controls are operated by movement of the appropriate knob or lever on the transmitter, and it is very impressive to see the control surface follow the transmitter. The transmitter has a control column for elevator and ailerons, which is biased to the central position, and knobs are provided for trimming control. Normal procedure is to take the model off using the trimmers, setting the model straight and level. Manœuvring is then carried out with the normal controls, and by releasing the column and rudder bar, the control surfaces return to the trimmed position.

With this equipment a model aeroplane can be built for an all up weight of about 10 pounds, which is no more than some others that have been heard of. With such a model all normal manœuvres can be carried out including loops, rolls, and spins, etc. True spins at that. (Not just the spiral dive that is so often mis-named a spin these days.) This model can be arranged so that if a failure should occur, it goes into a flat spin to land with little or no damage.

The receiver is a superhet operating in the 27 mc/s. band and has a crystal controlled local oscillator, so that there is no going out of tune, and no provision is made for tuning on the field. Each control uses an audio frequency sub-carrier. There is an R.F. stage, oscillator, mixer, three I.F. stages, and four valves each tuned to an audio frequency sub-carrier, one for each control. The outputs from these are smoothed to give voltages that vary according to the mark/space ratios at the transmitter, applied to servo amplifiers and then to the servo units.

These servo units use Mighty Midget motors, controlled by E.D. polarised relays, and the positioning accuracy is —1 to —5 per cent. This means that the position of the control surface on the model in the air can be ascertained from the control position on the transmitter, and therefore certain research into the aerodynamics of a full scale aeroplane can be carried out by means of a model. This satisfies one of the objects of the Association, which is, " To study the application of small scale flight tests to full scale aeronautics ".

The mark/space ratios at the transmitter are obtained electronically, and the pulse speed is about 50 per second.

While this equipment is too expensive and elaborate for the normal modeller, it is very gratifying to know that a group of modellers in this country should forge ahead and produce something so outstanding. This equipment will be used for flight tests on scale models of full size aircraft. We hope that Mr. Allen will be able to give a more complete description at a later date.

Superhets seem to be much in evidence this month as we have been sent details of such a receiver by Mr. Leonard D. Chioma of Baltimore, Maryland. The receiver is being marketed by Messrs. Electronic Model Engineering, Inc., at 49·95 dollars, and a crystal controlled transmitter with 5 watts input to the final amplifier is also marketed at 49·50 dollars. The frequency is of course 27·255 mc/s., so the equipment could be used in the British Isles, also in some other countries. Mr. Chioma has sent a circuit diagram (Fig. 1) and a few notes.

This receiver measures 3×5 ins. and weighs 12½ ounces, and is designed to operate a Sigma 4F relay, or its equivalent (resistance 8,000 ohms). It contains an RF stage, frequency changer, two IF's and detector-relay valve. Normally the relay valve draws one milliamp and drops to zero on receipt of signal. H.T. is 67½ volts, L.T. 1½ volts. While the receiver is larger and heavier

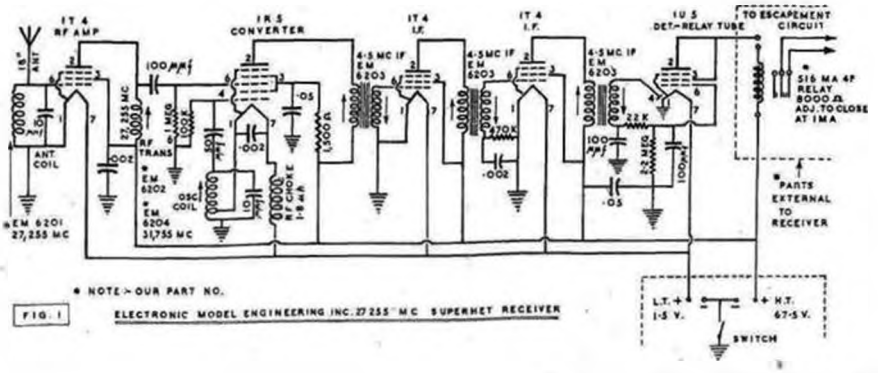
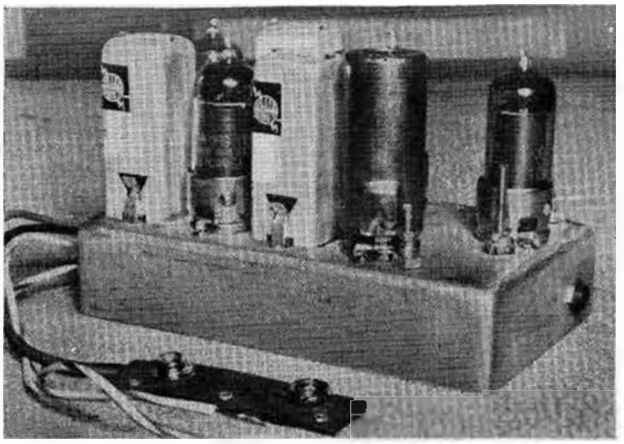
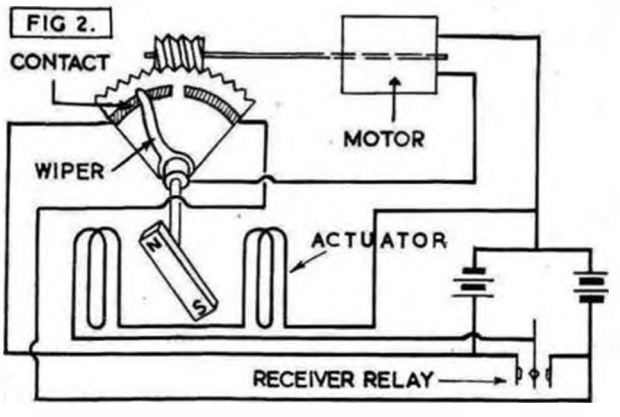


FIG. 1 ELECTRONIC MODEL ENGINEERING INC. 27255 M.C. SUPERHET RECEIVER

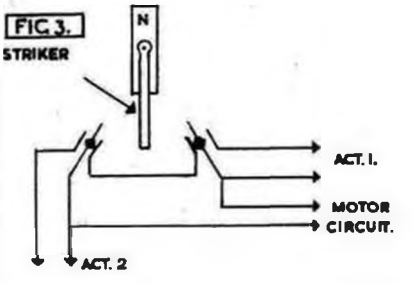


than the simple super-regen. it has advantages. For instance, it needs no adjustment after the initial, and as sold can be put in a model and not even tuned to the transmitter. It was primarily designed after witnessing innumerable hours spent adjusting gas valve receivers. (These need not require a lot of adjusting—more later. H.B.) The original receiver has been flown in a 56 in. span Berkeley Buccaneer, so it is quite suitable for models of 5 ft. or more span. Note—the 1 U5 det-relay valve is not very well known; it is electrically equivalent to the 1 S5, but has better pin connections.

It is rather interesting to note that soon after writing the notes giving details of Mr. McCullough's control system, and some time before they got into print, a letter was received from J. Tech Badger of the R.A.F., giving details of a similar scheme using exactly the same type of transmitter controls, but different decoding and actuating gear. This gear has not been made up and tested, but there seems no reason why it should not be made to work, judging by the fact that various parts have been known to work in the way suggested. The controls Mr. Badger wanted were—Rudder—Proportional, Engine-Sequence, slow and fast, Elevator-Sequence, neutral and up. Instead of elevator, a position was considered where the actuator current consumption would be greatly reduced. The method of obtaining proportional rudder with current economy is interesting, and is shown in Fig. 2. A Pike type actuator is used with high resistance winding, and this moves a wiper arm across contacts on the rudder operating shaft, this shaft being turned by a geared-down motor. The wiper arm will take up a position according to the mark/space ratio of the transmitter, and when this brings it on to a contact, current will be switched one way or other through the motor to bring the space between the contacts in line with the wiper. If the space is wider than the wiper it should switch the motor off at this point, or it might keep the motor moving the rudder gently from one contact to the other. If the space is narrower than the wiper, the batteries would be short circuited. If the rudder should go from one contact to the other, the mark or space button could be held down, and a striker could cut the current to the motor, see Fig. 3.



Normally the transmitter control will have stops to prevent the rudder lever from giving full mark or full space, as in the McCullough scheme, with push buttons for mark and space. Fig. 3 shows how switches can be arranged to operate at full mark or space, and used to operate further actuators, cutting the current to the motor at the same time, thereby leaving the rudder in its set position. If the extra actuators are not used, mark or space can be held on to keep down the receiver anode current, and rest the relay contacts with the rudder in any set position.



A diagrammatic layout of the parts is shown in Fig. 4 and the wiring for them in Fig. 5. The motor could be either

a Mighty Midget, or Frog Tornado, and these seem reliable starters on 3 volts, so if the actuator was wound for this voltage, only two 3 volt batteries would be required, providing of course, any further actuators would work off 3 volts.

The success of this scheme would depend on having a sufficiently fast pulse rate, so that the actuator rotor would not oscillate very much from its desired position, especially near its full turn position. Also the actuator switches would need very light springs.

Our old friend, Mr. Duvaletelis of Athens, has been thinking up receiver operation again, this time to improve operation, particularly where capacitors are used in delay circuits. Let us have an extract from his letter verbatim (see Fig. 6).

" In the simple XFGI or hard valve receiver, the standing no-signal current is adjusted by means of a potentiometer of about 5,000 ohms. A dry electrolytic ' paper ' type of capacitor of about 20 mfd. at 350 volts (if it is rated at less than 350 volts the leakage current is too high) is connected to the lead going from the potentiometer to the relay. The standing current is adjusted in the usual manner.

" With signal ' on ' the current taken from the H.T. battery drops, and in the usual receiver without the electrolytic capacitor there is less voltage drop in the potentiometer (in the relay as well, but that cannot be helped) which raises the voltage at the anode of the valve and increases the anode current. In fact, a considerable part of the ' change ' is cancelled by the current stabilising action of the resistances. The opposite action takes place when the signal is switched ' off ', for the increased voltage drop in all these resistances does not permit a high rise of the current.

" With the capacitor in the circuit and no signal, it is charged to the potential of the ' end ' of the potentiometer going to the relay. When a signal is received the current for an instant drops much more with the capacitor than without since the latter does not allow any sudden change of potential across it, thus providing for a momentary reduction of the anode voltage of the valve and a ' kick ' to the relay. By the time the signal is switched off the capacitor has charged to the new higher potential and at the moment of switching off the transmitter more current passes through the relay ' kicking ' it closed. If a sensitive meter with low inertia is inserted in series with the anode, these *increased* current changes can be easily observed, reaching as much as 0·3 ma. if the resistance of the pot. is not too small. In this respect it is worth while to increase this resistance to beyond 5,000 ohms, adjusting in compensation the regeneration of the super-regen. circuit to obtain the desired standing current and/or increasing the H.T. to 60 instead of 45 volts. Not only is much greater range obtained but also the action of the relay is much more positive since it is literally kicked open or shut, ensuring good operation of the contacts. If a high pulsing rate is to be used with such a capacitor in the circuit its value may have to be reduced to allow it to charge and discharge between pulses. The value given, however, will operate well with pulsing up to ten per second."

FIG 4.

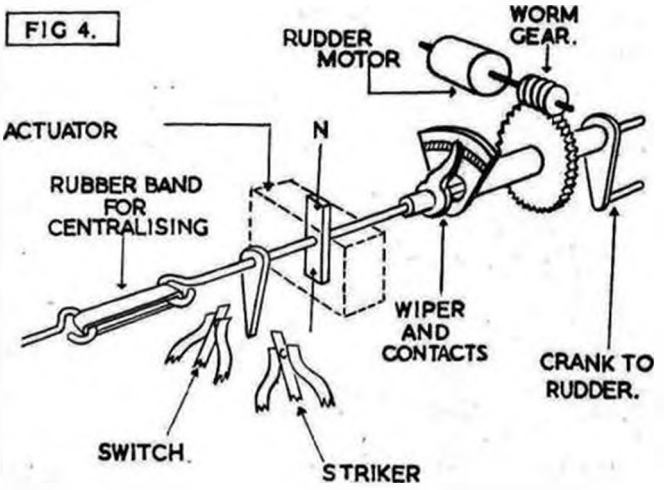
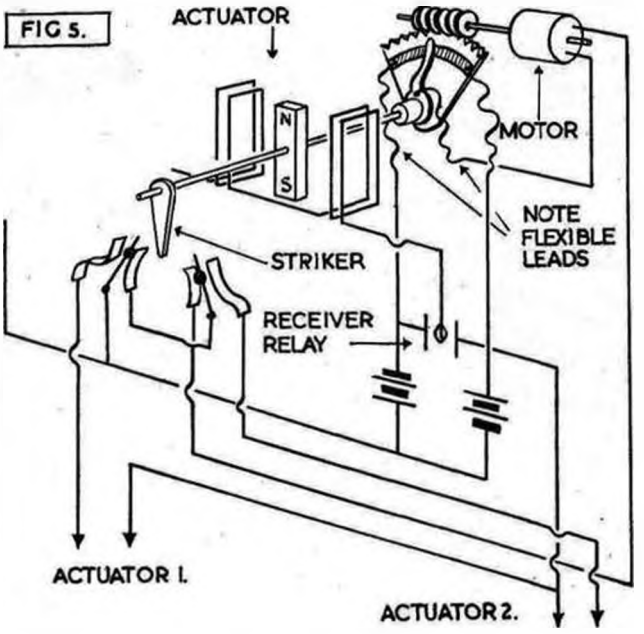


FIG 5.



Regarding the XFGI receiver, a few hints will be given in the next " Notes ". Readers may be interested to know that the writer has been using this valve type for nearly all flying, and the receivers have proved as reliable as any other.

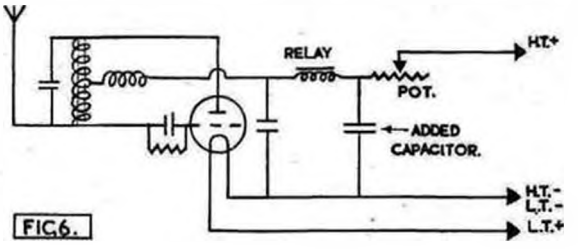
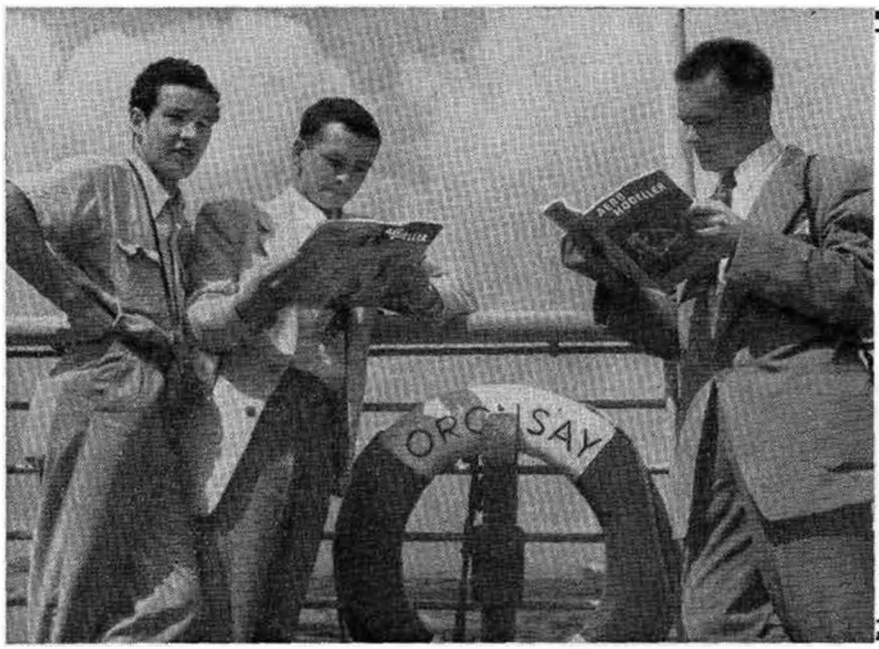


FIG.6.

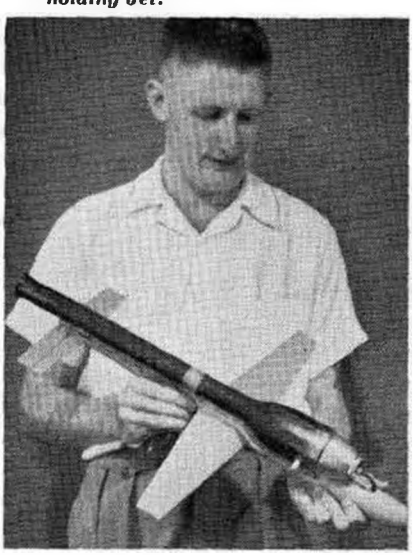


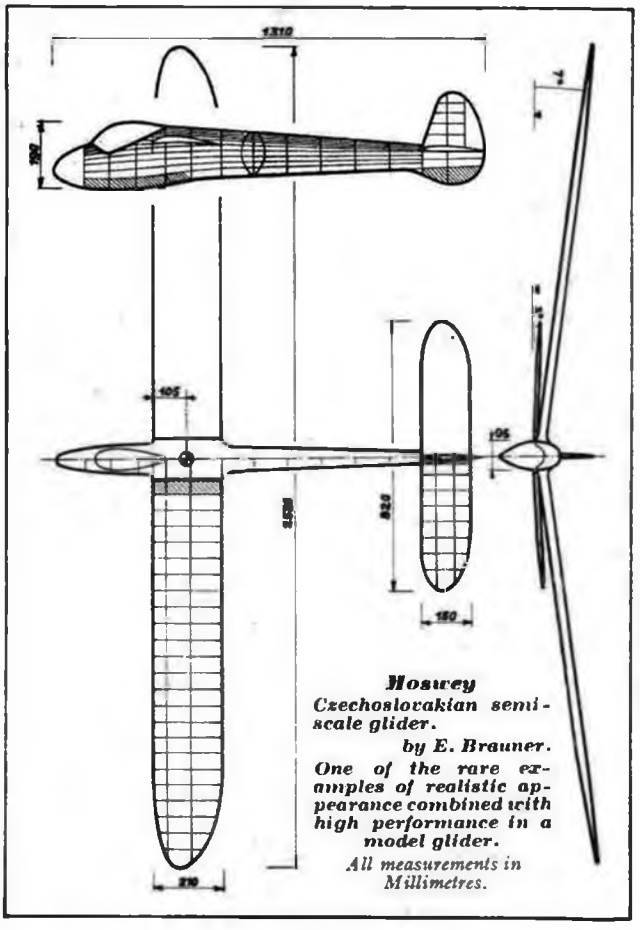
WORLD NEWS

First thing Dan McLarren, Derry Brown and Monty Tyrell did when they arrived at Tilbury dock on the Oronsay ***was to catch up with latest news in the "Aeromodeller." They have 14 models to fly whilst in Europe as the Australian Controline Team.***

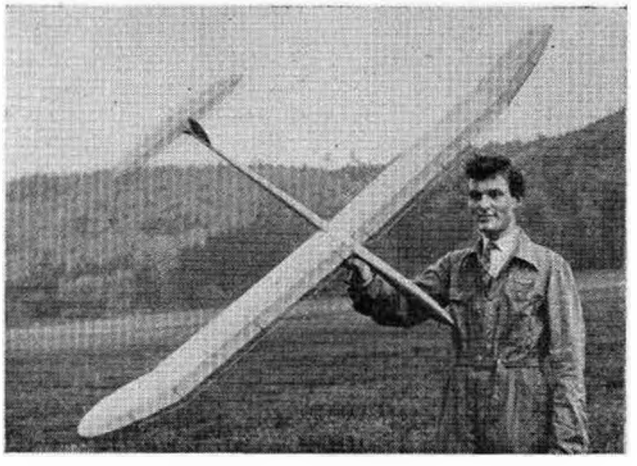
WHO'LL be flying for his country this year? That leading question is answered by some of these pictures, and very few new names are coming along for the 1953 International teams. The Hansen's of Denmark are well to the fore, and though not related, there are no less than three of them in the 1953 A/2 team. Other man is to be Ove Nesdam, with Fritz Neumann as first reserve. Times in their eliminators, held from 05.00 to 09.30 a.m., indicate that Hans Hansen has one of these flapped A/2's doing a near 5 min. average. In the Swiss team, A/2 flier Hans Schnabel has a genuine 5 : 15 to 6 : 00 average in dead air with the turbulated beauty opposite on a 328 ft. line.

Left: Monty Tyrell's Orwick 29b Racer will be entered in all possible British events. Below, left: Hans Hansen, Danish A/2 Champion, with flapped model which recorded 876 secs. in 3 flights. Centre: Czechs R. Cizek and C. Cimbura team raced a Chrislea ace over Zakopane Ice Rink in Poland. Right: Keith Kayton and 138 m.p.h. "Hot Canary" S. African record-holding Jet.



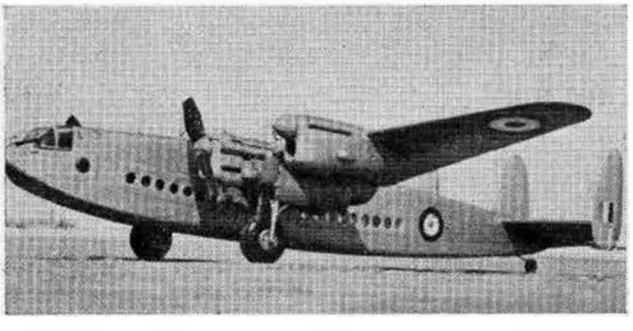


Mosurey
Czechoslovakian semi-scale glider.
by E. Brauner.
One of the rare examples of realistic appearance combined with high performance in a model glider.
All measurements in Millimetres.



One team is already in England, the Australian Control-line team who will be flying their big Spitfire and Fox powered stunters at Knokke, also proxy handling Mel Sharp's 139 m.p.h. Dooling 61 speed job and Jim Fullarton's F.A.I. power model—welcome and good luck for their European tour.

Below: U/Cart works on this 60 in. twin E.D. 2·46 York built by the R.A.F. Club at Khartoum in the Sudan. Weight is 78 ozs, and flying speed 25 m.p.h. Top Right: The British speed team for the 10 c.c. World Championship in Milan. Harry Timms of Harrow, McCoy 60, 139 m.p.h. Ron Davenport of East London, Carter Special, 158·7 m.p.h. and Reg Skinner of Harrow, Dooling 61, 138 m.p.h. Next: Schnabel and over 5 min. average A/2 uses leading edge turbulator. Right: M. Bodmer, top FAI power man in Swiss Eliminators, averaged 4 mins. over 7 flights. Bottom: Hansheiri Thomann and high average model, 4th in Swiss team.



the fact that you might, by more detailed trimming, get a little extra performance. If you stick to 80 per cent. of the possible maximum turns, too, your rubber motor should last for many, many flights. Good rubber can stand repeated windings to 80 per cent. full turns and deliver appreciably the same consistent power output without fatigue or deterioration.

Trimming then consists of packing the noseblock downwards slightly to compensate for the fact that the high initial thrust of the motor (high r.p.m. of the propeller) tends to make the model fly faster which, for normal model designs already balanced for a satisfactory glide, tends to pull the nose up into a stall.

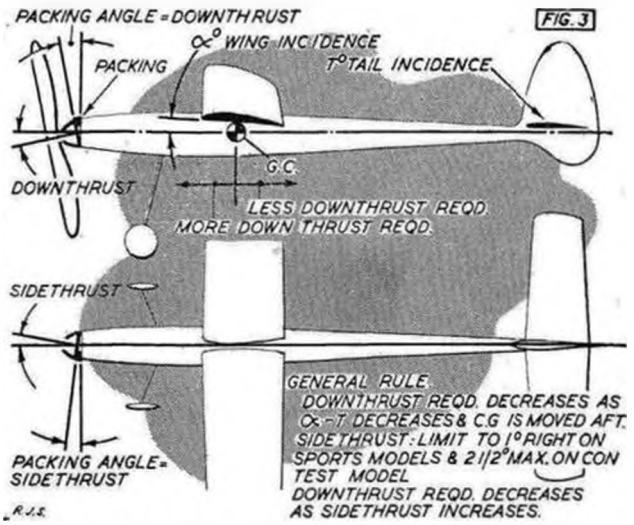
At the same time, if the model is initially rigged to fly straight, it will tend to bank to the left under power due to torque reaction. A left turn actually tends to aggravate any stalling tendency under power, so as a general rule, all rubber models are trimmed to fly to the *right* under power. This can be done by packing the noseblock around to the right *slightly* (not more than 1 degree on a sports model), i.e., adding sidethrust.

The effect of sidethrust is to induce the model to turn to the right under power, and this direction of turn has a tendency to hold the nose *down* under power. Hence, using sidethrust, we can dispense with some of the downthrust. However, this must be approached with caution. When the sidethrust angle exceeds about 2 degrees, the nose-down tendency in a right hand is quite strong and may well result in the model going into a spiral dive instead of a right-hand circling climb. Striking the optimum balance between side- and down-thrust can be difficult, so for sports flying use a minimum amount of sidethrust and then adjust only the downthrust, as required.

You can, of course, also make a model turn by offsetting the rudder or trim tab. This, again, can easily be overdone. Increased flying speed makes the effect of an offset rudder more powerful which may not be suspected on, say, half turns, but will lead to a spiral dive again when the model is wound right up.

Moderation is the secret of trimming rubber driven sports models. Incorporate just a little sidethrust with, perhaps, a shade of rudder offset to give a circle on the glide. The model is first trimmed for glide and then tried out under power, starting with low turns and gradually increasing each time, adding small amounts of downthrust, as found necessary. Be content with fairly wide circles under both power and glide. And when the optimum thrust line packing has been determined, *cement it in permanently*.

The contest modeller wants more out of his model than just stable, steady flights. His main requirement is *height*. In other words, he wants as good a climb as possible from the motor he is using. Provided the design itself is reasonably efficient and stable, this places the emphasis on good



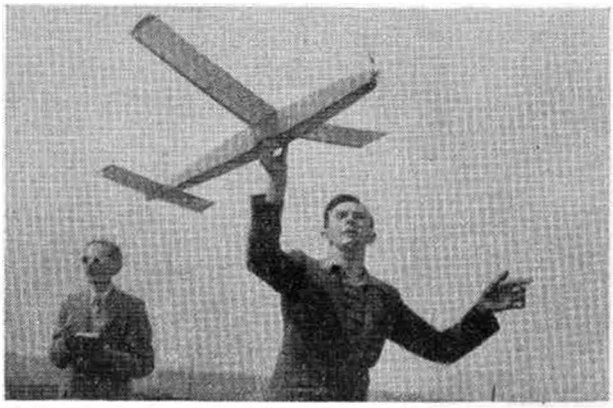
rubber, a good propeller and trimming technique.

The method of trimming is basically the same as for a sports model, only this time a more powerful motor is usually involved, which makes trimming that much more difficult, and the flyer wants to use that power as efficiently as possible to get the best possible climb.

Now " best climb " does not necessarily mean the fastest rate of climb. Most contest flyers have fairly fixed ideas as to the amount of weight of rubber they can accommodate in a particular design. This can be used as a relatively short, thick motor (i.e., large number of strands), or a long, low power motor. The *total* amount of power these two motors will give will be about the same. The first model will give a spectacular climb and a short power run ; the other a slow climb with a long power run. The former may appear to be the best method of obtaining " optimum " climb, but the latter is usually more efficient.

This is largely because, in trimming the model out satisfactorily with full turns on the powerful motor, once the initial burst of power has died away the power trim is over-corrected for the rest of the flight. In other words, after the first few

Ed Bennet's Wake actually got away from this one ; but almost decapitated photographer Keith Miller!



Tony Brooks is flying a geared Wakefield this year, not unlike the Scandinavian models that have retained the trophy for four years.

seconds of the power run, a proportion of the rest of the power run is actually being wasted.

The low power, long duration motor of the same weight is not automatically the best choice on these grounds. There are a number of other factors to be considered. Whilst, generally, this does enable the model to be trimmed out rather more efficiently (as regards optimum utilisation of the energy stored in the rubber motor), a model which climbs slowly is more susceptible to gusts and may hardly climb at all, or even be beaten into the ground on windy days. On most days the best " flying air " is some 250 to 300 feet above the ground. Here thermals are generally more apparent than near ground level and the air itself is less turbulent. Once a model reaches this height, it is generally flying in *smooth* air, regardless of how fast the wind may be blowing. Near the ground, by comparison, the wind may be gusty and the air churned up after blowing around obstacles, such as trees, hills, houses, etc.

Some modellers prefer the high-climb short power run model on the basis that this is the best way of combating normal weather conditions. In other words, they are prepared to sacrifice a certain amount of motor efficiency in order to get the model up to a good height quickly. In thermal weather this frequently pays, but on an overall basis the average performance of such models tends to be lower than that of a similar model with the same rubber weight arranged to give an *optimum* rate of climb.

It is possible to go to the extreme of low power, long duration and get away with it. Maybe sometimes the model never gets more than a hundred feet or so of altitude. But the duration of the power run may be in excess of 2½ mins. and so a relatively long flight duration is assured. Often, too, this assured long power duration results in the model finding an upcurrent near the end of the flight, simply because it has covered more ground and eventually flown into lifting air.

Generally speaking, however, it is best to aim at a mid-way solution—a model with a power run *long* enough to give it a consistent high duration and *powerful* enough to climb the model to a height similar to that of the first example. Properly done, in fact, using the rubber motor somewhat more efficiently, it should be possible to gain a greater ultimate height, Fig. 4. The only disadvantage from the practical point of view is that during this time the model will have drifted downwind farther than its high-climb counterpart and may more readily go out of sight of the timekeepers.

It is difficult to tell anyone how to judge the climb of a model. Expert contest flyers can do it by watching the flight. Most people, however, cannot dissociate their minds from the fact that they are standing stationary on the ground and the model is flying through an entirely different medium and drifting downwind at the same time. In flight the climb characteristics of a model have little relationship to the ground. To observe a

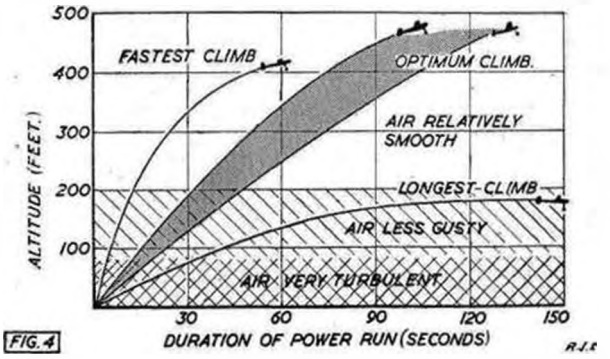


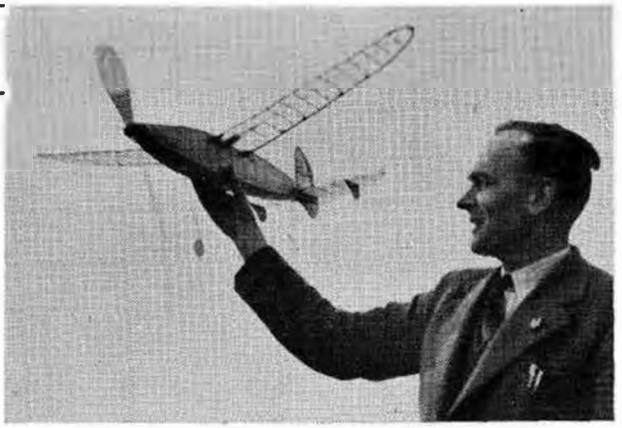
FIG. 4

model properly the observer must mentally " detach " himself from the ground and imagine himself a " passenger " flying in the model. This most valuable knack can only be acquired with practice—and even then is no infallible guide.

Comparative trimming can only really be done in still air. This means, in practice, calm evening air when vertical air velocities are largely absent or at least relatively small and widespread. Test

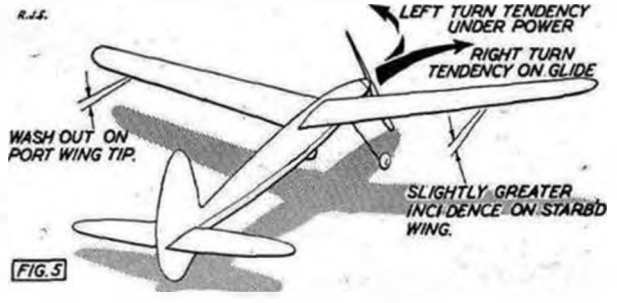
John Palmer of Croydon heaves his long fuselage Wakefield . . . or is he trying to get out of its way?

APS Favourite, Warring's Lightweight, is a reliable design. This one is over two years old, and still performs with the best. Builder is R. C. Brown of Luton.



flying a new rubber model on a normal day and getting " five minutes first flight " does not really mean a thing—except that the trim was reasonable and the model flew into lift. But consistent evening performance, with the model reaching a good height each time, generally ensures a similar degree of consistency and high performance under all conditions. The all-weather average performance is generally less than the consistent "evening" performance, so this also must be taken into account.

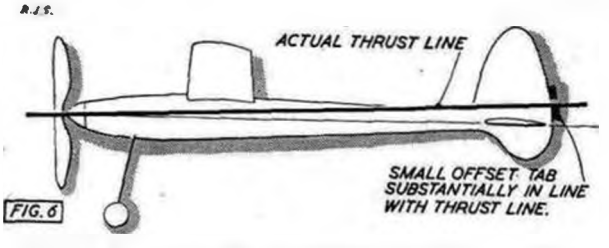
Contest rubber flyers have their own particular pet methods and prejudices about trimming. Seldom will a group of experts agree on this subject. All, however, follow the same basic rule of trimming with down- and side-thrust, after first having established the glide trim. Trimming the model for glide, however, cannot be done by hand-launched tests. The model needs height before the glide trim can be checked properly, so initial flights with a new contest rubber model are generally confined to about one-third turns, ignoring the power trim for the time being (generally with temporary, excessive downthrust packing for safety), and concentrating on making small changes to the tailplane incidence or relative centre of gravity position to get the desired glide. At the same time the required glide circle is worked in, either by using the trim tab or tilting the tailplane. Some modellers, especially those using plug-in wings, produce a glide circle by differential rigging of the wings. (Fig. 5.) The starboard wing



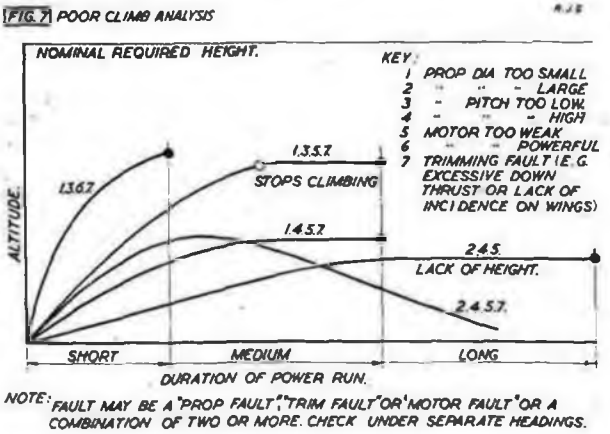
is rigged at a slightly greater positive incidence (or the left-hand wing tip washed out) so that the starboard wing generates more drag at the high angle of attack associated with best glide trim and so pulls the model round to the right.

This glide trim may or may not be modified when the next stage—trimming the thrust line—is attempted. It may be found necessary to take off some of the glide turn (or use a less sensitive method to produce the turn) so that enough sidethrust can be used to produce the required right-hand circle under power. With a freewheeling propeller, too, the amount of sidethrust used will affect the glide turn with the propeller windmilling.

Another interesting method of trimming for turn is the use of a small rudder tab for trimming the *power* circle, Fig. 6. This tab, being in the slipstream of the propeller, is very effective under full power. Its effect then dies off and, on the glide, has virtually *no* effect at all. Such a tab has been used successfully to produce a fairly tight right turn under power in conjunction with the minimum of side- and down-thrust, enabling the motor to be used *efficiently*, since its effect dies down after the initial burst of power.



The *only* answer to good trimming is practice—and plenty of it. The best *guide* is the type of flight pattern followed by the top-notch rubber flyers. In other words, they set the pattern of what can be done and, with practice, and experience, there is no reason why any rubber enthusiast should not be able to duplicate or at least approach similar performances. There are a few particular secrets about the models themselves. The answer lies in " know-how " applied to trimming.



THE DE HAVILLAND 75 'HAWK MOTH'

AIRCRAFT DESCRIBED No. 56. By G. A. CULL

IN the mid twenties, the biplane held full sway in all classes of aircraft and although many examples of the monoplane had been built there seemed little likelihood of its losing supremacy. Whenever the biplane-versus-monoplane argument arose it was usually the biplane which came out on top, but in 1926 a remarkable flight by a monoplane made the aviation world sit up. This was Lindbergh's non-stop crossing of the North Atlantic in a Ryan monoplane and thereafter the monoplane was looked upon with greater enthusiasm. Consequently, in 1928 when De Havillands were known to be building a high wing monoplane at Stag Lane it was awaited with interest.

Early in 1929, this second monoplane member of the Moth family was ready and appeared with an unusually roomy cabin which seated four in two side-by-side pairs with two large doors on the starboard side. This machine was the D.H. 75, which also featured a new engine, originally called the "Twinned Gipsy", but later named the "Ghost". This was an aircooled V-eight engine and comprised two standard D.H. Gipsy cylinder-banks bolted to a common crankshaft to deliver 198 h.p. The exhaust pipe from the starboard cylinders passed across the back of the engine and joined the port exhaust pipe which extended well down the fuselage. Brakes were fitted to the wide track undercarriage and the parallel chord wings folded backwards, hinging at the rear spar root. Only the one Ghost engined D.H. 75 was built and this was registered G-EBVV, but the standard machine appeared later in 1929 powered by the 247 h.p. Armstrong Siddeley Lynx engine and this was the D.H. 75A, also known as the Moth Six. All-up weight was increased by 300 lbs. and the wings were redesigned with tapered outer sections and greater span, while a further door was provided for the pilot on the port side.

The first Lynx machine went to Australia where it was registered VH-UNW and owned by Conellan Airways; this machine is believed to be still in existence. There was no home demand for the Hawk Moth, only G-AAFW, 'FX and 'UZ being registered, and it was in Canada where the Lynx-engined version was best known. Useful work was done here on forestry fire patrol and a float undercarriage was fitted for lake-flying. A small batch were built for the Royal Canadian Air Force and these had variable pitch Hamilton metal propellers. 1929 also saw the final development of the Hawk Moth, this being the D.H. 75B with the famous American 300 h.p. Wright Whirlwind which had made possible many famous flights, including Lindbergh's. This aircraft was the heaviest and fastest of the series and was the last D.H. 75 to emerge from Stag Lane.

Specification. Span (D.H. 75) 44 ft. 0 in., (D.H. 75A) 47 ft. 6 ins. Length (D.H. 75) 29 ft. 1 in., (D.H. 75A) 28 ft. 11 ins. Height 9 ft. 6 ins. D.H. 75 Wing Area 277 sq. ft. Wing loading 11·56 lbs./sq. ft. All up weight 3,500 lbs. D.H. 75A 3,800 lbs, D.H.75B 3,870 lbs. Cruising speed, D.H. 75 100 m.p.h., D.H. 75B 136 m.p.h.

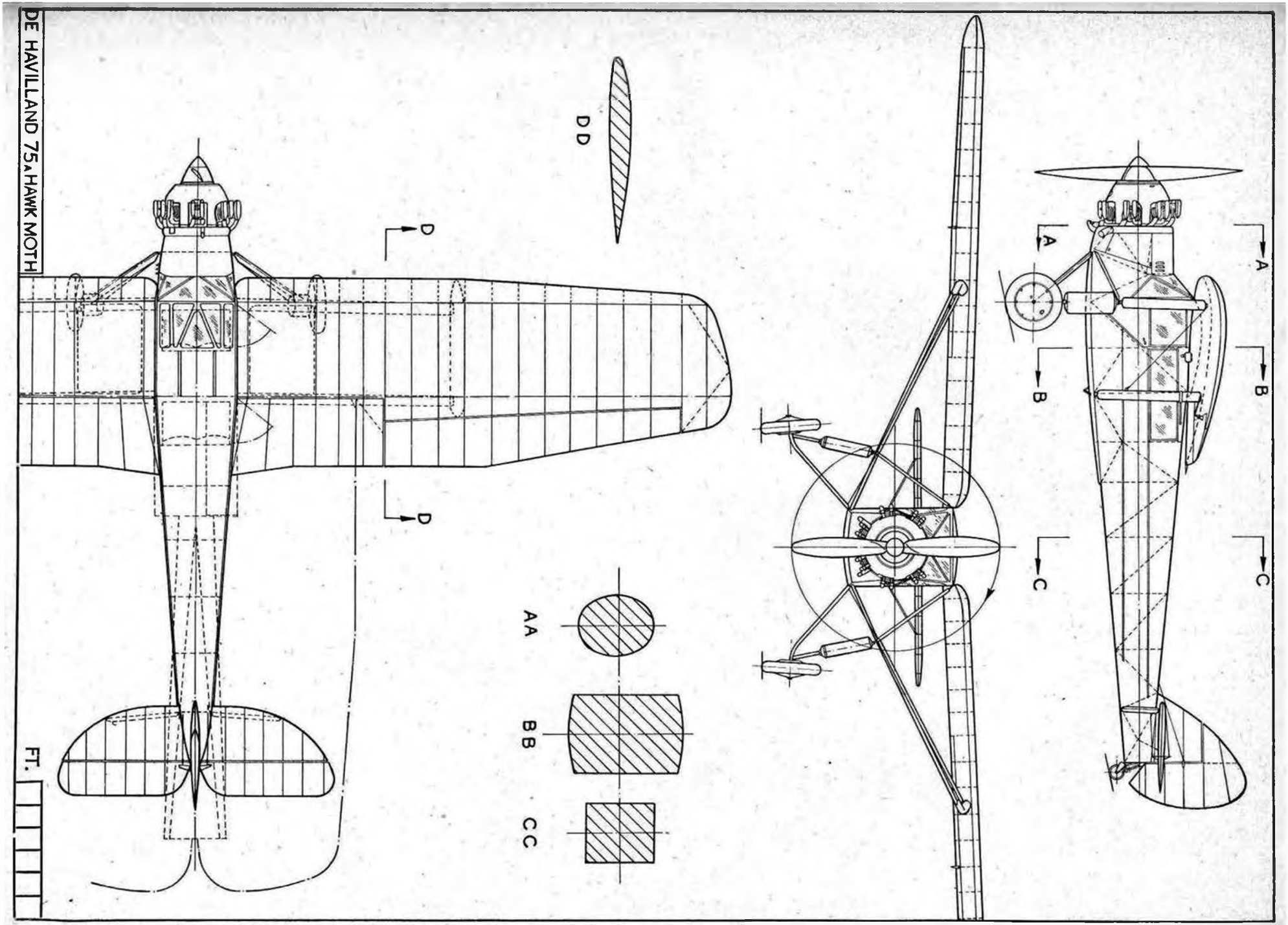
Construction. Fuselage of welded steel tubes with ply and fabric covering. Wings all wood with box spars, girder ribs and compression struts for two-bay internal wire bracing. 35 gallon fuel tank in each wing root. Wing and ailerons fabric covered. Tail surfaces of welded steel tube construction throughout with fabric covering. Undercarriage had rubber compression discs.

Colour. Prototype had dark blue fuselage with white outline registration letters. Wings and tail unit doped aluminium. Registration letters in black solid letters above and below wing, extending between spars. D.H. 75A G-AAUZ had light blue fuselage, fin and rudder with aluminium letters on fuselage and light blue letters on wings. All struts were dark blue. Wings and tailplane were aluminium doped. R.C.A.F. machines were aluminium doped all over with red, white and blue roundels and rudder stripes (red at trailing edge). Lettering, all struts and undercarriage and forward of front cabin doors in glossy black.

***Heading:** Shows a brand new R.C.A.F. D.H. 75A at the Toronto Factory. Right, Top: G-EBVV was first Hawk Moth and only one fitted with D.H. Ghost ("Flight" photo). Centre: D.H. 75B with American "Whirlwind" engine. Bottom: A Lynx-engined D.H. 75A fitted with long exhaust pipes and scrapers to clear mud from wheels.*

(Photos, courtesy of De Havilland Aircraft Co.).

DE HAVILLAND 75A HAWK MOTH



1/72nd scale 'J' type reprints and 1/36th scale 'F' type Blueprints of this drawing are available price 6d. and 2/– respectively, post free, from the Aeromodeller Plans Service.

Readers' Letters

Looking Back

MY DEAR RUSHBROOKE,

I have often thought of writing to you, if only to tell you what an excellent journal you provide for the thousands of aeromodellers in the world; or possibly to try and re-capture some of my younger days when I dabbled muchly and enthusiastically in the then halcyon days when "we all knew each other"—all 100 of the other chaps, and names like R. N. Bullock, L. Plater, D. A. Pavely, A. F. Houlberg, Richard Langley, Rasmussen, Newall and company conjured up thoughts of new designs and prospects; and we usually met after a Council meeting at "the Club", which was of course the Joe Lyons Corner House in the Tottenham Court Road!

Aye, those were the days; the days when Ralph Bullock was my hero; when Pavely made a tail-less model fly; when Claude Bowden persuaded a petrol-engined model called "Kanga" to take off from a strip of grass at Fairey's aerodrome (previously scythed and mown by me until it was smooth enough for the model to accelerate and get airborne) thus establishing the first officially observed power-driven flight in the United Kingdom—about 1929; when the Wakefield Cup first was contested and no eliminating heats were needed—and I almost won for America by flying Gordon Light's new-fangled balsa-made model; when I used balsa myself and all the pundits said that it was a stupid idea and no good for the U.K. climate; when I won the contest at Brooklands twice running—the prize being a free half-hour dual instruction, and George Lowdell said that if I lived to be old enough I would, at this rate, learn to fly for nothing! Yes, it was all fun.

The reason why I am writing to you (and practising my typing on an old friend at the same time) is a remark made in the February, 1953, issue about the H.P. "Heyford" which was adjudged the "Model of the Month". It said that the "Heyford" belonged to 57 Squadron and you could tell because it had a letter "F" on the fuselage. I think a small correction would be welcomed; the Squadron was probably No. 58, and stationed in those days at Worthy Down, near Winchester. The letter "F" indicated which machine it was in the squadron, and the letter itself was painted red, which was the colour of all the "A" Flight aircraft—that Flight using the first nine or ten letters in the alphabet. All this because by a happy coincidence I was in "A" Flight of 58 Squadron myself in 1935.

How are things with you and yours these days? The model movement seems to have assumed proportions that even in our wildest dreams in the twenties we could not have forecast. A lot seems to have reverted to the original in modern design—and a whole lot, of course, has not. Tricks like drinking straws, free wheeling props, paper tubes made from notepaper and geared rubber motors seem to be either still on or back again; I even notice the seaplane coming back into favour—a type I was very fond of.

My best regards to you, the magazine, and the modern generation. Having started modelling about 1926, I am beginning to feel a real old-timer!

Yours aye,

J. PELLY-FRY, Wing Commander.

SHAPE, Paris.

(P.F. certainly reminds us of those carefree—even slightly slap-happy—days before the war, when thermals were yet to be discovered, and spruce and silk were common building materials. Pelly-Fry's name appears on many S.M.A.E. trophies, though not as often as it should owing to an almost complete lack of record data prior to about 1935.—ED.)

Telekineticisms

DEAR SIR,

I feel that I must join my good friend Howard Boys on his hobby horse—the misuse of Radio Control terminology. I was sorry to see that your excellent journal has again been guilty of referring to progressive control as proportional control; this time in a caption on page 342 and in Trade Notes on page 370 of the June issue.

True proportional control is only that in which, as the name suggests, the control surface automatically takes up an angular position proportional to the position of the control knob or lever at a speed proportional to the speed of movement of the control knob.

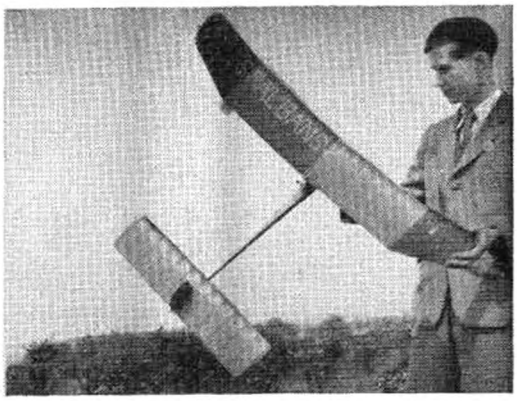
With progressive (or Beep) control the surface moves at a constant rate and is stopped in an intermediate position by returning the control lever to its neutral position. For instance, if the control surface takes two seconds to travel from its zero position to one extreme, then half rudder can be obtained by operating the control for one second only. The accuracy of control surface positioning depends on the control surface rate, the constancy of that rate and the skill of the operator.

Mr. Honnest-Redlich of E.D.'s is to be congratulated for placing progressive control within the reach of the modeller but he would be the last to refer to it as proportional.

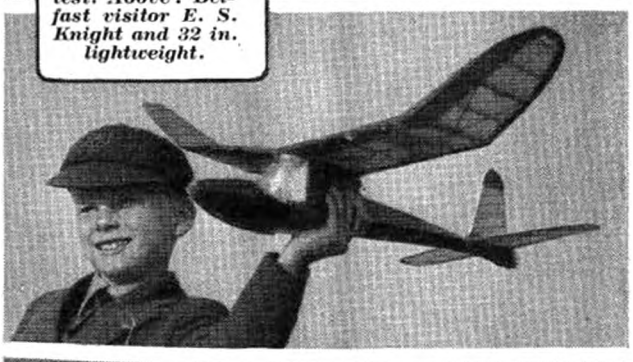
As far as is known the aircraft at present being operated by the Flight Control Project of the L.S.A.R.A. is the only model equipped with Multi-Channel Proportional Control that has been flown in this country.

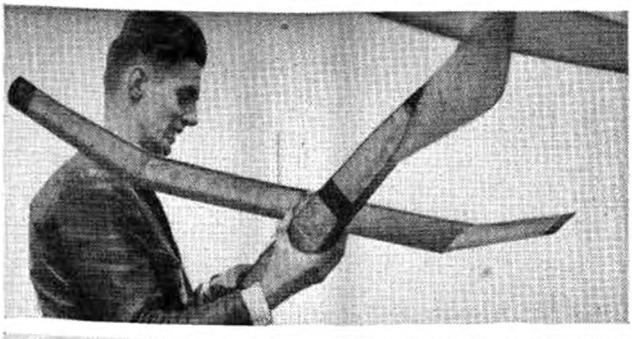
Guildford. D. W. ALLEN.

Planes & People at Croydon Gala



Top : Pete Wright and Eliminator on test. Above : Belfast visitor E. S. Knight and 32 in. lightweight.





Gala Champ John Lamble entered underfinned Dreep Wakefield in rubber. Below: Jim Wingate launches straight into a thermal

A 20 m.p.h. breeze across what is now popularly termed the London Area's " Blasted Heath " and located on survey maps as Chobham Common, rather spoiled the competitive atmosphere on Croydon's Gala Day. Just the same, great fun was had by all, and not a little spice was added to the occasion when an Epsom club model box, complete with contents, went up in blazing flame, a situation which, we may add, was soon under control. Surprise came with 8-years-old Clive Burge's winning flight slope soaring, and tough luck consolation should go to Henry Tubbs whose famed Red Swan met an unfortunate demise. Using slight altitude advantage off Chobham Clump, the chuck gliders were finding the set one minute max. relatively easy, humorist L. Ranson just beating John Barker with one of the latter's Misguided Missiles (March AEROMODELLER) for top place.

Top total of 13 : 18 in the three main events gave John Lamble, of West Herts and Wayfarers, the Championship prize : but it was his clubmate, Tony Noel, who produced the model of the day. Cleaving a genuine over 100 m.p.h. after each catapult launch, his D.H.110 " solid " went higher, faster and further than a great many of its tissue-covered brethren.

Centre, right, Clive Burge, and thermal-catching slope soarer. Heading shows W. L. Manuel of St. Georges Heights Club with veteran J. L. Pitcher of Croydon. Left: Tony Noel displays his lethal D.H.110 and massive ¾ in. sq. catapult. Model soars to over 300 ft. at 100 m.p.h. Needs extra careful safety precautions, both for launcher and general public.

SCOTTISH PAGE

UP at Cambuslang, the **WEST COATS M.A.C.** had fine weather and a good turn out for the C/L display on April 25th. The local lads had an array of scale jobs ranging from a " Bee " powered Lysander to a D.C. 350 D.H. Beaver, and some of the West of Scotland Area display experts came from Glasgow with a collection of stunters and team racers. To mention a few of the latter, there was Bob Murdoch's Elfin 2·49 " Virago ", a twin-engined project by Barnstormers, George Cowie and Fred Leigh. This job featured an Elfin 1·49 on one wing, and a Frog 150 on the other. The Clark brothers, Jim and Ian, kept the crowd on their toes with their stunts, Ian with a freelance Amco 3·5 powered design, and Jim with his E.D. racerised " Monitor ". Jas. McDowall of the West Coats Club had the bad luck to be trouble shooting most of the time with his " Beaver ", which proved to be a bit of a gremlin incubator. However, he eventually got it airborne, although the model bomb which it dropped failed to explode as intended.

The **WEST OF SCOTLAND AREA** nearly had a representative in this year's British A/2 team, Tom Menzies of Prestwick M.A.C. placing no less than 14th in the A/2 hundred at Kidlington, Oxfordshire. Tom's aggregate was 10·24; but bad luck in the way of prangs and no spare models put the Area's other two hopes out of the running, they were Bob Barr and Dave Brown of Irvine & District M.A.C. The area might be on the International contest field yet though, as it has been awarded seven selections for the Power trials, and three for the Wakefield. In the Astral and Weston, the top West of Scotland times were recorded as follows at the Lanark flying ground. Astral :— A. Clark, Barnstormers 8 : 31·8; I. Gilroy, S.A.S. 5 : 54·2; H. Gibson, Barnstormers, 5 : 08·0 Weston :—R. Owston, Glasgow M.A.C. 8 : 20·0; W. McConachie, Glasgow M.A.C. 7 : 54·0. Run concurrently with these contests were the West of Scotland Area Eliminators for the U.K. Trophy power team. Top time was as above but second place went to Joe McMaster with 8 : 10·8. Joe, incidentally, still picks the landing spots, on one of his flights his model scored a direct hit on a water-hen's nest containing twelve eggs ! ! ! Fortunately, none of them were hatched by the impact. Joe also had a new E.D. 2·46 power job on test, styled after his " Toreador " and " Scotsman ". Other interesting models seen at this contest were Wakefields, belonging A. B. Aitken of G.M.A.C., and Tom Menzies of Prestwick. Aitken's job featured geodetic wing structure, thread fuselage geodetics and a folding prop. The Prestwick model was somewhat revolutionary, the fuselage consisting of a light gauge aluminium tube, with no less than 5,000 ⅛ in. lightening holes drilled therein. This structure was covered with tissue, and the wings of orthodox construction were mounted over the fuselage on a fairly high pylon. High set dihedralled tailplane completed the set-up, the whole issue tipping the scales at 12 oz. The model could fly too, which possibly resulted in its name—"The Fluke".

Will B. Bremner writes from the far north, reporting on **WICK M.A.C.'S** current activities— Despite the " Pony Express ", and " Stage Coach " references so frequently applied to the North, Wick M.A.C. is by no means behind the times. Having mastered its teething troubles the club is now well into swing, and negotiations have been completed for the use of the local airfield, which is only ten minutes from the centre of the town.

The present trend is toward gliders, and control-line, with little or no F/F power, and only about two rubber models. The glider and control-line popularity is no doubt typical of a new club's first trend because of their relatively simple construction. Jetex has also proved popular and a recent " Arrow 50 " did 1 : 23 on 15 secs. power, which would appear to be a fairly good performance.

In the glider field they have a few A/2's but performance figures have not as yet been startling. However, on a recent flight of a "Snark", two flights of 2 : 15 were turned in on a 164 ft. tow line. Unfortunately this model was lost next day, having timed 15 mins. o.o.s. and last seen ascending and heading out to sea. Needless to say no D/T was fitted. Another glider of very consistent performance was the ½ A/2, which has been a real picture of stability on the line, and glides well too.

Finally Ian Gilroy reports from **GAISTON & DISTRICT M.A.C.** that the boys have been making full use of the recent good flying weather. B. Collinton has followed successful " Ladybird " with an E.D. ·46 powered " Debutante ", and two juniors J. Alexander and A. Hutchinson, joined forces and built a " Jimp " pylon model for the Mills 1·3. In the control-line class, Allan Muir is flying a new E.D. 2·46 team racer. The club recently paid a visit to the Stewarton Club's field, and although the day was slightly spoiled by some rain, there was enough flying done to make the day worth while. Bob Burns of Stewarton gave us a taste of radio flying with his own design R.C. glider. Ian reports on his own progress too; things like 10 min. o.o.s. with his new E.D. 2·46 power design, on ¾ power and with 6 sec. engine run ! MAC.

CLUB NEWS

A dozen enthusiasts of TAME M.A.C. (Stockport) out for a day's enjoyment with a miscellany of models.

EVERY now and then we have to jog the memories of club P.R.O's and outline to them roughly the sort of report we like to receive for "Club News". We enjoy sorting through the letters and write-ups we get, but we have to put in these columns items of interest to *all* modellers, and we can't do that if we haven't got the gen. from *you*. The golden rules for a club report are to give (i) Initials of anyone mentioned, (ii) Names of models if commercial or well-known designs, (iii) Brief details of original designs (e.g., "Span 45 in., 9 oz., Blaster 1·49, low aspect-ratio, short-coupled job on 'Elf Axe' lines"), (iv) Flight times and, where applicable, approximate motor runs, etc., (v) Interesting details of unorthodox models or construction.

It isn't always possible to include every club report received, and obviously the more interesting reports are first choice for inclusion, so if we didn't use *your* last report, glance through the above points and see if they apply to you.

South Midland Area

Longstaffe, of Beavers & Clements of Luton, topped Astral and Weston lists with 8 : 45 and 9 : 50 despite a strong wind. Safest flight was by P. Holland's (West Herts) sailplane-style "crash-proof" power job which flew stably o.o.s. at 3 : 38.

HENLEY M.C. members are having a shot at all the comps. but so far have had little luck. J. Waldron and A. Cooke gained places in the A/2 Trials, and the creditable time of 6 : 56 was returned in the S.M.A.E. Cup by junior M. Bird. The last-named is also the first junior to qualify for his "A". A. Cooke made a double by also qualifying for the Wakefield Trials.

Unusual nowadays is the **READING SOLID MODEL SOCIETY,** which is concerned only with non-flying scale models, aircraft recognition, and so forth. This well organised club receives a good deal of support from the full-size world, and visits to airline and manufacturers' premises frequently take place. Numerous makers' drawings are also supplied for the club's library. Monthly meetings take place at Lloyd House, when senior R.A.F. officers and civilian test pilots give occasional lectures.

London Area

A 60 in. L.O.A. "Sabre", under construction by D. Bolt, is one of several ambitious models in hand in the **EPSOM D.M.F.C.** Two motors are proposed in the duct, one acting as a booster for a g.p. Frog 500. M. Shepherd's 33 in. delta has given indications of a very high flying speed, so that complete tests are awaited with some apprehension. High speeds are also a feature of catapulted solid scale models, which, believe it or not, do actually soar over Box Hill. More dignified soaring is promised by W. Tinker's 74 in., 2¾ lb. R/C slope-soarer. Other radio members are A. Wolfe and B. Harman, who have almost completed a Piper "Grasshopper" and a Percival "Provost".

E. Bennett and A. Albone led **CROYDON D.M.A.C's** Wakefield men in the Eliminators, and N. Butcher and P. Cameron did likewise in the Power. N. Marcus endeavoured to stab himself a kangaroo with his E.D. powered job, but fell short by a few feet. Anyway, the motor stayed in one piece! J. Lamble (Wayfarers) proved Gala Champion on April 26th with aggregates of rubber 7 : 33, glider 1 : 28, and power 4 : 17. Biggest shock of the day was the lone thermal that took 8-year-old C. Burge's slope-soarer up for 1 : 08 to win under the best-of-three rules.

Barbara Simmons of **BUSHY PARK M.E.C.** followed up her Women's Cup win by second place in glider at the above gala (6 : 14) despite over-enthusiastic D.T'ing by a helper and the unfortunate use of the front hook for her third flight. Changing hook positions turned her docile "Ole Reliable" into an outside chance for the Gold Trophy, but she managed sufficient height to return a maximum. J. Simmons folded his lightweight's wings on his first flight, and Swedish member R. Carlson has yet to recover from shock at the damage caused by British contest weather.

Distinction of being top Area man in the A/2 Trials goes to J. Bowerman of **N.W. MIDDLESEX M.F.C.,** who placed eighth. A spate of lightweight gliders have appeared, all, it is claimed, turning in 4½ minutes off a 100 ft. line in still air. While not disputing the P.R.O's veracity, this we would like to see! Among Wakefield addicts, V. Smallwood and his potent model are to be watched. McCoy 29's in team racers are the C/L vogue, but the boys have decided that eight in a circle is a little dicy.

SURBITON D.M.F.C. have been in the contest placings lately, P. Buskell leading the Power eliminators with 9 : 38 from his "Slick Stick" after losing his "Zoron" with a stuck timer while trimming. P. Allaker placed fifth in Wakefield and at Croydon flew to second place after rebuilding from the wing forward. J. Hancock won glider at this meet with a Butler A/2, and used a "Slick Stick" for seventh place in the Astral. An exceptional situation obtains in this club—the juniors are building more models than the seniors!

CONTEST RESULTS

FARROW SHIELD
(22/3/1953)

1.	Croydon D.M.A.C.	35 : 10
2.	Whitefield M.A.C.	34 : 18
3.	Cheadle & D.M.A.S.	30 : 58
4.	Surbiton M.A.C.	29 : 56
5.	Birmingham M.A.C.	28 : 46
6.	Belfairs M.A.C.	28 : 15

WOMEN'S CHALLENGE CUP
(22/3/1953)

1.	B. Simmons	Bushy Park	8 : 22
2.	P. Healey	Belfairs	7 : 55
3.	C. Lloyd	Basildon	7 : 41
4.	M. Clayton	West Yorks	7 : 13
5.	E. M. Bennett	Whitefield	7 : 02
6.	—. Edwards	C/Member	6 : 45

(19 entries)

FLIGHT CUP
(5/4/1953)

1.	A. Bagnall	Whitefield	9 : 00 + 4 : 00
2.	E. Jackson	Littleover	9 : 00 + 2 : 40
3.	H. O'Donnell	Whitefield	8 : 58
4.	L. Biss	Littleover	8 : 57
5.	V. Dubery	Leeds	8 : 47
6.	H. Tubbs	Leeds	8 : 47

(32 entries)

HAMLEY TROPHY
(5/4/1953)

1.	T. Smith	Blackpool	9 : 00 + 5 : 28
2.	N. Willis	Central Essex	8 : 45
3.	S. Lanfranchi	Bradford	7 : 56
4.	E. Horwich	Whitefield	7 : 33
5.	P. Firman	Cambridge	7 : 24
6.	R. Monks	Birmingham	6 : 49

(25 entries)

WESTON CUP
(19/4/1953)

1.	E. Muxlow	Sheffield	15 : 00
2.	D. Sugden	Loughboro' College	13 : 42
3.	G. Jackson	Littleover	12 : 15
4.	W. Rockell	Lincoln	11 : 55
5.	J. O'Donnell	Whitefield	11 : 50
6.	D. Percival	Swallownest	11 : 47

(169 entries)

ASTRAL TROPHY
(19/4/1953)

1.	A. W. Spurr	Stockton	13·05 ratio
2.	C. Hickmott	Bridlington	11·08 ,,
3.	I. Harrison	Cheadle	10·51 ,,
4.	C. Westerby	West Yorks.	10·20 ,,
5.	A. Collinson	Bradford	10·05 ,,
6.	S. Lanfranchi	Bradford	10·03 ,,

(163 entries)

"AEROMODELLER" A/2 TROPHY
(3/5/1953)

1.	G. C. M. Byrd	Loughboro' College	15 : 00
2.	G. W. Linford	Loughboro' College	14 : 16
3.	M. L. Hanson	Solihull	13 : 25
4.	A. J. Brooks	Grange	13 : 01
5.	J. O'Donnell	Whitefield	12 : 54
6.	M. Power	Belfairs	12 : 48
	T. Bootland	Scunthorpe	

LADY SHELLEY CUP
(10/5/1953)

1.	F. Smith	Southern Cross	6 : 27
2.	G. A. T. Woolls	Bristol and West	6 : 15
3.	D. Waters	Grange	5 : 52
4.	R. Harris	Victoria	5 : 34
5.	P. Roe	Littleover	4 : 37
6.	E. Webb	Timperley	3 : 04

(13 entries)

JETEX CHALLENGE CUP
(10/5/1953)

1.	C. Watson	Brixton	32·5 ratio
2.	L. Ranson	Hornchurch	31·9 ,,
3.	P. Allaker	Surbiton	28·0 ,,
4.	M. Reynolds	Cambridge	26·9 ,,
5.	D. Lipscombe	Cambridge	24·0 ,,
6.	J. O'Donnell	Whitefield	21·1 ,,

(17 entries)

East Anglian Area

Thanks to a generous publican, **NORWICH M.A.C.** have a very attractive clubroom, which provides a foolproof excuse for senior members' wives. Radio member Davie is building a "Thermalist" to replace the 9 ft. R/C job he wrote off when tempted to demonstrate in a high wind to a local "ham" who has helped the club's radio members considerably. A large school field is the subject of negotiations as flying-ground trouble is likely to beset members when the crops appear.

WARE D.M.A.C. juniors are building a standard simple 48 in. sailplane designed by Sec. E. Barks, and a Jetex 50 duration comp. is scheduled, F. Hills having presented a Frog 500 as first prize. The latter gent lost his E.D. 1·46 "Eliminator" first flip in the Astral, for a near-max, but has since recovered it. Fifteen models will be on show in the local gas showrooms from June 22nd–27th—a pointer to other clubs, as gas showrooms are frequently prepared to tie up some form of publicity with model clubs.

North Eastern Area

Good weather has blessed every **TYNEMOUTH M.A.C.** comp. day so far this year, and the club have had a go at everything. K. Mole topped the Area's "Weston" times with R. Pollard a close second; the former also flew a newly built "Jaded Maid" to second place in the Astral. C/L deltas are interesting junior members.

Northern Area

"Methanol Soup" and similar items graced the menu at Silvio's Cafe on the occasion of the **BRADFORD M.A.C's** Annual Dinner, adding to the general hilarity of the evening. A. Collinson lost his "Hogan" on the second flight and used a 1·8 Elfin "Eliminator" to finish and place fourth in the Power Eliminators at Rufforth. S. Lanfranchi flew a "Hogan" to fifth and A. Lanfranchi an "Eliminator" to tenth.

The "Yorkshire Evening News" Festival will again be at Sherburn-in-Elmet, on September 6th, with Open Glider (50 metre line), Open Power (10 sec. run), Open Rubber, "A" and "B" Team Races, Concours (Scale and Freelance), Chuck Glider, and novelty events on the programme. Two-flight, 3 min. maxs. are the rules for the main events.

North Western Area

HYDE M.A.C. seem to have quite a character in Professor Shorter, who has recently completed an A.P.S. "Gipsy Moth" and a 96 in. "Puss Moth", both R/C. R. Wilson chased his "Southerner" 17 miles when the timer failed and the tank was full . . . The Coronation show laid on by this club includes a full-size jet giving a display, four bathing beauties with collection boxes, plywood C/L jobs for novices to try, and it is even hoped to secure a word or two on the local B.B.C. programme.

M. Thomas' long-fuselage Wakefield successfully represented **BLACKPOOL & FYLDE M.A.S.** at the Eliminators, placing second. To keep the talk off motor-bikes a series of club-night lectures by members is in swing, and very successfully at that. C. Davey won the recent club Jetex comp. for the second year in succession.

Thirty-five of forty-two members of **WALLASEY M.A.C.** attended the Annual Dinner, which included a film-show and a hectic hour of party games. On the flying field J. Hannay's new geodetic A/2 disappeared

CONTEST CALENDAR

June	21	**Keil Trophy, Frog Junior Cup.** D/C.
	28	**Slope Soaring Contest.** Clwyd Hills, N. Wales.
July	3–6	**International C/L Stunt and Speed.** Knokke, Belgium.
	5	**Super Scale Trophy, Bowden Trophy.** R.A.F., Halton, Bucks.
		East Midland Area Rally. To be announced.
	12	**Northern Heights Gala Day.** Langley, Bucks.
	19	**C.M.A. Cup, Frog Senior Cup.** D/C.
	26	**International R/C Contest.** Southend Airport.
Aug.	2–3	**WAKEFIELD TROPHY, F.N.A. Cup. INTERNATIONAL POWER.** Cranfield, Beds.
	9	**Cambridge M.A.C. Team Race Rally.** Cambridge.
	23	**WORLD A/2 CHAMPIONSHIPS.** Yugoslavia.
		All-Britain Rally } Radlett, Herts.
		International Jetex Contest }
		N.E. Coast Competitions. Town Moor, Newcastle-upon-Tyne.
	30	**Area Championships, Taplin Trophy.** Centralised.

from a 100 ft. line on a dull day, heading out over the Irish Sea. Mermaid readers are asked to keep an eye open. Club representation in the international sphere is relying on J. Dane's power job in the Power Trials.

CHEADLE D.M.A.S. has had an offshoot, the Cheadle Contest Group, as a result of the new S.M.A.E. fees. I. Harrison used a 2·5 Oliver Tiger for his first place in the Astral, and scored a double by returning top time in individual Farrow. W. Nield also doubled up by qualifying for both A/2 and Power Trials. A sidelight on the Northern Models Show—Junior Champ. B. Mackintosh couldn't fly in the A/2 Eliminators since his sailplane was at the exhibition! Still, one can't have one's cake, etc.

Midland Area

P. Roberts and T. Lee of **WOLVES M.A.C.** wrecked four models in the A/2 Trials, and cruellest blow was the loss of the former's model after a first-round max, only to have it returned ten minutes after the close of the second round. J. Barratt gained top honours in the Area F.A.I. Power.

International contest models are the main items in the **SOUTH BIRMINGHAM M.F.C.** A. Hewitt showed that he didn't only fly C/L by placing sixteenth in the A/2 Eliminators, and R. Lennox was tenth individual in the Farrow. Messrs. Peach and George, Snr. and Jnr., are getting excellent results from diesel and Jetex deltas, and have impressed clubmates with the simplicity and speed of building this type of model. Visiting participants will be welcomed at a public flying display on June 27th at Allen's Cross Sports Ground, Northfield.

SOLIHULL M.F.C. is pleased to record M. Hanson's qualification for the 1953 A/2 team—it was a near thing, though, since some confusion resulted in the third flight D.T'ing at just over 3 mins., when it could have been a maximum. Hanson is also in the Wakefield and Power Finals, accompanied in the latter by M. Bishop. Contest-minded members would be welcomed, as would be anyone prepared to supply any red Jap tissue. And don't all write at once.

Southern Area

Two stunt contests have been staged by the **SOUTHAMPTON M.A.C.** recently, the junior comp. being won by T. Morgan, and the senior by A. Sanger, who was, in fact, the only entrant to finish with an intact model. Sunday afternoon strollers formed quite large audiences for these events.

WEST HANTS A.A. now meet in the local Y.M.C.A. premises, which has a canteen and lots of space for R.T.P. Latest recipient of the new Club Trophy (the Highly Derogatory Order of the Irremovable Finger—shades of "Tee Emm"!) is R. Wheatley, who turned up at the Area meet at Andover on April 19th with a tip-top power job—complete except for needle-valve. It is hoped that this trophy will contribute towards the rising standard of flying. At the Area "do" W.H. members Naylor, Tugwell and Wheatley took 1, 2 and 4 in glider.

BOURNEMOUTH M.A.S. are getting very contest-minded, interest being towards the international classes. A/2's are, of course, well ahead in popularity and seven members placed in the first sixteen in the Area Eliminators.

R.A.F. OLD SARUM M.A.C. receive excellent co-operation from their Stationmaster, including the allocation of part of the airfield which is kept mown for C/L purposes. **SALISBURY D.M.A.C.** members are frequent visitors and, by helping to tidy things up after flying, ensure that their welcome is kept warm. With such facilities available, C/L naturally flourishes, main interest being centred on team racing.

Western Area

The West of England Championship Cup, held at Lulsgate on May 10th, attracted entries from a wide area. G. Woolls of **BRISTOL & WEST** raised sufficient points to win the cup, losing two models in the process—his o.d. "Upstart 162" rubber job on its first flight and his "Quickie" on its second and last. In the Lady Shelley this flier beat his own British Tail-less Rubber record with a flight of 3 : 27.

South Western Area

A new club in the "Zummerzet" region is the **MINEHEAD M.A.C.** which already has six active R/C members among its numbers. Flying takes place on the *beach* and in adjacent fields—would that be one reason for the strong R/C group?

ILMINSTER D.M.A.C. continue to stir up activity in this region, a recent sailplane contest saw R. Sattin the winner, only 13 secs. separating the top three. R. Peppitt (wonder if he uses a special fuel?) won the power comp. on the same day.

South Eastern Area

Windy weather upset **SOUTHERN CROSS A.C's** Lady Shelley aspirants, F. C. Smith being the only one to return a score, aggregating 6 : 27. E. W. Gravett placed eleventh in the A/2 Trials, scoring 10 : 27. A chuck glider contest (the first since 1946) held in East Hill Park limited entries to under 15 in. span; R. Smith placed first and second.

With the hay-crop and the dry weather coming along, remember to watch those fuses and cigarette ends—apart from upsetting farmers, you could emulate an unfortunate modeller whose large box, complete with large models, went up in smoke at Chobham recently!

Happy flying.

The CLUBMAN.

NEW CLUBS

CRANBOURNE M.A.C.
A. C. Gerr, Lovel Road, Cranbourne, Winkfield, Berks.
MINEHEAD M.A.C.
D. J. Woolgrove, 59, Periton Lane, Minehead, Somerset.
BRIDPORT D.A.C.
G. Corke, 36, North Allington, Bridport, Dorset.
HERNE BAY M.F.C.
L. Rae, 190, High Street, Herne Bay, Kent.

SECRETARIAL CHANGES

KING'S SCHOOL M.A.C.
N. C. Green, 170, Garton End Road, Peterborough, Northants.