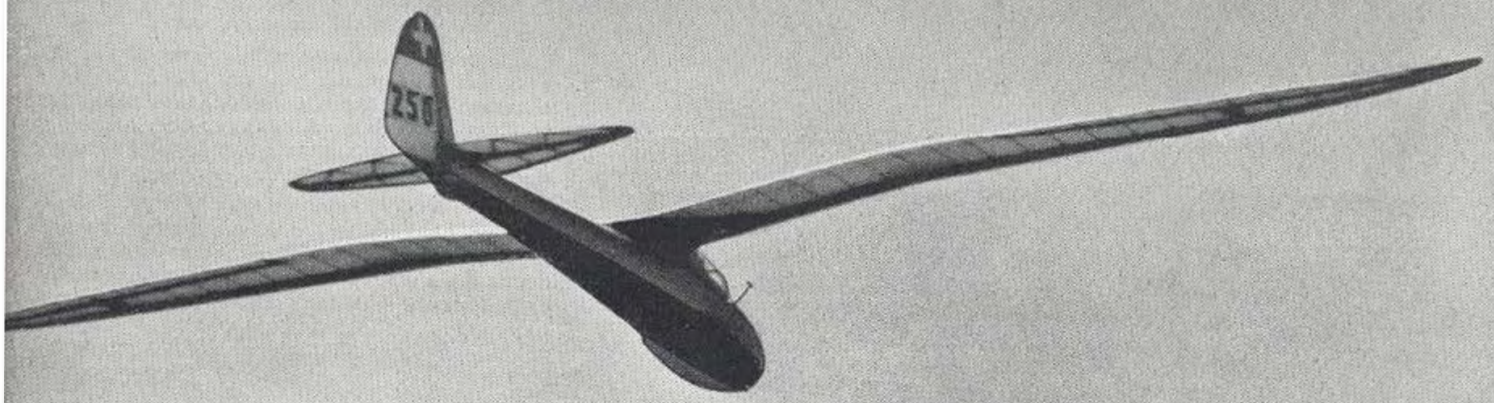
AERO MODELLER

38 T

AUGUST 1954



In this issue

Full 'Nationals' report and special feature on 26 of the World's leading Sailplanes

1'6

Digital Edition Magazines.

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

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

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

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

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

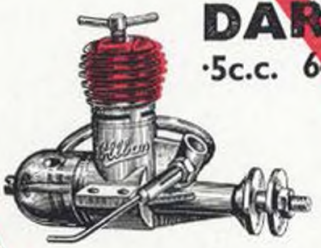
Hip Pocket Aeronautics Gallery Free Plans.

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

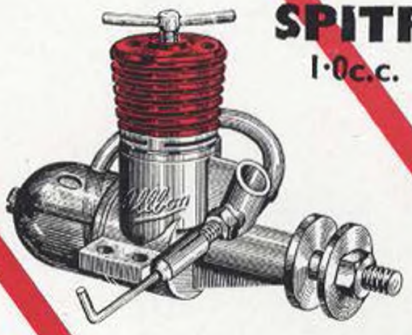
Diligence Work by Hlsat.

Stairway of Stars! or ALLBON above all!

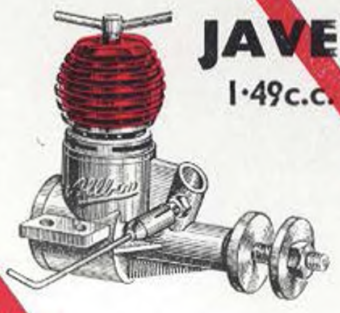
BAMBI
·15c.c. 108/11



DART
·5c.c. 64/2



SPITFIRE
1·0c.c. 64/2



JAVELIN
1·49c.c. 65/4

Whatever the choice of phrase it is certain that no brighter stars have shone in the modelling firmament than those of the famous Allbon range. Every engine from the diminuitive Bambi to the D.C.350 is packed with power and reliability, offering years of faithful service to modellers the world over.

Our well-known slogan "Engineered to last a modelling lifetime" is no idle boast, as thousands of satisfied users will bear witness. Quality is the prime consideration in the manufacture of Allbon engines, that is why we use the very latest in machine tool equipment operated by highly skilled engineers.

News Flash! Watch out for yet another star in our range, designed to meet the wide demand for a really low priced engine backed by the famous Allbon reputation for reliability. Capacity of this newcomer will make it particularly suitable for free flight scale and sports models.

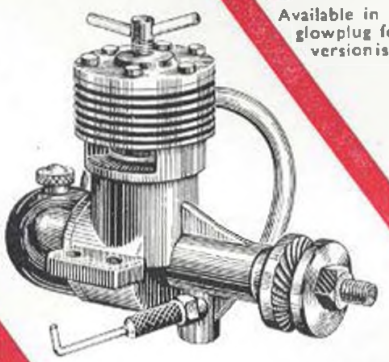
Trade Distributors:—
E. KEIL & Co. Ltd.
KeilKraft Works, Russell Gardens, Wick Lane Wickford, Essex.

ALLBON SUPER FUEL

Fine engines deserve the best in fuel. Step up the performance of your Allbon motor by using this new super fuel. Carefully blended from the finest ingredients it ensures long life through friction free running. Adequate supplies are at your local model shop, **price 3/3d. per bottle.**

D.C. 350 & D.C. 350(G)
3·5c.c. 78/5

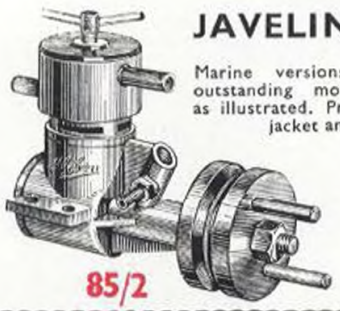
Available in either diesel or glowplug form. The diesel version is illustrated here.



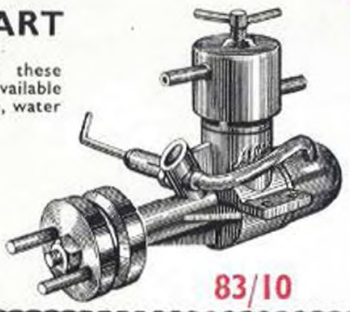
MARINE CORNER

JAVELIN & DART

Marine versions of both these outstanding motors are available as illustrated. Prices include, water jacket and flywheel.



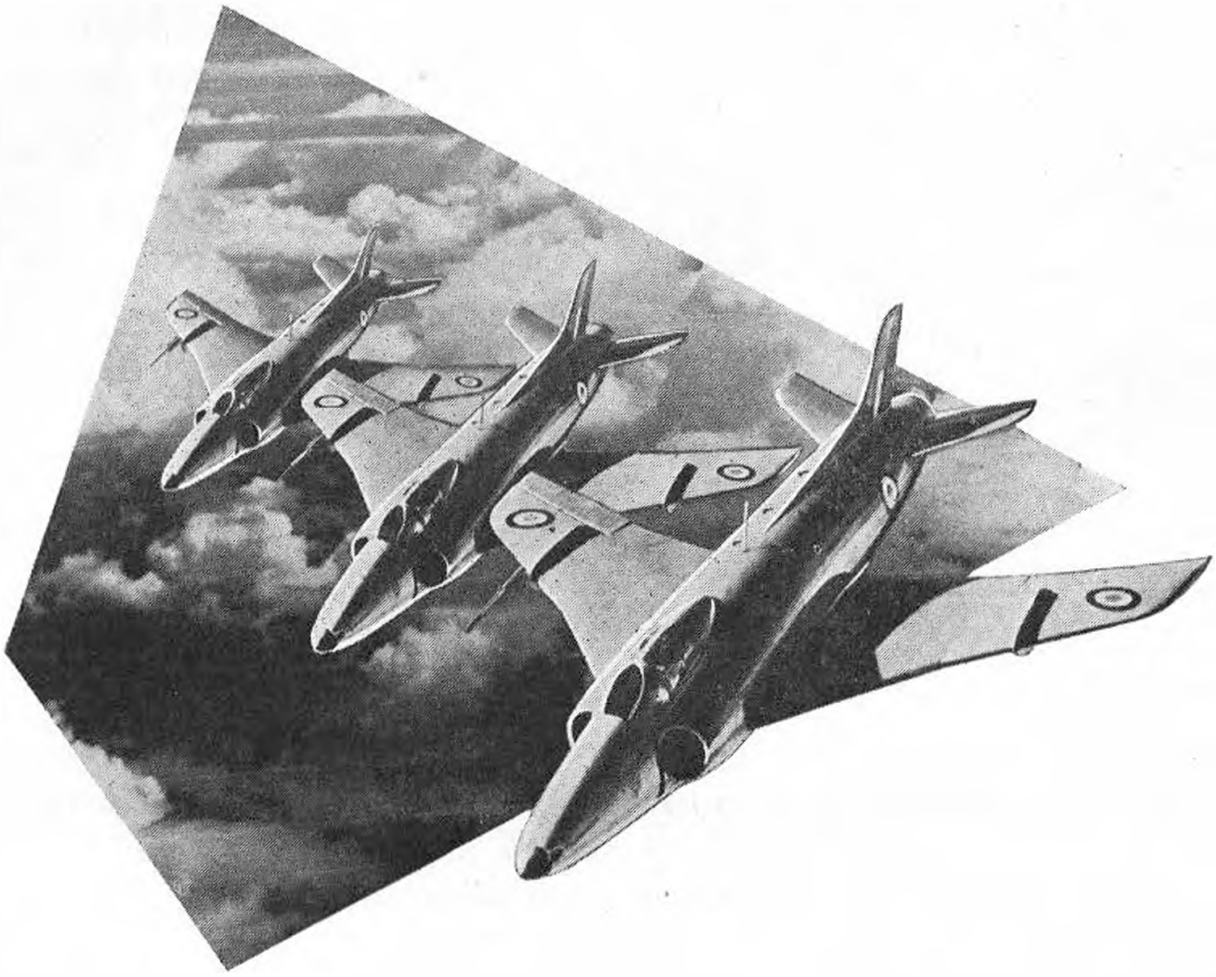
85/2



83/10

Engineered to last a Modelling Lifetime

DAVIES CHARLTON LTD. Barnoldswick via Colne Lancashire



YOURS TO FLY . . . . . IN THE R.A.F.

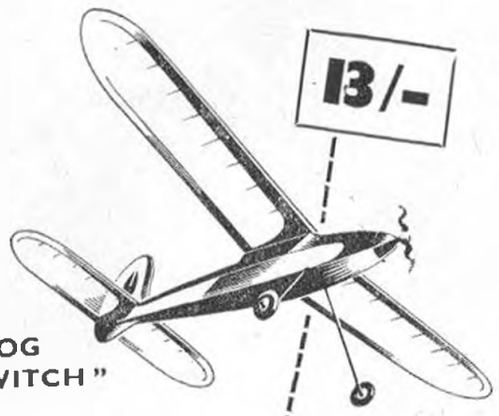
One of the world's finest jet interceptor aircraft, the Swift single-seat fighter is to be flown by crack pilots in some of the most renowned squadrons of the Royal Air Force—squadrons which flew Spitfires to glorious victory in the Battle of Britain.

Speeds have doubled since 1940, tactics have changed, but the spirit and skill of the men in the fighter squadrons remain the same. Is it your ambition to join them?

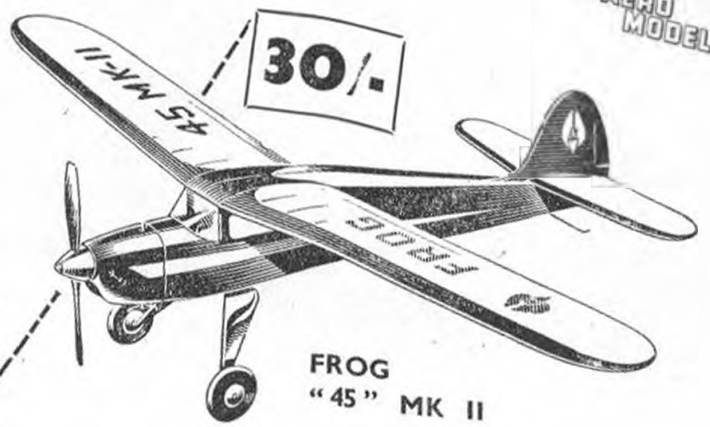
Fly as an Officer . . . . .

If you can measure up to the exacting standards of modern Service aviation, there can be a purposeful and vivid task in store for you: training to fly such high-performance aircraft, experiencing a new sense of freedom in high-altitude flight. All suitable pilots and navigators are commissioned in the Royal Air Force, with opportunities for a fine career. Why not write for full details, giving date of birth, brief details of education and qualifications? The address is: Air Ministry (A.M. 201), Adastral House M.R.2, London, W.C.2

THE ROYAL AIR FORCE



FROG
"WITCH"

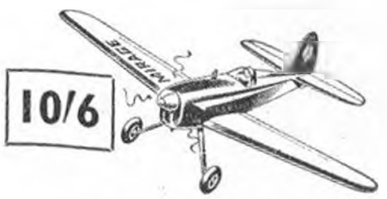


FROG
"45" MK II

FROG "WITCH" Mk. II
A new rubber-powered duration model, 36" span, which is ideal for contest work. Fully prefabricated, the FROG Kit includes a shaped airscrew, plastic accessories, etc.

FROG "45" Mk. II
A new and redesigned version of the world's most popular sports model. Now for the "150" diesel and with simplified prefabricated construction, new undercarriage, cowling, etc., this model is outstanding in every respect. Span 45".

FROG "MIRAGE"
A fine little 15" span C/L racer for the "50" diesel. Kit contents are complete, fully prefabricated and accessories include 3-blade airscrew.



FROG "VANDIVER" Mk. II
New 28" span C/L stunt model for the "150." Ready shaped parts all through and formed tank sections.

14/6

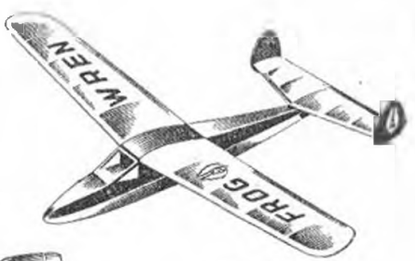
FROG

TRADE MARK

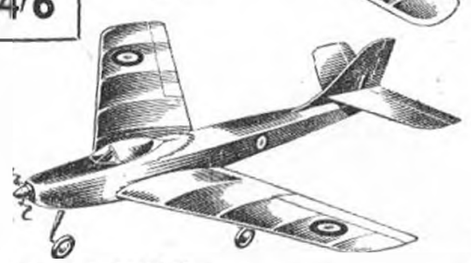
Prefabrication is NOT new! FROG Kits—from way back in 1936—have included precision-cut wood parts, plastic moulded airscrews and accessories, formed wire parts, moulded balsa fuselage shells and many other special features which are now hailed as something new. The moral is simple—buy FROG, the Kits with the real experience behind them!

AVAILABLE FROM MODEL SHOPS EVERYWHERE

FROG "WREN"
A 25" sailplane of the simplest construction. With cut-out parts plus easy-to-read drawings.



4/6



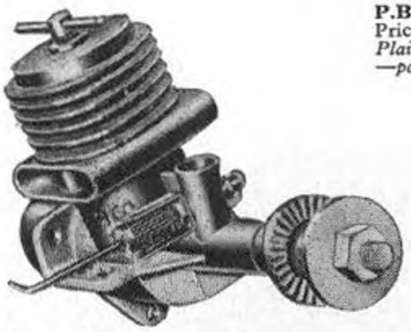
FROG "MAMBA"
Something new in sports models! 19" span swept-wing fighter of fully prefabbed construction.

7/6

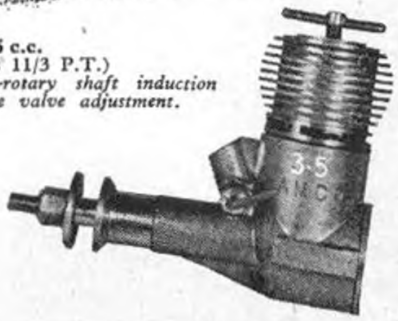
Manufactured in Great Britain by International Model Aircraft Ltd., Merton, London, S.W.19

LINES BROS. GROUP

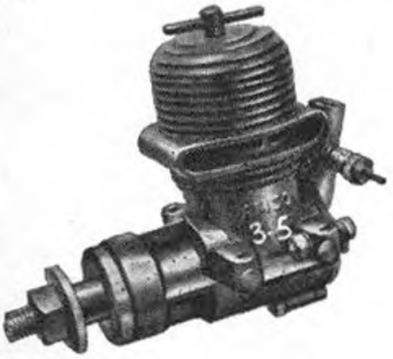
More Winners from AMCO!



Amco ATOM
1.5 cu. cms.—.09 cu. ins. Price **50/-** (Plus 9/4 P.T.)
Rotary shaft induction—built-in exhaust stacks—new all-purpose mounting—positive needle valve adjustment—integral tank—spinner nut available (extra) if required.



P.B. Amco 3.5 c.c.
Price **60/-** (Plus 11/3 P.T.)
Plain bearing—rotary shaft induction—positive needle valve adjustment.



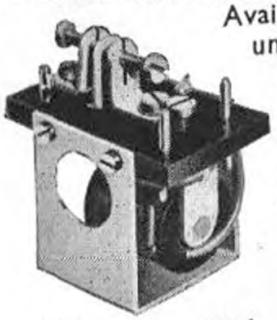
B.B. Amco 3.5 c.c.
Price **78/8** (Plus 14/9 P.T.)
Positive needle valve adjustment—crank case induction.

Come along, jump on the Band Wagon. Everyone is talking about AMCO's rapidly growing range of engines and accessories. Every month brings more top line products each with a performance unequalled anywhere for value. AMCO brings a new standard to model engineering.

Amco DIESEL FUEL

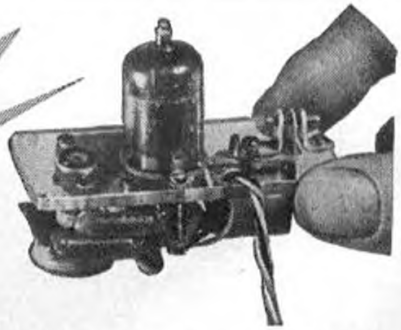
This new Atomic fuel is guaranteed to step up the performance of any engine. Try it today! In 8 oz. bottles ready mixed for immediate use.
Price 3/3

The Amco AVIONIC RELAY

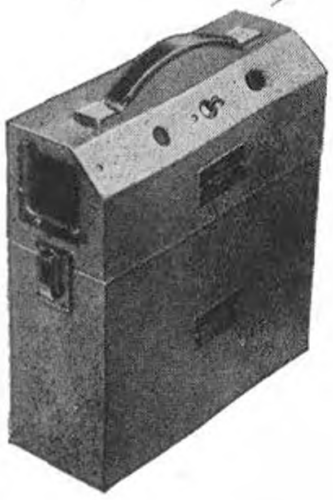


Available as a separate unit. The Avionic Relay has a coil resistance of 5,000 ohms and an operating current of 0.35 mA. High sensitivity, reliable. **Price 16/6**

AMCO AVIONIC



REMOTE CONTROL



TRANSMITTER 112/- plus 21/1 P.T.

Contained in a stoutly built attache type case, this unit is in two basic parts. The upper portion contains the transmitter itself and plugs into the lower portion containing the power supply. Space for a modulator is provided and an alternative power unit containing converter (for car batteries) can be had if desired.

RECEIVER 65/- plus 12/- P.T.

Small in size and light in weight this single hard valve (IS4) receiver is quench operated with slug tuning. Sensitivity and range are excellent and the new relay design gives reliable performance at all times. Contained in a damage and dustproof plastic case, the set is complete with ancillary components such as wire, plug and socket. Full details of "Avionic" remote control equipment can be had on request from:—

AMCO MODEL ENGINES LTD

Manufactured by AERONAUTICAL ELECTRONIC & ENG. CO LTD

SUNLEIGH WORKS, ALPERTON, MIDDX. *Tel.:* WEMBLEY 8585

WORLD WIDE MAIL ORDER Service

BRITAIN'S LEADING KIT STOCKISTS

No matter what branch of modelling appeals specially to you, I can supply the kit for it, be it solids, Jetex, beginner's gliders or de-luxe scale models for radio-control. I carry full stocks by all the leading makers and list herewith a selection of to-day's proven popular sellers.

MERCURY

GLIDERS	P.T.
Magpie 24" ...	4/– + 8d.
Gnome 32"	6/– + 1/–
Martin 40"	7/6 + 1/4
Grebe 49"	12/3 + 2/1
Marauder 65" ...	14/6 + 2/9
RUBBER	
Mentor 32"	9/– + 1/6
FREE-FLIGHT POWER	
Jnr. Mallard 34" (0.5–0.75 diesels) ...	15/– + 2/6
Mallard 48" (1.5–2.5 diesels)	18/– + 3/4
Magna 38" Cabin (0.–0.75)	11/– + 1/10
Matador 50" R/C Cabin (1.5–2.5) ...	21/5 + 3/7
F/F/ SCALE	
Monocoupe 40" ...	22/10 + 3/9
Stinson 105, 42" ...	28/6 + 4/9
Chrislea Skyjeep, 45"	28/6 + 4/9
D.H. Tiger Moth 33"	28/6 + 4/9
Monocoupe 64" ...	57/– + 9/6
Aeronca Sedan ...	57/– + 9/6
CONTROL LINE	
New Jnr. Monitor ...	19/9 + 2/9
Midge Class A Speed	5/3 + 11d.
Mk.II Class A.T. Racer	19/6 + 2/8
Texan Class T. Racer	13/4 + 2/2

SKYLEADA

Flying Scale Star Series for Jetex, each ...	3/– + 6d.
Jetmaster (Jetex 100) Series each	7/5 + 1/1
Auster 27" C/L ...	7/5 + 1/2
Hornet 20" C/L T/R	8/11 + 1/7
3-Footer Glider ...	5/– + 10d.
Point Five F/F ...	7/9 + 1/4

FROG

Mirage	9/– + 1/6
Tarquin	10/4 + 1/8
T/Racer	0/– + 0d.
Junior Racer Series	3/– + 4d.
Senior Racer Series	4/3 + 8d.

PUBLICATIONS

Chinn's "How to Make Model Aircraft." *Post free* ...	4/–
Sommerhop's "Radio Control of Model Aircraft." *Post free*	10/–
AEROMODELLER ANNUAL *Post free*	10/6

KEILKRAFT

Gliders	P.T.
Soarer Minor, 48"	8/– + 1/5
Soarer Major, 60" ...	11/6 + 1/11
Chief, 64"	18/6 + 3/1
Free Flight Power	
Slicker, 42"	17/6 + 2/11
Slicker, 50"	25/– + 4/2
Southerner, 60" ...	40/– + 6/8
Outlaw, 50"	22/6 + 3/9
Flying Scale Power	
Piper Super Cruiser, Cessna 170 and Luscombe, each ...	18/6 + 3/1
Control Line	
Ranger, 24" ...	10/6 + 1/9
Pacer, 30"	15/– + 2/6
Skystreak, 40" ...	10/6 + 1/9
Rubber Powered	
Competitor, 32" ...	7/– + 1/2
Gipsy, 40" (W) ...	10/6 + 1/2
Contestor, 45" (W)	17/6 + 2/11
Flying Scale Series	3/– + 6d.

VERON

Control Line	
Sea Fury	23/6 + 3/11
Wyvern	23/6 + 3/11
Philibuster	23/6 + 3/11
Panther	25/– + 4/2
Rubber Powered	
Sentinel, 34" ...	10/6 + 1/9
Hi Climber, 38" ...	25/– + 4/2
Free Flight Power	
Sabre Ducted Fan ...	25/– + 4/2
Streaker, 32" ...	19/9 + 3/3
Cardinal, 37" ...	14/6 + 2/5
Lavochkin, 37" ...	25/– + 4/2

And full range of Jetex and Quicky Models, etc.

PARAMOUNT

"Sunanvind." Record smashing world-famed sailplane ... **10/6**

Moose Glider 69", designed by Jan Van Hattum **22/6**

JETEX

Tailored Series

Hawker Hunter ...	18/– + 3/–
Swift	18/– + 3/–

All Motors, Fuels, Accessories, also suitable Kits by K.K., Skyleada, and Veron as advertised.

Latest Lists

Send 3d. in stamps for my popular 12-page Modeller's List—packed with details of kits, engines, fuels, dopes, accessories, materials, etc. etc.

MERCURY MATADOR

50" Cabin Model, ideal for beginners as well as contest flyers in Radio Control for 1-1.5 c.c. Motors **21/5** + 3/7

RADIO CONTROL

		E.D.	P.T.
Mk. II	Miniature 3-valve Outfit, complete ...	£14.17.6	+ £2.14.6
Mk. III	Miniature Outfit, complete	£9.1.6	+ £1.14.0
Mk. IV	Transmitter, Control Box and Aerial	160/–	+ 36/–
Mk. IV	Three Channel Receiver	240/–	+ 45/–
Mk. IV	Tuned Reed, Three Channel Outfit, complete	£20.0.0	+ £3.15.0

		E.C.C.	
P.100	Polarised Relay	29/6	
1061	Transmitter	168/–	+ 11/4
951A	Receiver	68/–	+ 11/4
FENNERS PIKE Unit		58/–	+ 10/–
Pulse Box		58/–	+ 10/–

ELMER

AUTOMATIC VARIABLE PITCH PROP

For Engines up to 5 c.c. Perfect for Radio Control. *Automatically* varies pitch to suit the engine and conditions of flight. Maintains constant engine speed. Ensures better landings by self-feathering when engine cuts out. Complete with spinner and instructions. Prop diam. 9". *Spare Blades (plastic) each 2/6d.* **18/6**

FROG NYLON PROPS

6"—4" ...	1/3½d. + 2½d.
8"—5" } 8"—6" }	2/6 + 5d.
8"—8" } 9"—6" } 10"—6" }	3/– + 6d.

Frog Plastic Props also stocked.

CELSPRAY SPRAY GUN

Model No. 3. With 5 years' guarantee for **8/6**

X-ACTO TOOLS AND KNIVES

Offer modellers a comprehensive range of first-class equipment. Blades are of finest surgical steel in shapes to suit all needs. Tool sets are ideal for all serious builders. Full range stocked as advertised.

BONDAGLASS

To-day's miracle building material (for surfaces). Wonderfully tough and light. Can be sanded, coloured, etc. Complete kit with 72"x2" "Bondaglass" strip, Polyester, Catalyst and instructions. 7/7 (*P. & P. 9d.*)

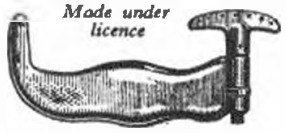
"DROME" AIRWHEELS

2" wheels ¾ oz. per pr. ...	7/–
3½" " 1¼ oz. " " ...	8/9
2½" " 2¼ oz. " " ...	10/6

AM-PULL

IMPROVED C/L HANDLE

Light and comfortable to hold. Double adjustment facilitie senable lines to be set exactly to suit size of model and flying distance, etc., and gives extra degree of control. Ideal for contests. (*Plus P/Tax 11d.*) **5/6**



KLEBMETALL

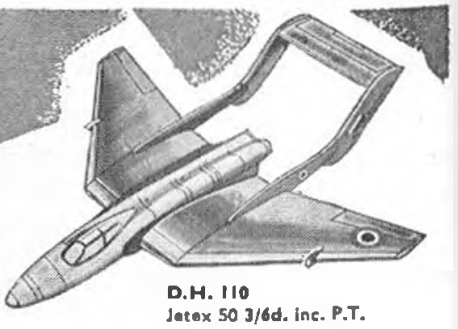
The wonder modelling sheet metal, per sheet 23" x 25" 13/– (*P. and P. 2/–*)

ENGINES FROM STOCK

Allen-Mercury 25	57/– + 9/6
E.D. Baby .46 c.c. ...	45/– + 7/3
Mills 0.75 c.c. with cut-out	55/– + 8/ 0
Frog 50	42/9 + 7/3
Mills P.75	50/– + 8/–
E.D. Bee I c.c. ...	47/6 + 7/3
E.D. Water-cooled Bee	67/6 + 8/9
Mills 1.3 c.c. ...	75/– + 12/6
E.D. 1.46 c.c. ...	52/6 + 4/6
Frog 150	42/9 + 7/3
E.D. Comp. 2 c.c. ...	57/6 + 4/3
E.D. 2.46 c.c. Racer	72/6 + 6/–
E.D. Hunter 3.46 c.c.	72/6 + 6/–
Amco 3.5 B.B. ...	92/– + 17/3
Amco 3.5 P.B. ...	60/– + 11/3
ETA 29	119/6 + 22/6
Webra Record 148 * ...	65/–
Webra Winner 15 * ...	70/–
Webra Mach I *	90/–

**Limited number only for home market.*

Skyleada



D.H. 110
Jetex 50 3/6d. inc. P.T.

MODEL AIRCRAFT KITS

THE WORLDS BEST SELLERS

SUPER SABRE
Jetex 3/6d. inc. P.T.

FLYING SCALE STAR SERIES
Designed for JETEX 50

AVRO 707A	3/6
AVRO VULCAN	3/6
GLOSTER JAVELIN	3/6
M.I.G. 15	3/6
HAWKER HUNTER	3/6
SUPERMARINE SWIFT	3/6
U.S. NAVY CUTLASS	3/6
THUNDER JET	3/6
MYSTERE IV	3/6
SABRE F-86	3/6
D.H. 110	3/6
D.H. VENOM	3/6
D.H. COMET	3/6
SUPER SABRE	3/6
Rubber Powered	
26" AUSTER	3/6
26" GRASSHOPPER	3/6
20" TIGER MOTH	3/6
24" COMPER SWIFT	3/6
24" PUSS MOTH	3/6

JETMASTER OR JETEX 100 SERIES

24" D.H. COMET	8/6
20" AVRO VULCAN	8/6
21" CANBERRA	8/6
17" DOUGLAS SKYRAY	8/6

16 in. FLYING SCALE SERIES

Rubber Powered

SPITFIRE	2/8
HURRICANE	2/8
TEMPEST	2/8
MUSTANG	2/8
HELLDIVER	2/8
HELLCAT	2/8
CURTISS OWL	2/8
ASCENDER	2/8
BOOMERANG	2/8
TYPHOON	2/8
THUNDERBOLT	2/8
MILES M.18	2/8

SKYROVA JUNIOR SERIES

Rubber Powered

TIGER MOTH	2/3
AUSTER	2/3
GRASSHOPPER	2/3
MUSTANG	2/3
TYPHOON	2/3
TEMPEST	2/3
BARRACUDA	2/3
FIREFLY	2/3
MESSENGER	2/3
DURATION	2/3
GLIDER	2/3

CONTROL LINE POWER

27" AUSTER (1 c.c.)	8/7
20" HORNET T/R (1 c.c. to 2.5 c.c.)	10/6

FREE FLIGHT POWER

POINT FIVE (½ c.c.) ... 9/-

GLIDERS

15" MIDGE	1/4
20" SWIFT	2/10
24" WIZARD	3/6
20" JEEP	3/9
36" THREE-FOOTER	5/8

DURATION

Rubber Powered

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BRITISH MODEL AIRCRAFT MANUFACTURING CO., LTD. 180-182 London Road, Mitcham, Surrey

AERO MODELLER

"Covers the world of Aeromodelling"

VOLUME XIX
NUMBER 223
AUGUST 1954

Managing Editor - - C. S. RUSHBROOKE
Editor - - - - - H. G. HUNDLEBY
Assistant Editor - - - R. G. MOULTON

★

In this issue

Special features

★

Regular features

★

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:
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Successful Nationals

DESPITE WEATHER diametrically opposite to that enjoyed in 1953, this year's British Nationals was an undoubted success.

Occasional showers put a temporary stop to proceedings now and then, but fortunately the steady downpours were confined to the "out of contest" portions of the holiday, though many campers must have thought they would become either airborne or afloat before the Saturday night was finished! It says much for their enthusiasm—and stamina—that we heard of no cases of illness, or even tent desertion, and the various contests were tackled with verve by all and sundry. Full marks to the East Anglian Area, and in particular the lads of the Cambridge club, who coped exceedingly well with the many details of ground arrangements.

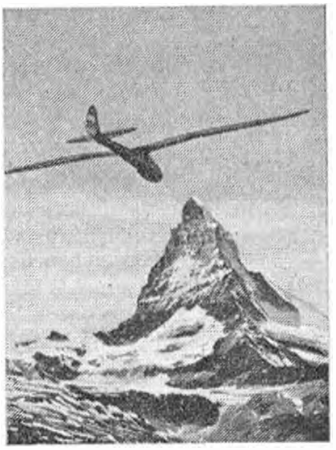
Not so praiseworthy was the way the majority of the contests themselves just happened, and we deplore the lack of a properly prepared programme and timetable, which would have saved much heartburning and wasted man-hours. With one or two notable exceptions, competitors rallied round and did the odd spot of timekeeping and other essential jobs, but it is no good telling people—who in some cases have travelled considerable distances—that a particular contest "will take place this afternoon."

However, it is said we learn from past mistakes, and we trust that sundry inquests like the foregoing will gradually produce a programme that is both workable and to everybody's taste.

R.A.F. station Waterbeach once again proved its eminent suitability for a meeting such as the Nationals, and our thanks—and we are sure those of our readers—go to the Commanding Officer, Group Captain B. A. Chacksfield, O.B.E., whose cheery interest in all that was taking place endeared him to all and sundry. It was therefore no surprise to learn that he had been an ardent modeller in his Halton days, and is a keen follower of the model movement in the R.A.F.

On the Cover . . .

In this issue we feature drawings of 26 international high-performance sailplanes, many of which will be flying at the World Glider Championships to be held in Derbyshire in August. What better cover could we therefore have than this beautiful shot by Dr. Dolfus depicting a Moswey IV Sailplane with Switzerland's famous Matterhorn in the background.



Heard at the Hangar Doors

Titled Gentry

Reference to our title page indicates a number of Editorial staff changes that bring a number of long-service members into positions in keeping with their present responsibilities. C. S. Rushbrooke—probably more widely known as "Rushy" to most aeromodellers—now assumes the title of Managing Editor, having held the post of Editor since joining the magazine in the early months of 1940. Diverted from his pre-war enthusiasm for contest work, his main interests these days are administrative and a keen desire to further the aeromodelling movement generally, particularly through his work as Records Officer of the S.M.A.E., a post he has held for a number of years.

Harry G. Hundleby, for many years Assistant Editor, now fills the Editorial chair—a task to which he is eminently suited by virtue of his long association with the production and editorial side of the magazine. Interested in all aspects of the hobby, his main interest is radio-control, a subject to which he has contributed many useful articles gained from practical experience. Currently engaged on writing a book devoted to the beginner's requirements in this sphere.

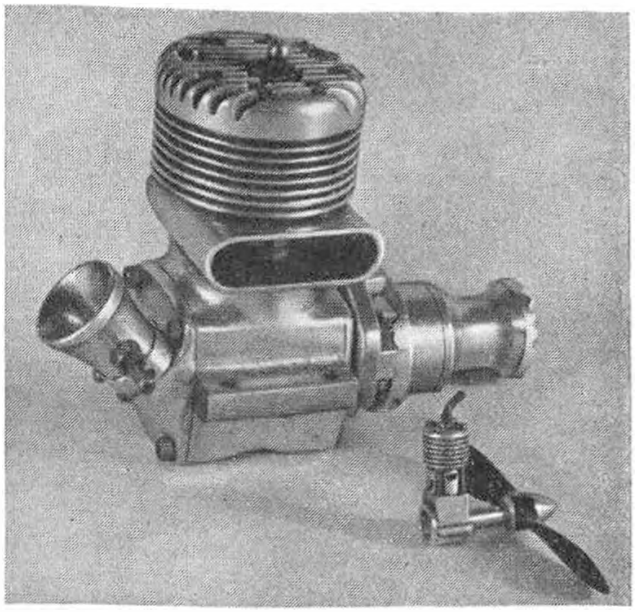
The duties of Assistant Editor are now undertaken by Ron Moulton, who joined the staff in 1950 as a production assistant. Spent some time in South Africa, and was probably the first exponent of control-line flying in this country. Currently having many successes in the free flight Power field, securing a place in the 1954 British Power Team which will compete—alas by proxy—in America this month.

Help !

Clubs and individuals are urgently required to organise events at the forthcoming Northern Gala, due to take place at Croft Aerodrome, Darlington, during the August Bank Holiday period. As is pointed out, a Committee can only do so much, and it is impossible for a small band of workers to cope with all the personnel requirements at a multi-contest meeting, and an appeal is therefore being made to anyone who is in a position to assist at this important function.

Remember, you can help yourself by helping others, and it is quite possible to fly as well as undertake an official position at such a meeting. All offers of assistance should be addressed to the Northern Area Comp. Sec., Mrs. F. Shirt, 13 Patmore Road, Sheffield 5.

Special awards are being made to the winners at this meeting, in addition to the usual Society prizes, and we look forward to generous support.



Readers will remember our reference to the engines made by Mr. Bibby of Wavertree last month. Above we show his 10 c.c. Racing Glo-engine with the amazing .05 c.c. diesel alongside. This fantastically small engine is 9/64ths bore and 5/32nd inch stroke, and was constructed on a 2 inch centre, homemade lathe.

Royal Support

H.R.H. Prince Bernhard of the Netherlands will open the 1954 *Model Engineer* Exhibition, to be held at the New Horticultural Hall from August 18 to 28. He will be flying to London especially for this function, and we welcome this further instance of Royal interest in the world of modelling.

A new trophy will be awarded this year in the form of the "Duke of Edinburgh Trophy," commemorating the opening of the 1952 Exhibition by His Royal Highness. This important award will be competed for by winners of previous competitions, who are barred from competing in the general sections, and should prove an interesting task for the panel of judges headed by Professor Low, and including our Managing Editor as representative of the aeromodelling fraternity.

Yugoslav International Teams

We hear from Yugoslavia that the following are the results of the eliminators held at Lisicji Jarak Airport, near Belgrade.

Power.—1. Vilim Kmoch 774; 2. Ljuba Nesic 729, Marko Vujic 729; 4. Vladimir Novta.

Wakefield.—1. Emil Fresl 846; 2. Joze Prhave 839; 3. Vilim Kmoch 764; 4. Tomislav Prukner 746.

Glider.—1. Pelikan Zvonko 822; 2. Bora Gunic 815; 3. Ljuba Nesic 716; 4. Maringer Milan 710.

There is no hope of sending teams to the States, but the A/2 boys will be flying in Denmark and, judging from the above times, will offer pretty formidable opposition. Glider fans in particular will be interested to see a few short notes on various Yugoslav ideas in "Reduce that Drag" on P.413.

K & B TORPEDO

K. & B. MANUFACTURING CO.
224 EAST PALMER ST., COMPTON, CALIF. - NEVADA 9-4741

May 28, 1954

Aeromodeller
38 Clarendon Road,
Watford - Herts
England

Dear Sirs:

It was with the greatest of interest that I read the letter that you directed to our Mr. Mahieu, concerning the Torpedo .15 horse power quotation, as extracted from the eddy-current dynamometer.

To put it mildly "Three cheers" for your organization. You have "stuck your neck out", as the old saying goes, but definitely in the right direction.

For some ten years now, I have been on record as stating that published horse power figures on the various model engines were not only erroneous but highly exaggerated. Of course we, like all the other companies, used the figures submitted to us by the various concerns that made the tests. This at least kept us on par with the other boys.

I too concur that it is high time that figures more related to the truth were published, and am exceptionally happy that the Torpedo .15 was the subject of your first Engine Analysis by the eddy-current dynamometer.

Yours sincerely,

K & B MANUFACTURING COMPANY

H. E. Brodbeck

Engine Analysis Figures

Following publication of the "Engine Analysis" tests no the K & B Torpedo and Oliver Tiger Cub we have received considerable correspondence both from manufacturers and readers alike.

We reproduce above a letter from Mr. Brodbeck of the K & B Manufacturing Company which needs no comment.

A few readers find it difficult to accept the "new" figures, but so far no one has offered valid rebuttal. Obviously it will take some time for this new standard of B.H.P. to become the generally accepted medium of comparison, but we would confidently challenge any reader to obtain the old figures using any normally accepted test equipment.

In this issue we include in addition to the full test on the "Bambi," revised figures for all the "Point Fives." Similar revised figures will be provided for all production engines.

International Handicrafts Exhibition

The Second International Handicrafts, Homecrafts and Hobbies Exhibition will be held at the Empire Hall, Olympia, from September 9th–23rd. Every type of handicraft and hobby will be demonstrated and a novel indicator will enable visitors to read off at a glance the time and place of each demonstration. The exhibition will be open from 11 a.m. to 9 p.m.

A/2 RESULTS

1 R. LINDNER, Germany
2 I. RECHENBERG, Germany
3 N. K. LUTHERSSON, Sweden

TOP TEAM:—Germany
WHEATLEY: G. Britain 12th
HANNAY: G. Britain 15th
British Team 7th

"AEROMODELLER"

1 c.c. PAA-LOAD CONTEST

By arrangement with the organisers of the 1954 *All Britain Rally, this special contest will take place at Radlett Aerodrome, Herts, on the 26th September.*

— 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 1¼ inches wide × 2½ 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. 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 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.

— Contest Rules —

1. All models shall conform to the above Model Specification in all respects, and the judges reserve the right to exclude any entry that does not comply.
2. Models must RISE OFF GROUND, and maximum engine run shall not exceed 15 (fifteen) seconds.
3. Maximum score for any one official flight shall not exceed 3 (three) minutes.
4. Two attempts will be allowed for each official flight. Engine run of more than 15 seconds or a flight of less than 20 seconds shall be be declared an attempt.
5. Each competitor is entitled to 3 (three) official flights, aggregate score deciding the winner(s).
6. Prizes will be awarded as follows:—

   1st, 2nd and 3rd, Bulova Gold Watches (kindly donated by Pan American World Airways Inc.).

Special awards will be made to the owners of published Aeromodeller Plans Service designs that place in the top twelve positions.

NO ENTRY FEE. Send now for a special pre-entry form, which will save your time on the field.

George Wooll's UPSTART LIGHTWEIGHT RUBBER MODEL

UPSTART was developed to the specification:

1. Simplicity to enable easy reproduction and repair.
2. Positive adjustment to ensure consistent performance.
3. High power and low drag for fast, high climb.
4. Low wing loading for good glide.

Most of the considerable development which has taken place since the original design was flown has been due to insistence on items 1 and 2, and has resulted in the standardisation of the laminated single-blade folding adjustable pitch airscrew with *pretensioned motor*. The use of the mechanical tensioner usually associated with folding airscrews inevitably results in difficulty of getting the motor to stop with an even row of knots every time in order to ensure constant C.G. position. A pretensioned motor of reasonable length does not suffer from such a possibility of C.G. shift. Some four copies of the finalised design presented here have been built to replace those lost O.O.S. and all show identical flying characteristics. Flight pattern is a fast steep right spiral climb with a fairly tight turn on glide.

Fuselage and Wing Mounting. Having assembled the fuselage, a slot is cut out in the top longeron to take the wing mount. It is a good idea to drill a series of 1/16-in. dia. holes through the longeron from corner to corner, and then join them by means of a small abra-file to form a slot. Chamfer off the front spacers—1/16 in. on port side—in plan view to give sidethrust only, before adding ply or celluloid facing. Don't forget the stiffener on the lower longeron under tail mounting.

Wing and Tail End Plates. Should be fitted after covering, but before spraying and doping.

Fin and Rudder. This unit should be mounted after the fuselage has been covered. The bottom sheet ribs are then added and the fin should then be covered.

Nose Unit. This is probably new to many people, but is nevertheless very efficient. Under power, the clutch is held clear of the stop on the nose block by the torque bar on the prop shaft. After the motor is unwound the prop rides-over and starts to free wheel. The clutch is pulled into the "stop" position by the rubber band and engages with the stop on the nose block, this permits the blade to fold.

Prop Blade. As will be seen, this is not carved, but laminated from four pieces of 1/16 in. soft sheet. These are cut to the shapes shown, well cemented together one on top of the other and bound with scrap strip rubber to the forme. Twenty-four hours are allowed to elapse before the blade is removed and then it is sanded to final airfoil section. By means of damping the top with water and doping the back the small amount of undercamber required may easily be imparted to the blade.

The 18 s.w.g. wire hinge attaching the blade to the hub may be twisted so as to allow alteration of the prop pitch to suit one's particular views on climb and length of motor run, etc. A tip angle of about 25 degrees is very satisfactory.

Covering. Whatever covering is used it should be water sprayed to shrink it. Two or three coats of thin dope plasticised with a little castor oil should be used all over the completed model.

Trimming. Two "line ups" have been used successfully. Either set the wings "square" to centre line with rudder offset about 1/8 in. for left glide turn, or cant the wings over so that the starboard panel is approximately parallel to the stabiliser (normal dihedral is retained) and eliminate the rudder offset.

No downthrust is used and powered flight is adjusted by varying the diameter of the circle by means of side thrust. A vertical climb followed by a tail slide is due to either insufficient side thrust, or if the turn is quite tight, then to too coarse a prop.

The high power stated may cause uplifted eyebrows amongst some modellers. However, after flying in the high winds associated with this part of the country, it has been found a great advantage to gain height as quickly as possible. This ensures maximum altitude is achieved almost vertically above the time-keepers' heads.

Full-size Plans of the ¼ scale reproduction opposite are available from A.P.S. Price 4/6d. Post Free.

A 36" SPAN UNRESTRICTED RUBBER DURATION MODEL

UPSTART

DESIGNED BY

G. WOOLLS.

4/6

THE AEROMODELLER PLANS SERVICE

38 CLAREMDON RD WATFORD HERTS

DATA	
WING SPAN	36"
WING AREA	152 "
TAIL AREA	72 "
LENGTH	34½"
MOTOR	2½ OZS ¼ x 1/24 12 STRANDS 37½ LONG APPROX.

MATERIALS REQUIRED

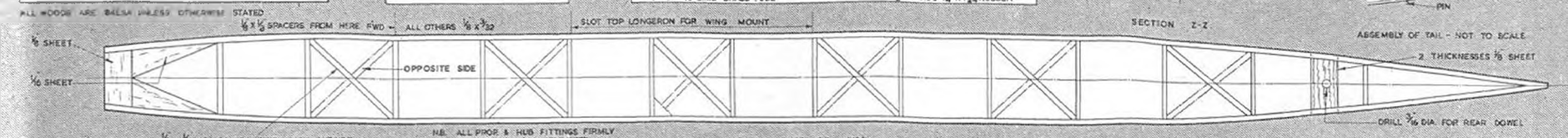
ALL BALSA MEDIUM UNLESS OTHERWISE STATED

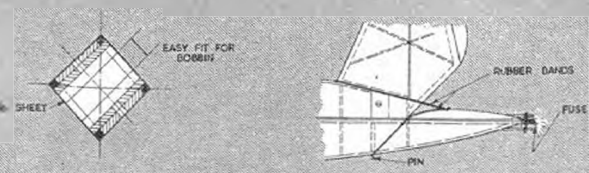
5 - 36" LENGTHS	⅛ x ⅛	BALSA
3 - " -	⅞ x 3/32	"
7 - " -	1/16 x 1/16	" MED HARD
1 - " -	⅛ x ¼	"
2 - " -	3/16 x 3/32	" TRLG EDGE
1 - " -	3/16 x 3"	" SHEET
1 - " -	1/32 x 3"	" "
1 - " -	⅛ x 3"	" "

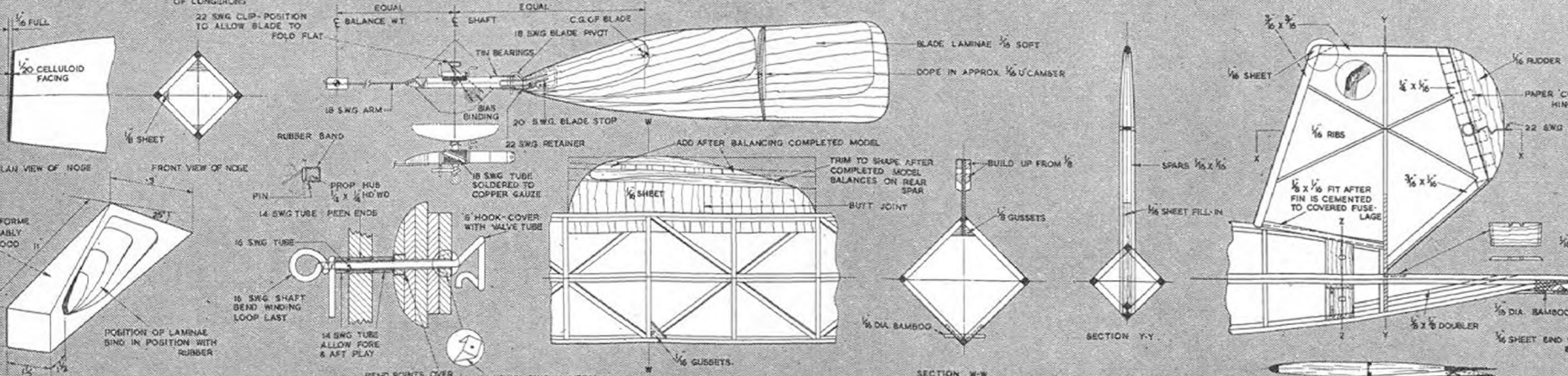
1" OF 18 SWG BRASS TUBE

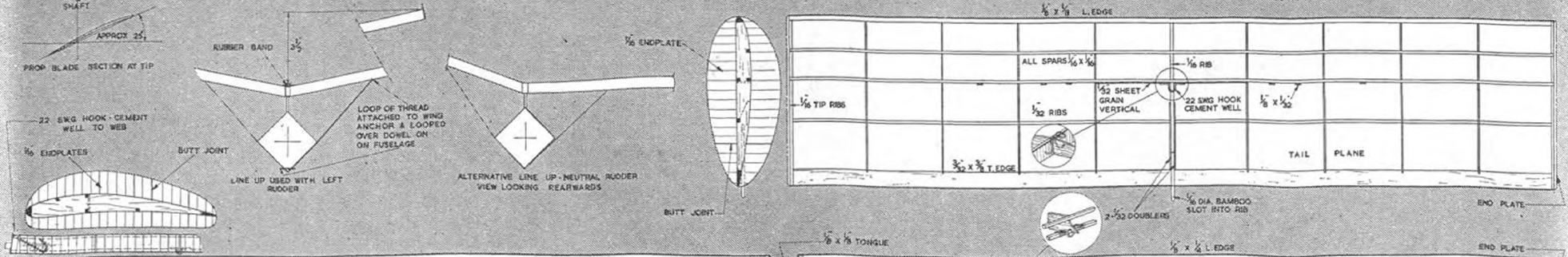
1" OF 14 SWG BRASS TUBE
1" - 16 SWG " "
12" - 18 SWG PIANO WIRE
3" - 18 SWG " "
6" - 22 SWG " "
THICK CELLULOID OR BIRCH PLY 1½" x 1½" x 1/16"
2" OF 3/16" DIA BIRCH DOWEL
1" - 1/16" BAMBOO
12½ YARDS ¼ x 1/24 RUBBER

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED









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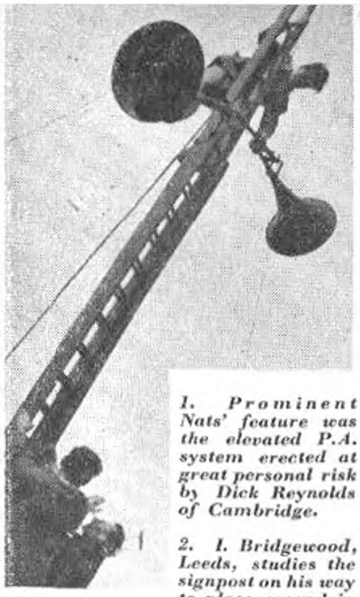
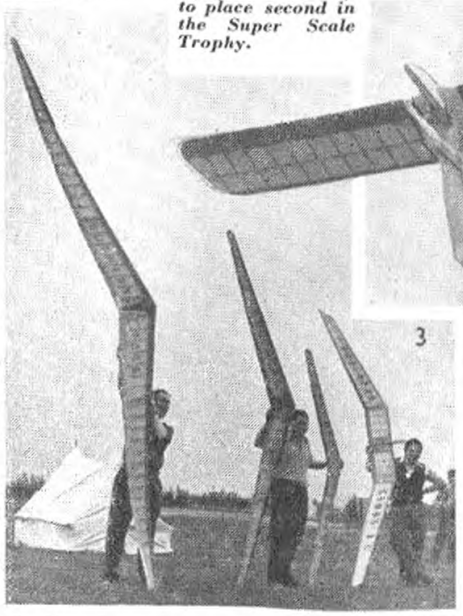
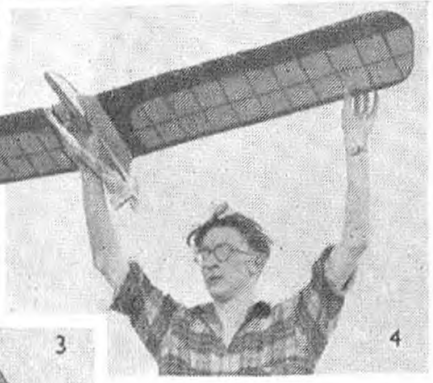
1954 BRITISH



1. Prominent Nats' feature was the elevated P.A. system erected at great personal risk by Dick Reynolds of Cambridge.

2. I. Bridgewood, Leeds, studies the signpost on his way to place second in the Super Scale Trophy.





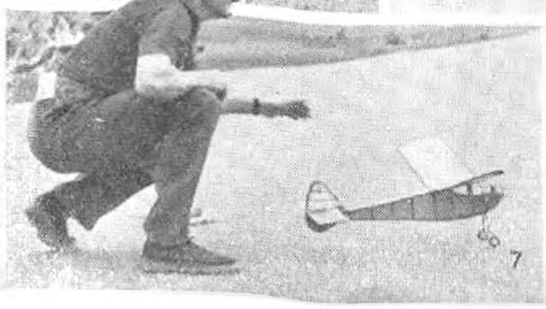
3. Southern Cross members with their impressive 'wings'. From left to right, they are: Gates, Donald, and Smith, who was the winner of the Lady Shelley Cup.

4. Lady Shelley entry by W. Tinker of Epsom who placed sixth.

5. Norman Marcus, Croydon, who placed 2nd in the Sir John Shelley Cup, with his 'Eureka'. Elfin 2.49 powered, this model had a phenomenal rate of climb.

6. Middlesborough's M.K. Stalker launches clubmate G. M. Robson's 'Tonto' in the Thurston.

7. 'Rushy' won the Bowden with his superbly built 'Tomboy', thus creating a new record by being the first S.M.A.E. Fellow to win a post-war comp.



FROM THE competitor's point of view the '54 Nats. were hard going. In every event the competition was close, and one had really to be on the top line to make the grade for a high placing. All credit therefore to the victors, each of whom indeed has a tale to tell—particularly in the free-flight events, where downwind recovery became a task for even the fleetest of foot—or fastest of motorcyclists!

To "Rushy" go honours for winning the first contest he has entered since 1939 . . . . to Fred Smith for placing highest among the strong Southern Cross contingent to collar the tailless event . . . . to Geoff Byrd for winning the hotly contested Thurston Cup—despite losing all the noseweight on his second landing, and flying with a larger than normal tail to combat the windy conditions. Jack North showed his all-round capabilities by topping Rubber with his 300 sq. in lightweight, and Chris Marsh eclipsed all else in the Paa-load event after a smart recovery from a flyaway "attempt" with a 60 sec. engine run. (This makes up for Chris' non-appearance in the Team Trials, where he would undoubtedly have done well.)

Surely the greatest satisfaction came for Pete Smith (Chingford) when winning the "Gold Trophy after so many second places in other years. In team-racing, High Wycombe came through in force to take first two places in an all Oliver Tiger "A" class final that all too few had the pleasure of witnessing, and Dick Edmonds leads the "A" field for the third year running. Those stalwarts of class "B", the Pete Cameron team from Croydon, flew "Little Sheba" to yet another victory.

Another Smith—Tom from Blackpool this time—confounded the critics by showing that a theoretical layout can be a practical contest design in the Sir John Shelley power event . . . . Tony Datkeiwicz of the Polish F.A.A. once more collected a 1st for his beautiful scale "Luscombe," and the E.D. Equipe placed best of the many attempts at radio control. With the speed boys claiming new records in three classes, there was certainly "summat for all" at the Waterbeach meeting, and one didn't have time to vegetate if keeping up with events.

With only 78 entries, the "Model Aircraft" Trophy event was the poorest supported of the general free-flight categories, but produced by far the best times with only 16 seconds separating the first and sixth men. Jack North again proved his claim to all-rounder, following his success at the Team Trials, and it was most interesting to watch his winding technique that employs a protective tube and extension piece, thus enabling the motor to be wound outside the vulnerable fuselage.

Other distinguished names appear in their usual place at the top end of the results, but we would take time out here for word of perhaps the worst piece of modelling sabotage that has come to our

NATIONALS

cars. Mike Thomas (Blackpool) has almost given up his model after its first o.o.s. flight, when a passing farmer indicated where the missing machine could be found. A general search failed to locate the model, and they were just giving up in disgust when a glance under a hedge disclosed the missing model—fully dismantled, address labels torn off, and the whole job strewn with grass in an attempt to hide it! But that is not all—on his third flight, Mike misjudged the distance flown, and spent a fruitless two hours searching outside the 'drome. Giving the job up for lost, he returned to the 'drome, and by a fluke stumbled upon the burnt out remains of his model. This might have been taken for an unfortunate d/t mishap, but examination of the debris disclosed that the wings, rubber motor, nose-piece and folding prop. were missing. As Thomas said—"if this is contest flying, give me philately or some other quiet hobby."

Could be the same gang that pulled the Everest trick on the hangars—sounds just like their mentality.

Once again the best supported contest with 146 entries, the glider affair saw Geoff Byrd of Loughborough College topping the results with a score of 11 : 51, thus upholding the reputation his club holds in this particular field of aeromodelling. Painter (Henley) was the only other competitor to reach double figures, and much natter took place on the subject of the "50 meter line/4 min. max."—but then, what does it really matter as long as the next man is a second short of your score, it's a contest! Certainly, the conditions did not assist the towline boys, but the standard of flying was nevertheless of a high order, and little prangery was witnessed. It is interesting to note that the models of both Painter and Clements (3rd) are three-year olders. Makes you think, doesn't it!!

Those who flew highest flew longest and farthest, and those who flew latest had the best chances of lift. That was the significant factor in the Shelley, and Tom Smith is to be congratulated for getting his slide-rule tactics into practical application. Following a first flight of 3 : 30 o.o.s. right upwards, his second effort still went upwards in spite of a persistent d/t, and Tom heard sometime later in the week that it finally brought "Fritter" to earth way beyond Ely. Substituting the "Oliver Twister" for his third, a max. was scored, and the aerodynamicist from English Electric made a great personal victory.

Also-rans were many in number—and also plentiful was the amount of hardware left downwind. Marcus, Fuller and Upson each left a model in the unfathomable depths of Cambridgeshire, and anyone keen enough to get three flights of more than 2½ mins. in this event was certain of a mighty long run for his entry fee.

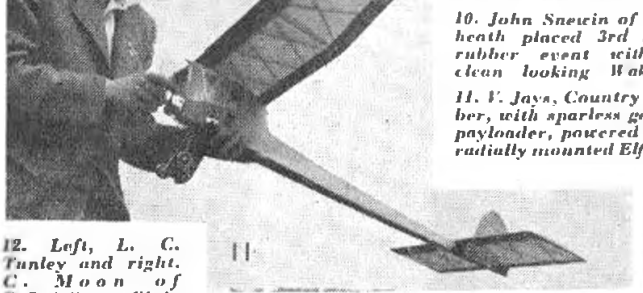
At any other National the speed circles have been tediously prone to prolonged periods of inactivity and false attempts, sufficient to bore even the keenest of reporters. Such was not the case at

8. 'Come to Daddy'! Sid Allen first place man in the Taplin Trophy had several attempts at landing owing to slight trouble with his 2-speed engine control but eventually demonstrated a copybook spot landing to the delight of spectators.

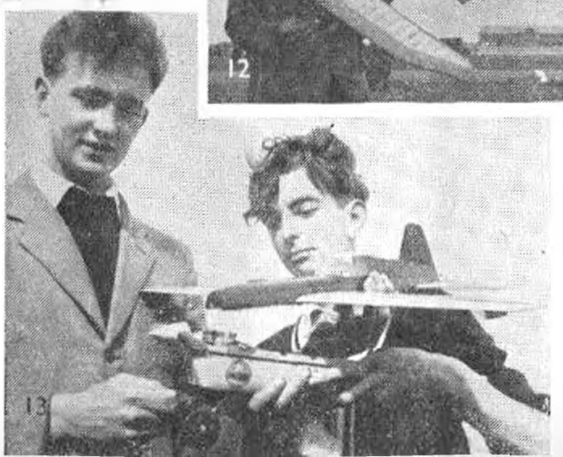
9. Roy Panteney and 'Ginger' Lewis of Eastbourne with the former's 'Sparky' which placed 3rd in the Taplin. Their familiar black and yellow 'Sparky' twins provided spectacular aerobatics in the radio events.

10. John Snewin of Blackheath placed 3rd in the rubber event with this clean looking Wakefield.

11. V. Jays, Country Member, with sparless geodetic payloader, powered with a radially mounted Elfin 2.49.

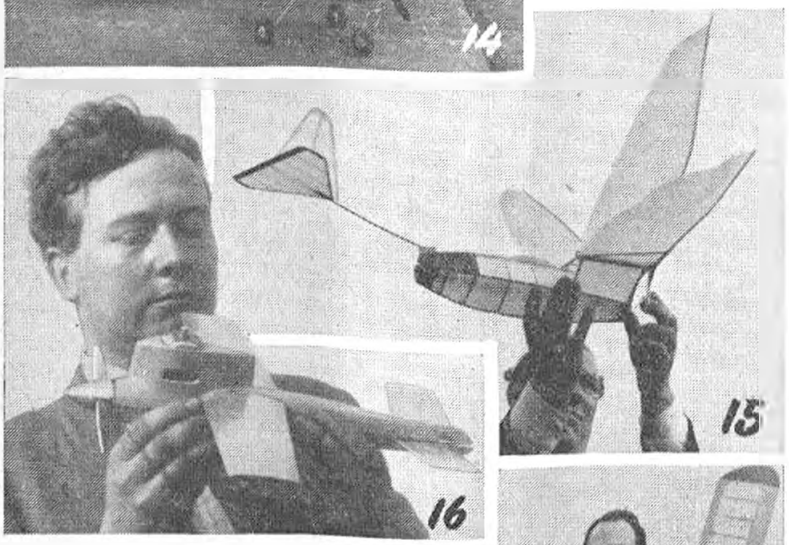


12. Left, L. C. Tunley and right, C. Moon of B.O.A.C. Club. used 1.5 c.c. scaled down versions of Cussy Gunter's well-known 'Clubman'. Tunley's used a diamondised fuselage with a Frog motor; Moon's the normal elliptic cross-section with an Elfin.



13. B. Dunn and B. Fairey of E. London had the fastest 'B' team Racer. McCoy 29 powered, it circulated at 109 m.p.h. and if they hadn't pranged even the Checksfield/Carter specials would have been left standing.

14. T. Nachtman, Polish A.F.A. with his new functional R/control entry. B. H. Amco powered the model uses a primary and secondary escapement system with a single channel receiver.



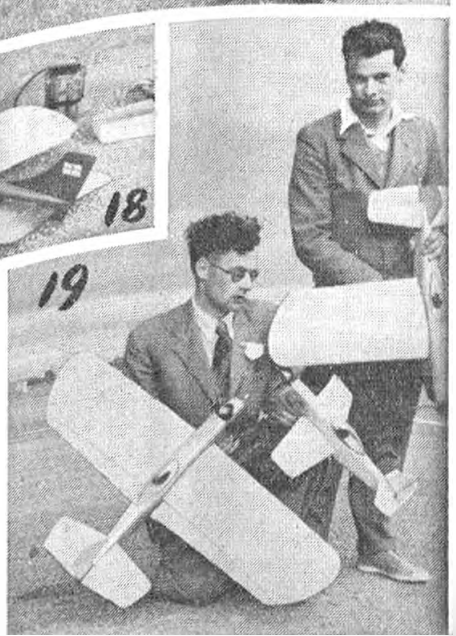
15. J. S. White with 4-winged ornithopter that set up a new British record. Plans will be appearing in a future issue.

16. D. Powell of E. London with his speed model that set up a new record of 133 m.p.h. in the 5 c.c. Class. Power unit is a Carter/Checksfield glomotor.

17. Roy Clements of Luton with his 3-year-old Nordic which placed third in the Thurston.

18. B. Hopkins of Bristol flew this McCoy powered, inverse tapered stunt job in the Gold Trophy.

19. R. Irvine and I. Dunne travelled 860 miles from Perth and back to fly in the Gold and Class 'A' T/race.



Waterbeach this year, for a new crop of Carter engines in the 5 c.c. class, and Checksfield Specials in 10 c.c. enlivened activity more than somewhat.

Don Powell's Carter/McCoy proved fastest of the 5 c.c. bunch with a new record of 132·7 m.p.h., which augers well for British standing at the World Championships in Holland next August. Amongst the "tens" the famous 160 m.p.h. Davenport model managed to survive, though its Checksfield motor shattered the crankcase. However, Gadget Gibbs maintained the East London honours with 144·3 m.p.h. with a similar engine.

Perhaps the most admirable achievement (apart from Gadget's exposure of underwear et al when he split his trousers from stem to stern on the pylon!) was Pete Wright's circulation in 2·5 c.c. at the fabulous rate of 14 turns in 20 seconds. Pete strained both wrist and ankle in the 111·3 m.p.h. effort, and we thoroughly commend his appeal to lengthen lines for this class to anything other than the present 37 feet. An E.D. Racer with "medium" Nitro Methane content in its fuel for glo ignition was responsible for this speed with the famous "Gook," and hopes are high for Pete to even faster and break the World Record he now almost equalises.

Despite controversy over certain of the rules, unknown to the majority of competitors until they

NATIONALS

LADY SHELLEY CUP—Tailless

1.	F. Smith	Southern Cross	6.33
2.	H. R. Bennett	Regents Park	5.48
3.	M. Thomas	Blackpool	5.12
4.	I. Crawshaw	St. Albans	4.00
5.	M. M. Gates	Country Member	3.50
6.	J. Hume	Belfairs	3.42

BOWDEN TROPHY—Precision Power

1.	C. S. Rushbrooke	Fellow	990
2.	L. Ellis	R.A.F. Debden	932
3.	G. Cripps	Abingdon	866
4.	R. C. Monument	Lincoln	844
5.	Col. Binney	Eastbourne	826
6.	W. Tinker	Epsom	800

THURSTON CUP—Glider

1.	G. C. M. Byrd	Loughborough Coll.	11.31
2.	D. Painter	Henley	10.06
3.	R. Clements	Luton	9.45
4.	A. Gelray	Croydon	9.44
5.	E. Welbourne	Hayes	9.38
6.	D. Tipper	St. Albans	9.31

SHORT CUP—PAA-Load

1.	C. Marsh	St. Albans	8.55
2.	J. Bickerstaffe	Birmingham	7.37
3.	R. Moulton	West Herts	7.00
4.	G. Fuller	St. Albans	6.52
5.	E. John	Grange	6.30
6.	R. Monks	Birmingham	6.20

MODEL AIRCRAFT TROPHY—Rubber

1.	R. North	Croydon	11.51
2.	J. Blount	Croydon	11.43
3.	J. Snewin	Blackheath	11.34
4.	R. Chesterton	Northern Heights	10.45
5.	D. Yates	Wigan	10.43
6.	R. Copland	Northern Heights	10.32

TAPLIN TROPHY—Radio Control

1.	S. Allen	Bushy Park	402
2.	G. Honnest-Redlich	Bushy Park	313
3.	R. Panteny	Eastbourne	218
4.	E. Hemsley	Hatfield	201
5.	R. Lewis	Eastbourne	190
6.	S. Miller	Luton	154

SIR JOHN SHELLEY CUP—Power

1.	J. Smith	English Electric	11.34

reported at the circles, performance did not suffer, as was amply demonstrated by the Edmonds/Lee team when going through the Class A heats, semi's and final. Oliver engines were supreme in this event, but Oliver Snr. told us that few entrants were using their Tiger's to the best advantage . . . . over-pitched props, wrong fuel, running settings, etc. This was emphasised by the fact that the faster racer in the air was a Foresters entry from Nottingham, the home of the Tiger factory, where surely they know best! Manufacturer's fuel is essential, and a 7 × 9 prop helps.

Class B, with a record breaking entry of around 44, was as snappy a racing session as ever witnessed, and was enhanced by the exceptionally fast West Essex and East London racers with Carter reworked engines. The Dunn/Gibbs/Fairey team who circulated at 109 m.p.h. might well have won, had they not ground off the glowplug flush with the head in an abbreviated landing.

An interesting contretemps took place before the final, about the first time in our memory that a protest for foul flying has been upheld. A few ears were certainly burning in one camp renowned for "elbows, shoulder barging, and strong-arm whipping," though the real offenders appeared to get their dirty work done unnoticed.

After last year's rather half-hearted fight for the

RESULTS

2.	K. Glynn	Brixton	11.28
3.	N. Marcus	Croydon	11.18
4.	J. Bickerstaffe	Rugby	10.50
5.	E. Nixon	Hinckley	10.18
6.	B. Wheeler	Birmingham	9.45

SUPER SCALE TROPHY—Power Scale

1.	Z. A. Datkiewicz	Polish A.F.A.	75
2.	I. Bridgewood	Doncaster	73
3.	M. Garwood	Epsom	65
4.	D. Deefee	Epsom	50

S.M.A.E. TROPHY—Radio Control

1.	G. Honnest-Redlich	Bushy Park	330
2.	S. Allen	Bushy Park	197
3.	R. S. Higham	Country Member	146
4.	J. Fox	Hatfield	100
5.	A. Botting	Leicester	69
6.	S. Sutherland	West Essex	50

GOLD TROPHY—C/L Stunt

1.	P. Smith	Chingford	353
2.	J. Miske	U.S. Army	308
3.	E. Lloyd	R.A.F.	303
4.	P. Russell	Country Member	297
5.	K. Muscutt	West Essex	292
6.	R. Buck	Five Towns	282

EASTBOURNE TROPHY—Team Race A

1.	R. Edmonds	High Wycombe	10.04
2.	R. Lee	High Wycombe	10.05
3.	P. G. Sharpe	Chingford	10.38

GODALMING TROPHY—Team Race B

1.	P. Cameron	Croydon	8.29
2.	L. Steward	West Essex	
3.	W. King	Northern Heights	

SPEED CLASS 1—2.5 c.c.

P. Wright	St. Albans	* 111 m.p.h.

SPEED CLASS 2—5 c.c.

D. Powell	East London	* 133 m.p.h.

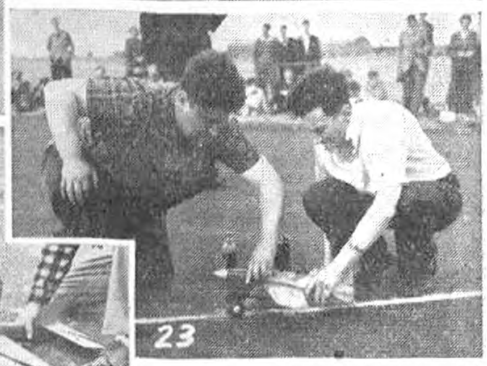
SPEED CLASS 3—10 c.c.

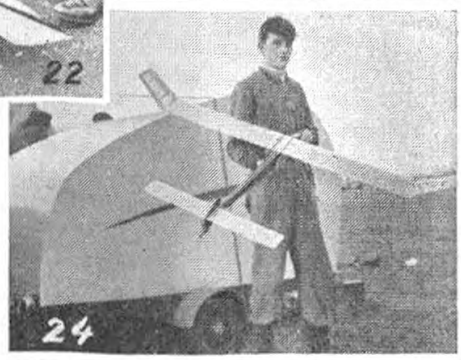
R. Gibbs	East London	* 144 m.p.h.

SPEED CLASS 4—Jet

J. Claydon	East London	128 m.p.h.

* New British Records (subject to Ratification)





20. Dick Edmonds of High Wycombe with winning high aspect ratio Class 'A' Oliver Tiger T/race.

21. Jack North, winner of M.A. Trophy, holds for 'Daffy' Dilly in the same event. Note the Croydon tube-winding system.

22. Miske of U.S.A.F.E. hitched from Karlsruhe Germany to place 2nd in Gold Trophy with this Fox powered Veco kit job which appears to be modified at the rear.

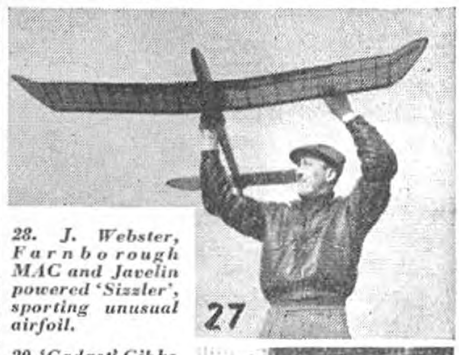
23. 'Stoo' and Denny Allen of W. Essex in the Class 'B' T/race final.

24. Max Byrd, Loughborough College, with winning A/2 glider. Note, natty model trailer in background with airfoil motif.

25. Winner George Redlich, makes a near-vertical spot landing in S.M.A.E. Radio Trophy, scattering officials in the process.

26. Pat Healy, Belfairs, one of several lady contestants in the Thurston.

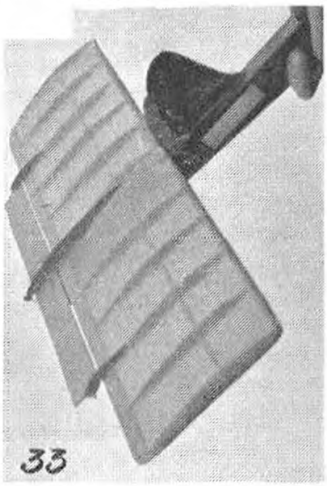
27. D. Painter, Henley, with 3-year-old 6 ft. lightweight, placed 2nd in glider.

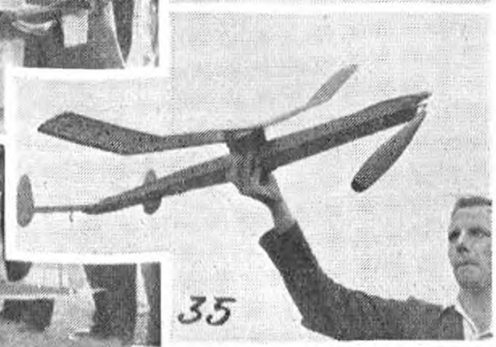


28. J. Webster, Farnborough MAC and Javelin powered 'Sizzler', sporting unusual airfoil.

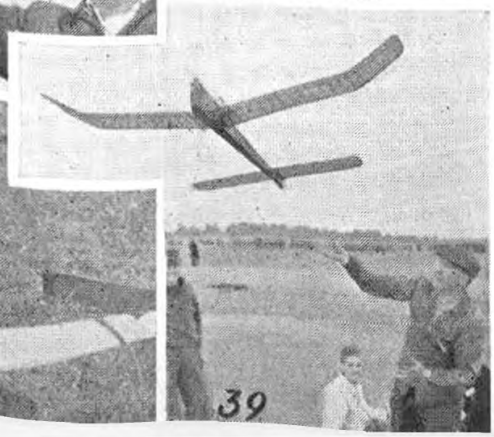
29. 'Gadget' Gibbs holds record 10 c.c. speed model.

30. The Olivers, congratulate winning High Wycombe 'A' racers who used 2.5 c.c. diesel. 31. Bob Copland departed from Wakefields by entering the Radio event.





32. Laurie Ellis with 2nd place Bowden entry.
33. L'borough College boys used automatic elevator with both power jobs and sailplanes.
34. G/Cpt. Chacksfield O.B.E., congratulatesvictorious Croydon 'B' T/race crew.
35. Tony Brookes had no luck with this 1954 Wakefield in the M.A. Trophy.
36. George Redlich tunes up the 5 c.c. Miles diesel in his S.M.A.E. Trophy Winner.
37. W. Carter, USAFE with 'Past Due' a 36 in. Wasp design.
38. Tom Smith, English Electric prepares his 'Fritter' for one of its winning flights.
39. Ron Moulton launches his 'Komet' which doubled in power and payload events.



top British stunt flying trophy, the '54 clash came as a refreshing change—and we are not referring to the frequent drops of rain! Two U.S. Army participants from Karlsruhe added variety, and the standard of flying was very high. Best hunts of the day—and some of the tightest manoeuvres of all—came from Ian Dunn of Perth, Ken Muscutt also making a very smooth show through very vertical loops and bunts. But it was to be Pete Smith's day. As last man to fly, he knew just what he had to beat, and how well he did so is shown by his 45 point lead.

Spectacular flights by the American all-wing and the large Piacentini Atwood model were overshadowed by Chas. Taylor's blow-up when a wing drifted off and the remainder came to earth sooner than intended. Charlie's ballet side kick in exuberance rated extra points for a special mano euvre!

The Bowden produced a motley collection of models few of which, we imagine, were to the liking of "C.E.B.," who was there in person. Standard of workmanship was poor, and the standard of flying much the same, with three exceptions in the shape of our own 'Rushy' and Vic Smeed, not forgetting Laurie Ellis with his superb deltas.

In spite of a rearwards take-off through the reverseability of his Amco ·87 'Rushy' certainly had his Tomboy trimmed for the job, and superior flying gave him the edge on Ellis his nearest challenger. Laurie's delta was definitely out of trim on his second flight, which error undoubtably cost him first place.

Workmanship in the tailless event was the reverse of the Bowden and many fine models and flights were witnessed, both amongst power jobs and gliders. The Southern Cross boys were there in force, and viewed collectively their outsize "wings" were one of this year's most impressive sights.

The Taplin was held on the Sunday under reasonable weather conditions and George Redlich was one of the first away with his 6 reed version of Radio Queen. With two speed engine control, rudder and elevator control, he put on an impressive performance in this stunt contest, only surpassed by stablemate Sid Allen later on. Sid, who was also using 6 reed E.D. equipment, made one of the best spot landings seen at the Nationals, the model actually running into his hands.

The S.M.A.E. Radio Control Contest the following day, produced more prangery than we have ever seen in a radio event. The weather was fine but a strong wind made the course flying this contest entailed very difficult. In fact only George Redlich managed the course once, never mind the official twice, taking first place from Sid Allen, and thus reversing the honours on this occasion. Many of the fliers were of the opinion that someone was either transmitting, or switching on a receiver during the contest, and from the behaviour of many of the models this would seem quite a possibility. There are still people who apparently do not realise that a super regenerative receiver will produce a signal when switched on, sufficient to operate another set at up to 100 yards range.

We liked . . .

The efficient way the camp was organised this year—a great improvement on the 1953 arrangements. The proximity of the R.O.C. camp was of benefit here, with latrines and water supply in abundance, plus the co-operation of the R.A.F. sanitary squad! Full marks to Emmency and Co. for their handling of this section.

* * * *

The better marshalling of cars, etc., by the Military Police, thus keeping the area clear for flying. Though this upset some bods, who are convinced that a model cannot be retrieved without road aids, such practice put everyone on the same footing.

* * * *

The (very few) motorists who whacked in and helped to move the considerable amount of control material from one end of the field to the other during the Sunday morning. The delay owing to a shift in wind was bad enough, but would have been much worse without this assistance.

* * * *

The way a mere handful of willing helpers kept the various contests running, though handicapped by lack of assistance and equipment. There was no fun in sitting out in the middle of an airfield either "waiting for customers," or trying to cope with dozens of flights at once in such weather. Pity it took a lady to show up most of the fellows in this direction!

* * * *

The Cambridge lads who manned the gates for the whole of the week-end, thus disposing of the full stock of printed programmes, and collecting a useful sum in parking fees. It is no joke manning a post like this and missing all the fun and flying, but someone has to do it, and these lads deserve full marks for their efforts.

* * * *

The action of Group Captain Chacksfield in visiting the camp site to ensure that the lads were comfortably bunked down. His informality and general keenness were a feature of this meeting, and says much for a C/O who was a keen modeller in his earlier days at Halton.

* * * *

The "cup of char and a wad" service laid on by the Station Y.M.C.A., their vans being a constant focal point on the field. Stocks of paper cartons soon gave out, so the staff were kept very busy washing up cups!

* * * *

The way F/O Rose, R.A.F. liaison officer, coped with the hundred and one details put on his shoulders throughout the three-day meeting. We trust a bit of extra leave will be thrown his way—he deserves it!

* * * *

The lads who cycled all the way from Hull and Sheffield—the Scot who had come all the way from Stewarton—Frank Holland and family from South Wales indeed—and the type who left a plastic mac in the Editorial caravan. It's come in very useful since Whitsun! !

* * * *

All those competitors and visitors who defied the elements, and are sure to be at the 1955 Nats.—the many who made constructive criticisms for the improvement of future events—the bods who loaned stopwatches to complete strangers (and got them back!)—the R/C fellows who keep coming up for more punishment, despite models that really cannot cope with high winds—the Scale enthusiasts ditto—and in particular the type who gave up his last rubber motor to his clubmate, thus getting beaten to a place in the contest!

We disliked . . .

The so-called campers who left their tent spaces littered—the early morning riders of noisy two-strokes, who blinded up and down the runways and brought forth complaints from the R.A.F. living quarters—the would-be Hillary's who removed the warning lights from a hangar, and then hid them in a ditch, presumably when they learnt they were being searched for. It's types like this that make it bad for those who appreciate the facilities offered, and are prepared to play the game.

* * * *

The West Essex types who made a scene at the entrance gate over the payment of the nominal parking fee—and later turned up with an "official" sticker on their car. We would be interested to learn where they got the label—and a further black mark to whoever provided it!

* * * *

Any form of static equipment that requires a major effort to shift when wind direction dictates. The lesson should have been learned by now, and the Wittering meeting a fortnight before was a prime example of the advisability of mobility at all times. Over two hours lost on the busiest day was inexcusable.

* * * *

The Croydon members who insisted on timing their own clubmates' entries, but steadfastly refused to work a watch for other competitors. We welcome any method which will overcome such dog-in-the-manger tactics in the future, even to the exclusion of any individual who cannot prove he has pulled his weight.

* * * *

Certain V.I.P.s who refused to judge special contests "because they had friends competing!" Surely an admission of inability to maintain a fair and unbiased attitude when adjudicating, and no credit to those concerned.

* * * *

The total lack of any timetable of events, which kept bods hanging about waiting for their particular comp. to commence. The hurried search for folk to organise contests, arrangements that should have been made weeks before. Recorders who made no attempt to maintain flight cards in order, thus delaying the announcing of results in the crowded last minutes.

* * * *

Inadequate P.A. equipment that blared music instead of badly needed official announcements . . . and the type(s) who pinched some of the records, thus sadly diminishing the selection of said music!

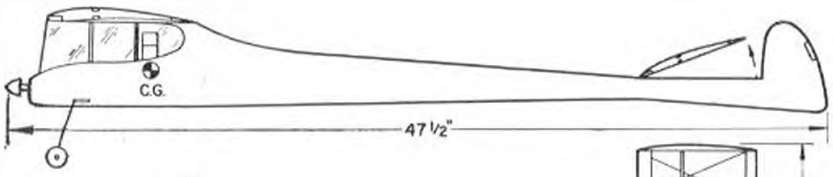
* * * *

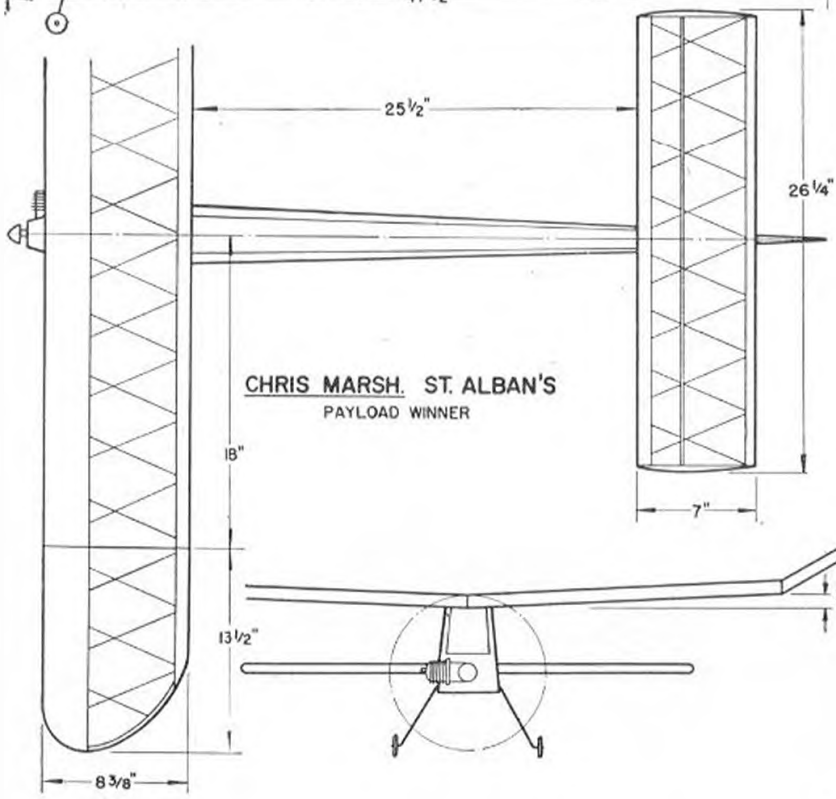
The R/C expert who ran over a fellow competitor's model with his car—though it should be recorded that said individual was actually speechless for a whole minute, an occurrence never before witnessed!

* * * *

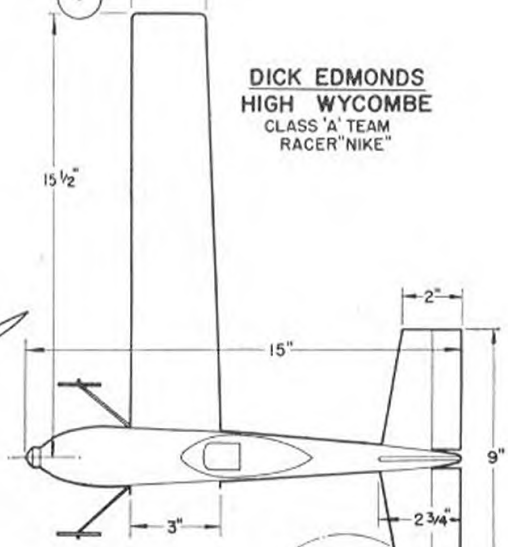
The absence of a large number of Council members, surprising in view of their prominence at Wittering a fortnight earlier. Probably the absence of buckshee accommodation on this occasion put them off—or could it be that the Wittering experience of no less than five Recorders for one contest convinced them that Waterbeach would be overstaffed?

Winners at the Nationals

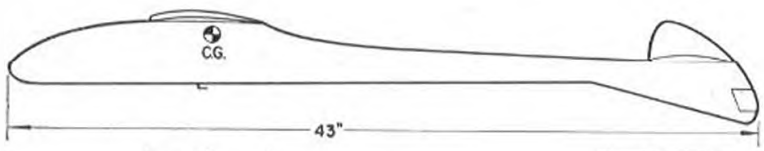


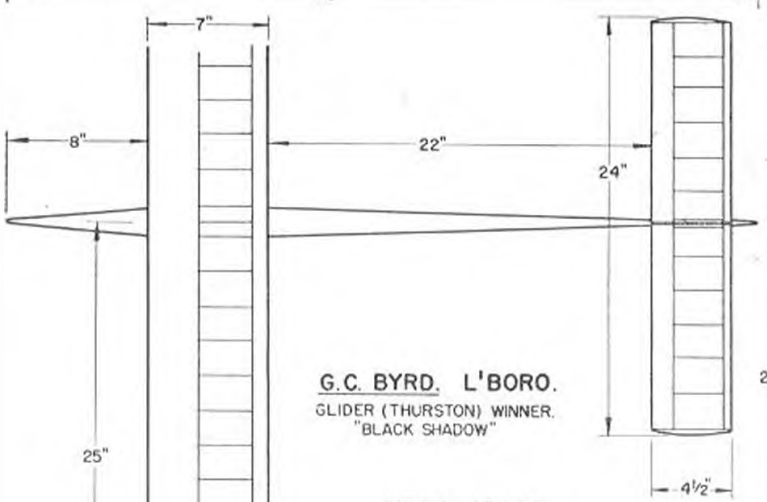


CHRIS MARSH. ST. ALBAN'S
PAYLOAD WINNER



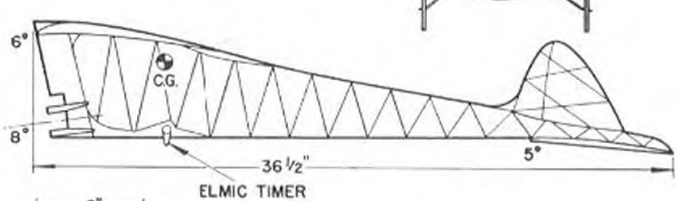
DICK EDMONDS
HIGH WYCOMBE
CLASS 'A' TEAM
RACER "NIKE"



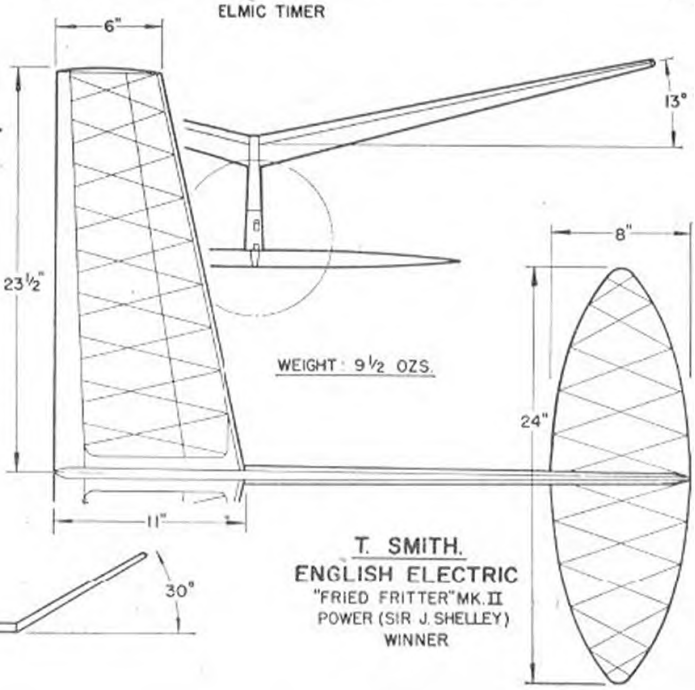


G.C. BYRD. L'BORO.
GLIDER (THURSTON) WINNER.
"BLACK SHADOW"

WEIGHT: 14 1/2 OZS.

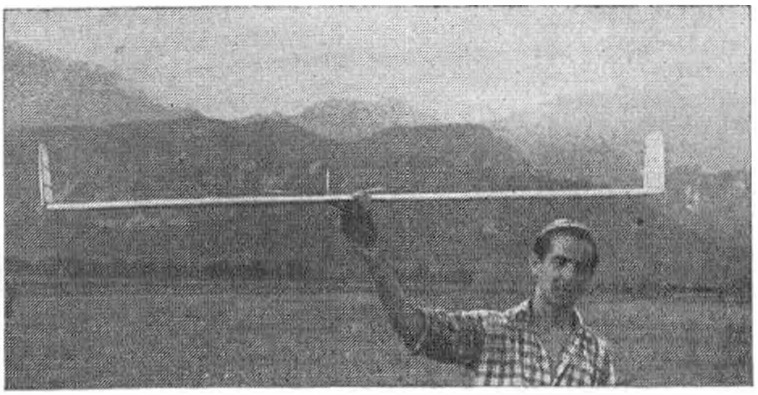


ELMIC TIMER



WEIGHT: 9 1/2 OZS.

T. SMITH.
ENGLISH ELECTRIC
"FRIED FRITTER" MK. II
POWER (SIR J. SHELLEY)
WINNER



No dihedral, arge tip fins, a long moment, Flamingo section, microscopic tailplane—these are the ingredients of the latest top-line Yugoslav A2s, typified in the above photographs by Rancin Gradimir's winning model at the 1954 Nationals. Could it be just coincidence that John Hannay, top man in the British A2 team, also uses tip fins—or, if you prefer it, endplates—on his model? A further article on these advanced innovations is scheduled for early publication.

A New Approach to A/2 Design in Yugoslavia

Reduce that Drag!

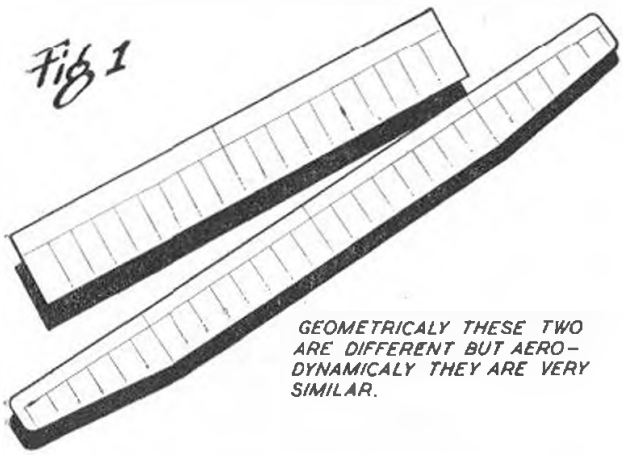
by S. Rasumenic and J. Tasic

How would you like a bonus of 20 secs. on each of your next A/2 comp. flights? Among new Yugoslav developments is an overlooked gadget that gives just that. The system is this: Make several shapes of tip fins to fit your model and pin a small balsa four-arm "paddle-wheel" (axis fore and aft) to the wing t.e. at the tip. The wing tip vortex will make this wheel revolve. Now try out the various tip fins and study the model in flight; the fins causing the slowest revolution are the best, and these fins should be fitted permanently. Consistent guaranteed still air (early dawn) flights of 2 : 14-2 : 16 went up 20 secs. fitted with these fins, and when tried on Gunic's famous BG 44 a gain of no less than 22 secs. accrued! The reason is, of course, a tremendous reduction in induced drag—the same as a big increase in aspect ratio but without the structural problems. More—using these fins means that you can do away with dihedral; it looks funny but it works, which is the main thing.

Sections is use here now tend to the so-called "Flamingo" aerofoils, which allow a generally much thinner section but still permit deep spars. What effect the hump on the undersurface has we're not sure, but such a wing flies extremely well. Lifting tails of minute proportions—around 50 sq. ins., often using the same section as the wing—are becoming almost universal. Auto-rudders are invariably used, set for wide (750 ft. plus) circles. C.G. locations are 7-11% of the wing chord ahead of the neutral point, and it has been found that *all* record models and team entries over the last few years fit into these limits. High angles of attack are used, and a certain amount of skill is called for in towing, since a bad release will induce oscillations which continue until terminated by the ground.

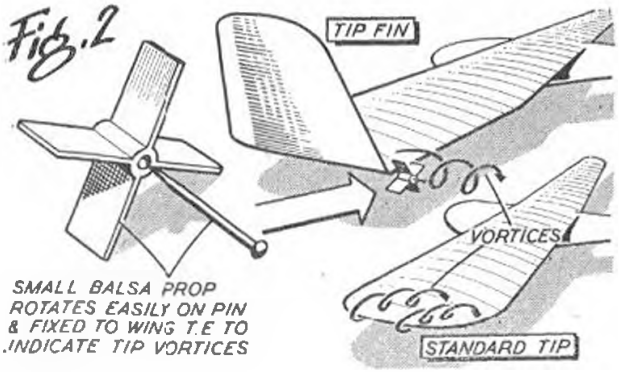
This, very briefly, is the trend in Yugoslavia, and we hope that the developments mentioned will help our English friends, to whom we send greetings.

Fig 1

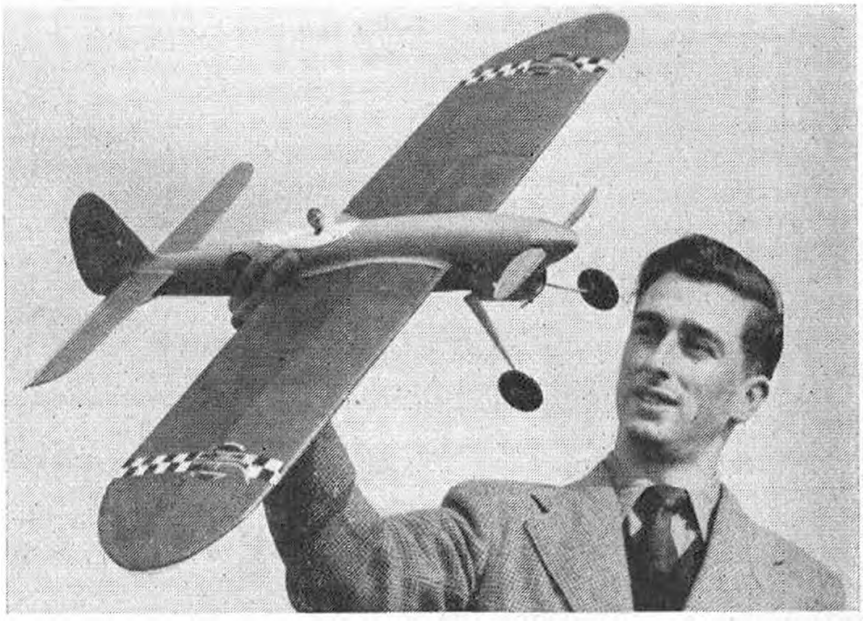


GEOMETRICALY THESE TWO ARE DIFFERENT BUT AERO-DYNAMICALY THEY ARE VERY SIMILAR.

Fig. 2



SMALL BALSA PROP ROTATES EASILY ON PIN & FIXED TO WING T.E TO INDICATE TIP VORTICES



1954 "GOLD" TROPHY WINNER

HARLEQUIN Pete Smith's super stunter

FOR Pete Smith, the win in this year's Gold Trophy marked the end of several years of "near misses" dating back to 1949 and reading as follows:

1949	FAIRLOP	2nd
1950	CLIFTON	No entry
1951	SWANSEA	5th
1952	GOSPORT	2nd
1953	CAMBRIDGE ...	2nd
1954	CAMBRIDGE ...	1st

During this period two 1st, two 2nd, and three 3rd places have also been gained in various club and area rallies. All successes prior to 1954 had been made with an Elfin 2.5, but as this motor had been wrecked last year whilst team racing, it was decided to design this year's model around the E.D. 2.46 Racer.

Pete's club-member, Les. Hayward, was flying a sidewinder streamline job powered by an E.D. at the time with marked success, so the plans were promptly borrowed, and modified to take an inverted motor. An aluminium cowl and faired undercart were added and the result was the model that won this year's Gold Trophy.

Owing to the inverted motor and fuel tank position, construction is more complex than usual, but the intending builder will find it well worth the extra trouble as the finished model has very pleasant lines.

Construction

Start by building the wing flat on the plan. When dry remove from plan and insert fuel tank, F.4, and bell-crank assembly. Solder on push-pull-rod and sheet over centre section. Web spars with 1/16th in. sheet and add tips, wing tip weight, lead-out tubes, and wires.

Durofix bearers together, not forgetting to round outer corners of upper bearers. Allow to dry and glue to F2 and F3. Bind undercart to F3 and cement whole assembly securely to L.E. of wing and F4. The fuselage sides are cut from 1/8 in. sheet and cemented to wing centre section. Draw together at rear and cement in rest of formers.

Cut elevators from two laminations of 3/32 in. sheet, insert elevator horn and hinges, allow to dry and cement securely to fuselage together with fin. Engine nuts are soldered to a strip of tinplate and held in position on top of the bearers with plastic wood. Add nose former and plank the rest of the fuselage with 1/8 in. sheet.

The entire structure is now sanded and covered with lightweight Modelspan. To obtain a good finish about six coats of sanding sealer should be applied with a soft hair brush or spray.

The Cowling

This is formed by wrapping a piece of 24g aluminium over a block carved integral with fuselage. Aluminium and block are clamped into a vice ensuring that metal is in contact with wood as far as possible. A leather headed hammer is then used to beat aluminium over the block. This is done very gradually by tapping lightly and frequently; commencing where the metal is hard on the block and

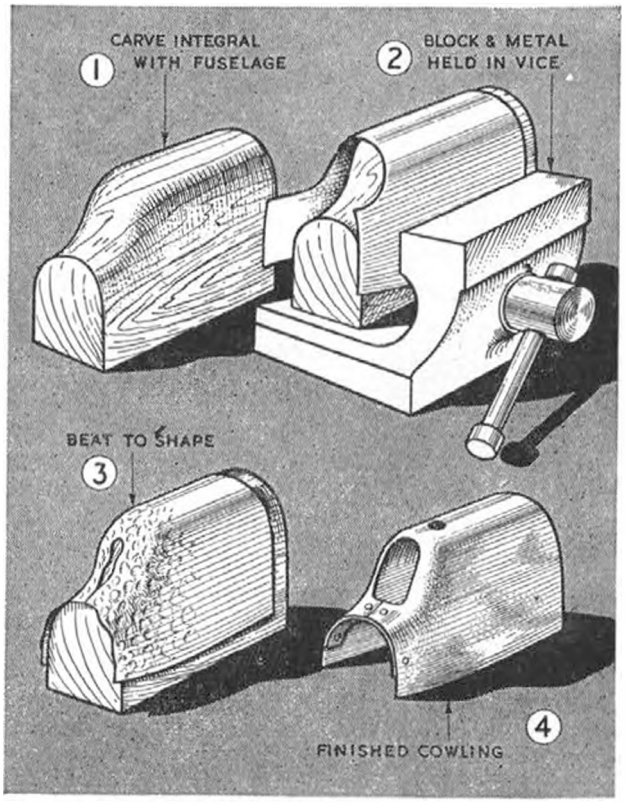
working forward. When shape starts to develop the alloy is slid forward about $\frac{1}{16}$ in. on the block and this is repeated until required shape is achieved.

Connect front sides of cowling by riveting in a strip of 18g aluminium and filing to shape. Dents can be removed with a file and emery cloth. Finally polish with "Bluebell." Drill necessary holes for compression lever and needle valve and attach to fuselage with four $\frac{1}{4}$ in. long wood screws.

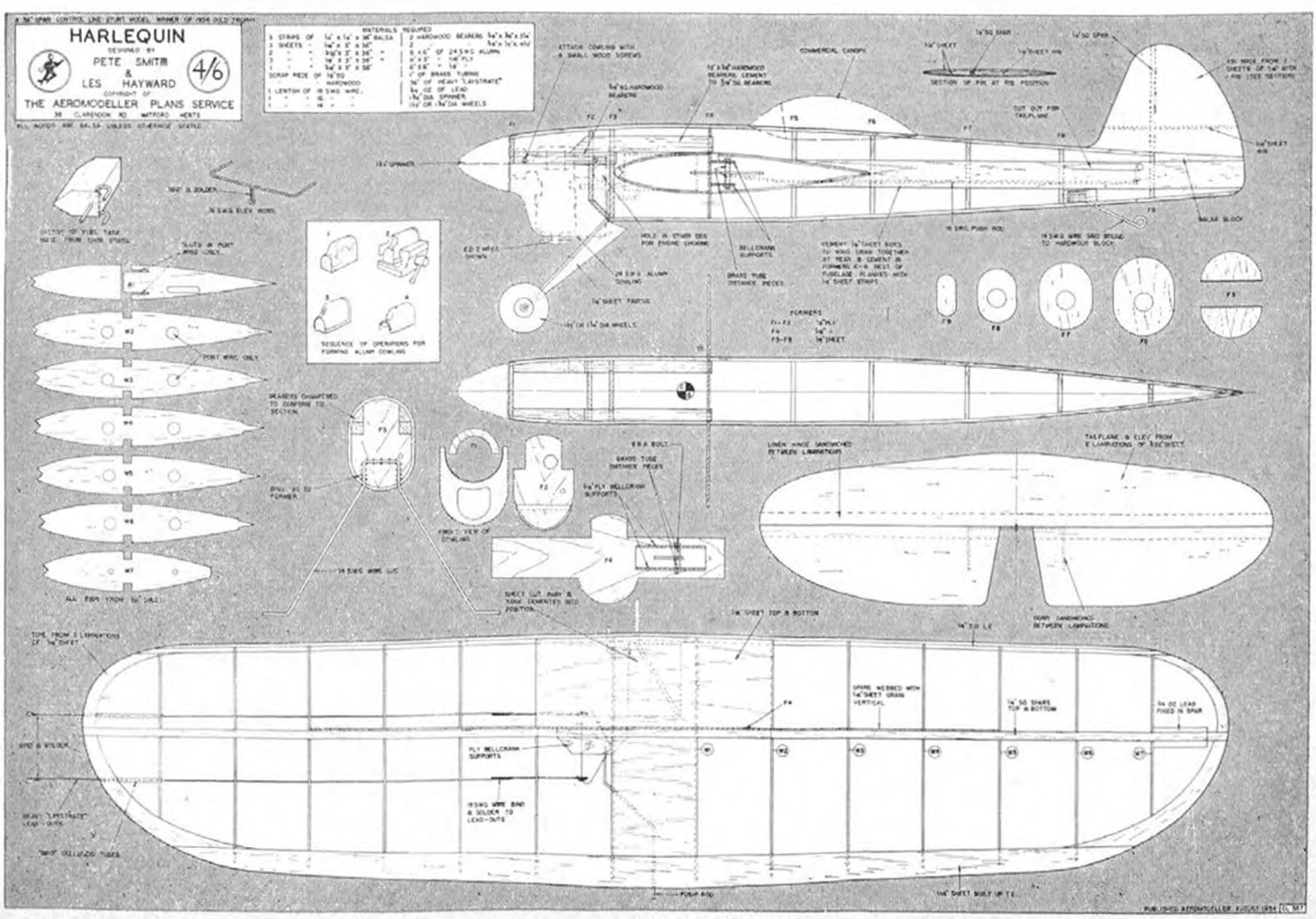
To beat a cowling of this nature, the main point to remember is to keep the metal close to the block and never to allow a gap of more than $\frac{1}{16}$ in. in any place. Try it, you'll find the panel beating very easy with thin aluminium and the results are very satisfying, as the photos show.

A pilot and bubble cockpit complete the model, which can then be doped in the colour of the builder's choice.

The prototype weighed nearly 20 oz. when finished, but with careful choice of materials this figure could probably be reduced by a couple of ounces. The finished model is very smooth to fly and an 8 in.×8 in. prop. with 55 ft. lines was found to be the best combination with Pete's own model.



Full Size Plans of HARLEQUIN are available from A.P.S. Price 4/6 as per 1/6th Scale reproduction below.



Sigurd Isaacson on...

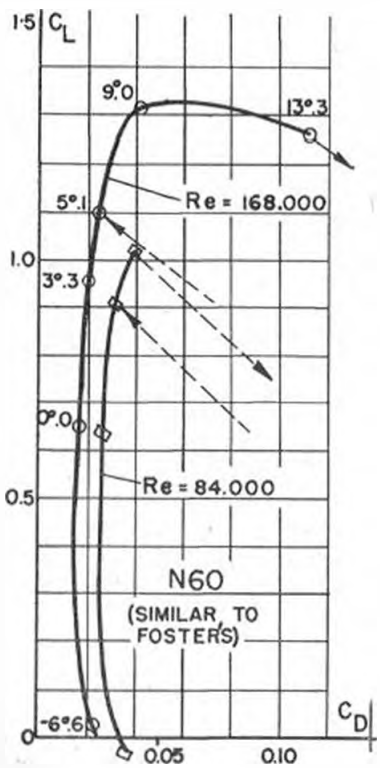
Airfoils & the Wakefield

renowned airfoil designer's comments on a very controversial subject

IN MY OPINION, the Wakefield Cup contest—he oldest and most distinguished of the model aircraft World Championships—has faded fatally, and is now working against a sound technical development rather than pushing it forward. This is not as a result of the change in power/weight rules, but as a result of the return to the old thermal conditions of flying.

In 1949 Aarne Ellila of Finland placed first with a (technically) very old model. Ellila continued to win, but now with a first class model designed to incorporate the latest German airfoil research developments, which had been adopted and tested in Sweden and Finland. The switch-over to slow-speed airfoil profiles gave the wing an over-critical Reynolds number, a point to which I refer later in this article.

These entirely new airfoil sections pushed up the performance far above the American and English machines using older sections, resulting in Ellila repeating his win in the 1950 event, *during air conditions allowing the models to compete on a basis of their real performance.*



Polar diagram for German section N.60, which is similar to that used by Joe Foster, shows high critical Reynolds number, stated by author Sigurd Isaacson to make this type of airfoil unsuitable for Wakefields.

In 1951 at Jami Jarvi, Sune Stark won the contest. No expert in Sweden doubted that Stark or his team partner Blomgren was able to win (provided no mishap occurred) for they had airfoils superior to those of other countries. The luck was with Sune, and once again it was shown that a model scientifically and practically superior has every chance to win *if thermals are not allowed to select the winner.*

The Wakefield Contest now moved to Sweden (Norkopping), and with early morning flying, Aarne Blomgren came first.

I am not the man to explain why the contest was moved to England in 1953 against the existing rules, but the Swedish Aero Club approved the arrangements, and the good old day-flying began again with dream thermals in marvellous summer weather.

(*The true position was that, following intimation to the F.A.I. that the Swedish Aero Club was not anxious to conduct the contest in* 1953, *Great Britain offered to stage the event in conjunction with the World Power Championship, to which the S.M.A.E. was committed by virtue of the British win in Switzerland in* 1952. *Contrary to the belief in some quarters, no pressure was brought to bear, and the double event was staged at Cranfield resulting in the first double World Championships to be held, the meeting being an unqualified success.*—EDITOR.)

We may now ask ourselves why a modeller becomes a champion when, without being controlled by himself, his model is caught by strong thermals, and—still independent of construction and trimming—happens to leave the thermals after a 5 minute flight, allowing the happy owner to make a further super flight in due time.

The decision of the F.A.I. that the Wakefield Cup shall not be flown earlier than one hour after sunrise, or one hour before sunset, may be justified in Southern countries where darkness falls within a short time, but still leaving several hours for controlled flying in relatively thermal-free weather. This decision jeopardises the contest, and makes it ridiculous, since any lucky man may have a fair chance to win.

Obsolete Airfoil Won!

Joe Foster, the 1953 Champion, is no doubt a top guy with a top model, but the model is crying out for a good airfoil profile to give long duration. The one he used is too thick and blunt to fly above

the critical Reynolds number (R_e) because the actual R_e is far below the critical point. This is a hard statement, but is based on approximate measuring on different drawings, giving the following approximate airfoil profile data (in percentage of the wing chord).

Airfoil Profile:	*Foster*	*N*-60	*SI*-63008
Thickness (d)	11	12	8
Nose radius (r)	1	1	0.5
Camber (f)	5	6	6

The German section N-60, which is very similar to Foster's, has been thoroughly wind-tunnel tested. To give a good picture of the profile data needed to fly Foster's model above the critical R_e consider the SI-63008, belonging to the thoroughly tested SI series. (SI denotes the designer; 6 = max. camber; 30 = position of max. camber; 08 = thickness; all in percentage of the wing chord.)

Turbulence and critical R_e are determined by thickness and nose radius. Consequently, we arrive at the true fact that the Champion won by the assistance of thermals, using an obsolete model without special consideration to the airfoil, which determines glide and rate of sink. His R_e number is approximately ($R_e = 7 \times 11{\cdot}6 \times 550 = 45{,}000$) at an estimated gliding speed of 12·3 m.p.h. and wing chord of 4½ inches.

Figure 1 shows the polar diagram of the N-60 similar to Foster's airfoil. At the *lowest* R_e recorded—84,000—the laminar layer of air separates from the airfoil at an increasing angle of attack equal to 5·1 degrees. At a decreasing angle of attack the separated layer rejoins the suction side of the profile at 3·3 degrees. The theoretical glide slope (induced and parasitic drag of wing and combined fuselage-fin-elevator not included) is 1·28.

N-60 until reaching R_e 168,000 stalls at 13 and 5·1 degrees respectively and the theoretical glide slope is 1·48 when the airflow gets over critical, and is correct for an aircraft wing with $R_e = 168{,}000$. Foster's model has Re = 45,000 (estimated) and consequently is flying far below the critical R_e. This is illustrated in *Figure* 2 in the model to the left. To the right is an imaginative design suited to the airfoil used, and being several times larger than a Wakefield formula machine. *Figure* 3 shows the critical R_e of a modern thin airfoil suitable for a Wakefield type of model. (SI-63008).

Magic Wing Spars

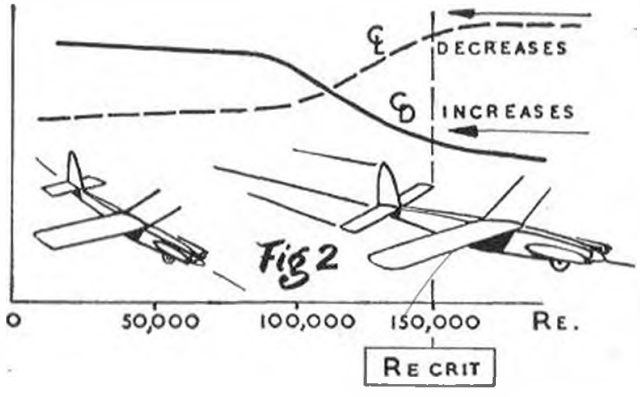
When a wing is flying *below* the critical R_e the airflow is laminar, *i.e.*, sweeping over the surface without turbulence. The airflow is continually retarded by the surface friction, and on the upper side it separates from the airfoil at a point where the energy of the flowing air has decreased to a certain value. This point moves towards the nose as actual R_e decreases from critical R_e.

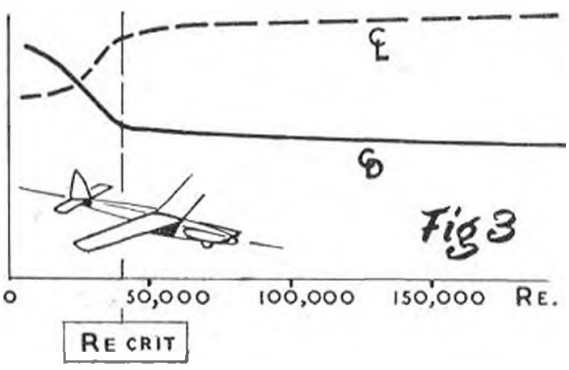
If the same model is flown at a lower Re, this is achieved by a thin, sharp—possibly cambered—airfoil. The boundary layer is forced to turbulate, and the airflow rolls on the turbulence layer over the upper surface of the wing without being retarded by friction, and without separating from the airfoil.

There lies the defence for Foster's model. The thick, blunt airfoil is compensated by several wing-spars up against the surface giving it small invisible "hills," which develop the turbulence necessary for over-critical flying.

The wing-spars of Foster's model give the same result as a turbulence wire at the leading edge. The latter arrangement was used in Scandinavia until recently, but is now abandoned on contest models. Artificial turbulence developed around a thick airfoil by a wire does not give the same useful result as the "original turbulence" round a thin, sharp airfoil. A wire does increase the lift, but the parasitic drag of the wire (or wing spar) negatives the gain in lift.

Thus, the duration of flight time (rate of sink) is best obtained on models with built-in turbulence rather than with turbulence wires. A top-class Wakefield model has a rate of sink of 1·3 ft/sec., and a Foster type model does not exceed this figure by more than 10% or 0·13 ft/sec. Prevailing thermals very often have a rate of climb above 3 ft/sec.; *thus normal thermals can compensate a second-class airfoil more than* 25 *times, and let an average medium good model win.*





WORLD NEWS

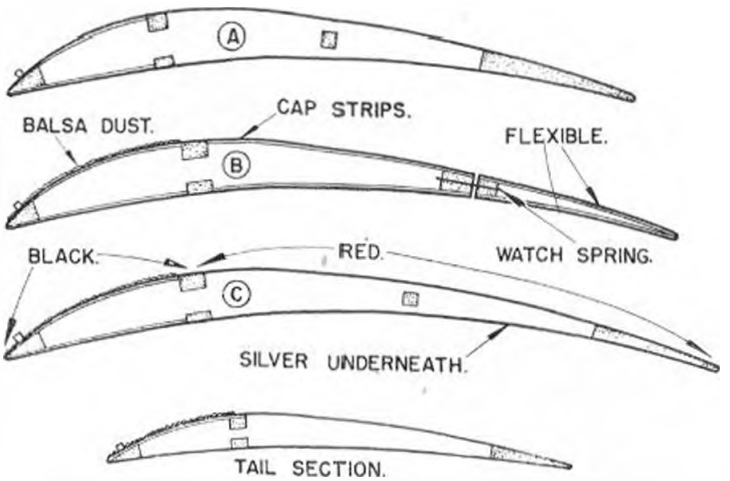
New Zealand Radio Control Duration Record has been raised to 2 hr. 00 min. .05 sec. by Frank Bethwaite using a Radio Controlled Sailplane, slope-soaring over a cliff with an onshore breeze. The record claim has been submitted to the F.A.I.

As this time is a 30-minute increase over the existing R/C duration record, a few details of the model may interest.

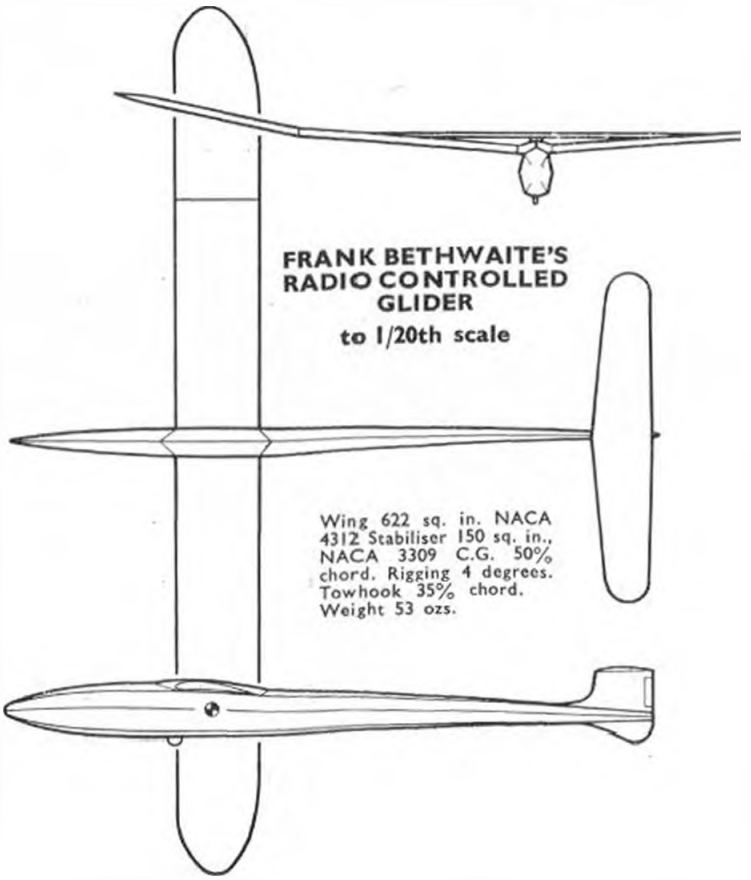
Built early in 1952, it was given to Mr. Les Wright as a test hack for R/C control and trim experimentation—but, for various reasons, not used. A few months later Frank began using it to determine the techniques of launching and slope-soaring on coastal hills and cliffs—and the model led a very, very, hard life in consequence. In January, 1953, success came with a World R/C Duration record of 1 hr. 05 min. exceeded by British (1 hr. 35 min.) and Russian (1 hr. 03 min.) attempts (plus the latest standing record of 1 hr. 31 min. 14 sec. by Russia). Another slope-soaring attempt in October, 1953, blew back overhead at 51 min. and two subsequent flights lasted only 30 minutes odd each. A further effort in February, 1954, lasted 63 minutes, but the model was swept away downwind during a mild squall, and landed far away.

The effort which netted 2 hr. 00 min. 05 sec. was terminated because Frank was running out of daylight—the model landed 130 yards away—which, remembering the extreme turbulence at low levels behind cliff-tops, is not too bad. During the flight seagulls were constantly in formation with the model—quite often they came too close so that the model seemed to be turned by their presence (quite a possibility, mechanically). Usually, however, the gulls just followed "line astern" and it was interesting to observe that the turn characteristics of the model and the gulls differed remarkably—it was quite easy to lose the gulls with a relatively gentle turn—to their obvious annoyance!

All this means that this model now has six hours logged over coastal hills and cliffs, plus an estimated two in shorter, thermal-seeking flights off a 600-ft. towline. There has never been the suspicion of control trouble. The reliability of Les Wright's radio gear and Venner accumulators is obvious.



Max Hacklinger's article on elastic turbulators has brought forth a number of independent theories on means of raising the efficiency of an A/2 wing (*see p.*414), and the venerable Dr. Sultan of Tel Aviv offers his findings. First he added a 1 mm. thread turbulator at the l.e. (section A) and sprinkled balsa sawdust over the first 25% of the wing. Model characteristics changed so much that he had to remove much of the nose ballast and shift CG back to 75% chord. Then he tried a hinged flap airfoil (section B), and a succession of O.O.S. flights followed. Section C is the final one for '54, containing T.E. droop, 2 mm. sq. turbulator and roughened surface, sharp leading edge and black covering for causing heat reflection on first 25% chord, red over remainder.



A Statistical Review of 26 of the World's leading Sailplanes

Produced with the co-operation of **Dr. W. Dolfus** "Aero Revue Suisse" and **Martin Deskau** of "Thermik"

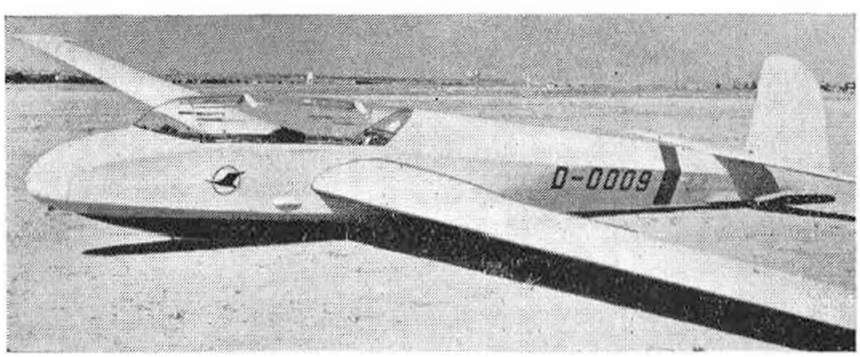
French high-performance sailplane Arsenal "Air-100". In this sailplane Charles Atger put up a world endurance record of 56 hours 15 minutes

THE CREAM of the world's sailplanes will attend the F.A.I. World Gliding Championships at Camp Hill, Derbyshire, the site of the Derbyshire and Lancashire Gliding Club, from July 20th to August 4th. A considerable number of "AERO-MODELLER" readers will either visit or carefully follow the Championships, and for their benefit we have selected twenty-six of the world's leading sailplanes, most of which will be making an appearance at Camp Hill; three-views and details of these machines appear in the next four pages. Unfortunately it has not proved possible to obtain sufficient data on some of the Championship entries to be able to include them, and we have accordingly substituted sailplanes of special interest to modellers.

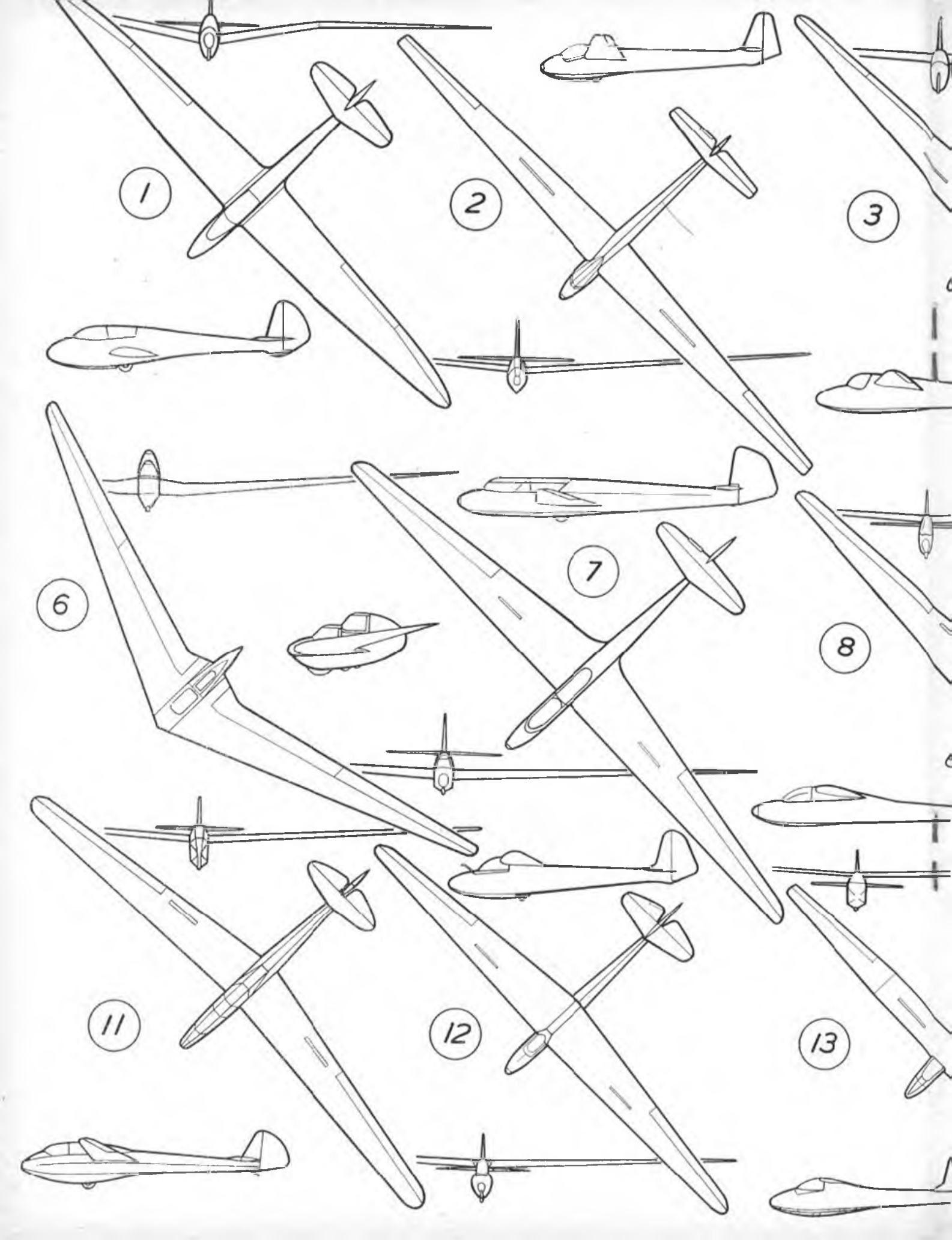
Probably the most advanced machine listed is the German IIKS-1 which incorporates many astonishing features. Points not evident in the drawing are the retractable skid and wheel, tail parachute brake, and variable camber wing (symmetrical variation to change flight characteristics, asymmetrical for lateral control). The wing is covered with a sandwich of ply, plastic foam, and ply, to preserve an accurate and smooth surface and take full advantage of the laminar section. No spoilers or ailerons are used. As well as being the most modern sailplane flying, the IIKS-1 is also probably the most expensive!

Two all-wing types are shown, the Horten XV and the Fauvel. Originally built in Germany, the Horten designs are now produced in Argentina; two XV ms were entered in Madrid in 1952, but both suffered damage. Two two-seat versions, side by side and tandem, have been built, as well as single-seaters. The Fauvel is a very popular French design, and although not entered at Camp Hill, one of these machines may be demonstrated there.

The only Russian glider shown is the Stakhanovetz, a pre-war design which held the world distance record for some time. Other machines of interest are the Kranich III, one of the finest aerobatic sailplanes ever, the tiny Prue 215, the original of which was alleged to have started life as a drop-tank, the new Slingsby T42, which will virtually be test-flying during the Championships, and the Schweizer 1-23 all metal job, which carries water-ballast in its leading edge to increase cruising speed during the early part of its flight, when thermals are stronger and more plentiful.



The German Kranich III entered in the last World Championships in Madrid, 1952. Earlier versions of this famous two-seater have held many world records, and its aerobatic reputation belies its comparatively high all-up weight. A pre-war design, it is still one of the sleekest multi-seat sailplanes flying.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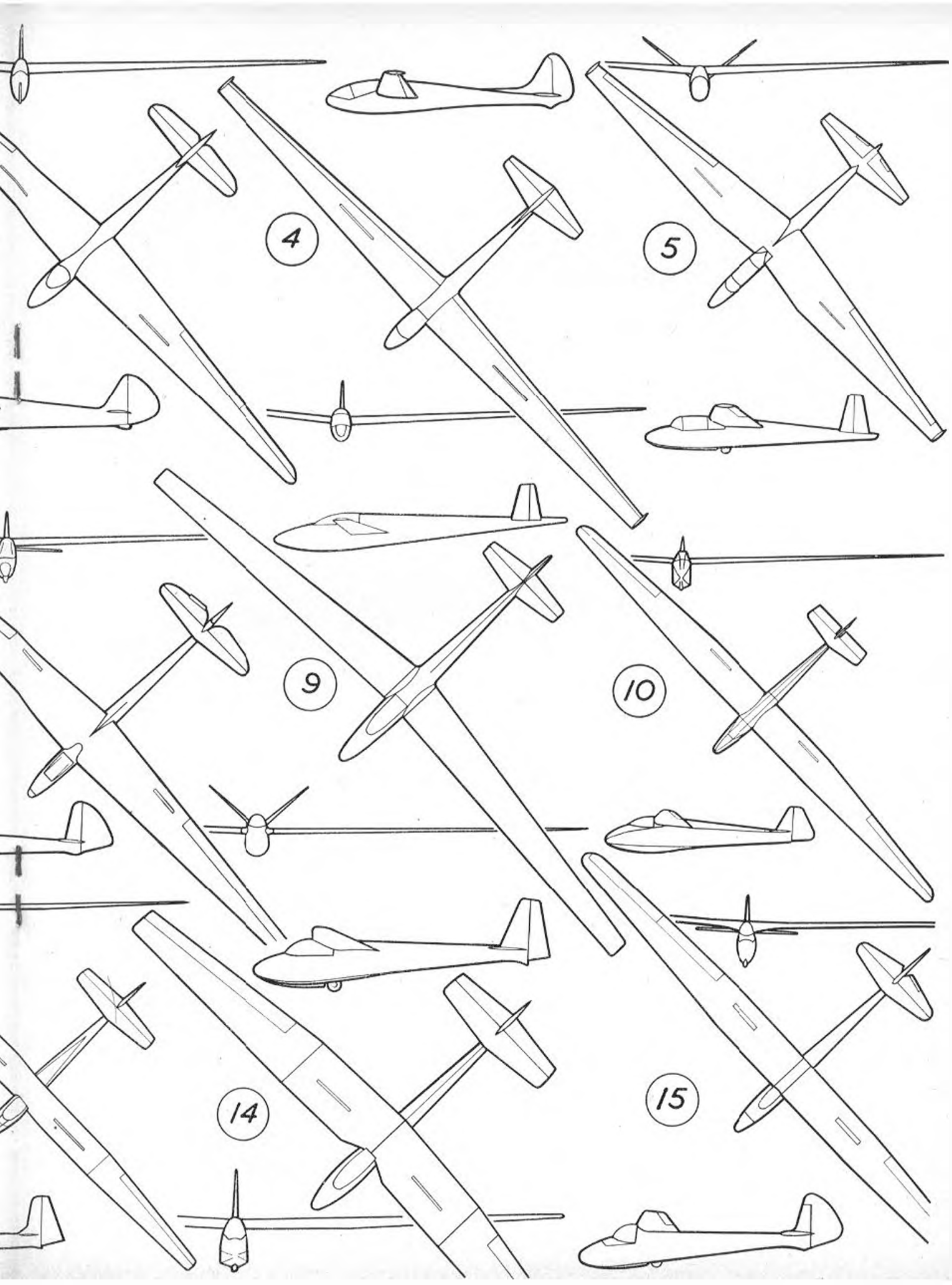
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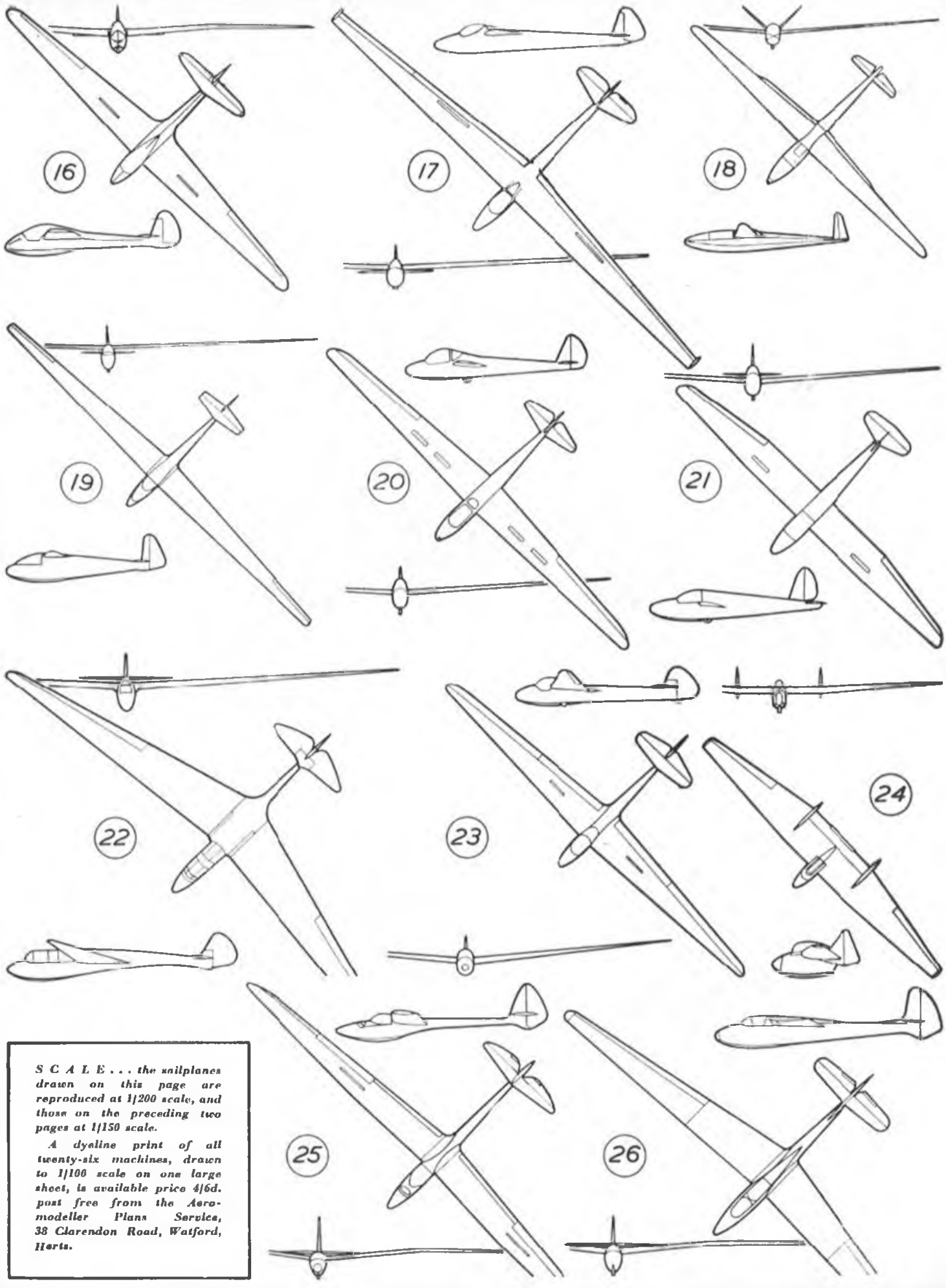


S C A L E . . . *the sailplanes drawn on this page are reproduced at 1/200 scale, and those on the preceding two pages at 1/150 scale.*

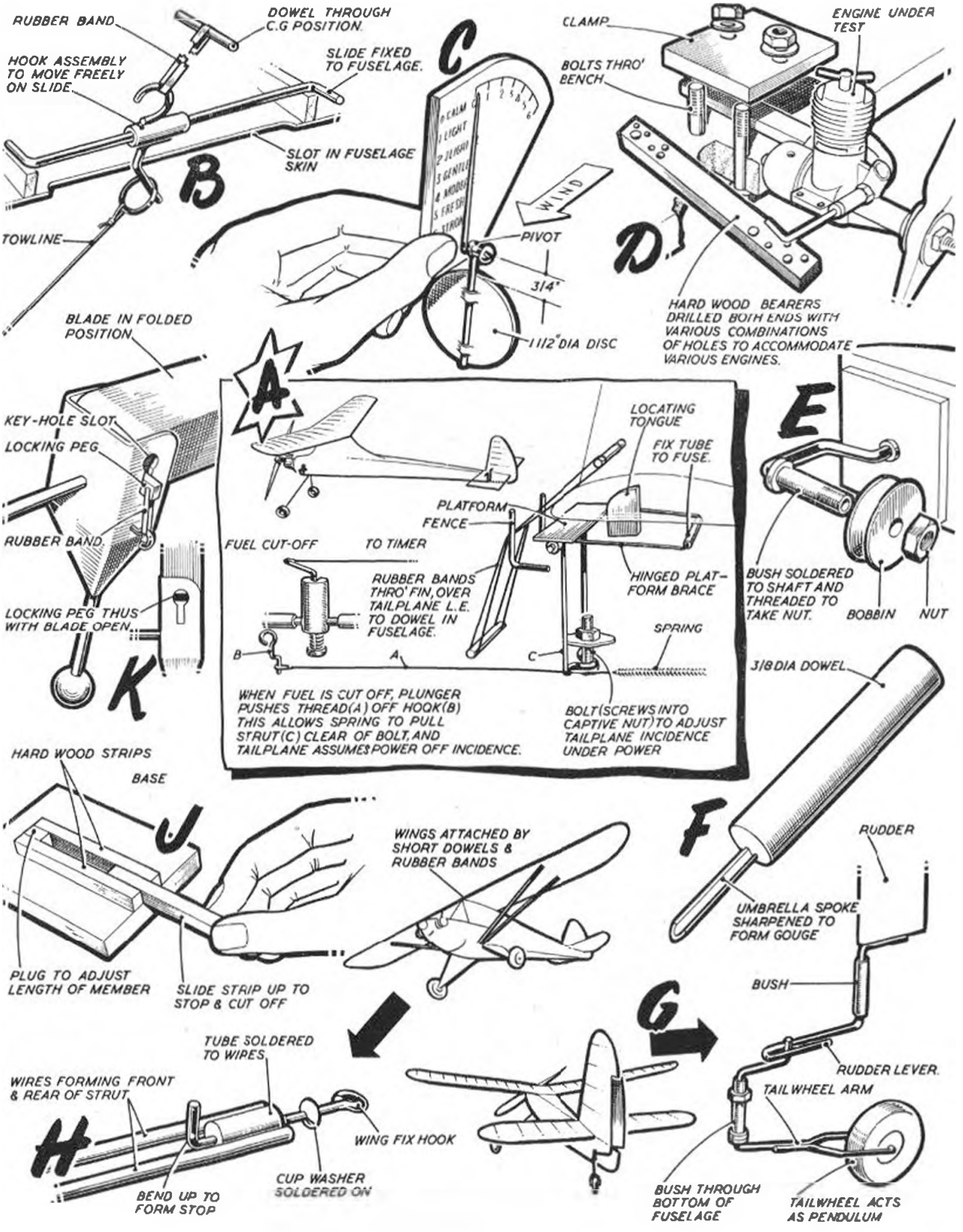
A dyeline print of all twenty-six machines, drawn to 1/100 scale on one large sheet, is available price 4/6d. post free from the Aero-modeller Plans Service, 38 Clarendon Road, Watford, Herts.

Above is the elegant HKS-1, the ast word in motorless aircraft design. After only one test flight, E. G. Haase placed second in the 1953 German Soaring Contest and established a new 100 km. triangular course speed record of 70.7 k.p.h. Right Retrieving is always a snag with soaring, and this sequel to our cover picture shows just how rough it can be!

KEY TO DRAWINGS WITH SPECIFICATIONS & PERFORMANCE.

Country	No.	Name	Span, ft., ins.	Length, ft., ins.	Wing Area, sq. ft.	Empty Wgt. lbs.	Section (root-tip)	Best glide angle	Min. Sink (f.p.s.) at speed (m.p.h.)
Austria	1	Musgor Mg19	58 —	25 6	228	532	——	26	2.42 at 42 *
Finland	2	PIK 13	57 8	23 6	160	405	GO549—GO693	30	2.32 —*
France	3	Air 100	59 —	26 4	200	507	GO549—GO676	30	1.84 37.5 *
	4	Breguet 901	57 —	23 —	165	448	——	33	2.15 40*
	5	Castel Mauboussin 71	47 —	23 9	150	——	GO 695 —NACA 230	—	3.28 56 *
Germany	6	Horten XVa	59 —	14 4	211	588	——	28.6	1.96 37.5
	7	Kranich III	60 —	29 10	221	426	——	27	2.15 —*
	8	Weihe 50	59 —	27 2	201	415	GO549 — M12	29	1.93 32 *
	9	HKS-1	63 —	28 2	200	680	NACA 65(215)714	30	—*
	10	L-Spatz	49 6	19 0	130	287	——	29	2.04 —*
	11	Bergfalke II	54 4	25 2	195	503	——	28.5	2.04 37
Great Britain	12	Olympia	59 —	25 4	163	550	GO 549 NACA 2,12	25	2.1 41*
	13	Type 37 Skylark	45 —	21 —	113	430	NACA 63_{3}-318 NACA 64_{3}-618	26.5	2.5 48 *
	14	Type 42	58 —	26 2	240	650	NACA 63_{3}-618 -NACA 4412	28.5	2.3 40 *
	15	Sky	59 1	25 5	180	560	GO 549 -NACA 2R,12	29	2.05 42 *
Switzerland	16	Moswey IV	46 4	20 9	—	383	——	30	2.22 42
	17	WLM II	59 6	24 10	189	542	——	33	1.96 40 *
U.S.A.	18	Prue 215	36 —	18 1	92	315	——	28	2.5 —
	19	RJS	55 —	19 4	—	—	NACA 63_{3}615 LAMINAR	—	——
	20	Schweizer 1-21	51 —	22 2	165	380	——	—	—— *
	21	Schweizer 1-23	43 10	20 9	149	380	——	24.6	2.45 45 *
U.S.S.R.	22	Stakhanovetz (KIM-2)	64 —	26 8	240	695	CAGI-R III	24.6	2.4 38
Yugoslavia	23	Triglav	49 6	27 7	146	372	——	—	— —
France	24	Fauvel	39 6	10 6	—	244	——	24	2.68 43
Yugoslavia	25	Orao	62 6	25 6	196	590	GO549—RAF34	—	1.92 42 *
	26	Kosava	63 —	27 1	232	—	——	—	—*

The above details are based on published figures or estimates.
***These aircraft will be competing in the Championships, though not necessarily for the countries listed.**


RUBBER BAND
DOWEL THROUGH C.G POSITION
HOOK ASSEMBLY TO MOVE FREELY ON SLIDE
SLIDE FIXED TO FUSELAGE.
SLOT IN FUSELAGE SKIN
B
TOWLINE
C
WIND
PIVOT
3/4"
1 1/2" DIA DISC
CLAMP
ENGINE UNDER TEST
BOLTS THRO' BENCH
D
HARD WOOD BEARERS DRILLED BOTH ENDS WITH VARIOUS COMBINATIONS OF HOLES TO ACCOMMODATE VARIOUS ENGINES.
BLADE IN FOLDED POSITION
KEY-HOLE SLOT
LOCKING PEG
RUBBER BAND.
LOCKING PEG THUS WITH BLADE OPEN.
K
A
LOCATING TONGUE
FIX TUBE TO FUSE.
PLATFORM
FENCE
FUEL CUT-OFF
TO TIMER
RUBBER BANDS THRO' FIN, OVER TAILPLANE L.E. TO DOWEL IN FUSELAGE.
HINGED PLATFORM BRACE
SPRING
B
A
C
WHEN FUEL IS CUT OFF, PLUNGER PUSHES THREAD(A) OFF HOOK(B) THIS ALLOWS SPRING TO PULL STRUT(C) CLEAR OF BOLT, AND TAILPLANE ASSUMES POWER OFF INCIDENCE.
BOLT(SCREWS INTO CAPTIVE NUT) TO ADJUST TAILPLANE INCIDENCE UNDER POWER
E
BUSH SOLDERED TO SHAFT AND THREADED TO TAKE NUT.
BOBBIN
NUT
HARD WOOD STRIPS
BASE
J
PLUG TO ADJUST LENGTH OF MEMBER
SLIDE STRIP UP TO STOP & CUT OFF
WINGS ATTACHED BY SHORT DOWELS & RUBBER BANDS
3/8 DIA DOWEL
F
RUDDER
UMBRELLA SPOKE SHARPENED TO FORM GOUGE
BUSH
RUDDER LEVER.
TAILWHEEL ARM
G
TUBE SOLDERED TO WIRES
WIRES FORMING FRONT & REAR OF STRUT
H
WING FIX HOOK
CUP WASHER SOLDERED ON
BEND UP TO FORM STOP
BUSH THROUGH BOTTOM OF FUSELAGE
TAILWHEEL ACTS AS PENDULUM

GADGET REVIEW

EACH YEAR sees fresh development in engine design to provide extra power per c.c. and the nett result is that for sheer contest work, the engine power is becoming more and more of a task to handle. Pendulum elevators, wing-warp trim, drag tabs, etc., are fairly familiar, but a two position elevator is a relatively neglected form of power control, mainly due to lack of confidence in such a scheme. In **A**, we have one such system which is tried and proven in New Zealand and has been used to good effect by Laurie Ackroyd. The tail-plane l.e. rests on a variable platform with up to ¼ in. range of up and down motion. Platform is cocked up for the power run and held in that position by a wire arm rather like those found on Elmic Timers. A shut-off valve of the spring loaded type is used to stop the engine *and* push off a thread or wire which extends forward from the tail and is spring or elastic tensioned to pull back the platform trip and allow the tail bands to pull the incidence down for glide. Trim, we are informed, is not over-critical for the power elevation, but of course the glide setting is very important.

B comes from Fleet in Hants, where G. M. Kennard suggests a towhook variation that has possibilities. The general idea is to stabilise the tow and avoid weaving or jerky climb on the line. A free sliding hook is attached to a slide bar, and elastic tensioned to a dowel at the C.G. position. In theory at least, the hook will always be "in-line" with the C.G., but a lot depends on the elastic tension. **C** is a useful "quickie" to make when the weather is too rough for flying and you've nothing on the board to finish. A simple wind indicator you can graduate easily and suggested by H. Blott of Newcastle.

Ingenious Ho Loon Shu from faraway Malaya sends his simple multi-fitting engine test mount for all to copy. A flat bench with two hefty bolts through it, a pair of metal or hardwood beams with all the various engine bolt spacings drilled through, and a flat clamp plate are all that are needed. In **D** the arrangement is obvious; all that needs to be done to change over engines, is to release the clamp, and switch the bearers around.

E is for the rubber fans, and like **K**, comes from Belfairs clubster, M. J. Pressnell. Dealing with the Bobbin gadget first, we have a method to prevent motors snaking around and up the prop shaft. It merely consists of soldering a brass bush onto the shaft, the Bobbin being placed over this and held securely in place with a nut on the threaded bush. Mr. Pressnell's other idea, K, is possibly of greater interest since it concerns the folder prop, now definitely in "full-fashion." It provides an effective means of locking a folding blade in the "folded" position, whilst also combining the idea of twisting the blade to fold against the fuselage. Drawing shows the keyhole slot which replaces the normal elongated round hole, and as will be seen, the "square peg in the round hole" will go into the slot by elastic tension.

Jumping back in the alphabet to **F**, we have J. H. Wilcox's suggestion for scale modellers who have difficulty in getting miniature gouges for scooping out gun troughs, etc. Just an umbrella spoke (you have to get an old umbrella of course!) stuck into a handle, ground and sharpened to make a very handy tool. **G** is another for the scale boys, and is yet one more to add to our fabulous collection of pendulum brainwaves. This is probably the best of the bunch in our opinion, though the scale subject must necessarily have a tailwheel or hefty tailskid to make it work, and that limits the field of subjects slightly. K. R. Woodford of Whitney actually first tried it with good measure of success in his sport flying A.P.S. Black Magic with Frog 250 and we commend it to others, for it utilises the practical crank leverage scheme and also provides a scalish castoring tailwheel for appearance. And why not use the same for ground steering a radio controlled model?

Still on the subject of the scale model, we have **H**, which is C. R. Plant's answer to the dihedral problem for strutted models. Basically it is a two-dihedral-position system, with an extendable strut to allow the wings to lift up when in flight. The sound of floppy wings may appal many a hardened aeromodeller: but we can offer every assurance that this will not have any effect on the stability, other than to improve same via increase of dihedral. Make a hollow strut with wire leading and trailing edges. In the "root" end, fit a short length of brass tube, and through this, pass a wire shaped as in the sketch. If as much as $\frac{3}{16}$ or ¼ in. movement is allowed, the dihedral will sweep up another 5 degrees or more to good effect.

Last of the sketches is **J**, from our regular gadgeteer George Woolls of Bristol. This time it's a spacer cutter with special application for parallel fuselages of the stick type where all the spacers are, or should be, identical in length. It only takes a couple of minutes to make and yet can save an enormous amount of time normally spent in trimming up and squaring off "free cut" spacer. Cement a couple of pieces of hardwood to an odd board so that the material to be cut for the spacers is a nice fit between them. Cut one spacer to correct length, slip between the guides and stop the end with a scrap plugging piece. Remove the master spacer, and go ahead, slipping in the square stock balsa and chopping away to your heart's content.

A 45" SPAN FLYING SCALE FREE FLIGHT POWER MODEL

RYAN. PT.-20.

DESIGNED BY
G. GANNON
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
38, CLARENDON RD. WATFORD, HERTS.

6/-

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.

MATERIALS REQUIRED			
24 STRIPS OF	3/32" X 3/16" X 36" MED.	12" X 6" OF 1/16" PLY.
1 " "	3/16" X 3/16" X 36" HARD	1 BALSA BLOCK 2 1/2" X 2 1/2" X 1"
2 " "	3/16" X 1/2" X 36" MED	1 LENGTH OF 14 S.W.G. PIANO WIRE
2 " "	1/4" X 1" X 36" "	5' " 14 " TUBING.
1 SHEET "	1/16" X 3" X 36" "	5" X 4" OF CELLULOID SHEET
2 " "	1/16" X 3" X 36" SOFT	6" OF 1/8" DIA DOWEL
2 " "	1/16" X 3" X 36" MED	2 HARDWOOD BEARERS 1/4" X 3/8" X 6"
1 " "	1/32" X 3" X 18" "	2 WHEELS 1" DIA
1 " "	1/2" X 1" X 24" SOFT	3/8" "
12" X 8"	1 M.M. PLY.	MILLINERS ROUND ELASTIC

SMALL HOLE SEWN & GLUED

PLY LUGS GLUED TO PROFILE TO SECURE COWLING USE SMALL WOODSCREWS SCREWED THROUGH PLY & INTO LOWER COWLING.

TO SET AT THIS SCREW DRILL SMALL HOLE IN TOP OF COWLING

METHOD OF SECURING TOP COWLING ON ORIGINAL MODEL

A SMALL HOLE IN TOP HALF OF C.S.

ALTERNATIVE METHOD OF SECURING TOP COWLING.

TOP COWLING

ATTACH PIECE OF 3/16" X 1/8" HARD BALSA ACROSS COWLING AFTER SEWING IT HALF PRESS STUDS INTO POSITION SINK STUDS SLIGHTLY INTO BALSA.

BOTTOM COWLING

FEMALE HALVES OF PRESS STUDS.

2 SMALL DOWELS

PAPER TUBE FOR BRACING WIRES

DETACHABLE TOP COWL PLANKED WITH 1/16" SHEET.

ADD 1/8" SQ EACH SIDE AFTER PLANKING SAND HALF ROUND

NOTE: HEAVY LINE ENCLOSES AREA TO BE PLANKED WITH 1/16" SHEET

1/16" SHEET PROFILE

F1 F2 F3 F4 F5 F6

WINDSCREEN SECTION.

1/16" SHEET GLUED BETWEEN BASIC STRUCTURE AT F3 ONLY

1/16" DIA SPINNER

NOSE BLOCK CARVED FROM HARD BLOCK. HOLLOW OUT TO SUIT ENGINE. DRILL HOLE IN BOTTOM FOR ACCESS TO COMPRESSION SCREW

PLANK LOWER FIXED COWLING FROM C6-C8 WITH 1/8" X 1/4" STRIPS. ALTERNATIVELY COVER WITH 2 LAYERS OF 1/16" SHEET

F1 F2 F3,F4,F5

SECTION OF HEADREST BLOCK

THIS EDGE AT F3 ONLY CEMENT TO FRONT OF C.S.1.

SIDE PIECES & BOTTOM OF F3 FROM 1/16" SHEET.

1/16" SHEET PROFILE

CUT HOLE FOR DRAINAGE

OIL SPRAY DEFLECTOR

1/4" X 1/4" HARD BRACING STRUT GLUE TO LONGERON & TOP OF C/S

SOFT BLOCK GLUED TO FLATS UNDER C/S SPARS & SANDED TO SHAPE. FIX WIRE LOOP UNDER CS2 FOR U/C BRACE WIRES TO PASS THROUGH

NOTE: IF HAND LAUNCHING IS ESSENTIAL PLANK BETWEEN SIDE STRINGERS FROM F4-F7.

NOTE: BASIC FUSELAGE FROM 1/16" SHEET SHOWN GRAINED. LONGERONS ALSO SERVE AS STRINGERS.

SOFT BLOCK SEE F4 FOR SECTION

AFT STRINGERS 1/16" SQ

1/16" SQ STRINGERS FAIR INTO 1/16" SHEET AT REAR. COVER WITH 1/16" SHEET AFTER COMPLETE ASSEMBLY

F3 GLUE TO F2 IN TAILPLANE

1/16" SHEET GUSSETS

PAPER TUBE FOR RUBBER BAND

T1 GLUE TO BASIC STRUCTURE

WASHER

1/16" DIA WHEEL

1/16" SHEET

ALL GUSSETS 1/16" SHEET

1/16" X 1/4" L.E.

1/16" SQ RIBS 1/16" SHEET

1/16" X 1/2"

COPPER FOIL HINGES PUSH INTO FIN & TRIM TAB EDGES WITH PINS

1/16" SHEET TRIM TAB

1/16" SHEET GLUE TO FIN & F5

1/8" X 1/4" GLUED TO FUSELAGE FAIR BOTTOM SIDE STRINGER INTO 'T' & SAND REAR TO FAIR INTO FIN

1/16" DIA DOWEL & 1/16" SHEET GUSSET

NOTE: AFTER CONSTRUCTING FIN GLUE TO TOP OF F3.

GLUE STRIPS

9 RED & WHITE ALTERNATE HORIZONTAL STRIPES

F6 F7 F8 F9

F10 F11 C5 C6 C1 C2

PART ON THIS LINE

DEVELOPMENT OF WINDSCREEN

NOSE BLOCK

C1 C2 C3 C4 C5

PLAN VIEW OF TOP COWLING

1/16" SHEET PROFILE

1/16" SHEET GLUED TO SIDES OF BEARERS

3/16" SQ HARDWOOD BEARERS

HOLES FOR MILLS 75 & 6

PAPER TUBE

SIDES OF F3 FROM 1/16" SHEET

POSITION OF U/C TUBE. BEND TO SHAPE DO NOT CUT U/C SLOT IN PLY SPAR.

BOTTOM ONLY

BOTTOM ONLY

ALL C/S SPARS FROM 1/16" SHEET. ADD 1 M.M. PLY TO CS2 & CS3. IT IS IMPORTANT THAT C/S SPAR ANGLES ARE CUT ACCURATELY AS THEY GIVE CORRECT DIHEDRAL ANGLE OF APPROX. 2 1/4°

CS1 CS2 CS3 CS4

1/8" BASIC FRAME

CS6

T1

BRACING WIRES

TROUSER FORMER.

TUBE BOUND TO CS3 TO TAKE U/C LEG.

WIRE LOOP UNDER CS2

RUBBER BANDS PASSED OVER DOWEL & AROUND BRACING STRUT.

BRACING WIRES

BRACING WIRES FROM 1/16" DIA WOVEN COVERED ELASTIC FITTED WITH HOOK

WIRE LOOP RIGHT THROUGH L.E.

SKETCH OF U/C CONSTRUCTION

COLOUR SCHEME
FUSELAGE SILVER
WINGS & TAIL YELLOW
BLACK LETTERING

IF REMOVAL OF WHEELS DESIRED, EDGE COVER WITH 1 M.M. PLY & SEW & GLUE ON PRESS STUDS. OTHER HALF OF PRESS STUDS GLUED TO SPAT

C3 C4 C5 C6 C7 C8

SLOT FOR TONGUE IN 1/16" SHEET & PLY RIBS

WHITE STAR ON DARK BLUE OUTER CIRCLE. INNER CIRCLE RED.

WING TONGUE 2 OFF 1/8" PLY

FORMERS
C1 1/16" SHEET.
C2-C8 1/16" "
F1 & T1 1/16" "
F2-F10 1/16" "
T2-T5 1/16" "

WING RIBS
W1 4 OFF 1/16" SHEET
W2 2 " 1/16" "
& 1/2" 1 M.M. PLY TO COMPLETE SHAPE
W WING SECTION WITH SLOT FOR TONGUE

T3 T1 T2

1/16" SHEET SIDE COVERS

SPATS MAY BE MADE 1/4" LESS IN WIDTH TO SCALE IF WHEEL REMOVAL UNNECESSARY.

SECTION A-A OF SPAT

TROUSER FORMER 1/16" SHEET

BEND LEG TO PLY

1/8" DIA DOWELS

1/8" X 3/16" EACH SIDE

1/16" PLY CENTER

WIRE LOOP FORMED FROM PAPER FASTENER

1/16" SHEET IN CENTRE AT REAR

2 OFF TO THIS OUTLINE FROM 1/16" SHEET.

2 OFF TO THIS OUTLINE FROM 1/16" SHEET.

2" DIA WHEELS.

COVER LEG TO TOP OF SPAT WITH 1/16" SHEET

BEND HERE

FAIRING

1/16" SHEET

1/16" SHEET

1/16" SHEET L.E.

1/16" SHEET TOP & BOTTOM

SLOT IN SHEETING FOR T2

1/16" SQ STRIPS

1/16" X 1/4" RIBS TOP & BOTTOM GLUE TO L.E. SPAR & T.E.

1/16" SHEET TIPS

T4 T2 T1

TO FIT OVER T2

TO FIT OVER T1

SLOTS TO FIT OVER 1/16" SQ.

1/16" SHEET

1/16" X 1/4" STRIP RIBS

SPAR

1/16" SQ

MUNSPAR 1/16" SHEET.

SKETCH OF TAILPLANE RIB CONSTRUCTION. BUILD ABOVE LINE ON PLAN. LIFT TAILPLANE FROM PLAN & ADD BOTTOM OF MUNSPAR & BOTTOM RIBS.

T4 SOLID RIBS 1/16" SHEET 2 OFF.

TRUE LENGTH OF 14 S.W.G. U/C LEG

POSITION OF BRACING STRUT

PLY FACING RIBS

SMALL DOWELS

GLUE BOTTOM OF F3 TO CS1

TAPER SPARS OFF INTO TIP

WING TIPS 1/16" SHEET.

3/16" X 1/8" L.E.

1/16" SQ SPARS

PAPER CLIP WIRE LOOPS TO TAKE TOP & BOTTOM BRACING WIRES

1/16" SHEET GUSSETS

HARD 1/16" SHEET TONGUE DO'H BEND SECURELY & PACK TOP & BOTTOM WITH SCRAP

AILERON OUTLINE

1/16" X 1" T.E.

FLAP OUTLINE

1 M.M. PLY FACING CS2

1/16" SHEET TOP & BOTTOM TO BUTT AGAINST FUSELAGE SIDES

SCRAP BALSA TOP & BOTTOM OF TONGUE & AROUND U/C TUBE.

1 M.M. PLY FACING CS3

CS4

CS6

ALL T.E. GUSSETS 1/16" SHEET.

W1 W2

WASHOUT BOTH FLAPS BY SANDING REAR EDGE 1/16"

1/16" SHEET FLAPS.

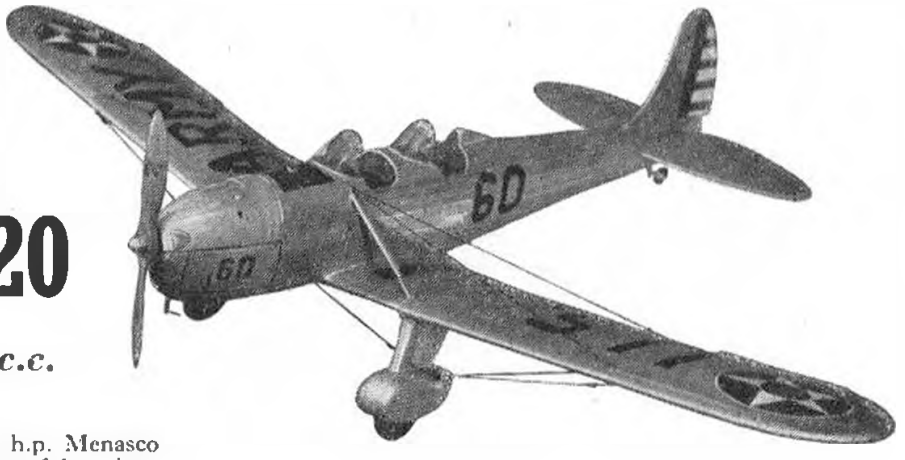
PUBLISHED AEROMODELLER AUGUST 1954. PSP 334

Geoffrey Gannon's

1½ ins. = 1 ft. Scale

RYAN PT-20

Free Flight for ·75—1 c.c.



THE RYAN PT-20 trainer with a 125 h.p. Menasco in-line engine was one of the most popular of American Service aircraft. More than 200 were built in 1940, and until 1942 their silver fuselages and yellow wings and tail assemblies added colour to their already distinctively attractive lines. After 1942, colouring was all-silver, and the PT.20 saw service with the U.S. Army and the Dutch East Indies Government.

The model by Geoffrey Gannon for a Mills ·75 is not a beginner's project; but it is certainly a proven example of a low-wing scale model that flies well in all conditions and possesses remarkable stability.

Fuselage.—Build the two skeleton sides over plan and join with cross pieces to give a simple box fuselage. Formers and bulkheads are then added.

Next fit in the engine bearers, carefully checking that they protrude the correct amount from F.1, then drill bolt holes. 8 B.A. bolts are used so that the engine can be just slightly adjusted for side thrust. The stringers can now be placed over the fuselage formers standing 1/16 in. proud of rear cockpit. Where wing centre section joins fuselage a space will be left until that part is fitted.

Bottom cowl bulkheads should now be built on to bearers and ⅜-in. pieces fitted to bearer sides, this can then be sheeted with a double thickness of 1/16-in. or planked with ¼ in. × ⅛ in. cutting in drain hole and compression screw hole. The formers for the removable top of cowl can be placed on the plan in position and sheeted while pinned down with 1/16 in. sheet. The rest of the fuselage should not be sheeted until the centre section has been built on to the fuselage, but this has first to be built with the wings.

Wings are built one at a time integral with the C/S spars. Pin left half wing to plan in following order: Bottom ⅛ in. sq. spars, ribs, T.E., L.E., and top ⅛ in. sq. spars. Into this build the lower half of tongue box. Next pack 1/16 in. sheet temporarily where stub wing ribs and C.S. spars will be, slide in C.S. spars with tongue attached to the appropriate pair, glue C.S. spars and C.S. ribs when it is seen that the tongue lies flat on the lower tongue box former. Care must be taken not to get cement on the tongue and the sides of the two adjoining ⅛-in. ribs. The rest of the box may now be built round the tongue making sure that the sheet sandwiches the tongue fairly tightly; use scrap balsa to build box top to height of top spars. The C/S spars have had the centre part and right hand stub wing part raised off the plan, so when the left wing half has been finished, tips, etc., added, the L.E. and T.E. can be slit by the two adjoining ribs as on plan and the tongue slid out of the box. The right wing is then built in the same manner.

The U/C tubes should be sewn to the correct C/S spar as shown on plan, making sure that they are flush with spar bottom. The C/S can now be joined to the fuselage and sheeted along with the rest of the fuselage, after first placing the ⅛-in. sheet on the bottom of stub wing to reinforce the U/C tube and where the U/C top will connect. Check at this stage that washout flaps are raised evenly.

Bracing wire tube of brown paper and ¼ in. × ⅛ in. hard bracing spar can now be added also the loops of wire on each side of the wings.

Cut out the ply undercarriage formers and the block and sheet parts. Stick on the block formers at each side, bend 14 s.w.g. wire to shape and bind firmly to the rear of ply former allowing wire to pass through the gap at the rear, then fill in this gap with ⅛-in. sheet as on plan. Glue on trouser formers and attach the bracing wire loops to main ply former then sheet the sides leaving loops protruding through, it is advisable also to fasten the small dowel to ply former before sheeting. The small fairings may now be added to bottom of trouser and the whole sanded off to streamline shape. The only fixings to the wings are the wire arm into tube and the rubber band on to dowel, the rubber bracing wires being mainly for the wing attachment.

The fin is made flat on plan and should not cause any difficulty, do not add the short stringers until mounted on tailplane and platform The tailplane itself is made practically flat on plan.

After sanding well and fitting details such as windscreens, cover fuselage with heavyweight tissue and flying surfaces with lightweight. Water shrink, two coats clear dope, one coat coloured dope (preferably sprayed on with mouth diffuser). Add lettering and insignia then give a coat of fuelproof all over, paying special attention to inside the cowl.

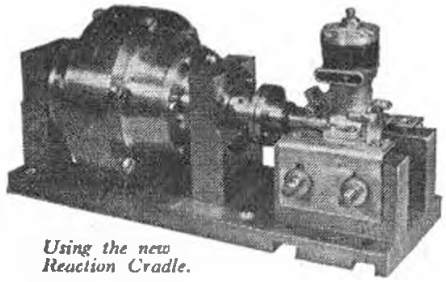
Trimming.—If built as plan the model should balance at the C.G. given, so only add ballast before trying glide if it seems essential. Once ballast is correct the model should have a good flat glide with the tailplane at about 2 degrees negative; it is inadvisable to have the tailplane at more than this, as a stall may result under power owing to non-lift tailplane. First power trial should be in the nature of a taxi-ing run on a drop of fuel to ensure that it is travelling straight for about 20 feet. Trim tab should be offset about ⅛ in. to starboard. The prototype had a long realistic take-off run and a steady flat climb left turn, and which should be aimed at for both realism and safety. Lastly find your best prop. size for full revs., the size should be 9 in.×4 in. if your engine will perform well with it, and no less than 8 in. × 4 in. should be necessary.

Full Size Plans of this 1/5th Scale reproduction are available from A.P.S. price 6/- Post Free.

ENGINE ANALYSIS

By Ron Warring

THE ALLBON "BAMBI"



Using the new Reaction Cradle.

THE "BAMBI" is one of the most fascinating engines yet received for test—quite orthodox in appearance and construction and yet opening up entirely new fields in aeromodelling by virtue of its tiny size.

Nominally ·1 c.c. capacity, bore has been enlarged on the finalised production version to give an actual displacement of ·15 c.c. which makes it the smallest model engine in the world ever to go into quantity production.

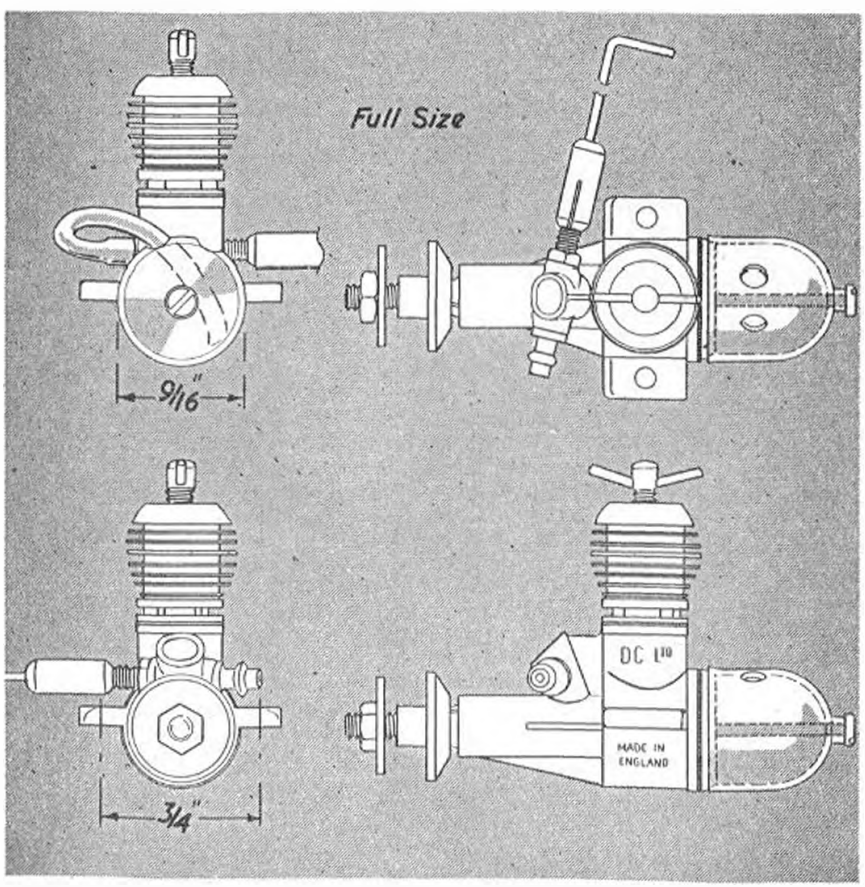
Normally scaling down an engine size to this order cannot be achieved without some snags, and the "Bambi" cannot be mass-produced like the larger engines. Each production motor needs a much higher proportion of individual attention so that the resulting manufacturing cost (and therefore the final retail price) exceeds that of the majority of larger working "machinery" which is almost entirely free from operating snags.

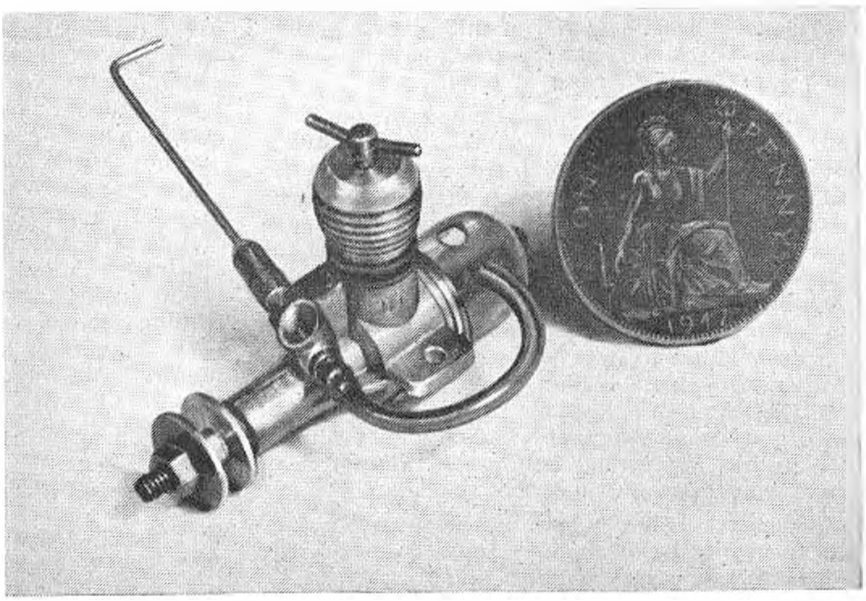
This test report is based on experience with two separate engines both bench run extensively to gain familiarity with settings and control (and to give each a proper running-in period) and both subsequently used for flight and static torque tests. With this protracted programme as a background we would say that the "Bambi" will probably, and unfairly, be classed as difficult to start.

The "Bambi" is *not* difficult to start. Once the approximate running settings have been found for needle valve and compression it is easier to start than a lot of larger engines. However, *finding* these particular settings in the first place may prove a tricky, tedious process. On this score we would hesitate to recommend a "Bambi" for a relatively inexperienced power modeller *unless the engine was first set up at the correct running position* and he was told to keep the controls within half a turn of these settings.

Due to its extremely small displacement the "Bambi" lacks the normal "feel" of a diesel and so there is no positive guide as to the approximate compression setting. The main thing to avoid at this stage is flooding the engine and the only "priming" necessary is finger choking until the fuel line to the spraybar is completely full of fuel. One should then flick and continue to advance the compression until either the engine fires or shows signs of "hydraulicing." If the firing consists of the propeller rocking backwards and forwards, then either the compression is too far advanced or the engine is rich. The fuel level in the tank will show how much fuel has been used up. Unless badly flooded, releasing the compression up to half a turn will give normal running. If the fuel level in the tank shows little change, decrease compression and open the needle valve.

Once the running settings have been established, starting technique follows, simply: finger choke to fill fuel line, slacken off compression one-quarter to one-third of a turn and flip smartly. The motor should start almost right away when you can smooth out the "miss" by advancing the compression again. Never turn the compression back more than half a turn past the normal running position and starting troubles should be eliminated.





Actual size photo (right) gives comparison of size with penny.

Some other practical points with regard to starting are: Lock the propeller at a "ten-to-four" position and *hit* the upper blade smartly with the finger. The faster you can spin the propeller over the better. If you are using a propeller which allows the engine to run at a high speed (say 12,000 r.p.m.) it may be an advantage to start with the needle valve open an extra half turn. Close down when running and adjust compression for optimum running.

Instead of finger-choking to prime, a short length of fuel tubing slipped into the filler hole in the tank and blown into primes the fuel line immediately. Alternatively, if finger-choking produces little but air bubbles in the fuel line, look for air leaks—quite possibly a cracked tank. We actually cracked two tanks on test—one during flight tests and one bench running. A crack of this type can be repaired by cleaning the tank thoroughly in petrol, or, preferably ether, and "welding" with acetone.

The right fuel also makes a lot of difference as regards straightforward starting. Our first bench runs were made with Mercury No. 8. The AERO-MODELLER staff running a similar engine expressed a preference for Mercury No. 6. There appeared little difference between the two, but both were improved by the addition of about 10 per cent. ether. The special diesel fuel marketed by Davies-Charlton proved the best and its recommendation by the manufacturers is endorsed by our tests.

Control response of the "Bambi" is excellent. Although the range of compression setting over which the engine will run is fairly critical (about a half turn), it will continue to run easily over almost the whole of this range, making final adjustment simple and unhurried. Needle valve control is not very critical, but for maximum speed should be closed down as far as possible, without starving the engine out. Properly adjusted, running is smooth and consistent at all speeds, a maximum figure of 16,000 r.p.m. being achieved on test. Peak power appears to be delivered around 12,500 r.p.m. A possible cause of inconsistent running is that the cylinder jacket may have unscrewed itself slightly which is easily checked and retightened.

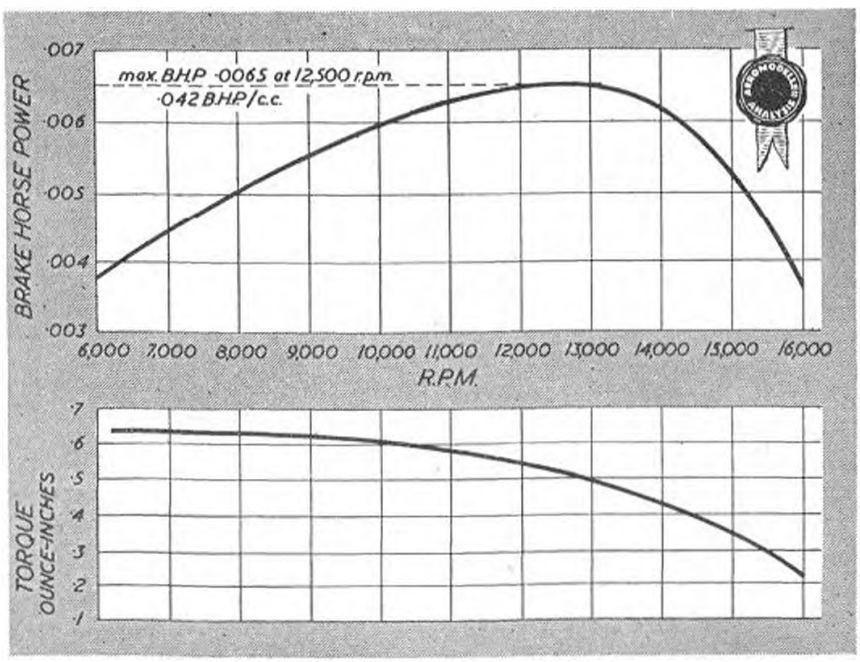
Flight tests got off to a disappointing start. Using a recommended size of wooden propeller, thrust was so low as to produce nothing better than

DAVIES CHARLTON "BAMBI"

Displacement: 0.150c.c. .009 cu. in.
Power rating: .05 B.H.P. per c.c.
Bore: 7/32 in.
Stroke: ¼ in.
Bore/stroke ratio 7 in.
Bare weight: ½ ounce (less propeller, including tank and fuel line).
Mounting: beam (½ inch centres; 8 B.A.).

Material Specification.
Crankcase: LAC 112A.
Crankcase bearing: Plain.
Cylinder: Nickel Chrome Steel.
Cylinder jacket (integral head): Duralumin.
Contra-piston: Nickel Chrome Steel.
Connecting rod: Nickel Chrome Steel.

Manufacturers.
Davies Charlton Ltd.,
13 Rainhall Road, Barnoldswick, via Colne, Lancs.
Retail price: £5 8s. 11d.



a powered glide. The pitch of this propeller, subsequently checked, was approximately one inch and r.p.m. figure in excess of 14,000.

Changing over to a metal propeller, an immediate improvement was realised. Maximum thrust appeared to be obtained by twisting the blades to a relatively coarse pitch, slowing the engine r.p.m. down to 10,000. In calm evening air this gave a 2-oz. 45 sq. in. cabin model a rate of climb of the order of 250 ft. per minute. The model was actually flown on a full tank each time, with a total engine run of around 1 min. 40 sec. average, reaching a height of about 400 feet by the time the engine cut. Further adjustment of pitch in either direction cut down the climb drastically so that the model would virtually cruise around in horizontal flight, gaining, perhaps, no more than twenty or thirty feet of height over the whole power run.

A metal propeller is supplied with each engine and the propeller backplate modified accordingly to accommodate such a "thin hub."

Model Design

As to model sizes, there appears to be conflicting schools of thought on the subject. Personal preference is for a small model, lightly built, but which by virtue of using a reasonably large pitch on the propeller, can be flown at a fair speed. A 50 square inch wing with orthodox "cabin" proportions seems excellent. Such a model will then still battle its way around quite successfully in winds, although it may need trimming out more undercleveated (than for "Calm" weather flying).

A larger, light model, on the other hand, built on the principle of aiming at a low flying speed to match up with a fine pitch propeller (higher engine r.p.m.) is unlikely to perform satisfactorily in anything but calm weather. Even then its rate of climb will be lower than its smaller counterpart, although its glide may be better.

For the purpose of torque testing, a reaction cradle was employed. It was impossible to utilise the dynamometer for this sub-miniature engine size, average torque being only of the order of one-half ounce/inch. The smooth, consistent running of the "Bambi" made it readily possible to obtain typical torque values over a range of speeds from 9,000 r.p.m. up to 16,000 (representing a change in torque output of nearly 300%) each of the spot readings obtained blending into a smooth typical curve.

The brake horsepower curve derived from these readings shows a steady rise to a reasonably flat peak. Maximum B.H.P. of ·0065 at 12,500 r.p.m. represents an increase of less than ten per cent. on the B.H.P. developed at 10,000 r.p.m., thus justifying the use of a high pitch propeller for flying, as previously mentioned. Beyond peak B.H.P. the fall-off in power is much more marked with increasing r.p.m.

Although the maximum B.H.P. figure obtained may seem small—only six and a half thousandths—it is actually consistent with the "average" figure for an engine of larger size. In other words, the ratio B.H.P. per c.c. displacement is very good, especially taking into account that efficiencies tend to fall with decreasing engine sizes.

Our unreserved recommendation to all power model enthusiasts—save up and buy one. A "Bambi" will give you hours of fun.

PROPELLER PERFORMANCE DATA.

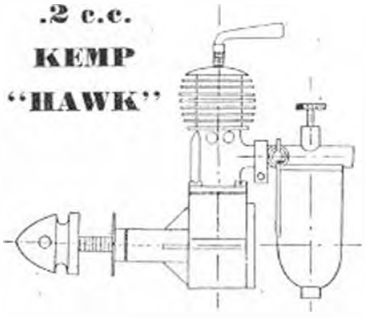
PROPELLER pitch	dia.	r.p.m.
4	x ! (wood)	14,500
4	(metal)*	10,000—12,000

* Pitch of metal propeller adjusted to give maximum thrust. On the basis of flight tests a metal propeller is recommended 4 in. diameter and ½ inch blade width. Adjust pitch by trial and error for best model performance. This setting will be fairly critical for maximum climb. Actual performance will vary with the size and weight of the model. A wing area of 50 sq. in. is recommended with a maximum total weight (including motor) of 2 ounces. Best climb will then probably be achieved with pitch adjusted to give a motor speed of about 10,000 r.p.m.

Fuel used in all tests: Davies Charlton diesel fuel.

.2 c.c. KEMP "HAWK"

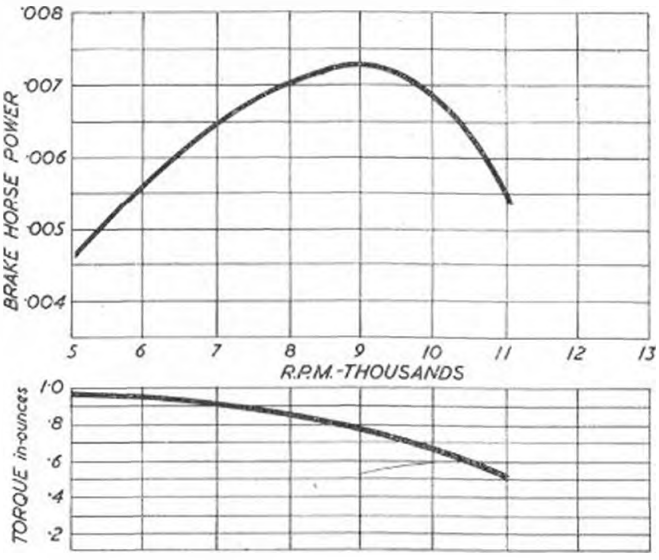
Previous test: June, 1952



Specification

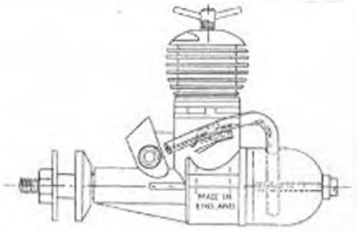
Displacement: .246 c.c. (.015 cu. in.)
Bore: .247 in.
Stroke: .3125 in.
Weight: 1 ounce
Max. B.H.P.: .0073 at 9,000 r.p.m.
.03 B.H.P. per c.c.

Although the Kemp "Hawk" is no longer in production, performance figures make an interesting comparison with the "Bambi." The "Hawk" was a sideport engine, and hence maximum r.p.m. is somewhat lower than modern standards. Maximum power is developed at only 9,000 r.p.m. and the engine is not too happy when forced to run at higher speeds.



ENGINE ANALYSIS (Revised)

ALLBON "DART" .5 c.c.

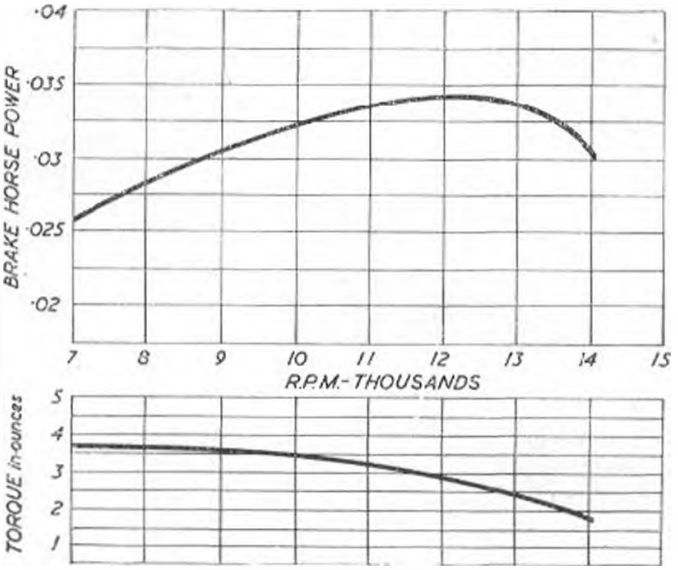


Specification

Displacement: .55 c.c. (.0036 cu. in.)
Bore: .350 in.
Stroke: .350 in.
Weight: 1¼ ounces (with tank)
Max. B.H.P.: .0342 at 12,350 r.p.m.
.062 B.H.P. per c.c.

The most powerful of our half-c.c. motors, the "Dart" is also somewhat larger than its contemporaries. A real work-horse of an engine, thoroughly to be recommended for all types of models. Performance is noticeably improved with Allbon ready-mixed fuel.

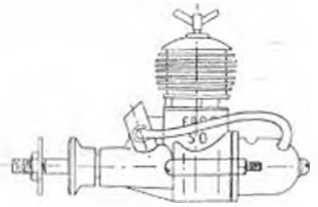
Previous test: April, 1953



FROG "50" .5 c.c.

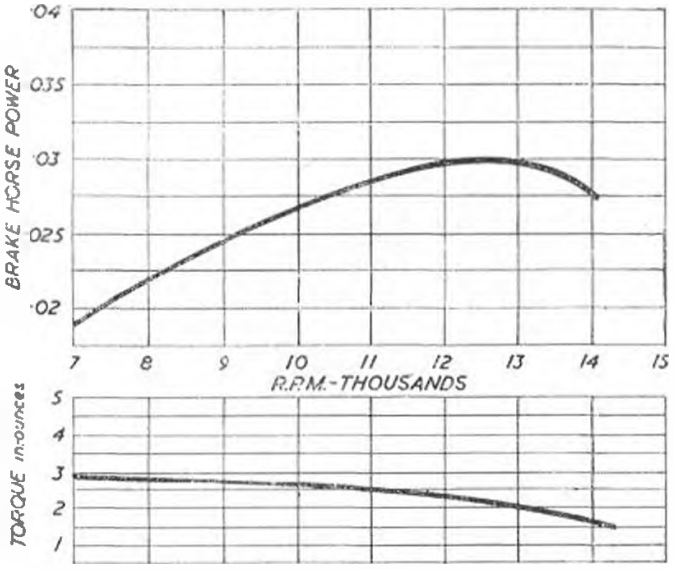
Specification

Displacement: .499 c.c. (.0305 cu. in.)
Bore: .343 in.
Stroke: .330 in.
Weight: 1¼ ounces (with tank)
Max. B.H.P.: .031 at 12,600 r.p.m.
.06 B.H.P. per c.c.

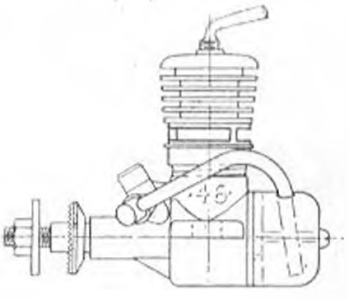


A compact little engine, the test subject was re-checked after several hours' flying time, virtually duplicating the original results achieved. Bad point is the hook-shaped needle valve end. Close up to prevent it snagging the fingers when starting.

Previous test; August, 1952



E.D. "BABY" .46 c.c.

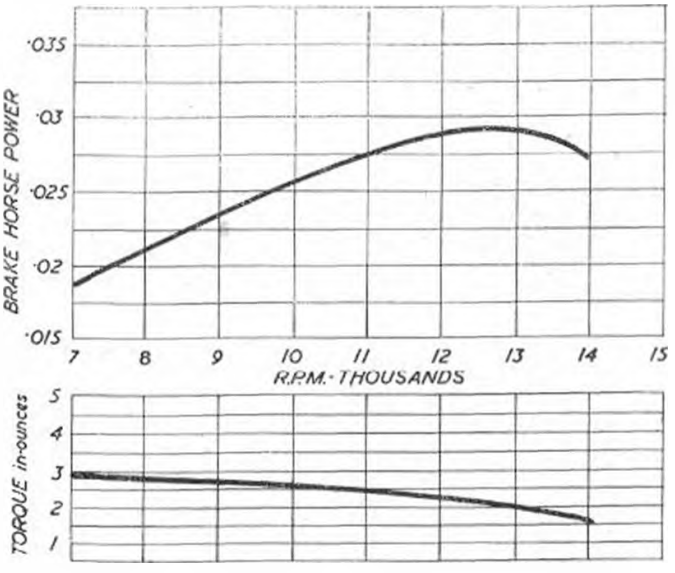


Specification

Displacement: .0471 c.c. (.028 cu. in.)
Bore: .3125 in.
Stroke: .375 in.
Weight: 1.4 ounces (with tank)
Max. B.H.P. .0289 at 12,800 r.p.m.
.061 B.H.P. per c.c.

Ruggedly built, the E.D. "Baby" is essentially a high speed engine and is not happy running below about 8,000 r.p.m. As supplied new, production engines tend to be stiff. The check engine "off the shelf" was run-in for thirty minutes with an electric drill before firing. Initial starting improved.

Previous test: June, 1952



AIRCRAFT DESCRIBED NO. 62

The Chilton D.W.1a

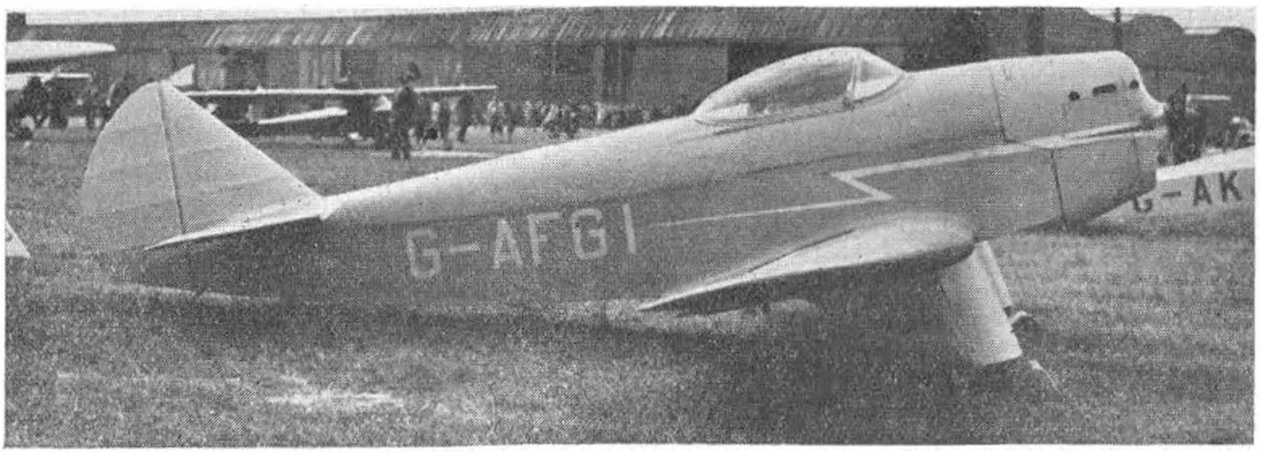
BY G. A. CULL

A gem among British aircraft is the Chilton D.W.1A sporting and racing monoplane; there is little in these views to indicate exactly how diminutive it is. On the left, the D.W.1a's bold lettering is shown relieving the very high gloss finish which contributes a lot to this low-powered racer's performance. (Photos by courtesy of "Flight" and Chilton Aircraft." Below, G-AFGI photographed in 1950 after being given a "fighter" teardrop hood by Lt.-Cdr. Sproule. 1/72nd "J" type reprints of the drawing (right) and 1/36th "K" type dyeline prints are available price 6d. and 1/- from the A/M Plans Service.

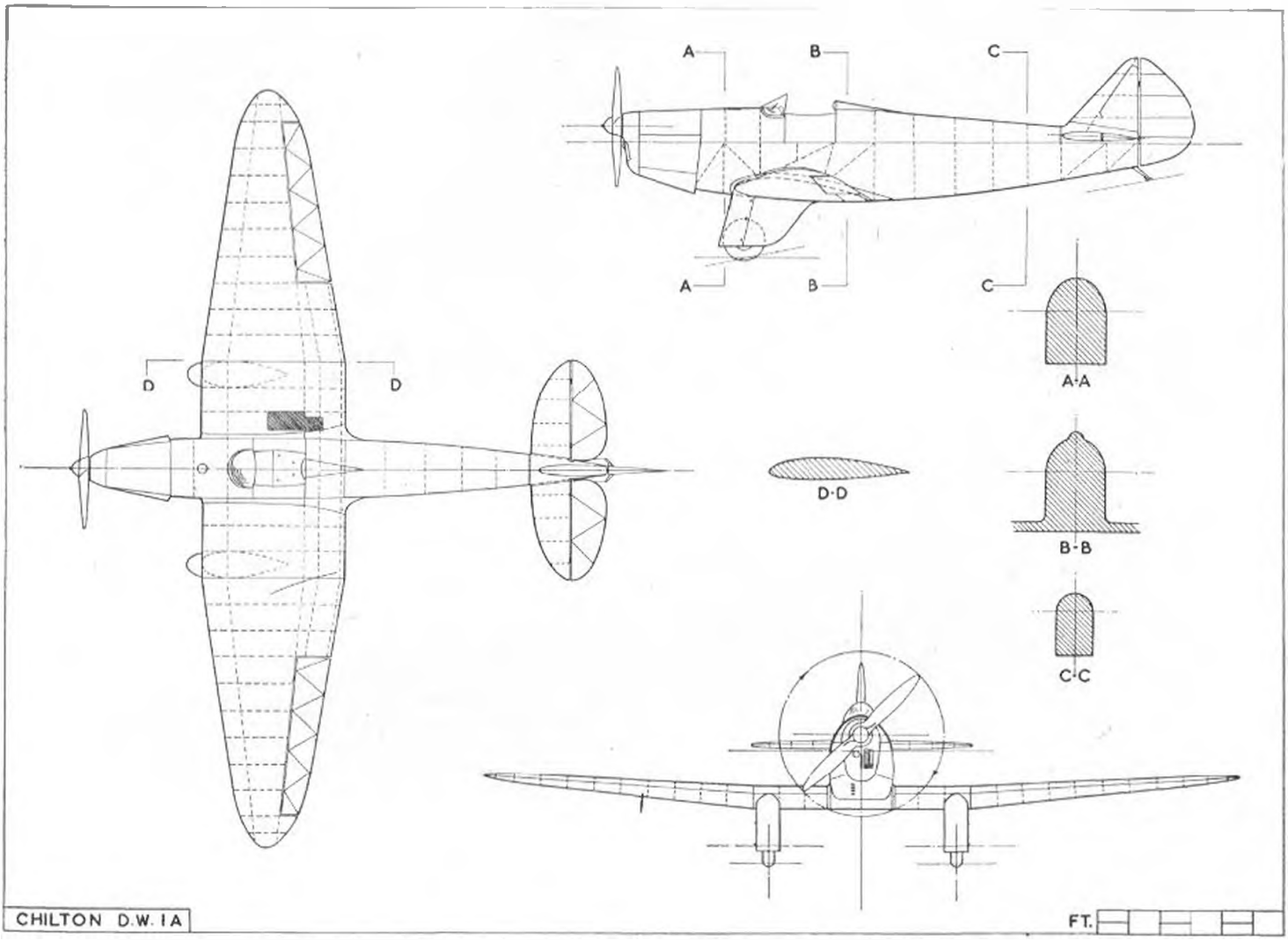
WHEN the first Chilton monoplane flew in 1937 its makers' aim to produce a "real aeroplane in miniature" was well and truly realised, for here was a fully aerobatic single-seater which could attain 112 m.p.h. and cruise at 100 m.p.h., all on a mere 32 h.p. The engine was a converted Ford 10 unit and, in those days, resulted in ½d. per mile running costs and 60 miles per gallon. The late Hon. A. W. H. Dalrymple and A. R. Ward were responsible for this remarkable little aeroplane and their names contributed the "D.W." to the Chilton's designation. Three Carden-Ford D.W.1's were built and registered: G-AESZ, 'FGH, and 'FGI.

These became well known, but were eclipsed in every way by the little known D.W.1A which beat the outbreak of war by a scant two months. In early 1939 a French 44 h.p. Train 4T (4 cyl.) engine was installed in a new airframe to make the D.W.1A G-AFSV. Thirty pounds lighter than the Ford and more powerful, the Train was definitely an aero engine and so made 'FSV an even more *real* aeroplane in miniature with a fighter-like performance. The lighter engine meant a longer nose and to balance this area the fin was enlarged with a rounded top replacing the elfin-like point of the Ford versions. FSV's racing lines contrasted with the blunt-nosed D.W.1, and were enhanced by a fitting colour scheme similar to that of the T.K.2 racer, reflecting its creators' D.H. Technical School background. On August 5, 1939, Dalrymple flew the new Chilton to victory in the Folkestone Trophy race at 126 m.p.h.—10 m.p.h. faster than anyone expected!

The Train engine still had power in hand, but the war intervened and prevented this from being put to further good account. Since the war, 'FSV has occasionally raced, but without its original racing finish nor absolute maximum power being obtained, the pre-war performance has not been bettered although a little serious preparation would ensure a still higher speed without doubt. However, in 1948 the 100 km. Closed Circuit record was taken



(Photograph by G. A. Gull).



at 124 m.p.h. with Sqdn./Ldr. Porteus in charge. In 1950 'FSV was stripped and rebuilt by the Chelsea College of Aeronautical Engineering at Redhill, and a development known as the "Chelsea Chilton" was designed by the students. It is hoped that this machine will be built as soon as a suitable engine, possibly a 51 h.p. Zundapp, has been obtained, and other differences include a higher aspect-ratio fin, wheelbrakes and tailwheel.

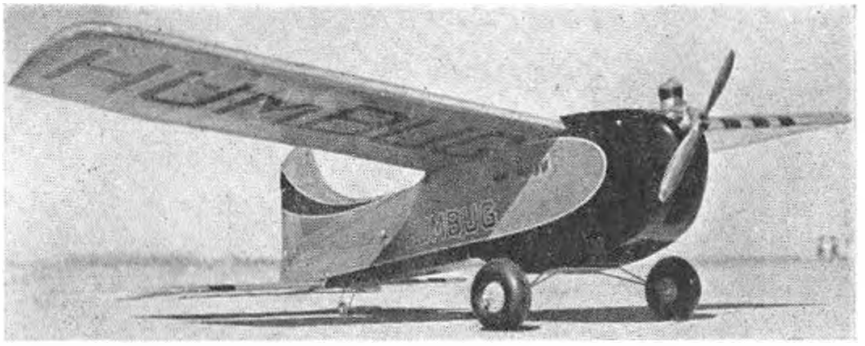
Since the war the Ford Chilton 'FGI has earned considerable fame by winning the 1951 South Coast Air Race. To achieve this Hugh Kendall really went to work on the Chilton to push the top speed up to 130 m.p.h. Numerous modifications were made, among them the fitting of smaller Olympia sailplane braked wheels, racing propeller and motorcycle carburettor.

But for the war, the Chilton D.W.1A would have been produced for £375 at Hungerford, where, despite a rough surface and landing run under 400 yards, the Chilton's split flaps and lively performance enabled regular flying with room to spare. Unfortunately, the engine manufacturers did not survive the war and so 'FSV remains unique, but although the Chiltons first flew seventeen years ago, their performance remains unsurpassed, a fact accentuating the inactivity which has prevailed in the ultra-light field. Although belonging to this weight and power class, the Chiltons are on a plane above the usual run of ultra-lights for they have none of the slow, unrefined and even crude characteristics that the term implies, and it is fortunate that the remaining three Chiltons have a great deal of life in them yet.

Specification: D.W.1A. Span: 24 ft. 0 in. Length: 18 ft. 9 in. Empty Weight: 380 lb. Loaded weight: 650 lb. Wing Area: 77 sq. ft. Max. Speed: 135 m.p.h. Cruising speed: 115 m.p.h. Landing Speed: 35 m.p.h. Initial Climb: 1,000 ft. per min. Range: 400 miles.

Construction: All wood. Fuselage is a conventional spruce box structure with decking and covering of ply. Wing has two box spars with ply covering back to the rear spar. Ribs have spruce outlines with ply webs, split flaps are manually operated and are in three sections. Tailplane is ply covered as is leading edge and root bay of fin. Remainder of fin and all control surfaces are fabric covered. All controls are internally operated except rudder which has external horns. 8½ gal. petrol tank under front decking and extra 4 gal. tank may be fitted behind seat for racing. Two luggage lockers also behind pilot.

Colour: Glossy black overall with white trimmings consisting of flash on cowling and white tips to wings, tailplane and fin and rudder. Lettering is also in white and on wings extends across whole span.



Internationally known Claude McCullough has a new heavy-weight r/c model, Humbug with Torp 32. Weight is 6 lbs., span 60 in., chord, 12 in. and control via MacNabb 465 mcs transmitter to reciever operating proportional rudder, motor control and shut-off plus an escapement elevator by means of delayed relays.

Radio Control Notes

by Howard Boys

CONTINUING the description of the reed unit equipment developed and used by Mr. H. Cuckson for the last three years, we now have some details of the transmitter. Mr. Cuckson says his first transmitter constructed in 1947 was a typical "ham" effort to fulfil all receiver requirements he could foresee. It was a rather complex job with master oscillator, doubler, power amplifier stages, anode modulated with a host of submodulators. The current consumption was appalling, and it was more trouble than it was worth. Present types are dry battery operated and much simpler. The first was a three reed type measuring 10-in. x 5-in. x 4-in. used in an eight foot span Rudderbug which first flew in March, 1951. The transmitter circuit is given in *Fig.* 1 and the R.F. power output is in the region of half a watt, which gives ample range with a three valve receiver. Let Mr. Cuckson describe this in his own words.

"The R.F. oscillator is a Colpitts. I have found this very stable. The valve used is a 958A acorn triode. The type of modulation used is amplitude anode modulation of the parallel transformer type. This gives 100 per cent. modulation and is also "upward" modulation. It is not generally realised that a class C oscillator or P.A. stage gives four times as much modulated power, other factors being equal, when anode modulated as when modulated by other means, *e.g.*, control grid or suppressor. Furthermore anode modulation is linear by a fortunate act of nature. In my transmitter the modulator valve is a 1S4 or 3S4. The low frequency oscillator is the common blocking oscillator and I find that the 1T4 is very useful here."

"Mr. Rockwood used to combine the L.F. oscillator with the anode modulator. I tried this, but found it not satisfactory, since any loading up of the R.F. oscillator was reflected back to the primary of the blocking transformer, reducing the voltage swing and increasing the frequency. The range under these conditions which forbade extracting maximum R.F. power was, however, not less than 300 yards. In my circuit, however, the L.F. oscillator is completely isolated from any loading upsets, which makes for stability."

"There is only one snag to my arrangement and that is the modulation transformer. It must be an exact match between the 958A and the 1S4, otherwise not enough audio power will be developed to fully modulate. One of my friends who for a modeller is well clued up on R/C had a lot of trouble over this because he could not see that any ratio was just not good enough. I can't emphasise this point too strongly. I think that on the whole the average home constructor would be better off with grid modulation which requires only voltage and not power and, of course, saves a valve and many components." *Fig.* 2 shows this circuit.

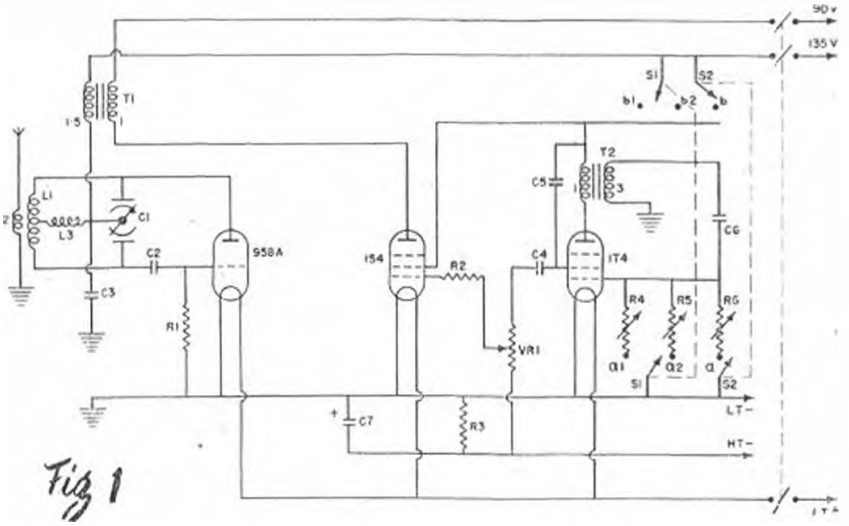


Fig 1

"Incidentally, with the blocking oscillator transformer (type 10 K584) shunted with a capacitor of about .04 mfd., a very good approximation of a sine wave is obtained. It is therefore possible to produce sinusoidal modulation with the normal anode.

modulated transmitter. With the simpler transmitter it is not so good, and it is best to get as much voltage swing as possible and cut the R.F. oscillator off every audio cycle. I have drawn the transmitter as for 3-channel for the sake of simplicity, and I would strongly emphasise that three channels is plenty to start with until one gets the hang of things."

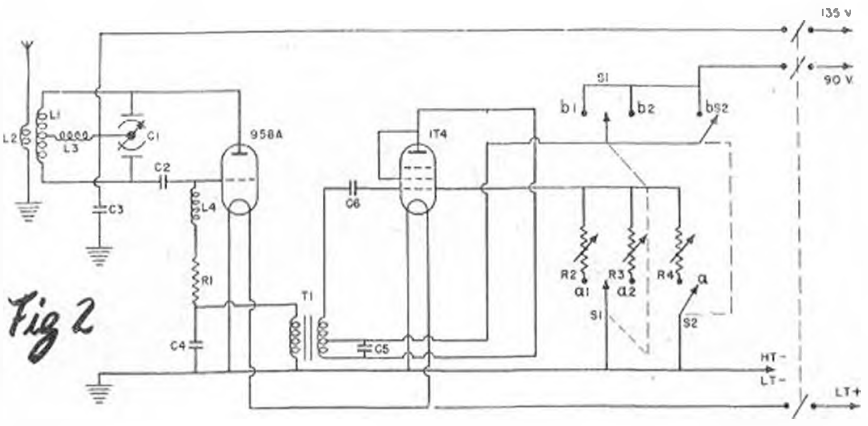


Fig 2

Here are the transmitter component values *Fig.* 1.

L1	12 turns 14 swg. copper 1 in. dia. coil centre tapped.
L2	Two turns insulated round centre of L1.
L3	Radio frequency choke.
T1	Gardener T31 transformer.
T2	3/1 intervalve transformer (10K7396 10K584).
S1	P.O. lever switch.
S2	P.O. press switch or push button.
R1	25K ½ watt R2 200 ohms. ½ watt R3. 500 ohms. ½ watt.
R4 R5 R6	½ megohm potentiometer.
VR1	½ megohm potentiometer.
C1	Split stator 30 pf per section.
C2	50 pf C3 .001 mfd. C4 .1 mfd. C5 .05 mfd. C6 .01 mfd.
C7	25 mfd. 12 volt electrolytic.

Here are the values for *Fig.* 2.

L1 L2 L3	same as *Fig.* 1 L.4 R.F.C.
R1	25K ½ watt R2, R3, R4 ½ megohm pot.
C1	5 Split stator 30 pf. per section.
C2	50 pf. C3 .001 mfd. C4 .001 mfd. C5 .05 mfd. C6 .01 mfd
T1	Centre tapped intervalve transformer.
S1	P.O. lever switch S2 P.O. push button.

Batteries used are Drydex H 11 84 L.T. 1·5 volt.
Drydex 526. H.T. 90 volt.
Drydex B109. H.T. 45 volt.

The H.T. batteries last an average of six months.

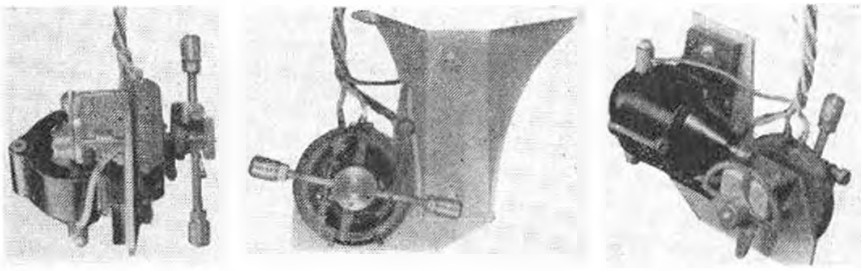
Current consumption: 958A unmodulated approx. 5 m.amp., modulated approx. 7 m.amp.; 3S4 10 or 11 m.amp.; 1T4 3 m.amp.

Note: The R.C.F. can be the usual 70 to 80 turns of fine wire on ¼-in. former. For six reed receivers it would only be necessary to add three more half megohm potentiometers alongside R4, R5, R6 in *Fig.* 1 and 2, 3, 4, *Fig.* 2.

We now have some photographs of Geoff Pike's original two-control servo unit. It is a very workmanlike piece of small engineering, and it seems a pity to put such a thing in a plastic box. A Plexi-glass case (Perspex in English) would be more suitable. Geoff always puts very good workmanship into his actuators and control boxes, which accounts for the reliable behaviour of his equipment.

This unit is, of course, the prototype of the Fenners-Pike servo unit, and gives proportional control by mark/space ratio, with a further pair of contacts which are opened or closed according to the speed of the mark/space signal. The principle is shown in *Fig.* 3. The mark/space signal causes the motor to keep reversing and at fast pulsing there is not time for the actuator to be rotated in each direction alternatively.

If the mark/space is uneven the shaft will creep round until the resistance (not shown in the diagram) balances the uneven current flow. The inertia switch weights are free to rotate on the shaft except for the restraining action of the spring. At slow speeds of rotation the weights follow the shaft maintaining the contact gaps, the contact screws being rigidly mounted from the shaft. Any weight and spring system has its own oscillation period, and if the mark/space pulse is adjusted to suit, the contacts will be made with every pulse. Although the contact is intermittent, it will keep another motor running, or hold an electro-magnet in, if a large capacity condenser is connected across it. There is no doubt that this system giving as it does two separate controls, one of them proportional, and using only a single valve receiver, has a lot to recommend it. It gives the equivalent of the usual 3-reed set except that only one model at a time can be used.



Three photos and diagrams above explain Geoff Pike's 2-control servo unit.

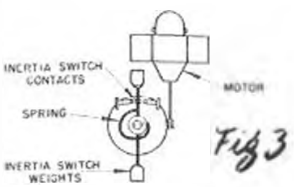


Fig 3

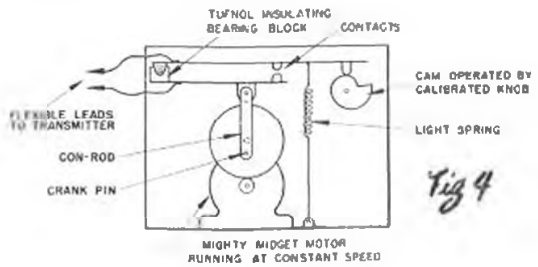


Fig 4

Mr. L. R. Williams, of Walton-on-Naze, has sent along a sketch of a mechanical pulse proportioner which is quite suitable for the usual types of proportional control actuators, and it is shown in *Fig.* 4. The crank on the motor drives the lower contact up and down, this being pivoted on an insulated block. The con-rod, or its top bearing, should also be insulated from the contact. The top contact bar is pivoted at the same point as the bottom, and the other end is held down by a spring on to a spiral cam. This cam is made so that it will allow the contacts to make, with the crank at the bottom in its lowest position, and also lift the contacts clear with the cam in its highest position. Although the motor is arranged to run at constant speed as shown in the diagram a resistance could be incorporated to give the motor two different speeds, in which case it could be made to operate a Fenners-Pike servo unit.

A query that has cropped up on a number of occasions recently concerns control failure with engine running and the model in the air. The writer has had this sort of thing happen on a number of occasions, and although not absolutely certain of the cause, believes it is due to engine vibration upsetting battery contacts. It is of course very difficult to find the cause of an intermittent fault that only occurs when the model is up in the air. Actuator batteries should always have soldered joints between separate cells. With the H.T. battery, all internal connections are only surface contacts held together by the construction of the battery. The best thing here is to put a rubber band endways round each battery. With the writer's equipment reliability has improved since receivers have been fitted with celluloid cases, and all batteries have the rubber bands, and are fixed in sorbo supports. Receivers are still supported on rubber bands, but also have sorbo buffers. Suitable sorbo is obtainable at the usual multiple stores, in the form of socks for shoes at about 1s. or 1s. 3d. a pair.

Correspondents sometimes ask for a circuit for a high power crystal controlled transmitter with audio modulation, so that they have a single transmitter that will cover practically all their needs. Mr. Leonard Chioma who gave us the circuit of his superhet receiver some months ago has now sent along the circuit of the transmitter that he has recently developed for this sort of thing. Although it is quoted as only 2.5 watts on the output stage, the valves used can be safely run at a much higher voltage than the 150 quoted, if more power is required. Here is Mr. Chioma's description for the more technical-minded. (check for new licence regulations).

"The oscillator valve is a modified Pierce electron coupled circuit which drives a 5763 amplifier. The plate circuit of the oscillator is tuned to the third harmonic. A phase-shift tone oscillator (6AK5) produces an excellent sine wave. The output of this oscillator is amplified in a 6AQ5 modulator which is used to modulate the 5763 amplifier. The R.F. carrier is always on and the tone modulation is accomplished by the action of the six volt relay. When the transmitter key is closed, the relay closes and earths the cathode of the 6AK5 permitting it to oscillate. The tone is variable and in this particular one it sets at approximately 500 cycles. This is a one-tone unit at present, but it is expected to convert later models to 3 or 5 tones. The units will have independent oscillators for each frequency."

The circuit is given in *Fig.* 5. He adds the following notes of his activities.

"The five-valve superhet is functioning very well. It has been shipped to model builders for use in boats and planes. I also now have, although not advertised as yet, a smaller version of the superhet 2½-in. x 4-in. This unit uses the following valve line-up: RF 5672 osc. IR5, 2 IF valves, 5678, IN70 crystal detector and one 5672 relay valve. The sensitivity is much better.

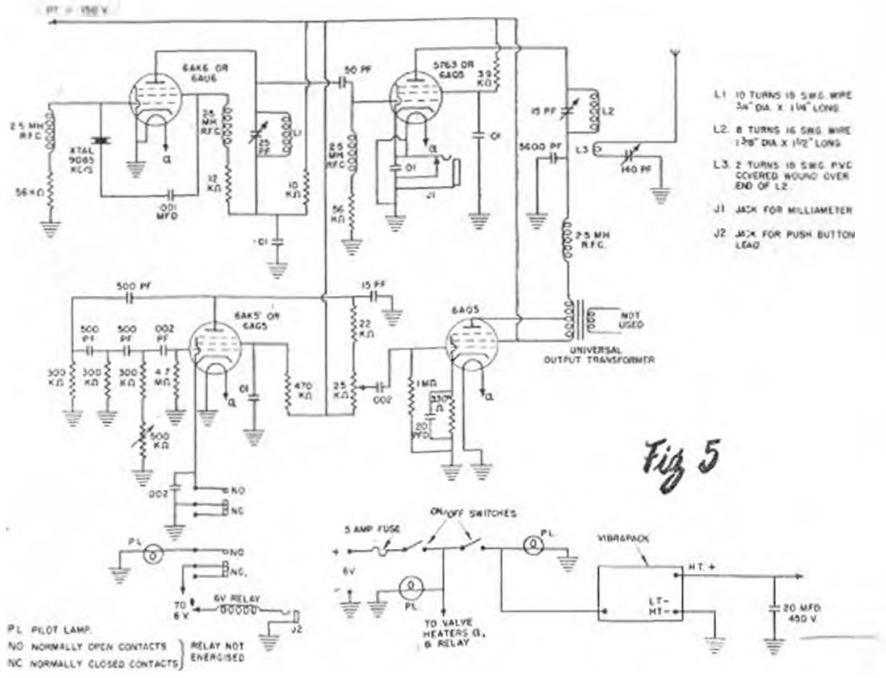


Fig 5

I am now developing a 4-valve superhet which is going to be very sensitive. At present I am running this new 4-valve unit and checking frequency stability. Everything looks good.

"The price of the 5-valve superhet is now $39.95 less relay. I am also selling plans as follows: 5-valve receiver $1.65 and 5 watt transmitter $1.50."

"His address is Electronic Model Engineering Inc., 6127 Alta Avenue, Baltimore 6, Maryland.)

CLUB NEWS

The Daily Dispatch Rally produced its usual crop of superb scale models many of which are featured here. A report on the meeting will follow in our next issue.

A MONTH or two back we dripped a bit about the weather and the pattern it seems to adopt. So far, the "pattern" is conforming amazingly to expectations, with a wet and windy Trials, a ditto Nationals, and now, as we go to press, the usual sun-scorched Northern Heights Gala Day. Besides the weather, the standard of flying still has the same familiar shape, but although the same names appear in roughly the same order, everyone seems to show a slight improvement on last year's performance. This is especially so in the radio sphere, where considerably better flying has been seen so far this season.

Talking of radio, the time is fast approaching when we shall have to take a tip from the boat world and establish an "escapement-only" class. This gives the click-clack boys a look-in and puts a neat division between the enthusiastic modellers and the electronic experts. So far the need for this has not been too pressing, but with fuselages beginning to bulge with all sorts of expensive gimmicks the average aeromodeller hoping to compete is going to wind up with a very lean pocket book.

Midland Area

Hay crops have temporarily suspended **LEICESTER M.A.C.'s** activities at Rearsby Aerodrome, but a temporary field at Kilby Bridge is keeping things going. A precision competition (Time? Spot-landing? Flight pattern? We always like to know) was won by D. Keeney with 174 points, P. H. Ball being close behind with 170.

Hold your horses on the **WALSALL M.A.C.** C/L Rally, scheduled for Bank Holiday Monday, as this event has had to be cancelled. The club boys are sorry, but circumstances beyond their control cropped up. A strong force visited the Nats., and while failing to cover themselves with glory, covered the runways with wreckage. However, all good aeromodellers look ahead, and the Club Comp. (glider) and the Mrs. Slater Scale Cup are now the immediate targets.

Many Sir John Shelley competitors, with fingers cramped with crossing while awaiting news of errant models, will agree with **WOLVES M.A.C.** members who ruefully feel that a 10 sec. run and 3 min. max. would have been more suited to the Monday weather at Waterbeach. However, J. Barrett's 2nd place in power at the *Daily Dispatch* do (E.D. 2.46 F.A.I. job) consoled the club. Some members, by the way, would like to get up a combination coach for the Northern Gala, so if you want to make one of a party, write now to J. Barrett at 10 York Gardens, Wolverhampton.

North Eastern Area

Latest club to break out into a periodical is the **NOVOCASTRIA M.A.S.**, and the first issue of the *Novocastrian News* is extremely well produced in a witty style which, with its excellent reproduction, should make it very popular among members. Like all club efforts, a club mag. needs *every* member's help, and in particular, we liked the Chairman's closing remark: "Don't leave it to the other chap—he's probably leaving it to you." How many members of any club should take that to heart!

East Midland Area

Also joylessly represented at the Nats. was **FORESTERS (Nottingham) M.F.C.,** who heard of the new line length rules for the first time soon after arrival. However, two A jobs were flown, one eliminating itself by bad starting, and placing sixth, and the other missing the final by 2 secs. and placing fifth, despite winning its semi-final comfortably and winning its heat in the second fastest time of the day. This, the boys say, is due to the peculiar eliminating system in operation. Incidentally, any club with a clubroom featuring tea and wads shouldn't clap itself on the back too hard—Foresters have all this plus a BAR—slap in the middle of Tollerton Aerodrome.

Southern Area

Cliff Edwards, back in the **WEST HANTS A.A.** fold, has resumed editorship of *Subject Normal*. Big date for the club team race fans is July 18th, when the Area Davies eliminators will be battled out on the S.R.D.E. ground, Christchurch.

Delving back into club history, **BOURNEMOUTH M.A.S.** *News* records an early payload event—in 1932, to be exact. The winner, G. Merrifield, aggregated 2 : 34.5 carrying 1 oz. 4 dr. 25 gr. with his 6 oz. rubber job. That year, too, G. F. Buster's *Fox Moth* won a scale event, with M. E. Hunt's *Avian* second. Free speed flying over a 150 ft. course (rubber, naturally), resulted in a win for R. Morris with 25·6 m.p.h. Wonder how today's fliers would cope with this last type of contest?

NORTHERN GALA		
	Croft, nr. Darlington, August 1/2nd.	
Sunday	C.M.A. Cup	Glider
	Frog Senior Trophy	Power
	Ripmax Trophy	Radio
	Davies Trophy A	"A" Team Racing
	C/L Speed	All classes
Monday	Flight Cup	Rubber
	Aeromodeller R/C Trophy	Radio
	1.5 c.c. PAA-LOAD	
	Davies Trophy B	"B" Team Racing
	C/L Speed	All classes

The first round of **SOUTHAMPTON M.A.C.'s** Team Race League resulted in a win in both A and B for the Silvey/Anderson combination. In each class the most serious opposition (A. Tomlin's Oliver Tiger and P. Mansfield's Eta 29) was handicapped by newness—un-run in motors and starting difficulty. Unfortunate end to the day was a B job's win by a technical K.O. over J. Anderson, who was removed to hospital with nose bleeding, etc., but is now A1 again except for a magnificent "shiner."

Six **READING S.M.S.** members were privileged to attend the R.Ae.S. Garden Party at London Airport on June 13th. The major attraction was the Nash Collection, but the clubmen enjoyed examining and sketching the *Viscount* and other modern machines on show as well as the *Camel*, Bleriot *Racer*, etc., in the Collection. Conducted tours of the Airport completed a really fascinating day.

North Western Area

Two year's "limited rubber" flying certainly appears to have paid dividends in the Wakefield, since three of the team come from the N.W., where a restricted-rubber class has been standard. Although Area funds can't cope with America, John Hannay will definitely be going to Denmark by virtue of a "sixpence a head" appeal fund which proved very successful. Any surplus in this fund is scheduled for the S.M.A.E. travelling kitty. A warning to Area members appears due over the liberties taken at R.A.F. Tern Hill, which is kindly lent for model flying and *not* motorcycle speedway. The bloke who was ordered to stop by R.A.F. police, but persisted in tearing up and down the runway, wants a couple of very swift kicks in the slats. Chief Area success at the Nats. was Tom Smith, taking 1st in the Shelley with his impressive fast-climbing *Fried Fritter* and *Oliver Twister* models. *Fritter* was lost on the second flight and the reserve was used for another max. Tom is an aerodynamicist and puts a lot of slide-rule work into his designs.

Funny how some people won't get up-to-date. Much preparation attended an attempt on the world height record by R. Wilson of **HYDE M.A.C.** Model (Junior 60) took off followed by a Proctor and a Tiger. Was last seen at 3,500 ft. in poor light and was seen to land an hour or so later fifteen miles away. Owner is now claiming British height record and class "C" duration record. Well, of course, there is no British height record (the category was abandoned some years ago) and since the flight must be in sight of the time-keepers, who must not move from the launching point, there's no hope of claiming a duration record.

Bank Holiday Monday at the Roodee, Chester, will see the **CHESTER M.F.C.'s** annual C/L "Rodeo" in full swing. A and B racing, stunt, and 42 ft. combat for excellent prizes on an excellent ground—if you're disappointed over the Walsall cancellation, would make a nice day out?

WALLASEY M.A.C. are extremely pleased over Hannay's topping the A2 team, and explain the simple structure of the model by relating that its predecessor, an all-geodetic high A.R. job lasted only one flight—landing well out in the Irish sea. The wing and stabiliser end-plates and auto-rudder and one or two other details on the winning model are, apparently, standard club features. The last three monthly club contests have been weather casualties, two being washed out and one blown out.

A cinema exhibition by **WHITEFIELD M.A.C.** attracted much attention, and a £5 prize was awarded to E. Horwich's C/L Bristol Olympus *Canberra*. The O'Donnell brothers have been well to the fore in contests recently, as noted elsewhere.

A plague of young bullocks has descended upon **MAGHULL M.A.C.** members, but flying goes on just the same. The boys are having fun towing a *Minimoa* behind a *Cardinal* and a *Bandit* (if you want to try it, use $\frac{1}{16}$ sq. rubber for the towline) and all types of models are being tried. B. Leatherbarrow turned in a 5-mile flight from a 25 sec. run, with an Elfin 1·49 *Mallard*.

The **BLACKPOOL AND FYLDE M.A.C.** joined the **ENGLISH ELECTRIC M.A.C.** for a coach trip to Woodford. The Blackpool boys did very well, M. Thomas winning Jetex with his Scorpion-powered job and F. Marsden coming 3rd in rubber with 7 : 36. This was M. Thomas' second placing in consecutive events, since his flying plank design came in 3rd in the Lady Shelley at Waterbeach.

A new club in the Area is **BLACKLEY D.M.A.C.**, formed at the turn of the year and now numbering twenty members. Monday evening meetings take place at St. Andrews Munn Lane School, and flying is done in Heaton Park. Experienced friends from other clubs, etc., come along to assist and advise on design selection, building, trimming, and so forth, and interest is high in the F/F categories, R/C and team racing. Indoors, Jetex and rubber have a following. The club is at present watching and listening and generally getting the feel of things and expects to launch out into the serious contest world next season. Sounds a live effort and on the right lines too.

South Midland Area

The Area will be holding a Rally at Cranfield on August 22nd, to which all Clubs are invited. There will be an excellent prize list and S. Midland members will not be competing. Events include open Rubber, Glider and Power. Special events are R/Control and Team Race "A" and "B", the latter being run to 1954 rules. Commencing time is 11 a.m. and interested aeromodellers are reminded that Cranfield, which is near Bedford, is one of the finest flying sites in the country.

CONTEST CALENDAR	
July 18th	International Wakefield and Power, U.S.A.
	N.A. C/L Rally, Sheffield.
24/25th	Munster Championships, Munster, N.I.
Aug. 1/2nd	NORTHERN GALA, Croft, nr. Darlington.
2nd	Chester C/L Rodeo, Chester!
7/8th	INDOOR NATIONALS, Cardington, Beds.
8th	Cambridge, T.R. Rally, Cambridge.
15th	Novocastria Rally, Newcastle-on-Tyne.
	Hyde M.A.C. Rally, Hyde, Cheshire.
22nd	International Speed, Holland.
	South Midland Area Rally, Cranfield, Beds.
	Croydon Gala, Chobham, Surrey.
29th	KEIL TROPHY, Power
	FROG JUNIOR CUP, Rubber/Glider } D/C.
Sept. 5th	Yorkshire Evening News Festival, Sherburn-in-Elmet, Yorks.
	West of England Championships, Lulsgate, nr. Bristol.

London Area

A total of 14 : 23 put **HAYES D.M.A.C.** into the L.D.I.C.C. semi-finals by a 67 sec. lead over **CHINGFORD.** Individual team members' times were: rubber, F. Brench, 4 : 15, J. Wassell 3 : 26; glider, J. Wareham 4 : 07, E. Wellbourne 2 : 35.

MILL HILL D.M.A.C., who as the "B.O.A.C. Model Club" (!!) put on that excellent TV show, have resolved that all F/F jobs will in future be trimmed in wind since their calm-air-trimmed jobs have consistently finished the wrong side of half-way in comps. so far. We'll look forward to seeing results of this policy—but we'll bet the next contest they enter will be in flat calm!

The first birthday of **HODDESDON M.F.C.** sees enthusiasm higher than ever among the 27 members. The juniors are making the seniors sit up by investigating models outside the general run; one youngster produced a fully wired biplane chuck glider recently, so if you see a Lilienthal glider in a scale event soon, you'll know he's progressing!

National successes for **CROYDON D.M.A.C.** included Jack North (2nd in A2 team) 1st in the M.A. Trophy with J. Blount second, Norman Marcus 2nd in the Sir John Shelley, with his *Eureka* now ballastless, and the Cameron/Butcher/Martin combo's 1st in B with a 72 m.p.h. average. Blount provided comic relief when, retrieving his power job, he surprised a horse with the tail sticking out of one side of its mouth and the motor out of the other; he is now muttering about using 10% cyanide in all dope mixtures.

Interesting efforts in **WILLESDEN D.M.A.C.** include D. Kirkup recording 30 mins. o.o.s. with his *Stomper*—a 5 sec. motor run and no D/T—model was found at Ashford. Junior I. James is having success with a Bee mounted on a *Lulu*. At the Nats. best performance was put up by J. Wightman's *Corsair* in the Thurston, but J. Ridley's *Invader* (2 Elfin 2·49s) attracted attention with parachute dropping and glider snatching. On Whit Monday an hour's demonstration (including five in a circle combat!) was given at a fete in Chalfont St. Giles.

South Western Area

The second round for the Area Shield in which only **EXETER AND PLYMOUTH M.A.C.'s** partake, again saw a 2-point win for Plymouth. In power and rubber, Plymouth's R. Wonnacott and Richards won with 6 : 03 and 7 : 04 respectively, and glider went to S. Gibbons of Exeter with 5 : 35.

Permission to fly on the local aerodrome puts **ILMINSTER D.M.A.C.** in the happy position of having two excellent sites. A.P.S. designs are very predominant, new models being *Luton Minor*, *Lysander*, *Douglas* 046 and *Thunderking*. In the club A2 contest a *Tadpole* and a *Quickie* placed 2nd and 3rd, the event being won by A. R. Peppitt's O.D. *Gook Mk.* 111 with a 5 : 17 aggregate.

Northern Area

If you're worried about where the N.A. C/L Rally is taking place on July 18th, it's on the Farm Grounds, Granville Road, Sheffield. Chief feature is the Davies Trophy Eliminators.

A spurt of new life has been evident in **STOCKTON D.M.F.C.** since the start of the contest season, and members have flown (alas, with little success) at the Trials, the Nats. and Woodford.

New models in the **WORKSOP AEROMODELLERS** include three new stunt jobs to Pete Russell's "334" design (4th in the Gold) and several Eta-powered *Super Fast Cats*—a B version of Bridget Russell's (nee McCann) well-known A job which, incidentally, now sports a Tiger and ran 3rd at Woodford. Other club activities are chiefly flying R/C and aviating in a full-size *Tutor* glider.

C. P. Miller flew a Wake to 1st in **BRADFORD M.A.C.'s** third general contest under conditions which enforced a 2 min. max. J. Pannett used a second model after his first's unfortunate meeting with a hill-side, to place second. Silvio's performance at Wittering was backed up by Miller, 6th in the Wakefield despite the latter's model being treed, blown into a second tree, and then dropping into a stream! Lanfranchi, Miller, and Calvert formed the club team which defeated **LEEDS M.F.C.** in the N.A.K.O. by a clear 3½ mins.

Scotland

The **ANGUS D.A. LEAGUE** had a good turn-out at H.M.S. Condor for the annual Scale and Open Rubber comps. D. L. Petrie (Montrose) led rubber with his *Upstairs Maid*, aggregating 7 : 35. In scale, Petrie's E.E. *Wren* tied with K. B. Whyte's (also Montrose) *Horsa*, which was towed R.O.G. Other scale entries, from Dundee and Arbroath, included two Stinson *Voyagers*, a Cessna *Bird Dog*, two D. H. *Beavers*, a D.H. *Gipsy Moth*, and a *Luton Minor*. An *F.E.*8 and an *S.E.*5 were demonstrated but not entered.

In the **SCOTTISH A.A.** Caledonian Shield, **PRESTWICK M.A.C.** just managed a win after a fly-off against **GLASGOW M.A.C.** The Shield is a team trophy, and in the fly-off (caused by a points tie) Glasgow easily won rubber but the Prestwick boys managed narrow wins in power and glider, and consequently took home the trophy for the first time.

RADIO CONTROL RALLY, LUFFENHAM.—Canadian R/C enthusiasts have arranged a Radio Control Rally at North Luffenham on Sunday, 29th August, to which all radio fliers are invited. 1st Prize £10; 2nd £5 and 3rd £2. Meals are available for entrants and it is emphasised that the event is being run on a "free-and-easy" basis. The aerodrome is available for other forms of flying but there are no other contests.

Call for a pen pal in America or France, comes from Terry McCoy, 16 F/F and C/L fan, of 50 Squire Street, Cheetham, Manchester 8, and a plea for information on a red model-box containing spares and a re-worked Racer, missing on the Sunday at Waterbeach, has come in. J. H. Westwood, 141 Dalston Gardens, Stanmore, Middlesex, is the unfortunate gent concerned.

And that's it for another month. 'Bye!

The CLUBMAN

NEW CLUBS

STALYBRIDGE M.F.C.
D. B. Potts, 53 Lord Street, Dukinfield, Cheshire.

BLACKLEY D.M.A.C.
W. H. Metcalf, 9 Cudworth Road, nr. Blackley, Manchester 9.

SECRETARIAL CHANGES

WEST YORKSHIRE M.A.S.
E. Humphrey, 9 Kilpin Hill Lane, Staincliffe, nr. Dewsbury, Yorks.

N.W. MIDDLESEX (THERMALEERS) M.F.C.
J. Bowerman, 36 St. Augustine's Avenue, Ealing, London, W.5.

HYDE M.A.C.
R. Wilson, 31 Bottom Street, Hyde, Cheshire.

HODDESDON M.F.C.
St. Day, 69 Ladyshot, Harlow New Town, Harlow, Essex.

S.M.A.E. Crossword £100 CASH PRIZE

Help to swell the International Contest Fund and at the same time win yourself this magnificent cash prize.

To ENTER this competition you simply solve the puzzle with the best and most apt answers you can find for the clues and send your entry in accordance with the directions given below. Every entry will be examined and the prize of £100 awarded to the entrant who, in any one attempt, has submitted the solution adjudged by the Adjudication Committee to be the best received—aptness and accuracy of answers to the puzzle and the clues being the test of merit. In the event of a tie the prize will be divided.

1. Each entrant's initial attempt/s must be completed IN INK, in block letters on the proper printed coupon.
2. The fee for one attempt is 1/-, and 4d. for each subsequent attempt.
3. Every entry must be accompanied by a Postal Order. (Loose stamps will NOT be accepted.)
4. Additional attempts in excess of three can be submitted on plain paper. Such attempts must be completed in full on a copy of the square.
5. Cut out the whole of the coupon around the dotted line (do NOT separate any of the squares).
6. Sign and address the coupon entering the number and value of the P.O. where indicated.
7. Write your name and address on the back of the P.O., which must be made payable to S.M.A.E. Limited and crossed /& Co./
8. Entry must be posted with P.O. in sealed 2½d. stamped envelope to reach this address:—
   S.M.A.E. X-Word,
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   38 Clarendon Road,
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   by the first post on **September 30th, 1954.**
9. Every coupon or attempt paper must bear entrant's own usual signature and address.
10. NO ALTERATIONS ALLOWED.
11. Proof of posting not accepted as proof of delivery.
12. No responsibility accepted for entries lost or delayed.
13. The Editor's decision is final and legally binding.
14. No correspondence can be entered into.
15. Employees of The Model Aeronautical Press Ltd., and Percival Marshall Ltd., and their families not eligible.

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Enter P.O. Number and value here:
P.O. No.....
Value .....

CUT COUPON OUT WHOLE WHETHER ONE OR MORE SQUARES USED

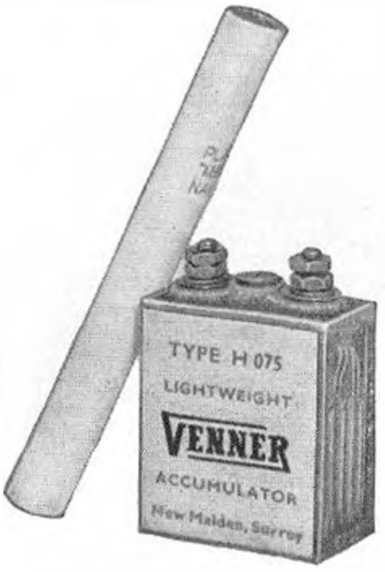
CLUES

Across.

1. Contest modellers should know every one.
6. Abbreviation.
7. Towlines sometimes do this.
8. Eager for drink.
10. Needed for model flying.
11. Avoid this with your engine.
14. Models in this are easily seen.
16. Abbreviation.
17. A little can be beneficial—too much can do harm.
22. Sometimes necessary to do this with opposite sex.
23. May affect landing.

Down.

2. Engines which are this upset their fliers.
3. What the Bookmaker—does not always win.
4. Abbreviation.
5. Modellers should always be this.
6. There is usually one of these at a contest.
9. Artistic State.
12. Abbreviation.
13. This begins when friends fall out.
15. Often seen near the green.
18. Time keepers need to do this.
19. A game.
20. A good this will sometimes loosen a sticking part.
21. Peas may be found in it.



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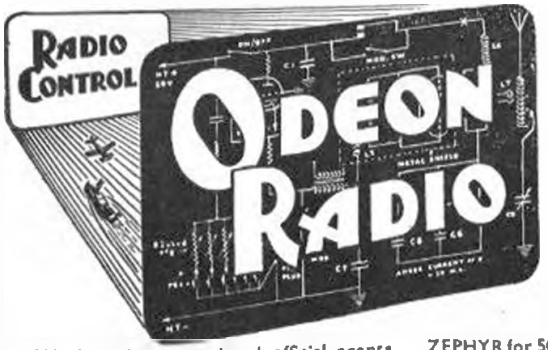

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8 x 8 ...	1/6	8 x 8 ...	3/6
10 x 6 ...	1/6	10 x 6 ...	3/6
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ditto. for 2½ in.	2/10
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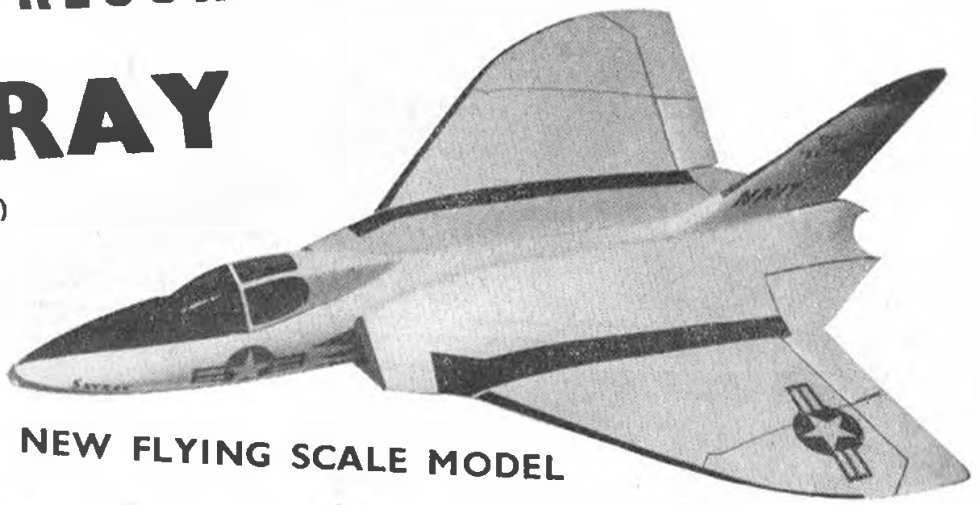

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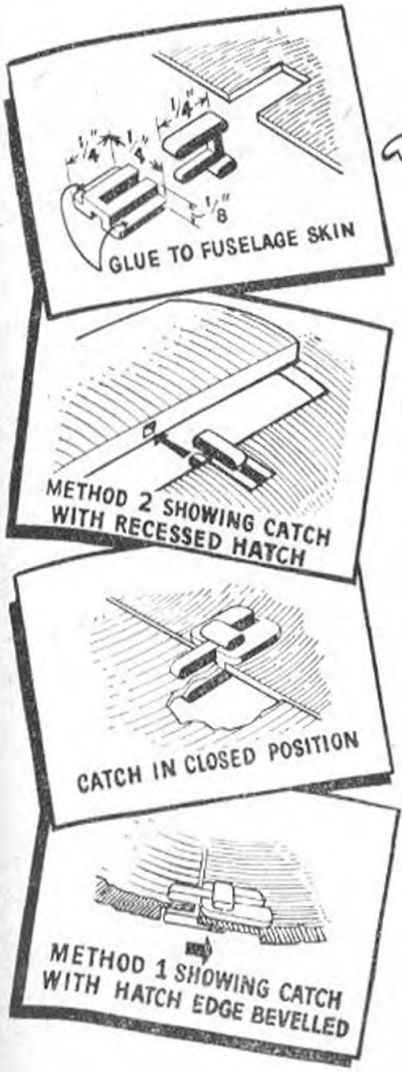

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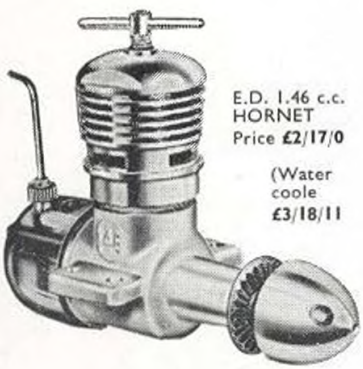

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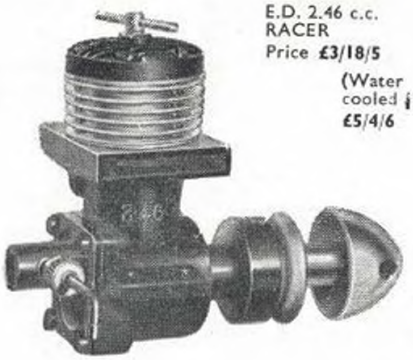

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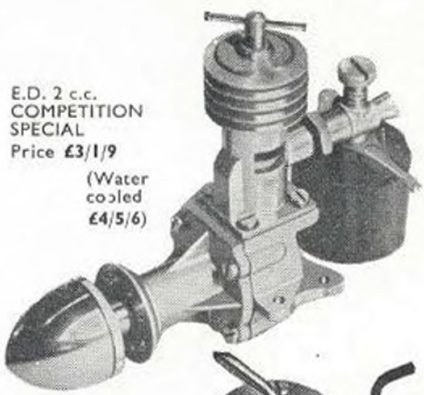

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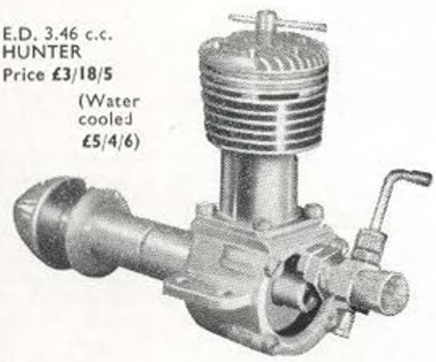

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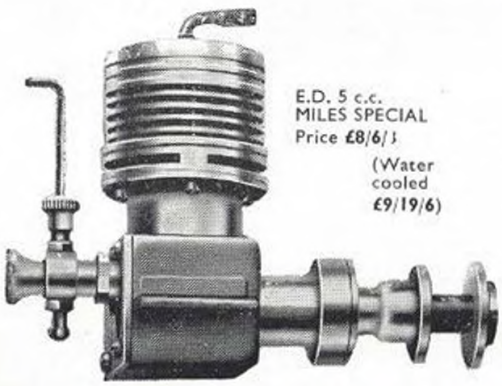

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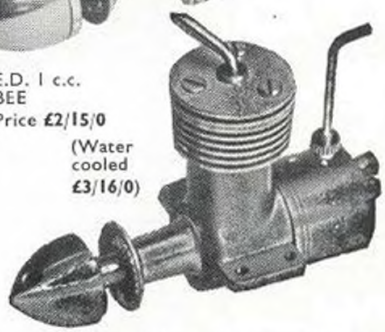

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