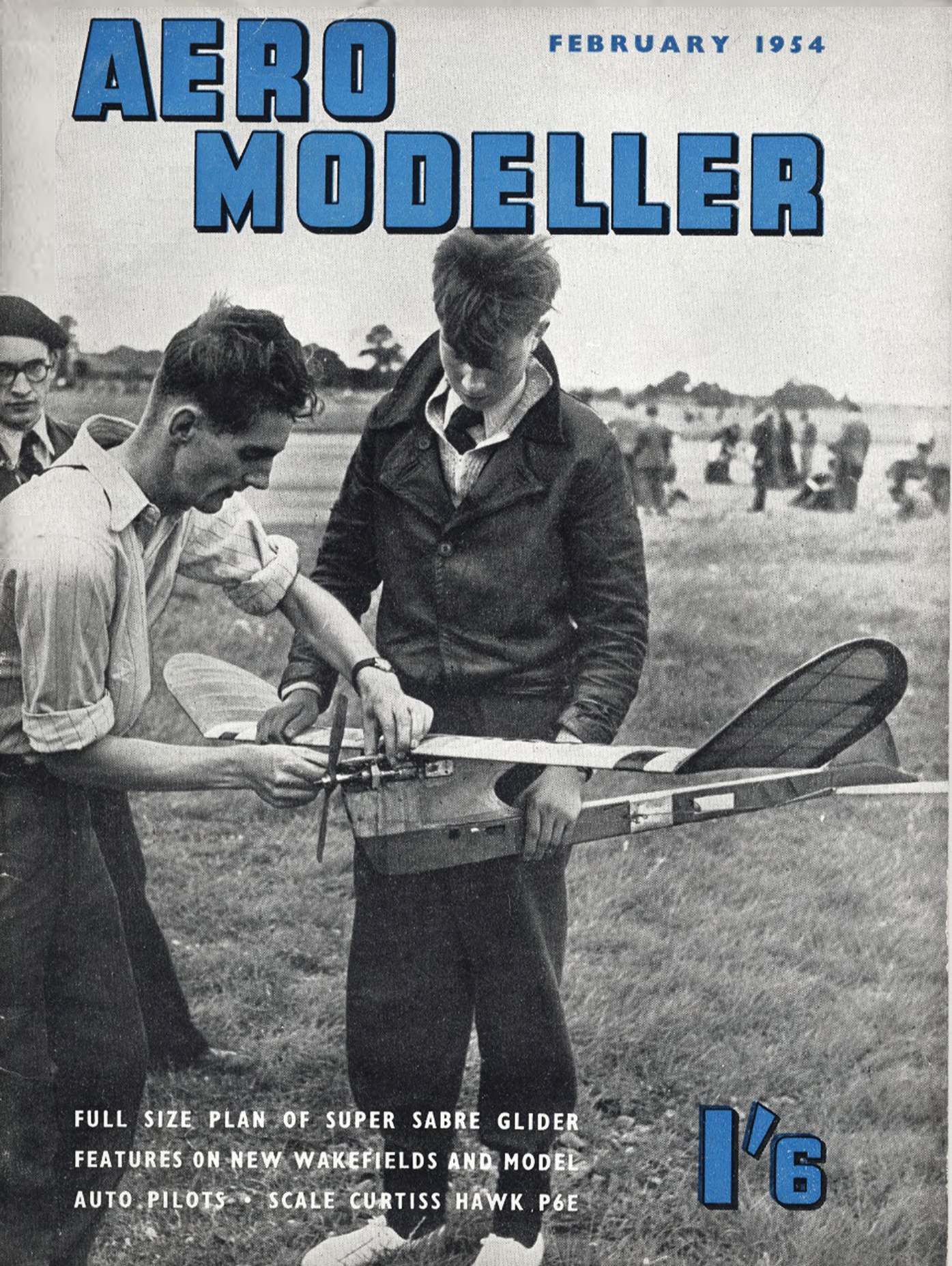
AERO MODELLER

FEBRUARY 1954



FULL SIZE PLAN OF SUPER SABRE GLIDER

FEATURES ON NEW WAKEFIELDS AND MODEL AUTO PILOTS • SCALE CURTISS HAWK P6E

1'6

Digital Edition Magazines.

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

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

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

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

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

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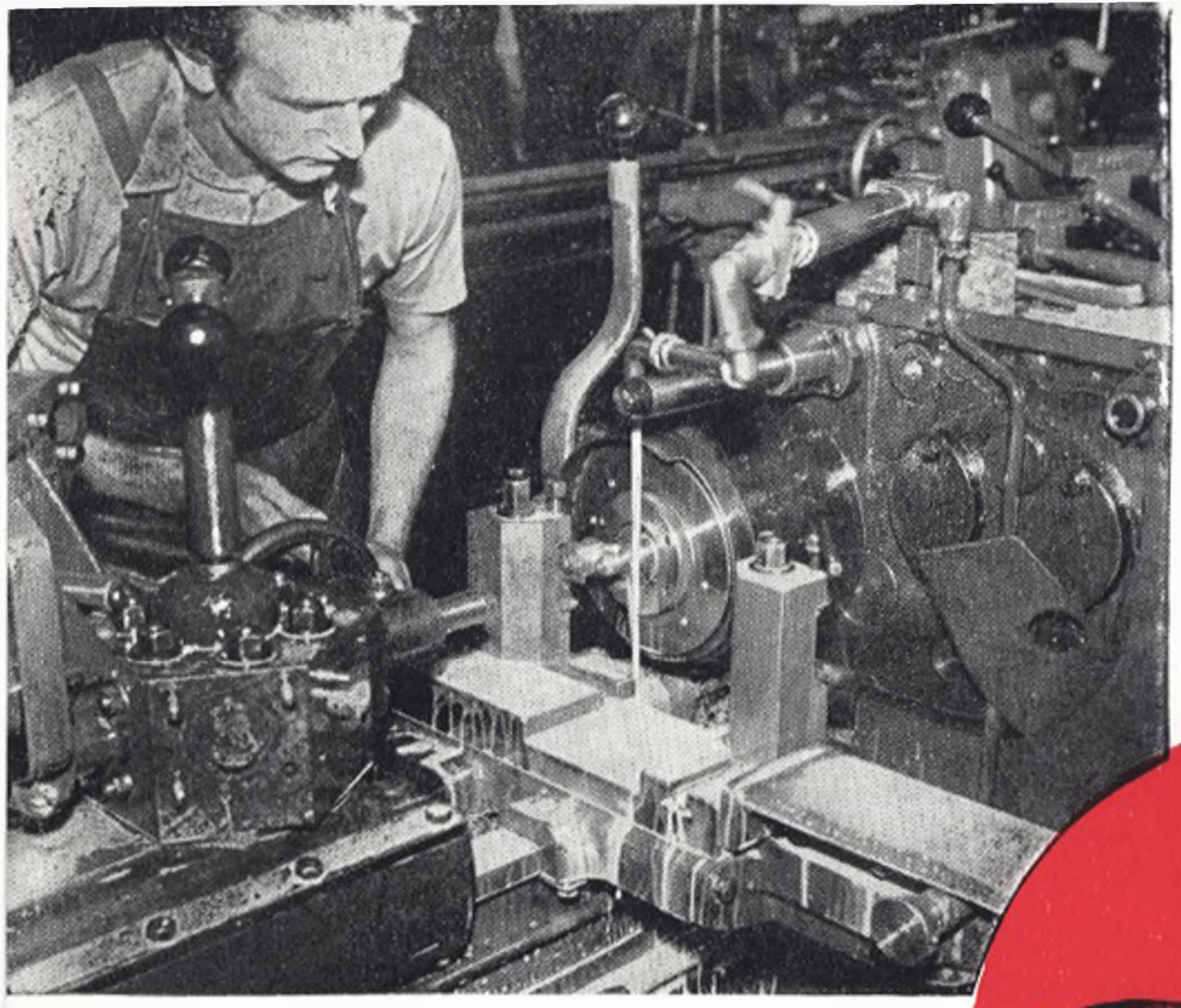
Diligence Work by Hlsat.



Inside Your Engine

No. 3 the Cylinder Head

Even a simple part of the modern engine has a surprising number of machining operations. Take, for example, the cylinder head which starts life as a section of dural bar stock, fed through the hollow mandrel of a lathe. First operation consists of drilling and tapping the bore followed by rough turning to shape. The head is then parted off and looks like the illustration shown inset above.

This roughly formed head is now screwed to a mandrel for the second operation, which we see a skilled operator performing in the photograph. He is in the process of turning the cooling fins with a gang of tools mounted in the front tool post. Next he will drill and tap the hole for the compression screw with tools mounted in the turret, and will then machine the face with a tool mounted In the rear tool post. The head is then passed to another operator who machines the spanner flats on a horizontal milling machine before final de-burring, inspection and electrical anodising. This last process gives the familiar "redhead" appearance which by now is a feature of our famous Allbon series.

Attention given to finish and appearance can be seen and appreciated by every Allbon user. Even more important is the expert care given to parts that seldom if ever see the light of day, and here the buyer is most safely protected by the world wide reputation for long and untiring performance associated with the Allbon range.

Obtainable at your Local Model Shop

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

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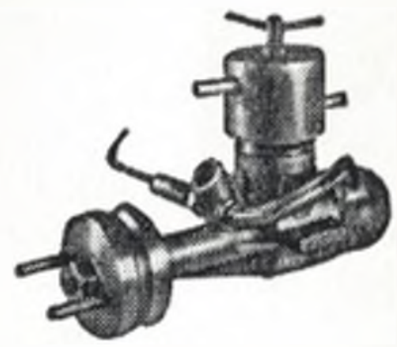
0·5 c.c. 64/2 Inc. tax



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0·5 c.c. 83/10 Inc. tax

MARINE JAVELIN
1·49 c.c.
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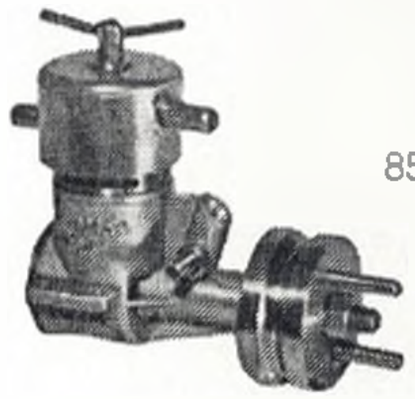

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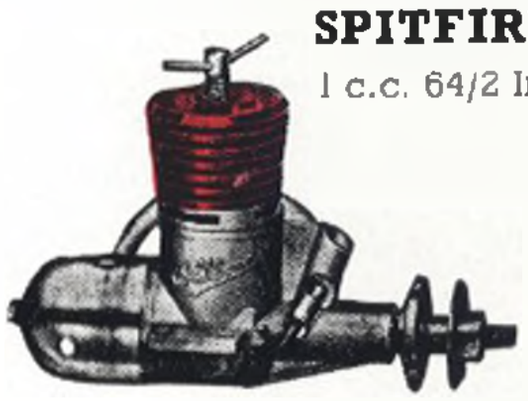

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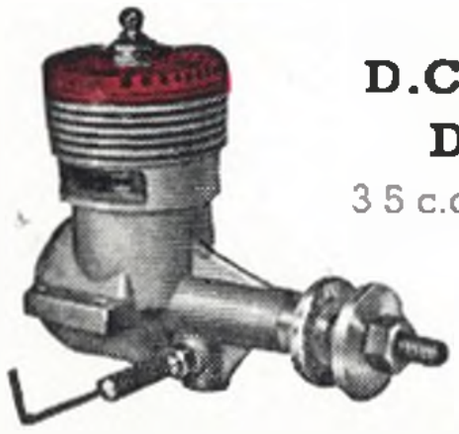
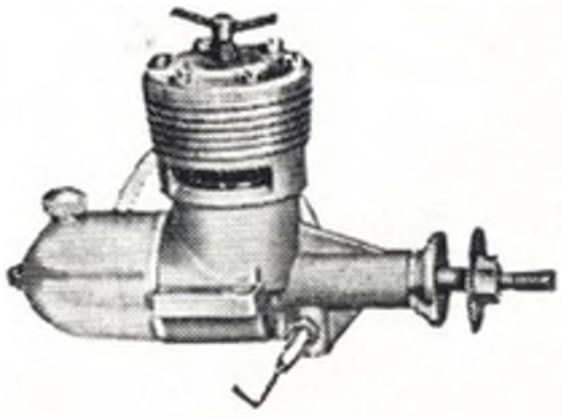


D.C. 350 (G)
D.C. 350
3 5 c.c 78/5 Inc. tax



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TWO NEW MERCURY MODELS

Among the many Mercury Kits now reaching me, these two new ones are already showing signs of being extremely popular and are fully in keeping with Mercury tradition.

MERCURY "MAGNA"
38-in. Free Flight Cabin model for 0.47 to 0.75 c.c. 11/3 Plus 1/7 PT

MERCURY "TEXAN"
Class "A" C/L Contest model ... ... 13/- Plus 2/6PT
Many other Mercury Kits in stock

VERON KITS

Control-Line	P.T.	Rubber Powered	
Bee Bug	12/-+2/-	Sentinel, 34"	10/6+1/9
Sea Fury	23/6+3/11	Hi Climber, 38"	25/-+4/2
Wyvern	23/6+3/11	**Free Flight Power**	
Philibuster	23/6+3/11	Sabre Ducted Fan	25/-+4/2
Minibuster	15/-+2/6	Streaker, 32"	19/9+3/3
Panther	25/-+4/2	Skyskooter, 48"	25/-+4/2
Gliders		Cardinal, 37"	14/6+2/5
Verosonic, 46"	10/6+1/9	Lavochkin, 37"	25/-+4/2
Vortex, 66"	18/6+3/1	**Marlin Marine Cruiser** ...	62/6+10/5
		Quicky Kits	3/-+6d.

PARAMOUNT
"Sunanvind." Record smashing world famed sailplane 10/6

BARRY WHEELER
World-champion Eliminator kit 19/6

SKYLEADA KITS

Point 5 F/F	7/10+1/3
Comet or Vulcan (Jetmaster)	7/4+1/2
Jetex 50 Scale Series ...	3/-+6d
Curtiss Hawk C/L	15/6+3/7

K.K. KITS

Chief, 64" Glider	18/6+3/1
Slicker, 42" F/F	17/6+2/11

Slicker, 50" F/F	25/-+4/2
Southerner, 60" F/F	40/-+6/8
Contester, 45" Rubber ...	17/6+2/11
Champ C/L	10/6+1/9
Ranger 24 in.	10/6+1/9
Gypsy 40 in. (W)	10/6+1/9
Piper Super Cruiser ...	18/6+3/1
Luscombe 40 in. Scale ...	18/6+3/1

FROG (I.M.A.)

Racer Series, each	3/-+6d.
Senior Series, each	3/11+7d.

FENNERS PIKE SERVO UNIT

A wonderful new lightweight servo unit, more adaptable and with a wider control range than anything yet produced for radio-controlled flight. Available now. Price **58/- + 10/-**

FENNERS PIKE CONTROL BOX

Designed specially for use in conjunction with the above. Price **TO BE ANNOUNCED**

Orders for the above will be met in strict rotation

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I am delighted to offer to modellers this truly remarkable metal which has been so enthusiastically received by the "Aeromodeller" (Sept. issue). Full arrangements have been completed for me to distribute Klebmetal exclusively in the British market. Per sheet, approx. 29" x 20" (including special cement) **13/-**
(Postage and Packing 2/-)

STARLON ENAMEL

The wonder paint with the plastic content, per tube **1/-**

FULL RANGE OF JETEX KITS, MOTORS AND ACCESSORIES STOCKED

- ★ All overseas orders, including ALL Forces Overseas are FREE of P.T.
- ★ All orders acknowledged by Air Mail and despatched on day of receipt.
- ★ As a Licensed Exporter, I supply direct and allow full rates of exchange.
- ★ No inferior substitutes sent against customers' orders. Packing guaranteed.

We've been doing it for years

... Yes, the accent is on export more than ever.

Yet almost from when I started in 1937 (apart from the War) we've been supplying modellers overseas, and believe me, I think I know all the answers when it comes to giving customers what they want in the way they want it. That's why, of course, I don't have to "stunt" my export service. We just get on with the job, and on the whole customers like it that way.

ARTHUR MULLETT

RADIO - CONTROL

Full stocks always carried, including special equipment for marine modellers. A representative selection of today's most important lines is given here. Enquiries for all R/C lines welcomed.

E.D. TRANSMITTERS AND RECEIVERS	P T
Mk. II Transmitter and Aerial	112/-+21/-
Mk. II Receiver	184/-+24/6
Mk. II Miniature 3-valve Outfit complete	£14/17/6+£2/14/6
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Mk. III Receiver complete	69/6+13/-
Mk. III Miniature Outfit, complete	£9/1/-+£1/14/-
Mk. IV Transmitter, Control Box and Aerial ...	160/-+30/-
Mk. IV Three Channel Receiver	240/-+45/-
Mk. IV Tuned Reed, Three Channel Outfit cmplt	£20/-/-+£3/15/-
Boomerang	£10/-/-+£1/15/9
E.C.C.	
1061 Transmitter	70/-+13/2
951A Receiver	70/-+13/2
COMPONENTS, Etc.	
HIVAC Valve	15/-+2/6
E.D. Escapement	18/6+3/3
E.C.C. 202 Escapement	15/6+2/10

Accumulators :: Batteries :: Meters :: Pots

ENGINES

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

	P.T.		
Allbon Dart .5, Mk. II	54/-+10/2	E.D. Comp. 2 c.c. ...	57/6+4/3
Allbon Mk. II Javelin	55/-+10/1	E.D. 2.46c.c. Racer...	72/6+6/-
Allbon Spitfire I c.c.	54/-+10/2	E.D. Hunter 3.46 c.c.	72/6+6/-
E.D. Baby .46 c.c. ...	45/-+7/3	Elfin 1.49 c.c. ...	47/6+8/8
Mills 0.75 c.c. ...	50/-+8/-	Elfin 2.49 c.c. ...	56/-+10/6
Mills 0.75 c.c., with cut-out ...	55/-+9/10	D.C. 350 3.5 c.c. ...	46/-+12/5
E.D. Bee I c.c. ...	47/6+7/3	D.C. 350 G.P. ...	46/-+12/5
Mills 1.3 c.c. ...	75/-+12/6	Amco 3.5 B.B. ...	92/-+17/3
E.D. 1.46 c.c. ...	52/6+4/6	Amco 3.5 P.B. ...	60/-+11/3
		Fuel Cut-off Valve	3/6+7d.

There's a Mercury Fuel for every engine.

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Send 3d. stamps for latest 12 page fully detailed and right up to the minute.

Today's Most Popular C/L Handle

The AM-PULL is now an accepted part of every keen C/L flyer's equipment. It gives extra fine adjustment and is very responsive and comfortable to hold.

5/6 + 11d. P.T.

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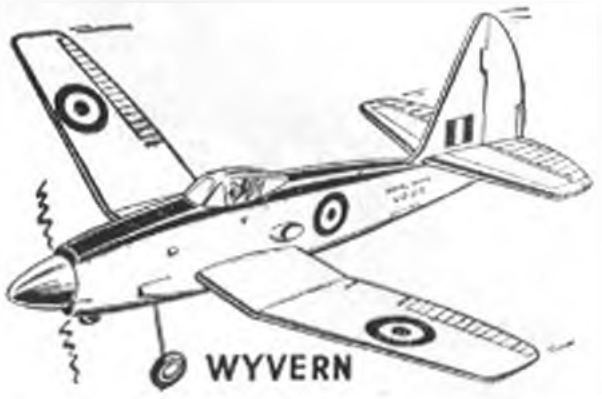
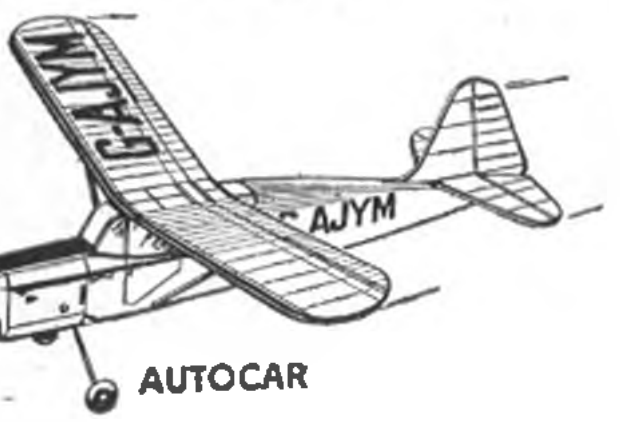
VERON QUICKY KITS

SUCCESS FROM THE START !!

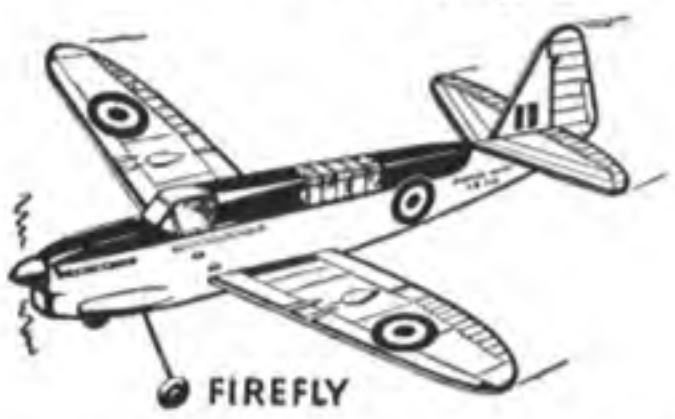


We knew that these VERON kits would "catch on" ! ! Quality plus the right price for all pockets has made them the choice of model enthusiasts all over the country.

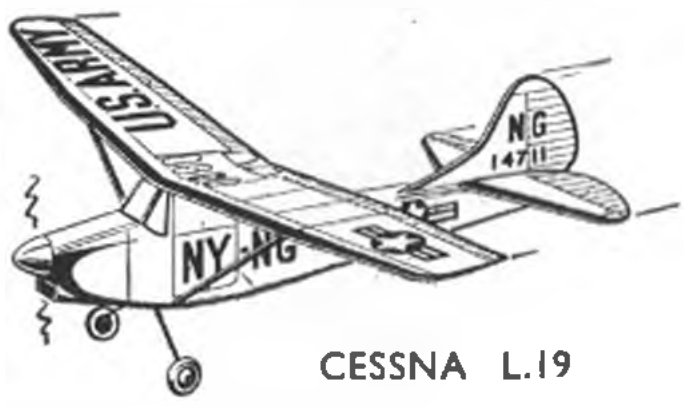


They're Prefabricated and Pre-decorated
Here we offer a really wonderful range of six 11½-in. span scale rubber duration models of Sheet Balsa construction.

Each Kit contains ready-stamped out and coloured balsa sheet parts, pre-bent undercarriage wire, ready formed propellor shaft, plastic nose bush and wheels, plastic air screw and rubber motor . . . AND YOU'VE GOT ALL YOU NEED TO COMPLETE YOUR MODEL IN HALF-AN-HOUR ! ! !



WE ARE NOW DISTRIBUTORS FOR "TITANINE" MODEL AIRCRAFT DOPES AND SUPER FINISHES



CESSNA L.19

ONLY 3/6 EACH
INCLUDING P. TAX

...AND THESE TWO BOATS ARE WINNERS

"MARLIN" Marine Cruiser

Designed especially for Radio Control this superb kit is ideal for 1 to 5 c.c. power units or electric motors (up to 12 volts). Removable cabin top allows access to the commodious radio well. Kit includes 30 in. × 40 in. plan and descriptive instruction leaflet.

KIT PRICE **£3-12-11** INC. P. TAX

LONDON RIVER POLICE LAUNCH

Here you have an ideal companion for the "MARLIN." This is a 26 in. replica of the famous prototype used by London's River Police. Suitable for small Diesel or Electric Motors. No shaft or propeller is provided, thus enabling you to fit the propulsion of your choice.

KIT PRICE **42/-** INCL. P. TAX

VERON

IF YOU WOULD LIKE TO SEE OUR COMPLETE RANGE ASK YOUR DEALER FOR THE **FREE VERON FOLDER**

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WHOLESALE ONLY

Tel: **SOUTHBOURNE 43061**

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EAST WEST

GREGORY'S

Service is the Best

CONTROL LINE KITS

	Span	Price	P.T
FROG			
Vanfire ...	40"	24/–	+ 4/–
Vantage t/r Class B	32"	17/3	+ 2/9
Mirage		9/–	+ 1/6
KEIL KRAFT			
Ranger t/r Class A	24"	10/6	+ 1/9
Pacer t/r Class A&B	30"	15/–	+ 2/6
Scout Biplane t/r Class B ...	20"	22/6	+ 3/9
Phantom Mite ...	16"	11/6	+ 1/11
Phantom ...	21"	18/6	+ 3/1
Skystreak 40 ...	40"	10/6	+ 1/9
Skystreak 26 ...	26"	9/6	+ 1/7
Stunt Queen ...	41"	21/–	+ 3/6
Champ		10/6	+ 1/9
VERON			
Nipper	17"	10/6	+ 1/9
Midget Mustang	24"	22/6	+ 3/9
Focke-Wulf 190	33"	21/–	+ 3/6
Sea Fury Mk. IX	25"	23/6	+ 3/11
Spitfire Mk. XXII	27"	27/6	+ 4/7
Bee Bug ...	22"	12/–	+ 2/–
Wyvern ...	26"	23/6	+ 3/11
Panther	41"	25/–	+ 4/2
Philibuster t/r Class B ...	28"	23/6	+ 3/11
Minibuster t/r Class A ...	14"	15/–	+ 2/6
DOUGHTY			
Ambassador ...		21/–	—
JASCO			
Trojan		8/8	+ 1/6
SKYLEADA			
Hornet t/r Class A	20"	9/–	+ 1/6
Auster	27"	7/4	+ 1/3

FREE FLIGHT KITS

	Span	Price	P.T.
KEILKRAFT			
Cessna 170 ...	36"	18/6	+ 3/1
Luscombe Silvaire	40"	18/6	+ 3/1
Piper Super Cruiser ...	40"	18/6	+ 3/1
Junior 60 ...	60"	39/6	+ 6/7
Southerner 60 ...	60"	40/–	+ 6/8
Southerner Mite	32"	10/6	+ 1/9
Slicker 50 ...	50"	25/–	+ 4/2
Slicker	42"	17/6	+ 2/11
Slicker Mite ...	32"	9/6	+ 1/7
Outlaw ...	50"	22/6	+ 3/9
Bandit	44"	18/6	+ 3/1
Ladybird ...	41"	18/6	+ 3/1
Pirate	34"	12/–	+ 2/–
VERON			
Lavochkin 17 ...	37"	25/–	+ 4/2
Skyskooter ...	48"	25/–	+ 4/2
Streaker ...	37"	19/9	+ 3/3
Cardinal ...	35"	14/6	+ 2/5
Sabre	34"	25/–	+ 11/2
DOUGHTY			
Eliminator ...	48"	19/6	—
E.D.			
Radio Queen ...	84"	78/6	+ 2/10
SKYLEADA			
Point Five ...	31"	7/9	+ 1/3
S.E. 5A	27"	14/4	+ 2/4

ORDERING INSTRUCTIONS

HOME CUSTOMERS :—
Cash with order or C.O.D. All orders under 10/– add 9d., 25/– add 1/1, 40/– add 1/6, over 40/– post free.

OVERSEAS CUSTOMERS :—
Customers resident outside United Kingdom, including H.M. Forces, buy free of Purchase Tax.
Cash with order or C.O.D. See earlier issues for list of countries for C.O.D. Postal rates vary according to postal service requested, and destination. Information concerning dispatch to any country given on request.

FORCES CLUBS. Recognised Clubs can buy on a credit account. Details on request.

NOTE. Will all customers requiring information please include a S.A.E., or if overseas, International Reply Coupon.

X-ACTO TOOLS. From 3/– to 84/–. All spare blades in stock.
Burlington Chest, 84/-; No. 82 Tool Chest, 30/-; No. 78 Wood Carving Set, 37/6; No. 77 Wood Carving Set, 23/-; No. 1 Knife (with No. 11 blade), 3/-; No. 2 Knife (with No. 22 blade), 3/6; No. 5 Knife (with No. 19 blade), 6/6; No. 51 Knife Set (No. 1 knife and 6 blades), 5/6; No. 52 Knife Set (No. 2 knife and 6 blades), 6/9; No. 62 Knife Set (No. 1 and 2 knives with 12 assorted blades), 12/3; No. 50 Plane, 5/6; No. 52 Spokeshave, 3/6; No. 41 Sander, 3/6; No. 58 Stripper, 5/–; X-acto Handbook, 4/6. **Free** Leaflet.

Veron, Keilkraft and Bateman Solids. Rubber Duration Kits by leading Manufacturers. Ample Accessories.

GLIDER KITS

	Span	Price	P.T.
KEILKRAFT			
Topper	40"	8/6	+ 1/5
Chief A2 ...	64"	18/6	+ 3/1
Soarer Baby ...	36"	5/–	+ 10d.
Soarer Minor ...	48"	8/–	+ 1/4
Soarer Major ...	60"	11/6	+ 1/11
Minimoa ...	50"	7/–	+ 1/2
Invader ...	40"	6/6	+ 1/1
Cadet	30"	4/–	+ 8d.
Cub	20"	2/6	+ 5d.
Dolphin ...	30"	4/–	+ 8d.
VERON			
Cataglider (Ready to fly)		4/6	+ 9d.
Coronette ...	26"	3/6	+ 7½d.
Verosonic ...	46"	10/6	+ 1/9
Vortex A2 ...	66"	18/6	+ 3/1
FROG			
Prince	60"	17/3	+ 2/9
Diana	36"	7/4	+ 1/2
Fortuna	48"	12/–	+ 2/–
Vespa	30"	5/10	+ 11d.

WHEELS

K.K. Streamline Rubber	1½" dia. per pair	1/3	+ 3d.
" " "	2" " "	2/–	+ 4d.
" " "	2½" " "	3/–	+ 6d.
S.J.A. Streamlined Sponge Rubber ...	2½" " "	3/6	+ 7d.
Veron Sorbo Scale Type	1½" " "	3/–	+ 6d.
" " " "	2" " "	4/3	+ 8½d.
" " " "	2½" " "	6/6	+ 1/1
K.K. Sponge Streamline	1½" " "	2/6	+ 5d.
" " "	2" " "	3/6	+ 7d.
" " Balloon	1½" " "	2/6	+ 5d.
" " "	2" " "	3/6	+ 7d.
M.S. Air Wheels Standard	2" " "	10/–	+ 1/8
" " " "	2½" " "	14/6	+ 2/5
" " " "	3" " "	18/6	+ 3/1
" " " "	4" " "	22/6	+ 3/9
" " " Superlite	2" " "	7/–	+ 1/2
" " " "	2½" " "	12/6	+ 2/1
" " "	1½" " "	3/–	+ 6d.

Z.N. Wheels as available

GLIDER WINCH

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

RADIO CONTROL COMPLETE OUTFITS

E.D. Mk. II, 3-valve unit. Complete transmitter and receiver only. 296/– + 55/6 P.T.
E.D. Mk. IV Tuned Reed. 3 channels unit, including control box. P.T. Complete 400/– + 75/–
E.D. III (Hivac) ... 181/– + 34/–
*E.D. Boomerang ... 200/– + 39/6

TRANSMITTERS

E.D. III and aerial ... 92/6 + 16/6
E.D. II and aerial ... 112/– + 21/–
E.D. IV control box and aerial 160/– + 30/–
E.C.C. 1061 ... ... 70/– + 13/2

RECEIVERS

E.D. II ... ... 184/– + 34/6
E.D. III (Hivac) ... 69/6 + 13/–
E.D. IV... ... ... 240/– + 45/–
E.C.C. 951A ... ... 70/– + 13/2
*E.D. Boomerang Receiver Pack (incl. escapement) ... 109/6 + 17/2
*E.D. Boomerang Receiving Set only ... ... 89/– + 16/–

COMPONENTS

E.D. escapement, compact and normal type ... 18/6 + 3/3 P.T.
E.D. clockwork escapement 47/6 + 9/6 P.T.
E.C.C. 202 Escapement 15/6 + 2/10
E.D. polarised relay 30/–
E.C.C. 5A relay 25/–
E.D. Standard relay 22/6
E.D. Reed Unit (high or low frequency, state which) ... 60/–
Hivac Valve ... 15/– + 2/6 P.T.
Hivac Valve Holder 1/3
Milliameter, 0.5 M/A 14/6
Milliameter, 0.50 M/A ... 14/6
E.D. IV Control Box 44/– + 8/3 P.T.
E.D. Rudder Mechanism 48/– + 9/– P.T.
Venner Accumulators.
*Boomerang Receiver can be supplied in hard or soft valve type.

ENGINES

		P.T.
Amco B.B. 3.5 ...	92/–	+ 17/3
Amco P.B. 3.5 ...	60/–	+ 11/3
Allbon Dart .5 c.c. II	54/–	+ 10/2
Allbon Spitfire ...	54/–	+ 10/2
Allbon Javelin ...	55/–	+ 10/2
E.D. .46 Hornet ...	45/–	+ 7/3
E.D. Bee I c.c. ...	47/6	+ 7/3
E.D. 2.46 Racer ...	72/6	+ 6/–
E.D. Mk. IV 3.46 c.c. Hunter	72/6	+ 6/–
E.D. 1.46	52/6	+ 4/6
E.D. 2.46 + Watercooled	98/6	+ 10/9
E.D. 3.46 + Watercooled	98/6	+ 10/9
Frog 250	60/–	+ 10/–
Mills P.75	50/–	+ 8/–
Mills S.75	55/–	+ 8/10
Mills 1.3	75/–	+ 12/–
Elfin 1.49 c.c.	47/6	+ 8/8
Elfin 2.49 c.c.	56/–	+ 10/6
E.D. Miles Special 5 c.c.	140/–	+ 26/3
E.D. Miles Special 5 c.c. + Watercooled	160/–	+ 39/6
E.T.A. 29 III	119/6	+ 22/5

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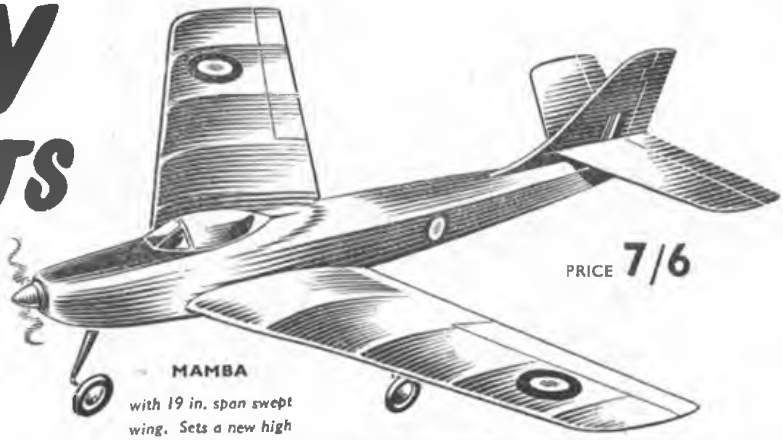

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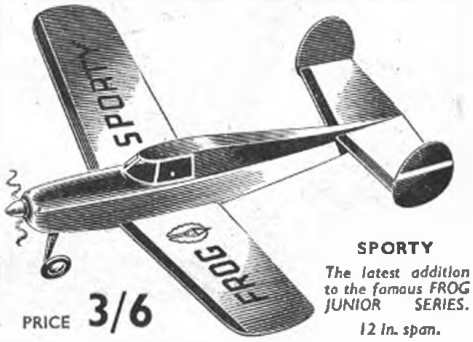

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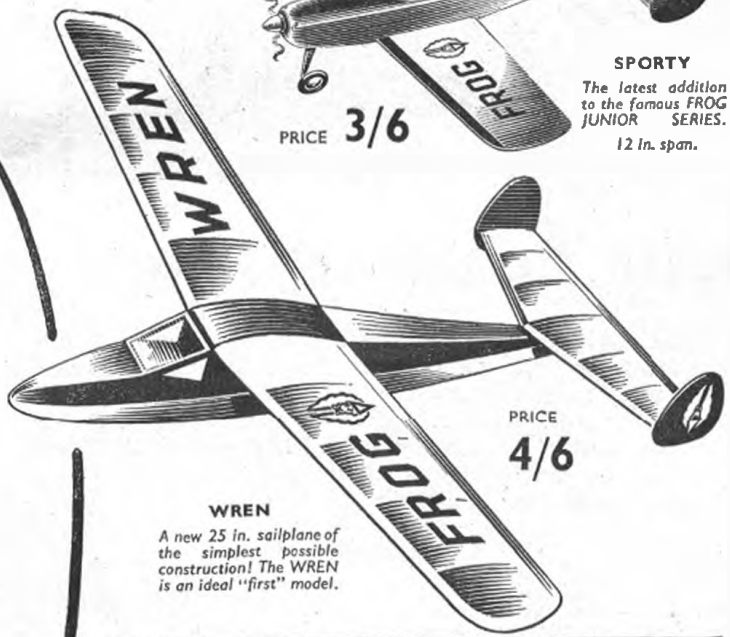

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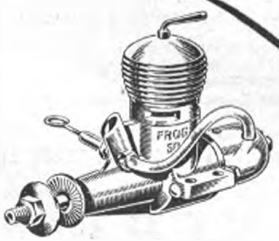

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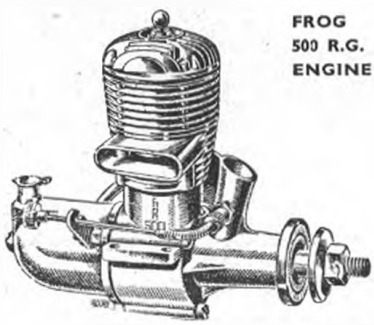

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AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

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"Covers the World of Aeromodelling"

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Contents

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Time Flies !

DEEPLY immersed in the regular production of this magazine, one tends to ignore the passage of time, a condition amplified by the fact that we are always working two months ahead with cover dates! On looking back therefore, one is apt to be surprised that so long has passed since a particular Editorial was written, and it seems a very few months ago that we made reference to Valentine's Day.

Harking back, as on that previous occasion, what comes to mind when reviewing the 1953 season? Prominent in our minds is the almost uncanny run of fine weather enjoyed for the major contests and rallies, with the possible exception of the Northern Heights Gala, all the more noticeable in view of the luck this club has had in recent years with the elements. In almost every district, fine calm weather was the order of the day at those vital Area Elimination contests which mean so much to the keen contest men, and all in all the whole season was blessed with an unusual number of fine Sundays to gladden the hearts of aeromodellers.

Nowhere was this openheartedness of the Clerk of the Weather more noticeable than at Cranfield for the occasion of the World Championships meeting, a factor that enabled the hard organisation work to be fully appreciated. This meeting set a high standard that will be hard to maintain but we take heart from the fact that meetings of a lesser order will benefit by the experience gained, and already plans are under way for a general sprucing up of all-round competition organisation.

Our friends in the Trade, whose continued support is an indication of their confidence in our production and circulation, have enjoyed a good year as evidenced by the bigger, better and newer kits appearing in ever increasing numbers in model shops all over the world. The crippling handicap of Purchase Tax legislation has been tackled with initiative and vigour, and we note with satisfaction the increasing solidarity of the Manufacturer's Federation, a sure sign of a live industry.

Twelve months ago saw the commencement of what has proved to be a "trials" period for the organised aeromodelling movement in these islands through the S.M.A.E., and time has shown that the measures taken at that time were perhaps a little too timid for the consolidation of a strong, healthy governing body. Now, with the broadening of the aims of the Society at the recent A.G.M., we foresee an organisation in a better position to cater for all the many requirements and aspects of the youthful, but ever vigorous, aeromodelling movement in this country.

And what of ourselves? We also have consolidated our organisation at Watford, and striven to provide our increasing readership with the best that can be offered in the hobby. We can be excused for a little preening perhaps, for as always, the "proof of the pudding, etc.," and we go into the new year with over 10,000 more readers than at the commencement of 1953—a sure sign that our editorial fare is appreciated by a widening field of aeromodellers, not least being the increasing numbers of overseas subscribers from almost every country in the world.

Being members of the Audit Bureau of Circulation, figures quoted by us are genuine and certified, and not subject to "editorial licence" or even wishful thinking. We look forward to 1954 with every confidence, and trust that we continue to satisfy our ever widening field of friends in every sphere of the hobby, and as always welcome comments and constructive criticism from all who care to offer them, with the promise that each and every item will receive careful consideration in our efforts to provide even better fare than hitherto.

Cover Picture . . . .

The hatchet front of this power model immediately identifies the engine starter as John Lamble of Wayfarers. John adheres to this aerodynamic layout for all his power models, and his latest version for open contests with Amco 3.5 ratios 19 : 1. Area is 540 sq. ins., with 40% tailplane, section a Goldberg Sailplane 301, and weight, 22 ozs. Both wing and tail are mounted at zero incidence.

Heard at the Hangar Doors

An Annual Spree

Held once again at the famous "Horseshoe Hotel," the 1953 S.M.A.E. Annual Dinner and Prizegiving repeated its success of former years; in fact this annual function seems to be achieving such popularity that more and more non-modellers are attracted to the Tottenham Court Road venue, to the possible exclusion of actual members! It would appear that some form of selection will have to be introduced in future, as the demand for tickets this time far exceeded the number of seats.

Such sardining did not affect the spirits of the jolly crowd attending, and it is probable that some learnt new ways of getting a spoonful of jelly to the right opening by studying the amazing contortions of one of the cabaret turns! (We have not yet succeeded in lighting a cigarette by means of our pedal digits, but have high hopes of adding this feat to our abilities in time for the new flying season. What a useful attribute to be able to light the d/t fuse whilst still fully occupying the hands with putting on the turns!)

In the unfortunate absence of Sir Sidney Camm and S/Ldr. Neville Duke, who were to have been guests of the evening, Miss Barwood of the Royal Aeronautical Society presented the growing list of "hardware" to the successful 1953 competitors. Speeches were happily brief and to the point, and the evening passed all too quickly for all concerned in dancing, etc.—the "etc." covering all those activities found where the breed Homo Aeromuddulus congregates.

(**Note:** 'Orrible 'Orace, our tame office boy, suggests that here is the opportunity to introduce a further Area Eliminator, with the top 25% qualifying for their places by virtue of a public demonstration of their gastronomic abilities. "Fuselage" cross sections would have to be below a given dimension, and processing—particularly of wetted area—should be most diverting!)

Cries of "Shame"!

A recent press release on behalf of the Avro firm gives interesting statistics in respect of aircraft apprenticeships. Of the 70-80,000 boys leaving school each term-end, a large number seek training in the aviation world, and it is getting to be as difficult to obtain an apprenticeship as it can be to get into some of the better known public schools. Avro's received thousands of applicants—the "short list" was 1,500—for 130 vacancies in 1954. We mention this because Mr. Lomas, head of Avro's training schemes, ascribes the boys' interest in aircraft to parental influence, a statement which, we respectfully submit, is unutterable balderdash, as any of the country's thousands of aeromodellers will tell him. Parents may encourage their children when they express a wish to apply for an apprenticeship—after all, the aircraft industry has a future—but the *interest* is already in existence and is largely so, we are convinced, because of the tremendous growth in aeromodelling activities in recent years. Most model flying clubs have had several members secure apprenticeships in the full-size world, and nearly every aircraft factory has a very strong model club. To name but four, what about De Havilland, Bristol, Vickers-Armstrong and (sssh!) Avro? We suggest Mr. Lomas firstly reads the following paragraph concerning Sir Frank Whittle's earlier days; and secondly he has a word with the present Avro apprentices, who will no doubt assure him of the great part aeromodelling played in their introduction to aviation.

Passing of a Pioneer

The sudden death was reported on Wednesday, 9th December, of Mr. C. G. Grey, founder and former editor of the *Aeroplane*. Born in 1875, he became one of the earliest members of the staff of the *Autocar*, and in 1909 accepted joint editorship of a penny weekly called *Aero*. In 1911, with the co-operation of Sir Victor Sassoon, the *Aeroplane* came into being, and C. G. Grey remained editor until 1939. From 1912 onward much of the F. T. Jane *All the World's Airships* (later changed to *Aircraft*) was compiled in the *Aeroplane* offices, until an unfortunate caption compelled Grey's resignation from the editorship in 1941. In addition to being Air Correspondent for several well-known papers, Grey wrote a number of historical and technical aviation books; although he never

appreciated model aircraft enough to allow them any space in his columns, he was not unfamiliar with them—in fact, Harry Hundleby recalls employing C. G. Grey as an assistant when flying a glider at a G.T.C. demonstration in 1941! With his death, aviation has lost one of its most loyal champions, a man who, perhaps, did more than any other to bring aircraft into the layman's home.

Unsolicited Testimonial

A review of the recent publication "Jet," by A.Cdre. Sir Frank Whittle, K.B.E., C.B., F.R.S., appears this month in our book review columns, and we feel that the following quote, with due acknowledgments to the author, will interest all modellers, especially those younger enthusiasts who have yet to convince their parents of the value of the hobby. The writer, who surely needs no introduction, refers to his early R.A.F. days at Cranwell (1923-6) and states:

"My dislike of the strict discipline and barrack-room life was tempered by my association with the Model Aircraft Society .... It would be difficult to over-emphasise the importance of the Model Aircraft Society on my subsequent career, partly because of the absorption of the large amount of aircraft engineering knowledge which went with it, and partly because my abilities in model making compensated in the eyes of authority for certain shortcomings in other directions. There is little doubt that my model work had much to do with the fact that I was one of the five apprentices to be awarded cadetships at the R.A.F. College .... "

Sir Frank then goes on to describe a team project, a 10 ft. 6 in. power job fitted with a petrol motor made by a laboratory assistant named Westbury (surely the renowned Edgar T.?), and the failure of the plugs during an attempted demonstration before a high-ranking audience draws the remark: "Possibly my strong prejudice against piston engines dates from this event." The Editor, incidentally, clearly remembers seeing this model under construction during a model meeting at Cranwell in that year.

Wright Brothers Jubilee Exhibition

A special exhibition commemorating the 50th anniversary of the first successful flight by the Wright aeroplane is running at the Science Museum and remains open until approximately the beginning of March.

It should be of great interest to aeromodellers as there are models, books, aeronautical relics and diagrams displayed, illustrating early contemporary thoughts and ideas on powered flight by a man-carrying machine; and how this was ultimately achieved by Wilbur and Orville Wright on the 17th December, 1903. A series of 16 large, and in some cases dramatic photographs, emphasises the many hazards faced by the early aeronautical pioneer. Amongst the exhibits is one that will be familiar to "AEROMODELLER" readers—the original painting by our cover artist C. Rupert Moore of the Wright brothers' historic flight; this painting was, incidentally reproduced on the front cover of our June 1945 issue.

Facts of interest about the Wright brothers' flight make interesting reading. Apparently the two brothers tossed a coin as to who should have the privilege of being the world's first power driven aviator and Orville won. Wilbur ran alongside and steadied the wingtip until the machine became airborne. Their power plant they made themselves, and consisted of a four cylinder in-line water-cooled petrol motor, that developed some 12 h.p. Airframe of the machine was constructed of ash and spruce, covered with rubberised cotton fabric. Almost an aeromodelling job, in fact!

Hours of opening at the exhibition are as follows: weekdays:—10 a.m. to 6 p.m. Sundays 2.30 p.m. to 6 p.m.

A New Trophy

For many years we have felt it an embarrassment when the annual prizegiving of the S.M.A.E. only called upon certain of the Trials winners to receive a tangible token of their prowess. For many years, only the winner of the Wakefield section received acknowledgment through the Premier Shield, donated in 1936 by the late F. R. Barnard, Esq., and in 1950 the "AEROMODELLER" presented a trophy for annual award to the top man each year in the A/2 Trials for model gliders.

This still left the best Power man "out in the cold," and the Model Aeronautical Press Ltd. have now rectified this condition by presenting the silver gilt trophy depicted to the S.M.A.E. for annual award to the top man in the Power contests staged to pick the team to represent Great Britain in the increasingly popular World Contests.

AERO MODELLER

February, 1954

Don Deeley

Gives a Super Scale Fully Aerobatic Stunter for 3·5 c.c. to 5 c.c. Motors . . .

CURTISS HAWK P-6E

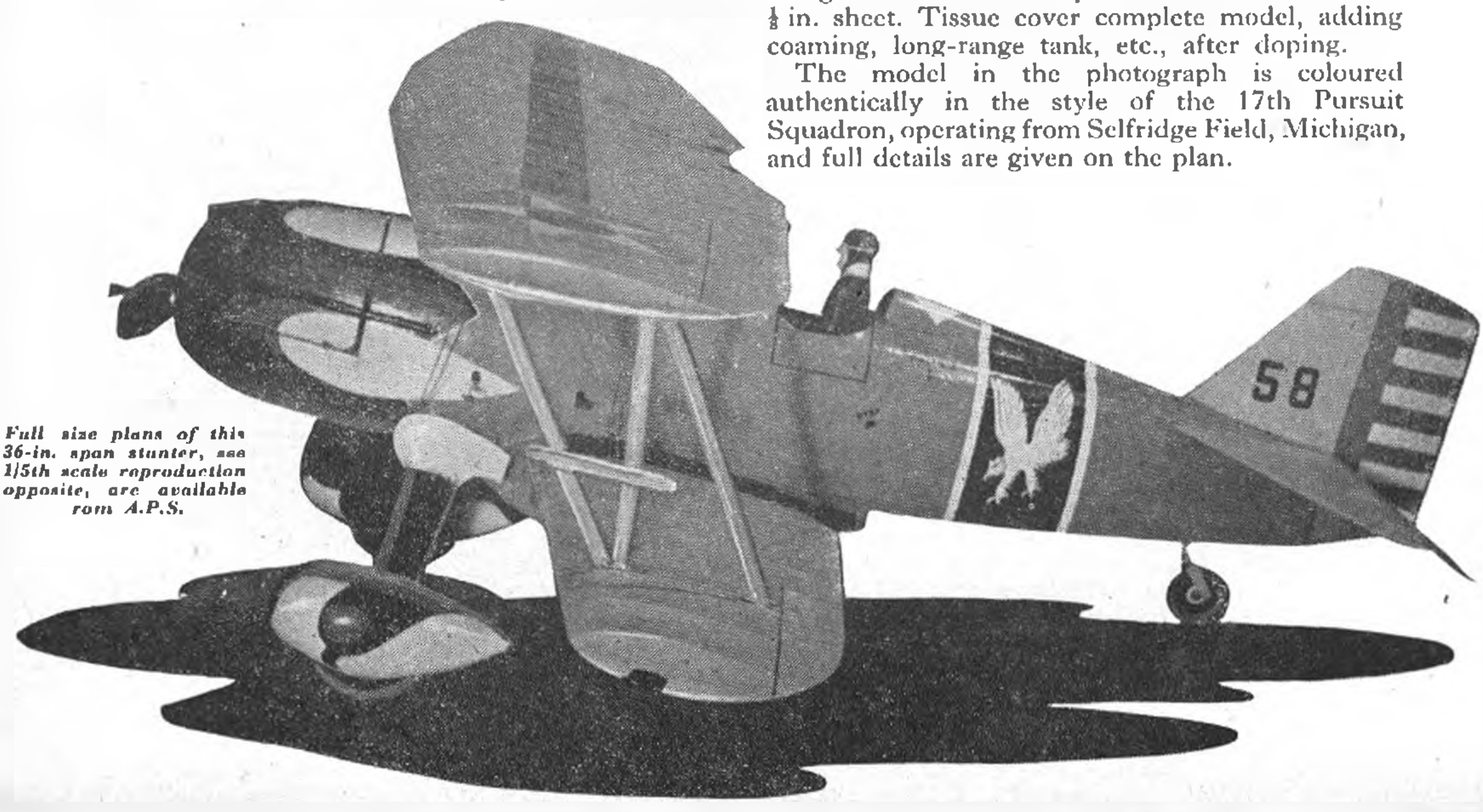
THERE have probably been more scale models of the P-6E Hawk than of any aircraft in history. Before the war, every other scale kit was a Hawk, and they were built in thousands in this country, let alone America. Since the war, one or two kits and plans have appeared in the States, and the machine's popularity has proved little diminished. The trim and racy lines and simple engine cowling, added to a handy aerodynamic layout, make it a natural for a scale stunter, or, if preferred, a lower-powered concours job which can take full advantage of the natty colour-schemes used on the full-size machines when they formed the equipment of the crack American pursuit squadrons of the 1930's.

Don Deeley's accurate model was prepared from "inside information" obtained from the States, and with a total wing area of 412 sq. in. and an all-up weight of 28 oz., is a real thrill to fly. Any hot 3.5-5 c.c. motor able to swing a 9 × 6 smartly is suitable, but the model is definitely in the "advanced" class, and is suited only to experts and those tyros willing to spend a fair amount of time building. The following notes therefore cover only essential points.

The fuselage is constructed by cementing the former pieces to a basic ¼ in. sq. box frame. Formers 2 and 3 are fitted in with the centre-section struts ready bound in place, and are followed by the bearers, bell-crank, push-rod, undercarriage, and former 1. The exhaust duct is then built through F1, and the tank and rear wheel fitted. Planking is now carried out, followed by the nose blocks.

After sanding and grain-filling, the dummy details and stringers are added, followed by the undercart fairings and spats. The wings are built in the conventional way (except that the upper one is built upside down) and the lower wing cemented in place. The interplane struts are bound to the upper wing before siting on the centre-section struts, but are not firmly attached to the lower wing. The tail assembly is cut and sanded from ⅛ in. sheet. Tissue cover complete model, adding coaming, long-range tank, etc., after doping.

The model in the photograph is coloured authentically in the style of the 17th Pursuit Squadron, operating from Selfridge Field, Michigan, and full details are given on the plan.



Full size plans of this 36-in. span stunter, see 1/5th scale reproduction opposite, are available rom A.P.S.

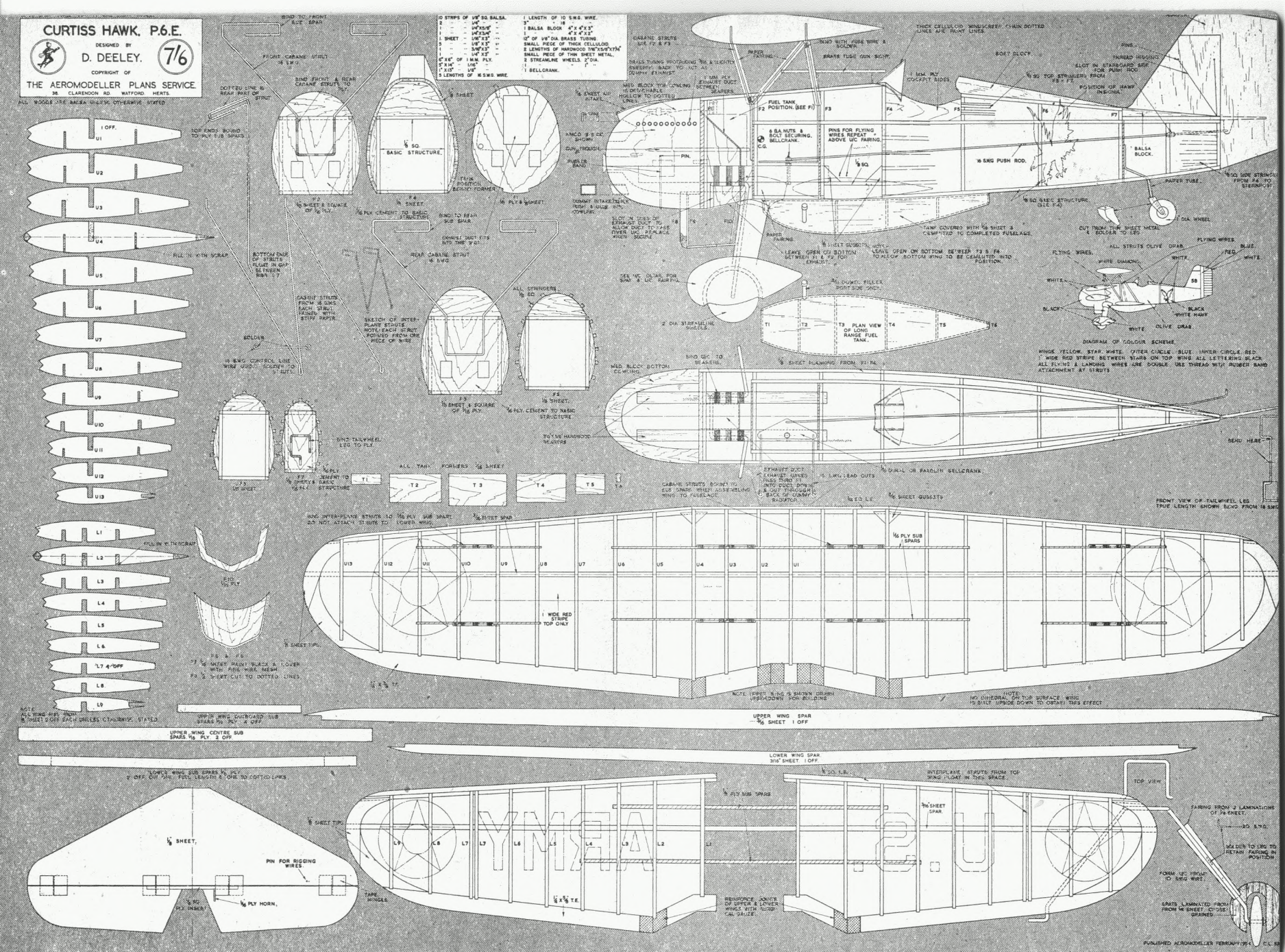
CURTISS HAWK. P.6.E.

DESIGNED BY
D. DEELEY.

7/6

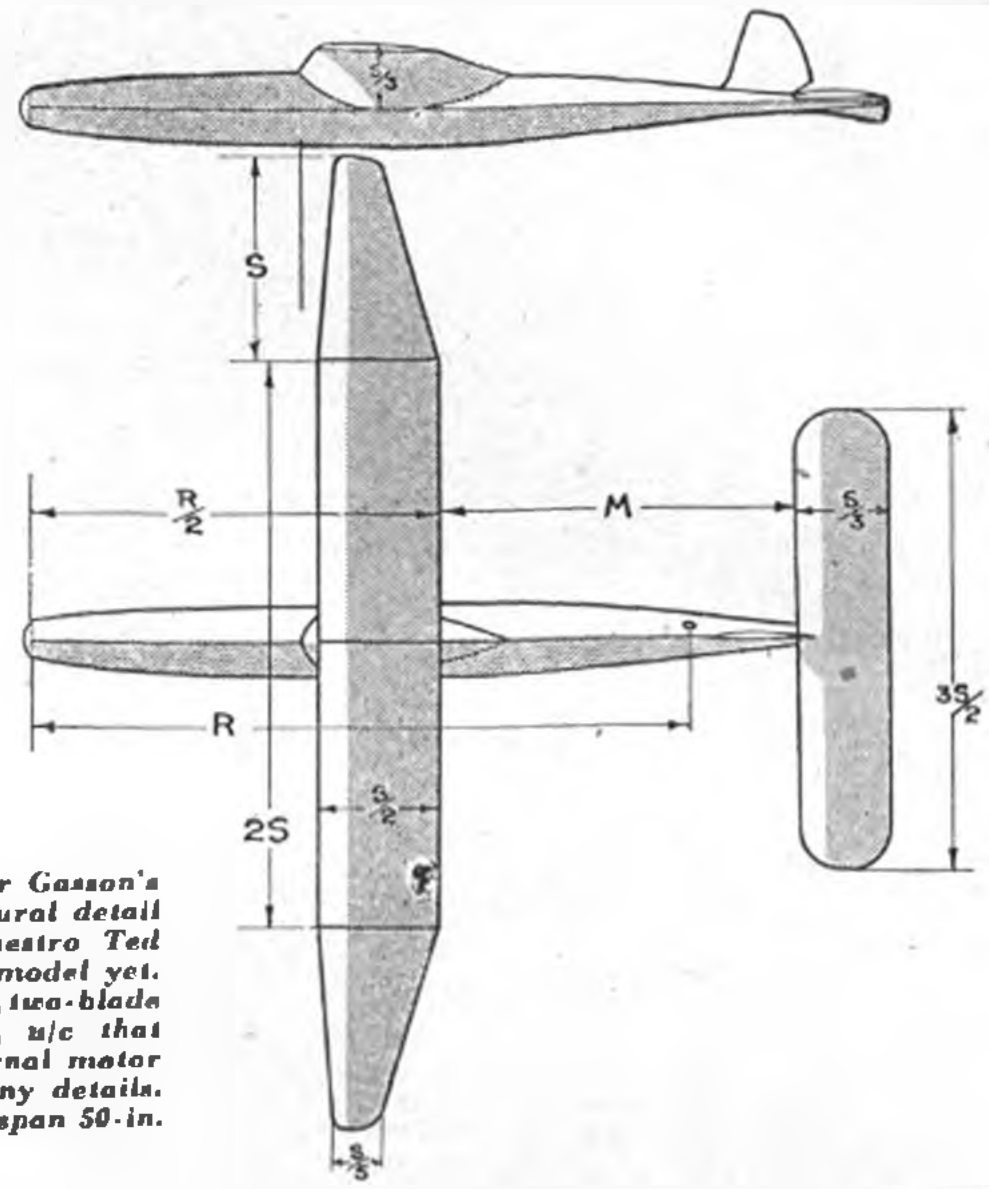
ALL WOOD 1/16 BALSA UNLESS OTHERWISE STATED

10 STRIPS OF	1/8" SQ. BALSA.	1 LENGTH OF 10 S.W.G. WIRE.	
2	" " 1/4" "	3" " 18	
1	" " 1/4"X3/8" "	1 BALSA BLOCK 4"x 4"x 3"	
1	" " 1/4"X3/4" "	1 " 4"x 4"x 2"	
1 SHEET	" 1/16"X3" "	12" OF 1/8" DIA. BRASS TUBING	
1	" " 1/16"X3" "	SMALL PIECE OF THICK CELLULOID	
1	" " 3/16"X3" "	2 LENGTHS OF HARDWOOD 7/16"X5/8"X7¾"	
1	" " 1/4"X3" "	SMALL PIECE OF THIN SHEET METAL.	
6" X6"	OF 1 M.M. PLY.	2 STREAMLINE WHEELS. 2" DIA.	
5" X1/4"	" 1/16" "	1 " 1" "	
1" X1/2"	" 1/8" "	1 BELLCRANK.	
5 LENGTHS OF 18 S.W.G. WIRE.			



Peter Gasson discusses

The Shape of Wakes to come...



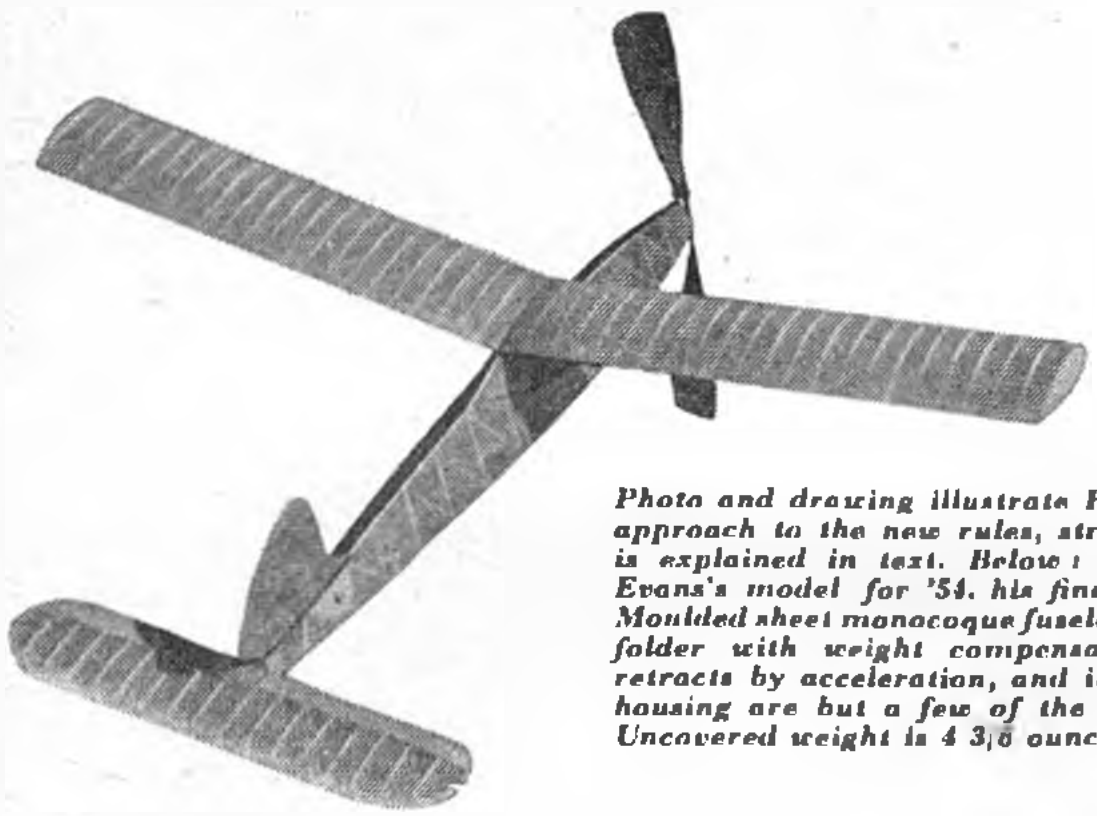


Photo and drawing illustrate Peter Gasson's approach to the new rules, structural detail is explained in text. Below: Maestro Ted Evans's model for '54, his finest model yet. Moulded sheet monocoque fuselage, two-blade folder with weight compensator, u/c that retracts by acceleration, and internal motor housing are but a few of the many details. Uncovered weight is 4 3/8 ounces, span 50-in.

MANY words have been written and spoken about the new Wakefield rules and most Wakefield enthusiasts regard the prospect of limiting their rubber to 2.8 oz. with a despondency bordering on despair. When we look at the beautiful light and strong construction of the old Wakefield fuselage which would hold an eighteen strand motor with ease, and are now faced with the prospect that we can build the fuselage like an untidy timber yard and immensly stronger but can put only a comparatively puny motor in, no wonder we feel a little peeved.

The new situation almost puts the complete beginner on equal terms with the former Wakefield expert, since the specialised techniques of the past no longer apply. There is also the danger of poor workmanship as modellers now have no incentive to take pains in getting the maximum strength out of a limited airframe weight.

Performance will naturally be reduced although in a few years there might again be a four-minute model and some bright spark will suggest we fly on one ¼ in. strand of rubber. Facetiousness on one side, however, one of the greatest faults with the new rules is that the Wakefield, which used to be the favourite all-round model for many modellers can no longer be expected to beat all-comers.

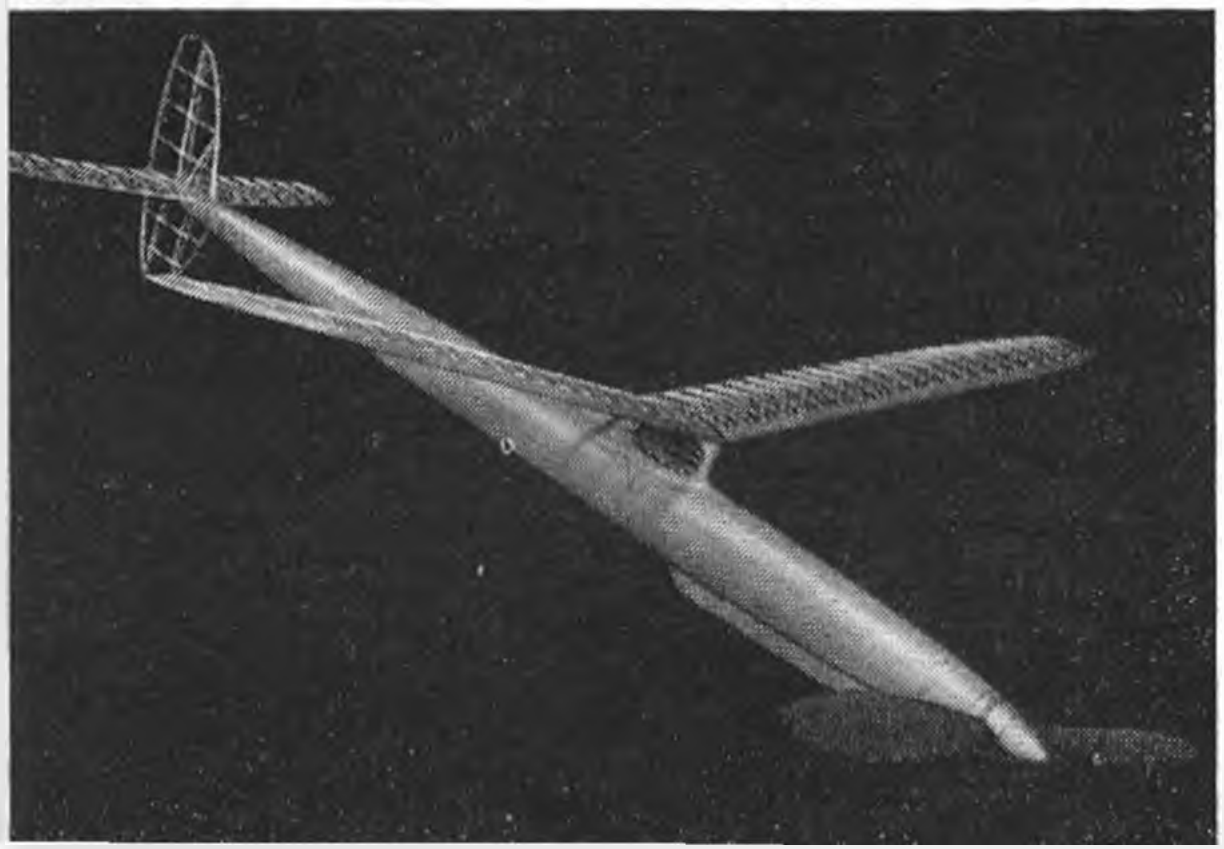
But however we look at it, moaning won't help in the slightest. The whole point is that the new rules are here and we have to accept them and make the best of them.

Incidentally, it seems reasonable to presume that a check will be made on motor weights before each flight. This in many cases will be quite a problem because if full advantage is to be taken of the rules, bobbins and other attachments will have to be removed from the motor and congestion and havoc is the likely result.

Speculation is becoming acute as to how our top-ranking Wakefield fliers will take the fullest advantage of the new conditions and eyes are skinned on the flying fields for appearances of the new species. We have already seen many models converted from the old Wakefields, as the present trials show, but these are merely the products of a period of transition and a fresh outlook in design and technique is inevitable.

Power Model Pattern

Since the alteration in the specification has been rather revolutionary, they need to be faced boldly and with a new outlook. My new-ruler is designed to copy the flight pattern of the power model. The



idea is to have a fast-climbing model with a short, powerful motor run so that in 30 or 40 seconds, it would gain about 350 feet, or in other words do almost exactly the same thing as a power model with a time-limited motor run. The advantage this type of model gains over the one which climbs slowly is that it gets away from ground air turbulence as quickly as possible. This is the best way of ensuring consistent performance in all weathers. The layout for this fast-climbing new-looker can readily be adapted to the new rules. Models designed for this type of trim require a very high reserve of spiral stability. There is no problem with the new rule Wakefield when it comes to the fuselage strength being adequate to hold the high power.

You will probably be saying "But there is no high power available under the new rules." True, we are limited, but if the motor is arranged short with a large number of strands, it is possible to get a climb approaching power model standards and there is not such a great disadvantage as at first imagined.

It will be essential to build any design of new-ruler down to the exact weight specifications since the climb must take absolutely the fullest advantage of the limited power. In many cases this difficulty of building to weight will not arise since the fuselage will have to be ballasted and the final adjustments will be made in playing around with the ballast. The best way of doing this is to build ½ oz. under weight and incorporate a narrow weight box three inches long under the centre of gravity in which the discrepancy in weight can be added (in form of plasticine preferably).

Firm Housing Essential

The glide performance of the new model will be equal to that of the old, as the same size lifting components will be used and the same total weight will be incorporated, either as ballast or extra strengthening. Caution will have to exercised when it comes to using the extra weight available, in strengthening the airframe. It is useless to strengthen the tailplane and wing tips excessively since extra weight distributed at the points farthest away from the C.G. will result in excessive sluggishness.

Providing the fuselage is of moderate length it may be built as strong as is felt necessary, even as far as using ⅛ in. sq. longerons.

The overall appearance of the model should be as clean and streamlined as possible. The wing span should be of moderate size (about 42 in.) the chord being large enough to ensure good efficiency (about 5 in.). To reduce both drag and weight at the tips it is a good plan to use a taper starting at the tip dihedral break. It is completely essential that the wings should be rigid and no flutter should be tolerated especially when the model is at the height of its power output in the climb. The fuselage must be designed to give a good housing to both the wing and the tailplane since any wobble here may prove disastrous in flight. The fuselage should also possess the ability to resist high torque.

These last two factors are of the utmost importance and it is largely upon them that the performance of the model depends.

The fast climb prompts the use of a folding propeller, which of course will greatly improve the glide performance. Prop assemblies are often made too flimsy. With no worries about weight on the new model, care should be taken to see it is strong enough for the job.

Strengthening the Fuselage

The fuselage is the component which may be strengthened the most providing it is not of abnormal length. The essential requirement of a fuselage of a model of this type is capability to remain true without twisting when the motor is fully wound. It must be able to stand up to rough handling in the initial stages of trimming. A few vertical dives are not improbable at first. I have found the best method of building a model to these requirements is as shown in Fig. 1.

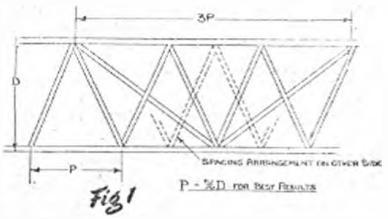
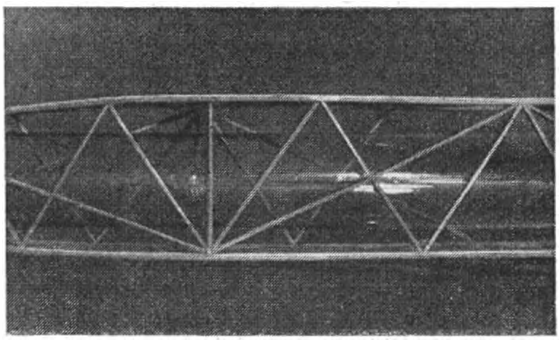


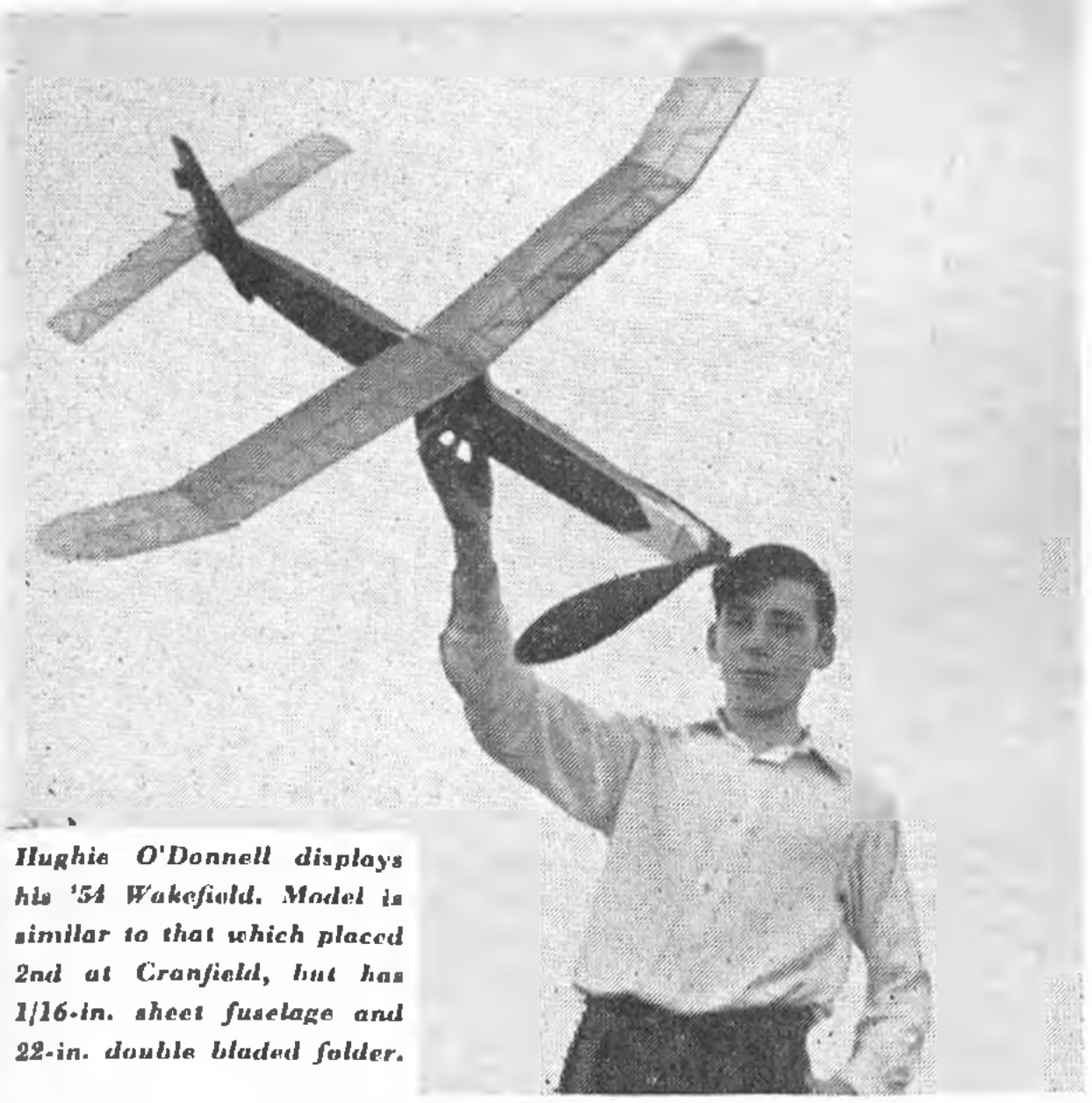
Fig 1

This arrangement of two Warren girder systems, one period (or length between the spacers) being three times that of the other, produces a phenomenal strength. It is also a good plan to double cover the fuselage if lightweight Modelspan is used, as this tends to prevent shattering in a crash. It is also a great help to bind the sheet part of the nose with tissue well soaked in cement.

To prevent the motor slashing the covering, it is a good plan to incorporate an anti-vibration tube. This is a tube of celluloid mounted down the middle of the fuselage as shown in the photograph below. It also stops the lubricant from soaking into the balsa fuselage construction.

The wings must be rigid but extra strengthening must be applied only to the centre section. It is advisable to use good size spars coupled with hollow ribs one inch apart at the tips. A sheet leading-edge also acts as a good stiffener.





Hughie O'Donnell displays his '54 Wakefield. Model is similar to that which placed 2nd at Cranfield, but has 1/16-in. sheet fuselage and 22-in. double bladed folder.

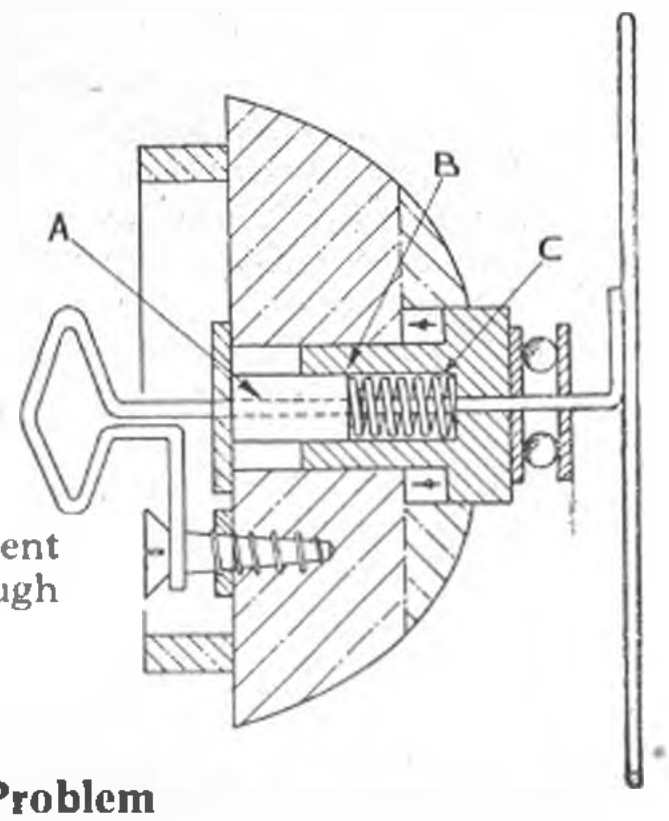
A Larger Prop Shaft

The prop shaft is a good item to strengthen and can now be of as large a size wire as can conveniently be bent. Much hard work will be put into bending 12 s.w.g. piano wire but it is well worth it, since the hardest crash, even on concrete, will not bend it. Those who have tried to fly with bent 16 s.w.g. prop shafts will see the value of this (once bent, always bent).

Although the prop will have to cope with high power, it must not be too large, or after the initial burst has died off, the model will not continue to climb but just maintain height, which is obviously no good at all. Emphasis will now be placed on the motor and now even more than ever the model with the best power-prop combination will win the contests.

A great failing with the modern folding prop assemblies is their inability to remain true. This is mainly due to the "V" shape tension spring which is universally employed on the system. Of all that has been written on prop assemblies, little if anything has been said about this problem. There is one ideal solution which, now that weight saving is not so important, may be utilised. The method is not widely known, although it was used by one of the 1950 American Wakefield flers. Anyone who has access to a lathe should find it a very interesting piece of mechanism to build.

Referring to Fig. 2, "A" is a $\frac{3}{16}$ in. dia. aluminium rod. It has a spring locator at one end which is turned to suit the inside diameter of the spring. A hole is bored right through to clear the 12 s.w.g. shaft. The bush "B" is drilled to be a good sliding fit over "A". It also has a "stop" flange about $\frac{1}{2}$ in. dia. This arrangement works on the same principle as the normal type but encloses the shaft in all positions and thus eliminates any chance of it bending in the event of a crash or a rough landing.



The Lubricant Problem

It is unfortunate that, to save weight, lubricant will probably be used sparingly which will, of course, decrease motor life. Just how much lubricant can be spared is a debatable point and it should be borne in mind that the motor will not give its best without it.

The best type of lubricant is made by dissolving soft soap in hot water and adding glycerine and a few drops of castor oil. This solution has a number of advantages which the commercial lubricants often lack. It gives the best results for the minimum application and has the ability to remain in solution form and not solidify into powder after it has been on the motor a little while. The proportions of this solution are not very important providing it is well mixed.

The purpose of the motor lubricant is to ensure that each strand is able to slide over the next with the least amount of friction. Rubber has a relatively high coefficient of friction and it is this point which makes the lubricant necessary.

If no lubricant is used, the strands will bind together when winding and the potential maximum

MOMENT ARM AND TAIL AREA SIZES

Tail Area % Wing Area	Wing Area	Tail Area	Moment Arm (M)
40% TAIL	206	84	1.2 S
35% TAIL	215	75	1.4 S
33% TAIL	220	70	1.5 S
30% TAIL	224	66	1.7 S
25% TAIL	232	58	2.5 S

The above figures are based on a total area of 290 sq. inch and therefore allow for a positive error of 4 sq. inch.

PIRELLI MOTOR DATA USING (6 x ·8 mm.)

Strands	Length new	Run-in length	MAX: Safe turns
12 strand	40 in.	43 in.	1,000
14 strand	35 in.	37 in.	800
16 strand	30 in.	32 in.	660
18 strand	27 in.	29 in.	560

The weight increase due to lubricating is about .2 ozs. in all cases. And therefore the new motor should weigh 2.6 ozs., giving an approximate length of 48 ft.

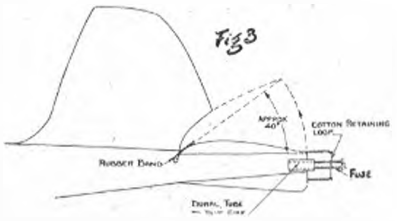
turns will be reduced with a consequent reduction of motor run or a broken motor when approaching half turns. If there is a tendency to go too sparingly on lubricant it is as well to remember these points.

It seems unwise to try and save weight by reducing the amount of lubricant used. The maximum weight, possibly a tenth of an ounce, added by a good coat of lubricant is well worth while.

Trimming is Tricky

Trimming a fast-climber is a very tricky job, as the most minute maladjustment at this stage may mean you digging the model out of the ground. Once you have got a good trim, it is just a matter of a check now and then. Long grass is of especial help and eases the mind considerably.

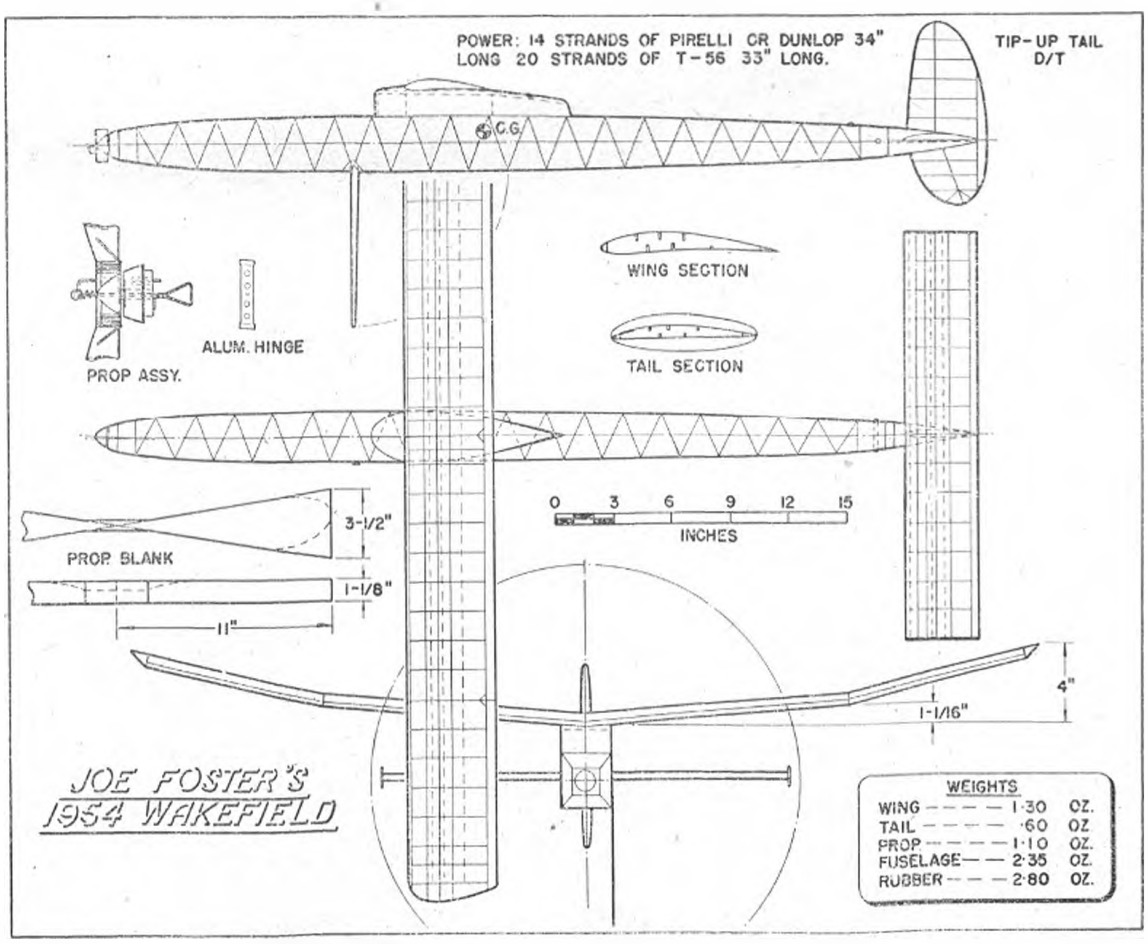
Do not make any power tests until a reasonable glide has been obtained. This must be with no sign of a stall. It is best to keep the power down to about 100 turns at first. Correct any stalling tendency by adding downthrust and on no account add more sidethrust than will give you a turn of about 75 ft.



If you do, the model will turn into the ground as torque dies off. It is a good plan to set a 40 second D/T on tests using more than 150 turns as this has often saved many a model from spinning to earth in the event of something going wrong at the end of the power run.

Use a long, quick-burning fuse (25 seconds per inch) as it gives more accuracy and the opportunity to observe the climb carefully without too much worry about what will happen at the end. Make sure the D/T fuse is on the plan centreline of the fuselage (see Fig. 3) as any offset will cause more drag on one side than the other, which on a fast-climbing model is suicidal.

Below, and worthy of study, is Joe Foster's answer to the new Wakefield Rules.



PAA - PACKET

DESIGNED BY

W. P. HOLLAND

4/6

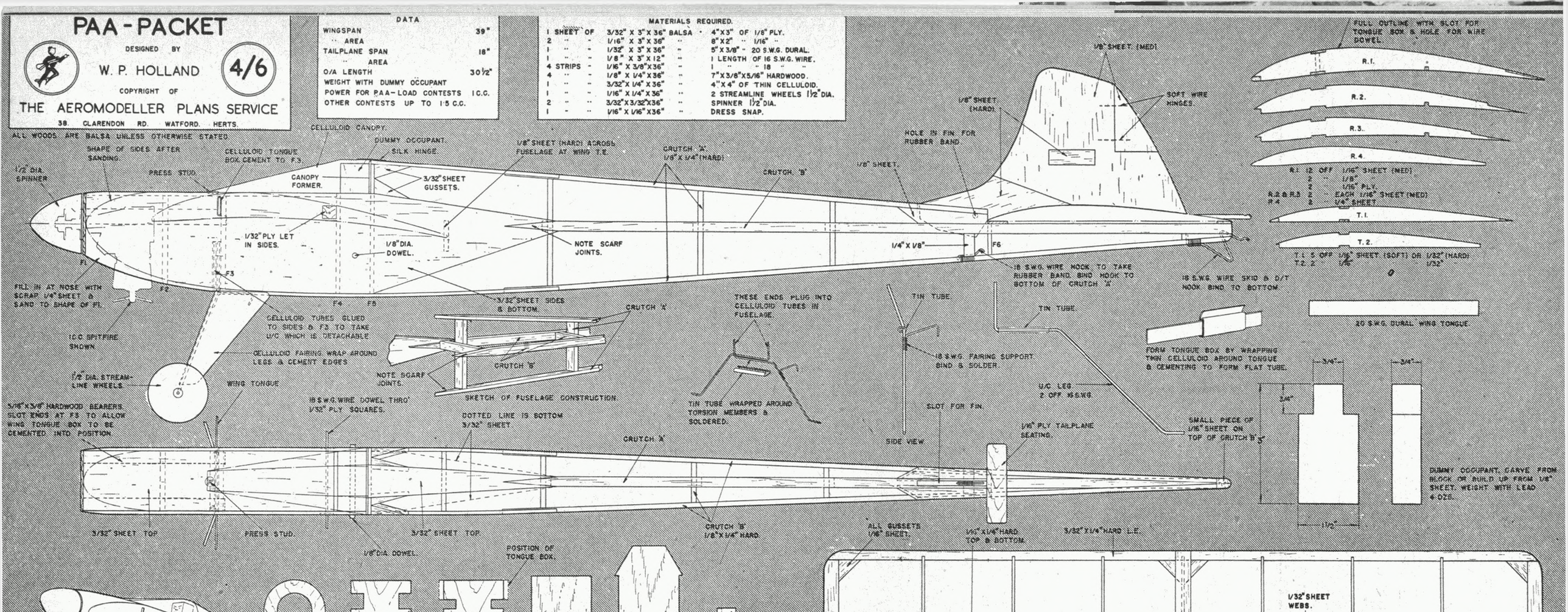
38. CLARENDON RD. WATFORD. HERTS.

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.

DATA	
WINGSPAN	39"
" AREA	
TAILPLANE SPAN	18"
" AREA	
O/A LENGTH	30½"
WEIGHT WITH DUMMY OCCUPANT	
POWER FOR P.A.A - LOAD CONTESTS	1 C.C.
OTHER CONTESTS UP TO	1·5 C.C.

MATERIALS REQUIRED.

1 SHEET	OF	3/32" X 3" X 36" BALSA	4"	4"X3"	OF 1/8" PLY.
2	"	1/16" X 3" X 36"	"	8"X2"	" 1/16" "
1	"	1/32" X 3" X 36"	"	5"X 3/8"	- 20 S.W.G. DURAL.
1	"	1/8" X 3" X 12"	"	1 LENGTH	OF 16 S.W.G. WIRE.
4 STRIPS		1/16" X 3/8"X36"	"	1 "	" 18 " "
4	"	1/8" X 1/4"X36"	"	7"X3/8"X5/16"	HARDWOOD.
1	"	3/32"X 1/4" X 36"	"	4"X 4"	OF THIN CELLULOID.
1	"	1/16" X 1/4" X 36"	"	2 STREAMLINE WHEELS	1½" DIA.
2	"	3/32"X3/32"X36"	"	SPINNER	1½" DIA.
1	"	1/16" X 1/16"X36"	"	DRESS SNAP.	



PUBLISHED AEROMODELLER FEBRUARY 1954. PET 340

2nd place winner in the AEROMODELLER PAA Load design contest . . . . Pete Holland's

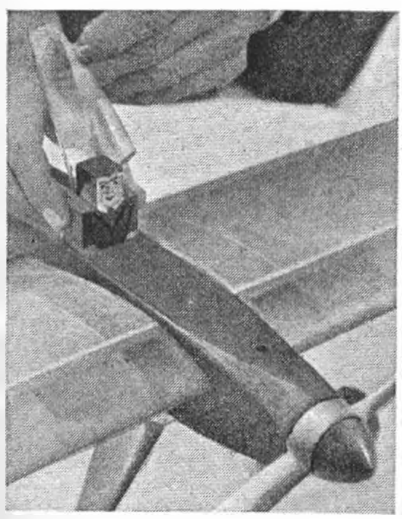
PAA - Packet

About the Designer . . . Aged 29 . . . Secretary of the West Herts Group . . . Architect by profession . . . hobbies are painting and sculpture . . . is renowned for his unorthodox approach.

HERE you have, for three evenings' work and two different engines, in effect, *FOUR* models . . . . 1 c.c. PAA load, and 1.5 c.c. F.A.I. (and without the payload); 1 c.c. and 1.5 c.c. Open,—the latter, though definitely *HOT*, has a rate of climb still within the trimming range. It was felt that a model that conformed only to the PAA load rules might have limited appeal to the average modeller, who though he generally does not have time for building several models of classes so near to each other, and PAA-Packet has the advantage that there is *no change of trim* for various uses.

Most modellers prefer a quick form of construction, and the "PAA-Packet" is no exception to the quickie tradition; it follows the layout of some sucessful 1½ c.c. F.A.I. models previously built, with the same airfoil section (one developed in the Apsley Club's wind tunnel). Theory was proved when the completed airframe came out at 4.15 oz., making 7 oz. with the engine, and 11 oz. loaded. A veteran E.D. Bee was used for the qualifying flight, and although it could only manage about 5,000 r.p.m. gave a still air flight of 1 min. 40 on 15 secs. run having a very tight left spiral climb with practically no bank, and a wider left glide.

The bearers are long enough if you wish to accommodate the Bee, Spitfire, Javelin or Elfin, (latter two if you wish to use the model as F.A.I. 1.5 Class). A Frog 150 was installed, resulting in precisely the same trim, but with about twice the altitude from the same power run.



Cabin cover hinges for access to the PAA load Pilot.

Reduced plan opposite is to ¼ scale. Full size plans are available from APS price 4/6 post free.

As regards construction. . . . The main feature is the "Cross-Crutch" fuselage, only three spacers each way, and light in weight. These are scarfed in to a simple box front fuselage of 1/16 in. sheet which is in turn faired into the 1½ in. spinner with scraps of ¼ in. sheet. The bearers are mounted in two plywood formers which also serve as wing tongue box mounting and U/C mounting. There are no curves to cut, other than the fuselage bottom.

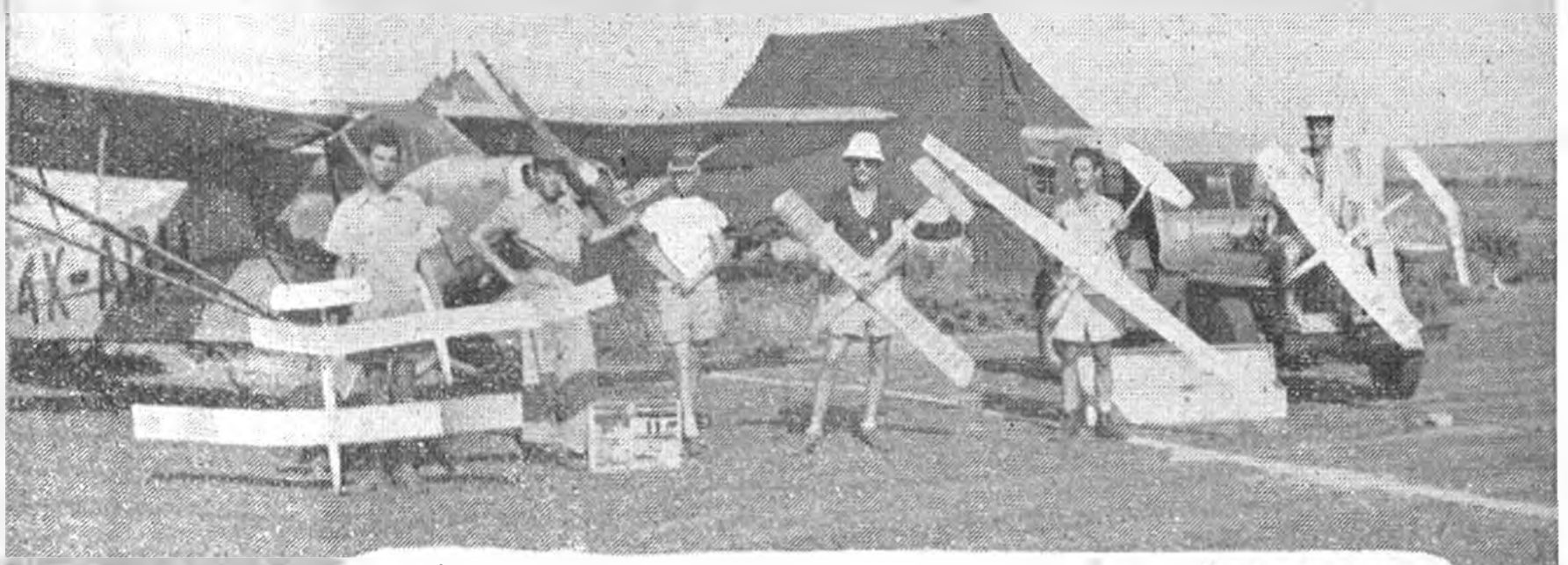
Wings. Use two 1/16 in. sheet spars laid flat and webbed centrally, the tongue is 1/16 sheet Dural and is mounted vertically in celluloid boxes. (Just wrap thin celluloid round the tongue, cement well, and remove); this gives a more compact box and this is a fraction of the weight of plywood. A wire locating dowel secures the wing against incidence variation.

Tailplane is extra light to avoid inertia, and is of similar construction, having anti-warp struts between the 1/16 in. ribs. The ¼ in. sheet fin is mounted on a capping strip. A rubber band goes through a hole in the strake, securing the tailplane and acts as D/T lift; the strake acts as a stop on the bottom of the crutch and the little D/T band is the only external band on the whole aircraft.

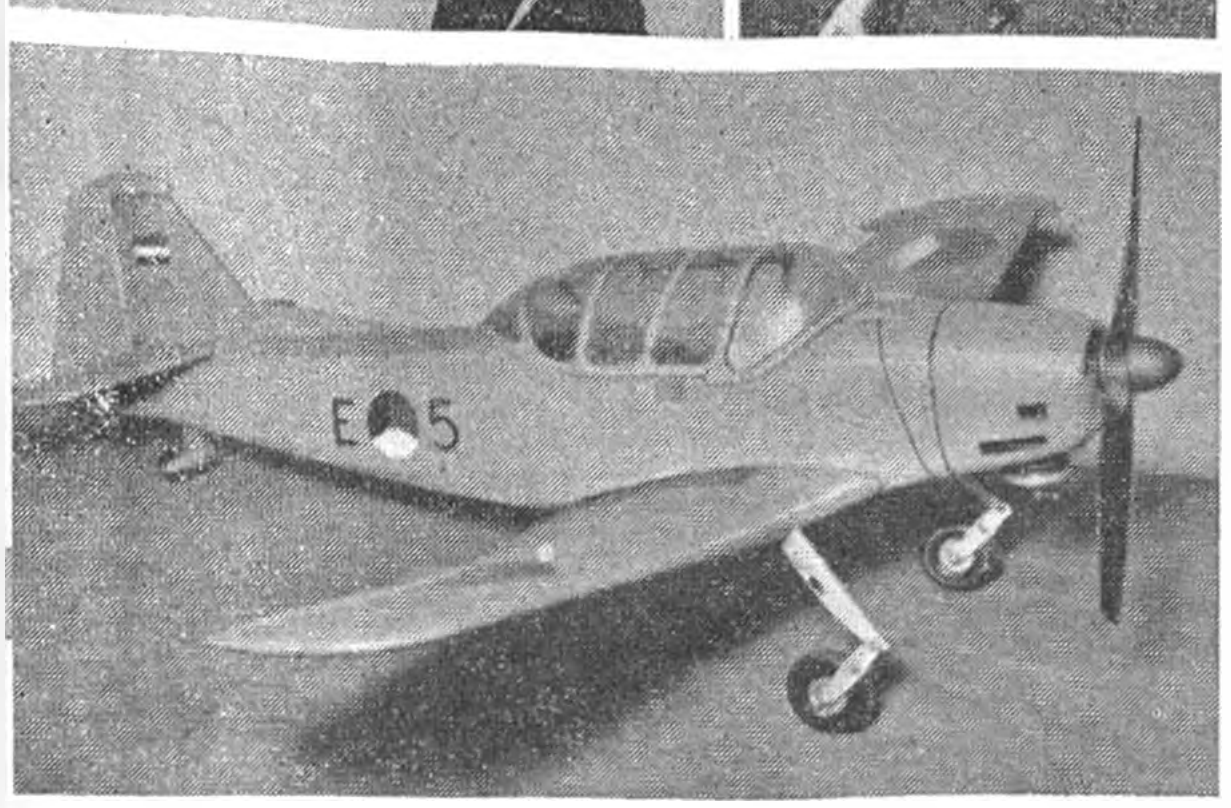
Undercarriages are usually quite weighty items, so a lighter gauge wire was used together with a novel double torsion bar which gives independent springing to each leg.

The whole structure is definitely *not* flimsy. for due to some packing falling out, the job did a vertical spiral dive from about 300 feet, engine flat out, (it was the Frog 150 this time), and the only damage was a small tissue tear!

Covering is lightweight Modelspan all over and a different colour on the leading edges of wings and tailplane saves the weight of colour dope; jointing is easy with the wide mainspars. The cockpit canopy is folded from celluloid and requires no moulding, a wire former keeping its shape. An alternative moulded canopy can be made extending right up to the spinner if you like a "supersonic" appearance.



WORLD NEWS



Above : Ron Bird, Victorian State Champion for '53 with his winning A/2 the first Australian A/2 it has been our pleasure to publish. At right : Keith Hearn launches his r/c winner at the same Australian event. Bottom : Beautiful scale Fokker S-11 Instructor is the work of Kpl. van Eerde, Royal Dutch Airforce and uses an ED.2.46.

NO official news as yet on the '54 World Championships, though rumours are flying thick and fast. The A/2 will probably be held in Denmark in the latter half of June, and the A.M.A. is making every effort to alleviate the transport problem for European teams attending the Power and Wakefield finals. Beyond that, nothing official has been released. Among the countries already planning eliminators for team selection, is **Czechoslovakia** where a centralised meeting for all classes including control-line, took place in January.

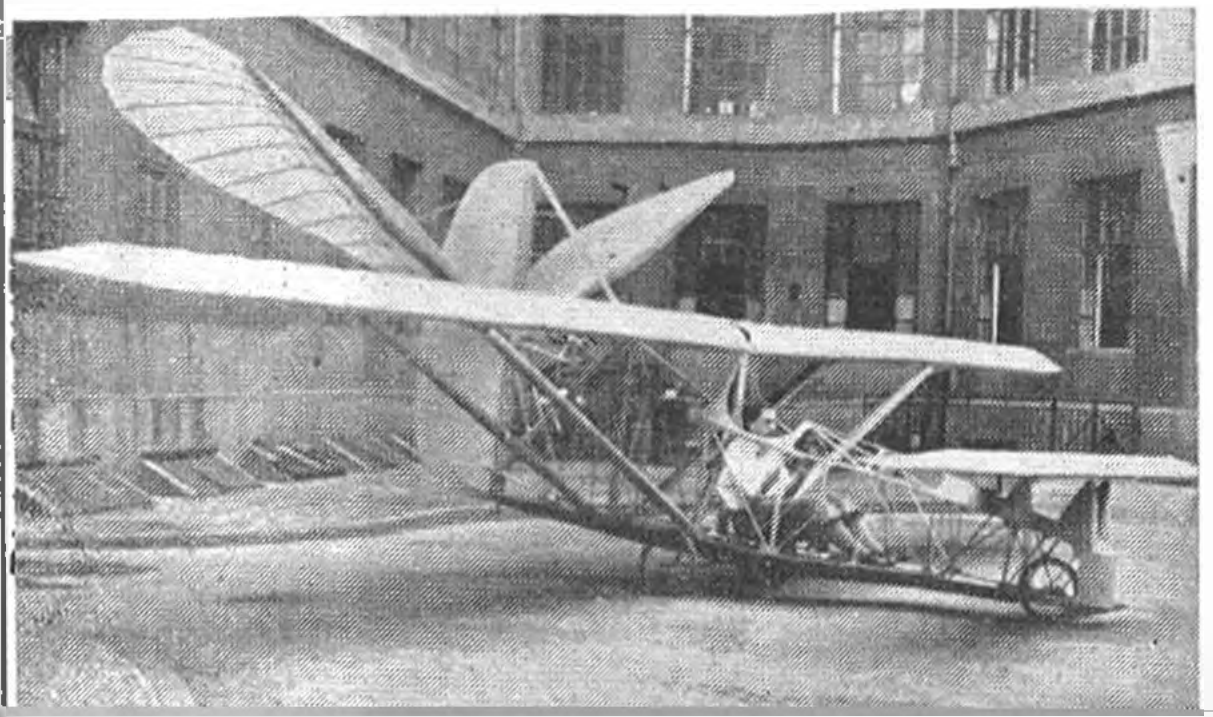
In **Israel,** first A/2 eliminators were held on December 2nd at Tel Aviv airfield. A Piper Cub and retrieving Jeep were on hand should any of the 24 entries show signs of wanderlust, and for the first time in Israel, the 50 metre towline and five 3-minute flight rules were used.

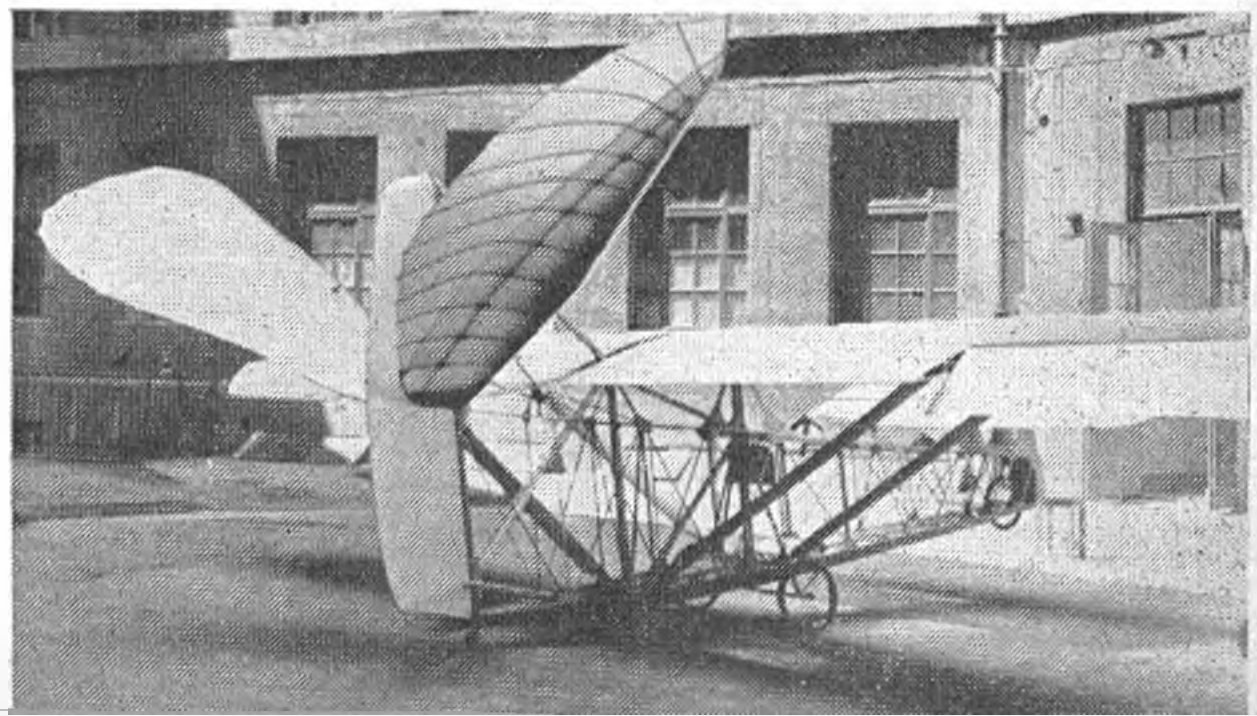
Israel is making an all-out effort in the A/2, and following the invaluable practical experience gained by attendance at Lesce-Bled, they have decided to select the 1954 team through three of these intensive training camps cum eliminators. The pilot of the spotting Piper Cub at Tel Aviv was a 17-year-old modeller who had no A/2 to compete with, and the third place man, Ze'ev ben-Shahar, who was in the team to Bled, alternated contest flights with full-size flying instruction given free of charge by the Aero Club of Israel. He earns this free tuition for services as an active modelling instructor.

Such intensive aeronautical activity, which has now been in operation for two or three years, must certainly develop the general standard of modelling to a very high grade, leading us to expect an experienced Israeli team at the glider finals in Denmark.

One of aeromodellings most enthusiastic devotees is Dr. Martin Sultan of Tel Aviv, who has two particular loves,—Canards and large power models. His O.K. Twin (20 c.c.) cabin sports model has a

Below : Fullsize Canard Ornithopter is the work o Dr. Martin Sultan, and was constructed in the early '30's in Germany. Famous as a "Muscle-Power" machine, the project was not apparently fully completed and no flying performance is available. Dr. Sultan hopes to compete in the '54 Wakefield with a Canard—see text.





Heading opposite: Intensive effort is being made by Israel to attain a high standard of A/2 flying. Piper Cub and retrieving jeep are part of the equipment loaned for the first eliminator in December. X-Acto tool chest in front of Cub enabled the British team at Bled to make their "Last Straws."

fuel tank capacity of 500 c.c., which by our reckoning is enough for twenty minutes motor run per flight! Canards are the Doctor's big interest, and now that he is 61, he announces the intention to take a Canard to the Wakefield, and then retire from the hobby. Photographs on the opposite page show that he knows more than average on this subject, for in the early '30's he made this full-size canard ornithopter for muscle powered flight. Dr. Sultan still holds several patents for this machine which he built in Germany, and relates that the forward thrust of the enormous bamboo ribbed flappers was terrific. A total of over 320 lb. of effort had to be exerted by the pilot as he stretched himself out between a foot slide and a wedge for his shoulders. This brought the flappers "up" and then, when the feet were relaxed, and the slide returned along the fuselage floor, the flappers pulled "down" by means of doubled rubber ropes. After all that effort we sincerely wish Dr. Sultan every success with his canard Wakefield, and hope that he gets to the finals in America.

The new Allbon Bambi 0.1 c.c. diesel is given a close run in the claim for the "World's smallest production diesel" by a new engine from **Russia.** Designed by V. N. Krasnogolovoj of Riga, the V.N.K.4 is an 0.13 c.c. diesel with 5.5 m.m. bore and stroke and weighs 13 grammes (approx. 45 oz.). Lack of fins make it look austere, and a gravity tank seems unusual. Like the .5 c.c. V.N.K.3 diesel, it is used expressly for indoor models.

The most significant statement in modelling literature from the **U.S.A.** that it has been our pleasure to read this month, is the following quote from the *West Coast Model News* and the *Flypaper*.

"Speaking of F.A.I."—they state, "How about a campaign to revise our (American) engine classes to conform with the Europeans?"

So the wheel returns full circle, and a fully International system of engine classification may yet be a possibility. We can remember many an ardent campaigner on this side of the water, who was anxious to see an adoption of the A.M.A. classes in Europe, and the more recent plea for opinion on extending the F.A.I. 2.5 c.c. limit was a move to allow use of the American .19 cu. in. class engine which has as yet come to naught. The strange thing is that the popular .09 and .19 capacities do not fit favourably in influential Pop Robbers' suggested list in West Coast Notes.

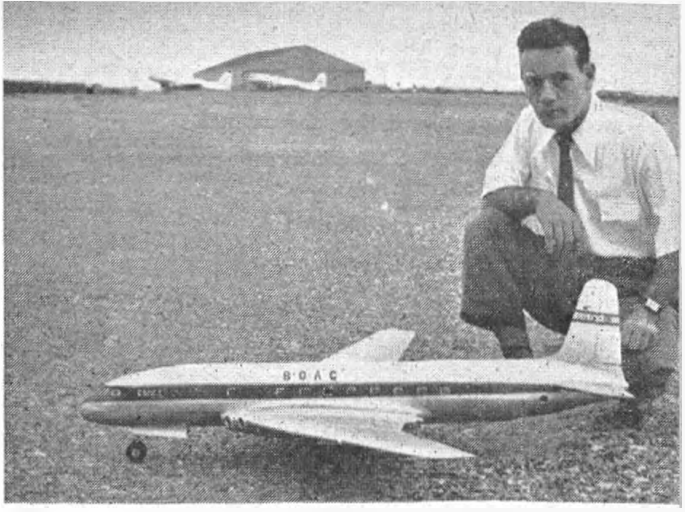
½ A	.001 to .060	Approximately	1 c.c.
A	.061 to .150	... ...	2½ c.c.
B	.151 to .300	... ...	5 c.c.
C	.301 to .610	... ...	10 c.c.

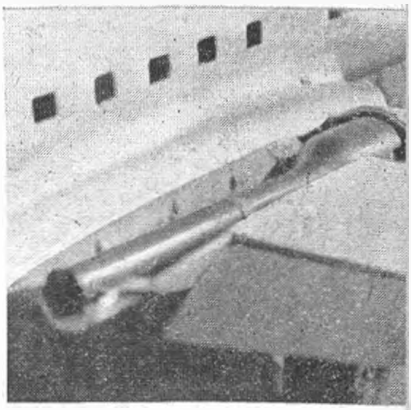
As Don Santee mentions in the Flypaper, now is the time to think about rules revisions for 1955. We wonder, couldn't they also consider a ½ A class to accommodate the increasingly popular 1.5 c.c. diesel and its American .099 glowplug counterpart?

Also mentioned in the Flypaper is the very first quotation of a "B" Team Race time seen in magazines from the U.S.A.

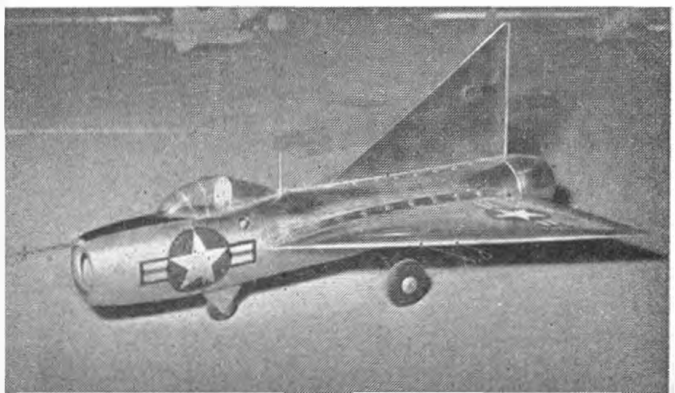
Bobby Huffer of Annapolis covered 140 laps on 60 ft. lines (Ten Miles) in 9 : 04,—which is faster than British average, and matches the Australian times mentioned last month.

After crediting World Glider Champion, Hans Hansen of **Denmark** with the design of the airfoil section using droop T.E. in December issue, we now learn that honours should go to Borge Hansen for developing this new line in airfoils . . . . further news on this subject appears in Readers' letters this month.





Scaled up from an A.P.S. scale drawing, this 2-in.-1-ft. De Havilland Comet is jet powered. John Stivala of C. Paula in Malta is the ambitious constructor, and in the inset photo the Swiss Furrer jet is seen installed in the starboard outer nacelle. Another similar jet will be fitted to the port wing before flight trials. Note the flap to aid lift and improve landings.



The "World of Models" International exhibition in Geneva proved to be one of the greatest shows ever staged in the modelling world. Among the aircraft exhibits were two from Captain Milani, who sent his Hawker Horsley and Fairey Firefly as sole British entries, and we can vouch for the excellence of the packing and transport, all of which is at the expense of the organisers. Photo here shows a jet semi scale Convair XF-92A of all alloy construction by L. Gregoire of Geneva. A Swiss jet of 2-lb. thrust is used.

There is no doubt that tuned reeds are the most practical and economic answer to the problem of multiple control operation, at least as far as the immediate future is concerned. Mr. Boys explains the operation of the simple reed unit for the benefit of the uninitiated, and gives sufficient information to enable the enthusiast to construct his own unit.

W. S. Neild of the Cheedle Club launches his entry in the 1953 S.M.A.E. Trophy held at Long Marston Aerodrome.

INTEREST is increasing in tuned reed units for operating more than one control, due to a large extent to the success achieved by French enthusiasts using this system. To avoid misinterpretation of this statement it should be recorded that a successful pioneer of reed units is Mr. E. L. Rockwood of California, and Mr. G. Honnest-Redlich has pioneered reeds in this country, though in a less spectacular manner. It was however the manoeuvrability of the French models in last summer's contests that demonstrated the capabilities of reed units, and competitors with rudder only control at the International Competition at Brussels found themselves outclassed.

Until then most units had been confined to three reeds, but the Frenchman turned up with six. Messrs. E. D. will be producing a six reed set and Sid Allen has been using one of these in a scaled up Rudderbug. The three reed unit has been used to give in general rudder right, rudder left, and a sequence for engine or elevator. The six reed unit gives rudder right, rudder left, elevator up, elevator down, engine advance and engine retard. Each of these controls is progressive. That is, the controls move in the appropriate direction as long as the button is held down. Sid Allen has fixed up a control box with a "joy stick" in the middle with left and right and fore and aft movement for rudder and elevator, just two push buttons for engine speed control, one for increase, and the other for decrease.

Since all classes of readers have asked about reed units, let us start a description at the beginning.

For controlling models by radio we are allowed a narrow band of radio frequencies with which to transmit signals to the model. In this band we have room for only one transmitter at a time, unless we go to rather complicated equipment. (We have another band, but it is not so suitable for model aircraft.) We have then only one line of communication or channel. With the usual simple equipment this is switched on and off to operate a relay in the receiver, but only the one relay is operated. To operate three relays independently we need three channels. This is done by superimposing three audio frequencies on the radio frequency. By having suitable differences between the audio frequencies they will not interfere with each other. The radio frequency is then carrier wave, and is said to be modulated by the audio frequencies. These are amplified in the receiver, and then have to be separated either by electronic or mechanical means. The tuned reed is a mechanical means. A reed will vibrate at its own particular frequency quite easily, but not at any other. If it is fixed in an electro-magnetic field, and the current pulsed at the reed frequency, the reed will vibrate. If three reeds are in this field, any one can be made to vibrate by pulsing the current at the appropriate frequency. A contact can be arranged to be open with the reed stationary, and closed intermittently with the reed vibrating. With a suitable circuit this intermittent closing can be made to hold a relay closed. A relay is required then for each reed.

The reed unit takes the place of the relay in the anode circuit of the receiver, and it is usual for a three valve receiver to be used to obtain the necessary amplification. However, Mr. Lindsey of the I.R.C.M.S. has had one working with a single valve XFG1 receiver at a range of 300 yards, with a medium power transmitter. For this, the modulation is made to pulse the transmitter at the reed frequency. Using a system like this with a full power transmitter, a perfectly satisfactory range should be obtained.

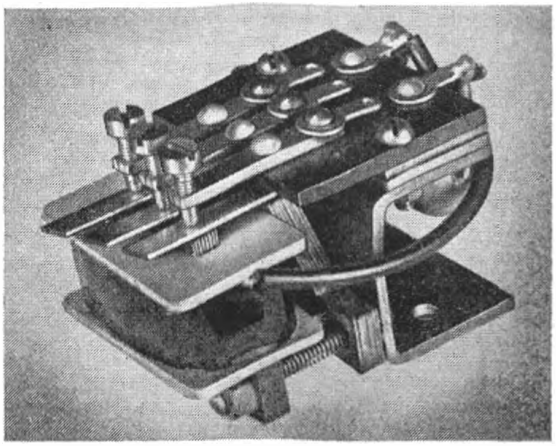
Construction of a reed unit is not very difficult, but good workmanship is necessary. Fig. 1 shows one good type which uses a coil similar to that used in the Sigma relay or the ex-gov. SGR 522 that was at one time available. With the bobbin wound full of No. 47 s.w.g. enamelled wire the resistance comes out at about 7,000 ohms. Any similar coil of about 4,000 to 7,000 ohms. should do. The core is made from stampings taken from an old LF transformer or choke, and the magnet is a permanent one of Alnico or similar material and can be obtained from an old headphone. Unfortunately these things do not seem easily obtainable new. A contact arm is required for each reed, made of brass, and mounted on insulation. The reeds can be made of thin spring sheet steel, watch spring or even razor blades, as shown in Fig. 2. About one inch long and $\frac{3}{32}$ inch wide is about right, and they can be different lengths as in 2a and b, or the same length as in 2c. If the latter, they must be soldered to a piece of brass where shown shaded with the brass cut to the shape of the solid line. Fig. 2a shows the reeds cut from sheet, and 2b and c cut from watch spring or razor blade soldered to a brass plate. Before soldering, the reeds should be tempered. This must be done in daylight for the colour to be seen correctly.

The steel is cleaned bright with emery cloth on one side, and then heated. It is best done with the reed lying on a piece of metal, and heating this from underneath with a gas flame. As the reed gets hot it turns first yellow, or straw colour, and darkens to blue. When blue is reached the reed is dropped into cold water.

Reed units can be made from high resistance headphones, two designs being shown in Figs. 3 and 4. The two coils must have a total resistance of 4,000 ohms., or more. In all these units the contacts should be made of silver, one flat and one pointed. Bits of silver or contacts from old relays can be soldered on.

The way the reed unit is connected up in the receiver circuit and connection to the relays is shown in Fig. 5. Across the reed coil is a condenser CT which is used to tune the unit. Its value must be found by trial after most other things have been done by using a signal to make the middle reed vibrate and find which value gives the best vibration with the weakest signal. About .01 to .05 mfd. should be somewhere near the mark. The common reed connection is taken to HT and each reed contact is taken to a relay coil and resistor R to HT. A condenser C of about .05 mfd. is connected across the relay coil, and this with the resistor slows down the operation of the relay, and thereby delays its opening. The relays should be sensitive types of high resistance, about 4,000 to 10,000 ohms. and the resistors 15,000 to 10,000 ohms. to make a total of about 20,000 ohms. across the HT.

These notes should enable enthusiasts to make a start on a reed outfit, and further information will be given in the next issue.



Above, is the neat and workmanlike E.D. three reed unit. The reeds themselves are clearly visible, also the adjustable contacts. Note also the connecting tags at the base of each reed.

Fig 1

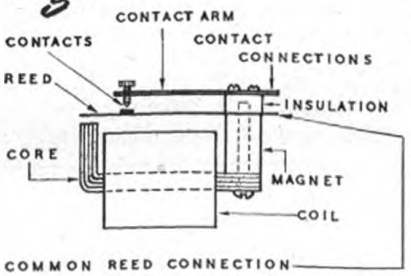


Fig 2

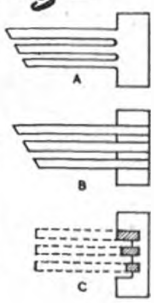


Fig 3

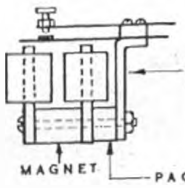


Fig 4

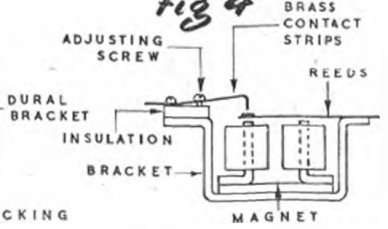
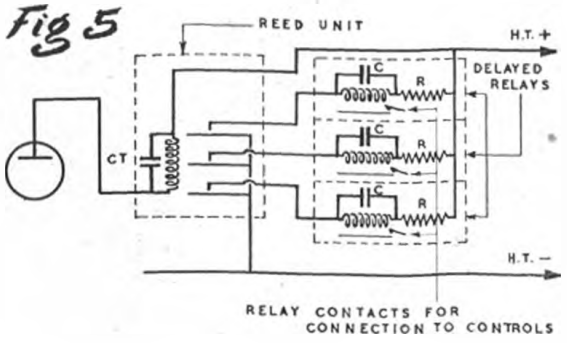
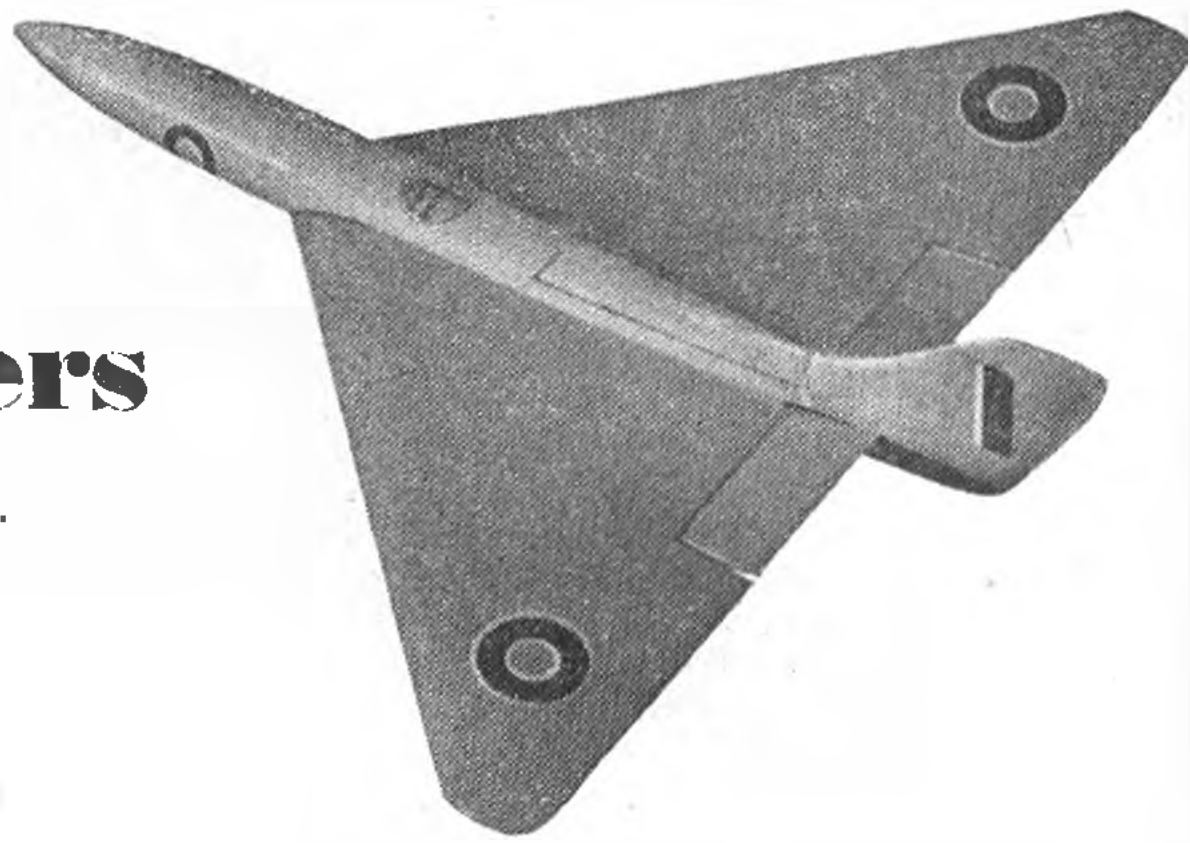


Fig 5



Spectacular High-Speed Gliders

By J. E. HART, *D.C.Ae., Grad., R.Ae.S., G.I.Mech E.*



MANY creditable performances have been recently achieved with High Speed catapult launched gliders, embodying a novel automatic control. Representative scale models have been built achieving take off speeds estimated at over 80 m.p.h., heights of 200 ft. and durations of up to a minute.

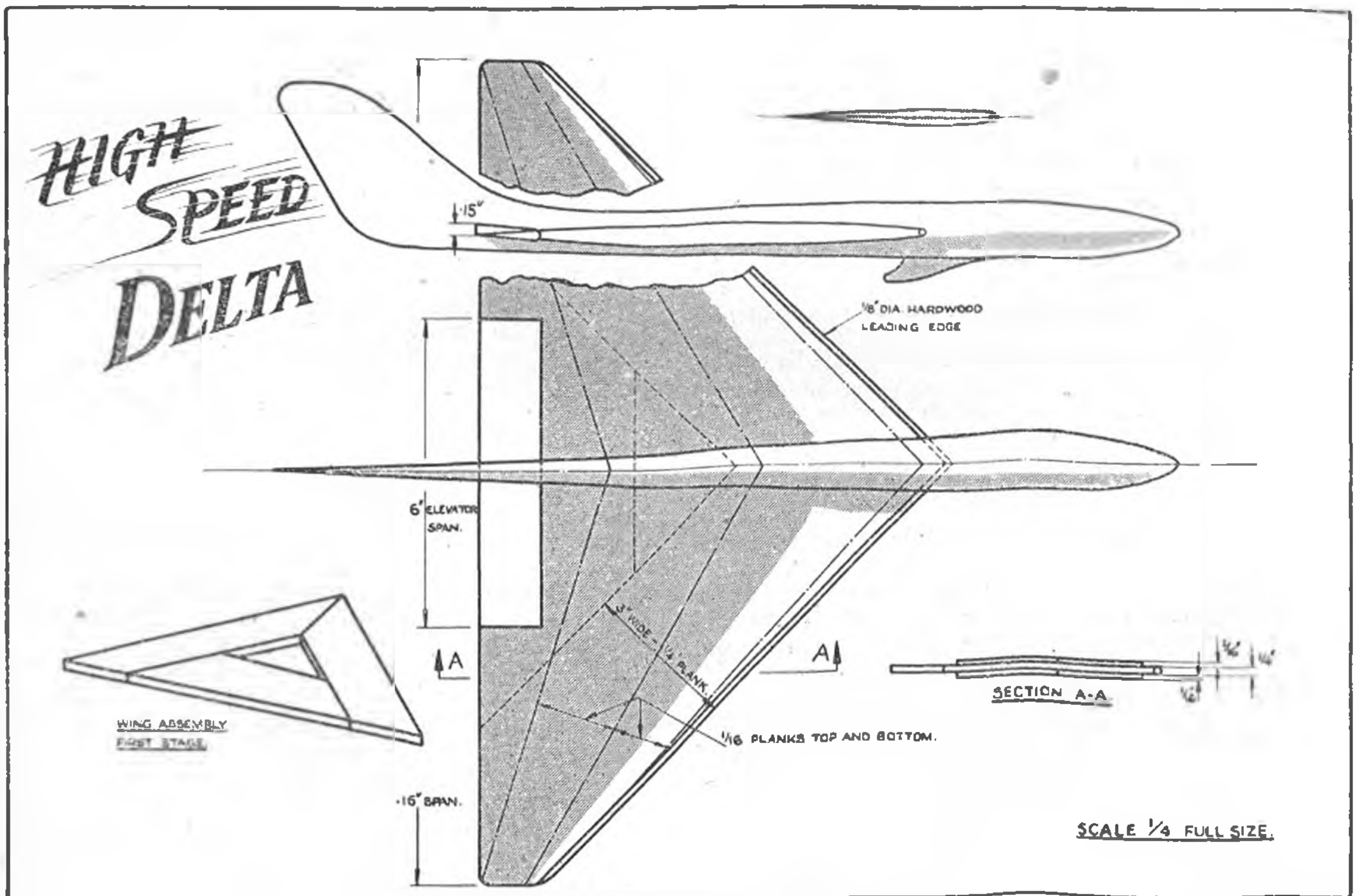
The large speed range of a catapulted glider requires some trim device between launch and glide speeds, in order to avoid the normal loop or trajectory flight path. One satisfactory answer to this problem has been found in the "Blow Back" elevator control.

This is adjusted to blow back to a down stop at launch and moves under a spring load, as the speed falls off, to a stop so arranged for trimming in the glide. Therefore, straight Flight paths from release to near maximum height can be obtained.

For a given launching speed the length of climbing flight path will depend on the Weight/Drag Ratio and therefore weight is not such a disadvantage as in other powered models. This enables robust and smooth (aerodynamically clean) models to be quickly constructed without impairing the performance by weight.

Another interesting development has been the differential "Blow Back" Control, *e.g.* Elevons on the Delta configuration. With this the following flight sequence can be achieved:—

Straight climb on release.



Roll at maximum altitude.
Loop if desired and straight or turning glide.

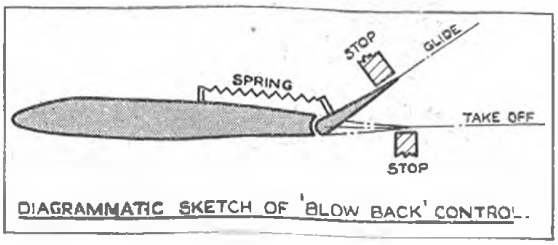
For example. Both controls blow back together against individual springs to down stops on release. One control lifts in advance of the other, giving roll, until both are on the symmetrical up stops for the glide.

It is apparent that each control has three variables, "Up Stop", "Down Stop" and spring tension, the flight path being adjusted with each. It should be noted that a large speed range is required in order to make this form of control practicable.

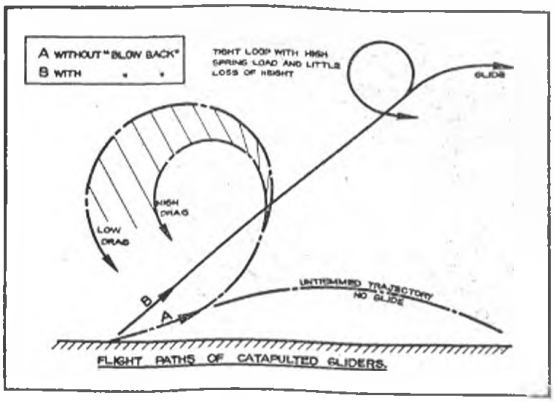
The hook position is well forward of the C.G. and sufficiently low to allow the "v" launch rubber to avoid entanglement with the wings.

Fins extending aft of the control, as in the Delta shown, enable the model to be pulled back and released without damaging the control. The fin must of course be strong enough to carry the full rubber tension but sufficiently thin for low drag and aerodynamic efficiency.

Control hinges must be absolutely free and robust enough to withstand high speed crashes. Fabric hinges have not been used because of high friction and difficulties in adjustment.



DIAGRAMMATIC SKETCH OF 'BLOW BACK' CONTROL.



FLIGHT PATHS OF CATAPULTED GLIDERS.

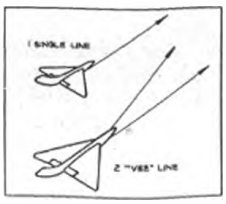
LAUNCHING

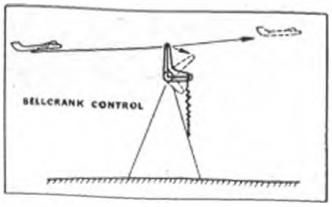
Two types of launching may be used, (1) Single line, (2) Vee line.

(1) Single Line

The drag of the rubber itself being small, results in high launch speeds, although a problem arises in that the model travelling in a straight flight path may collide with the anchorage post.

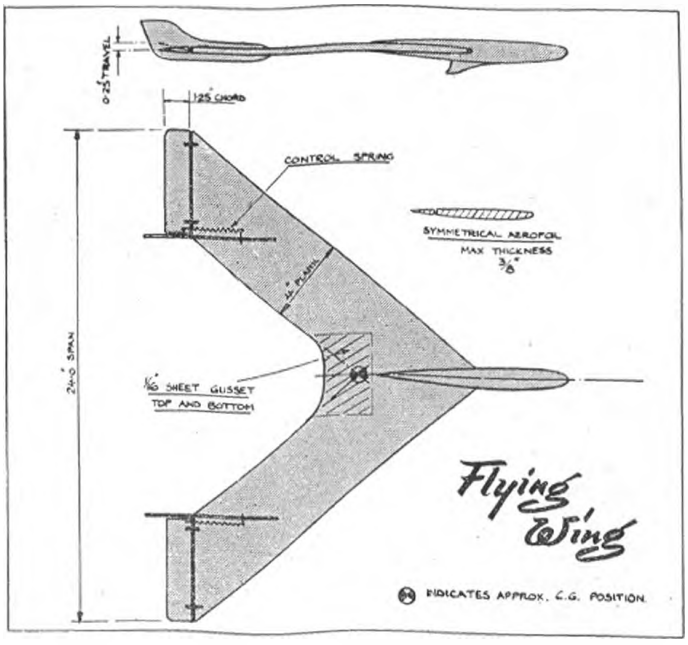
One method of overcoming this matter is to employ a spring loaded bell crank lever as shown. This has been constructed and works satisfactorily, the lever moving downwards and clear as the model is released.





(2) "Vee" Line

Has high drag, but is simpler and may be anchored more readily. Rubber may entangle with model on certain configurations unless care is taken in the design, in particular the location of the hook. Various catapults, from several strands of $\frac{1}{4} \times 1/30$ up to $\frac{1}{4}$ in. square and $\frac{3}{8}$ in. dia. round have been used, and the single strand heavier sections have been found more economical; 10 yards of $\frac{3}{16}$ in. square being found a practical and efficient form of motive power.

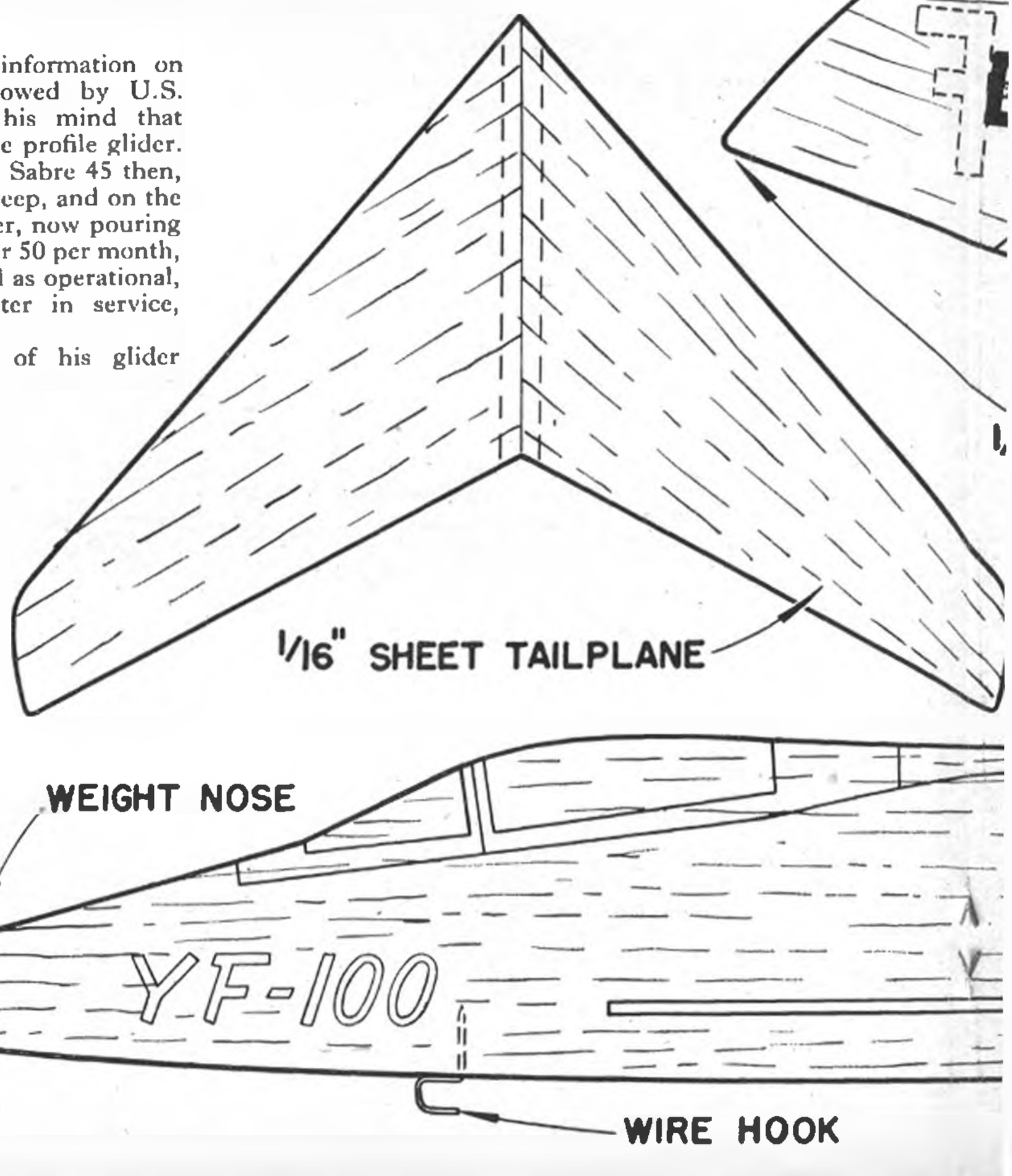


STRAIGHT FRO
AMERICAN F.
THIS PROFILE
WORLD'S FA

Bob Linn's Super

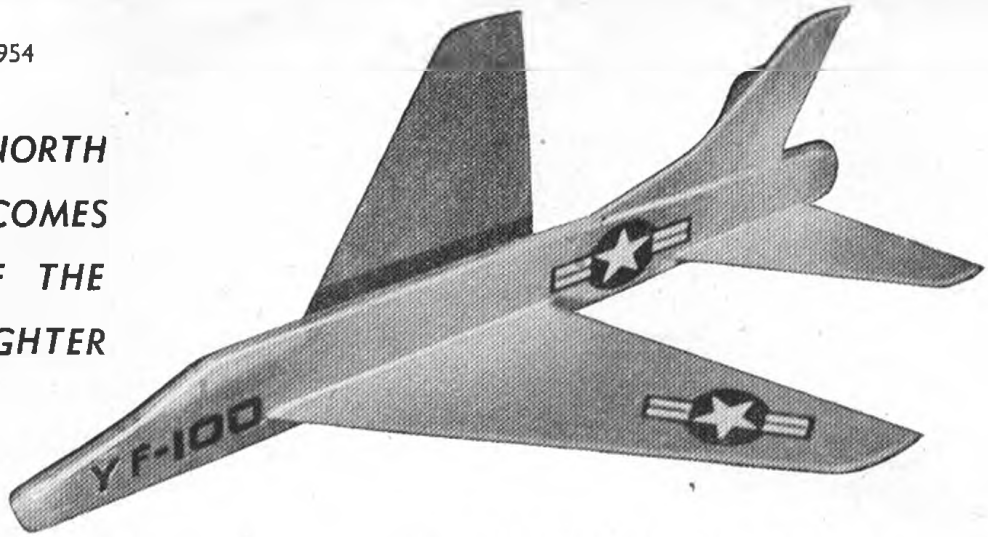
LONG before official release of information on this transonic fighter was allowed by U.S. authorities, Bob Linn made up his mind that here was the ideal subject for a scale profile glider. The Super Sabre was known as the Sabre 45 then, by virtue of its 45° angle of wing sweep, and on the very first test flight, this latest fighter, now pouring off production lines at the rate of over 50 per month, exceeded the speed of sound. Passed as operational, the F.100 becomes the first fighter in service, capable of supersonic level flight.

Bob Linn pressed for release of his glider drawings as soon as the first photo of the YF.100 was seen in the American national press, and full co-operation with the factory information department enables us to present them with proper official sanction. Construction is simple, and providing the wing and tail slots are cut accurately, no undue trouble should present itself, even for the raw beginner. Add weight ballast to the nose to bring the C.G., hook up a length of four ¼ × 1/24 rubber strands, and catapult off at a slight angle. You'll be surprised at the speed and glide of this swept wing model, and if you can manage to wear a shirt like Bob Linn's, you'll probably surprise your clubmates as well!



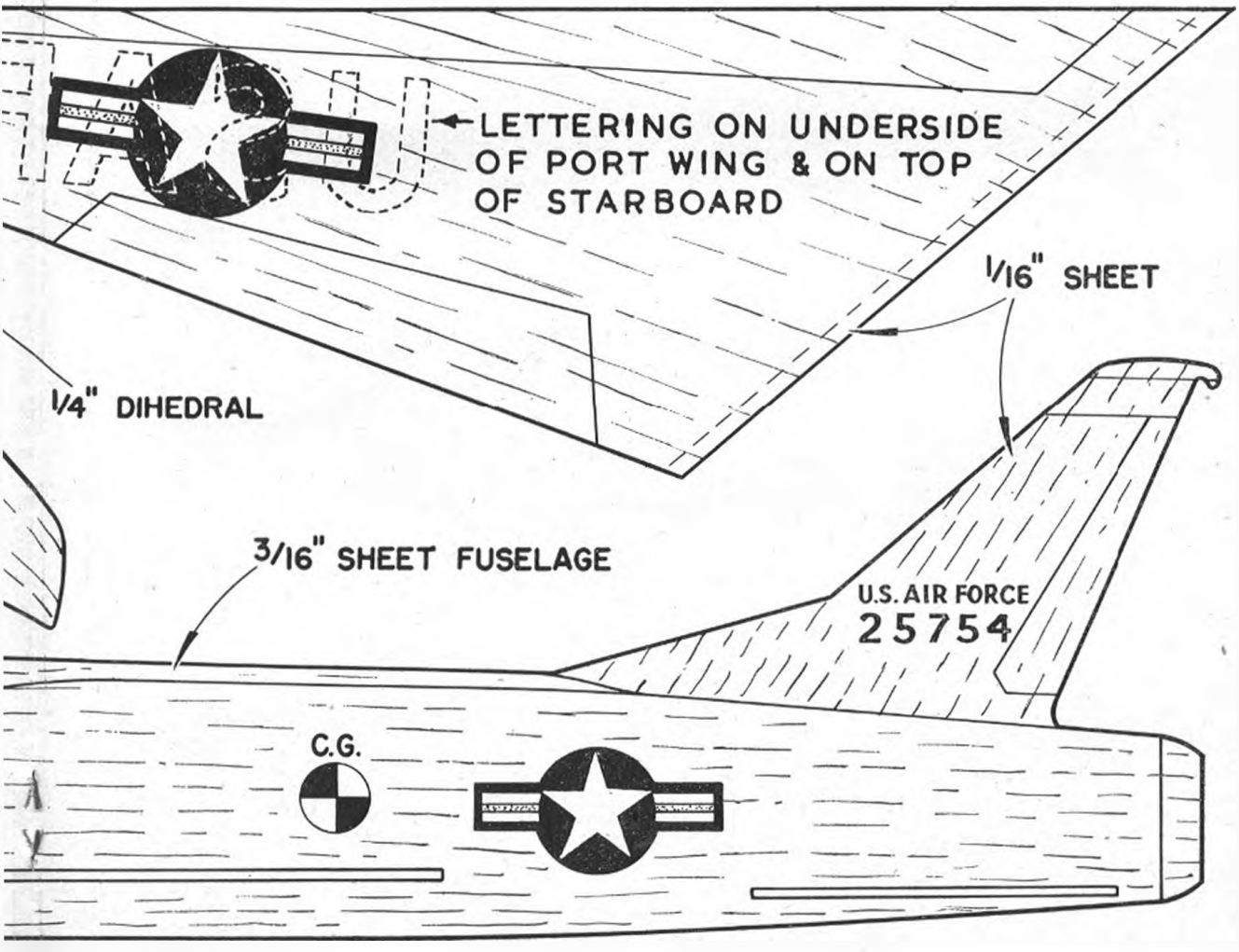
February, 1954

FROM THE NORTH
FACTORY COMES
ILE GLIDER OF THE
FASTEST FIGHTER

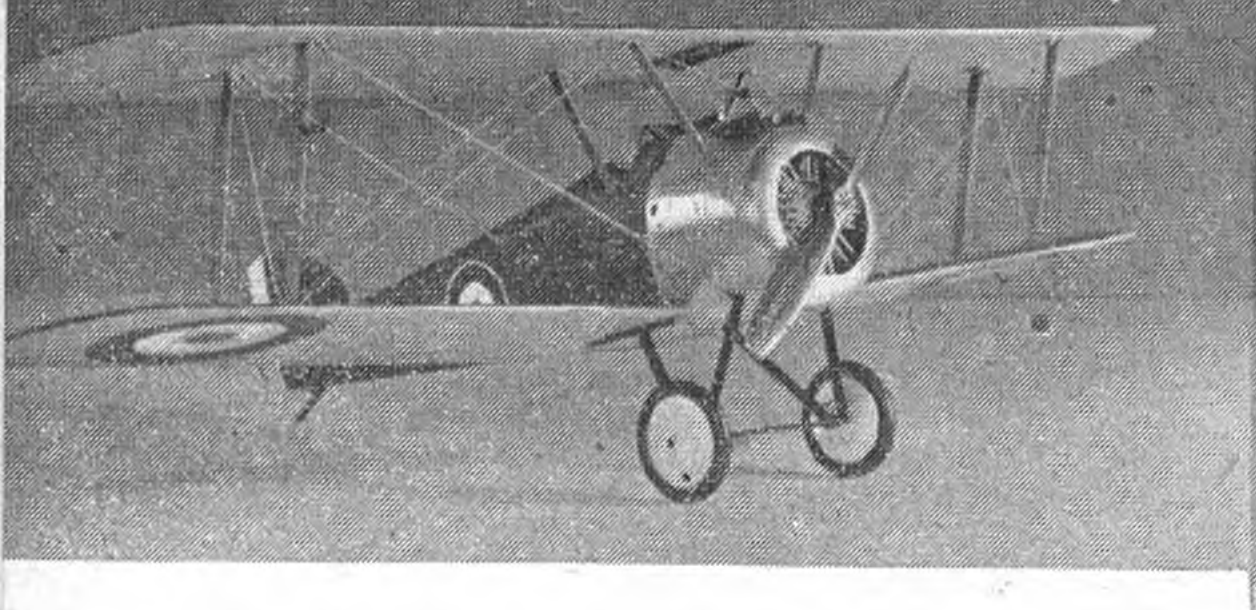


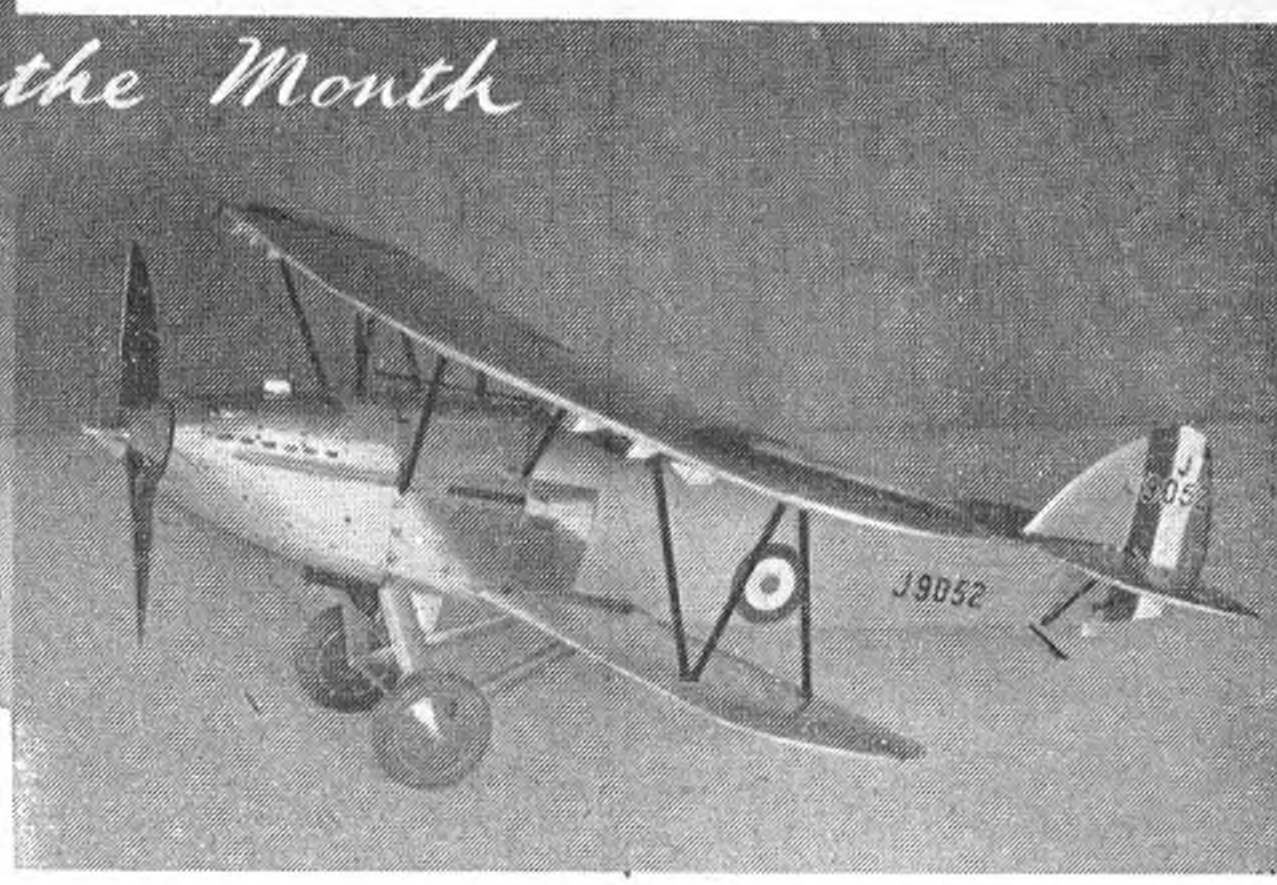
Sabre

NORTH AMERICAN
YF. 100



Models of the Month

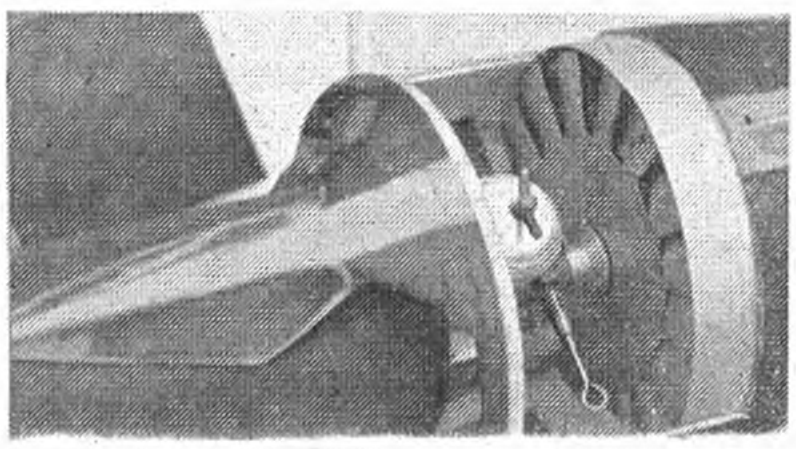


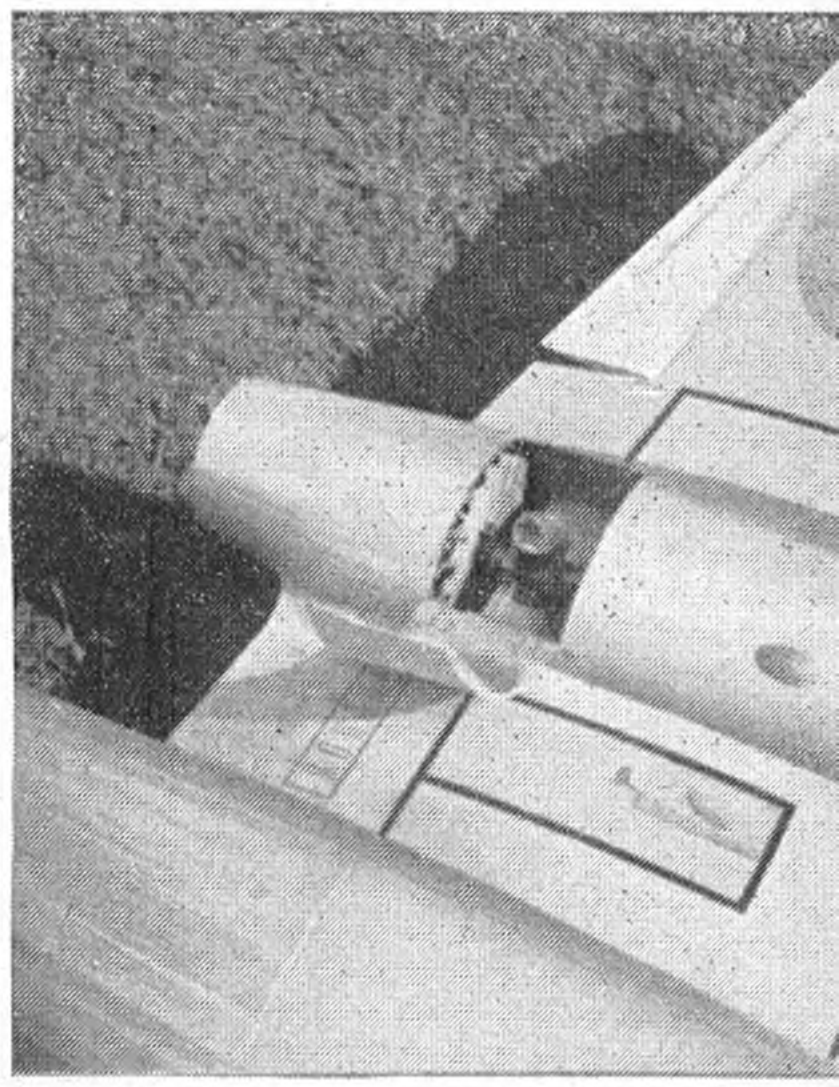


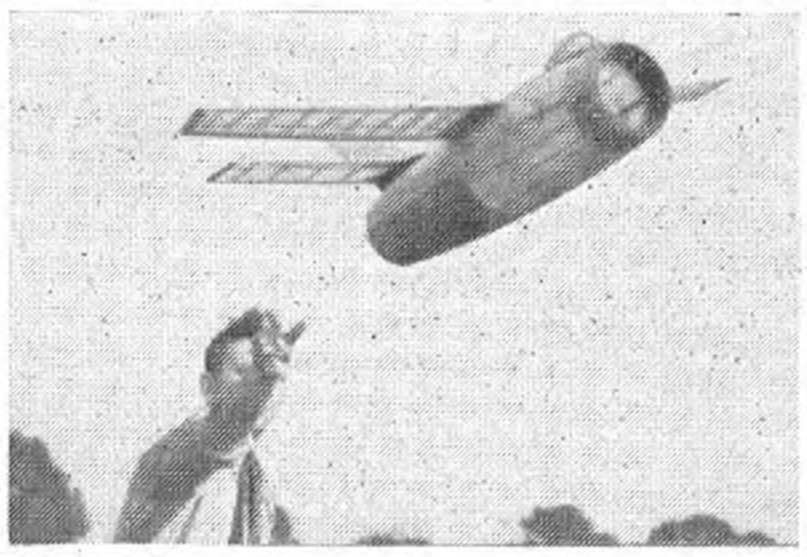
Model News

TWO gems of the solid modeller's art take pride of place as "Models of the Month," and few readers will be surprised to learn that they bear the professional model-making stamp of Westway Models. Each is to 1/24th scale. The Sopwith Camel on the left is 14 in. span and 9½ in. long, yet every detail is exactly reproduced and even the rotary engine goes around with the spinning propeller. Cowlings of both this, and the Hawker Hart are from hand beaten aluminium, whilst gun detail and cockpit interiors are there in perfection. The models have been made to special order for the Australian National Museum at Melbourne, where they will doubtless be held in high esteem by the curators and all fortunate enough to give them a close study. What a


1







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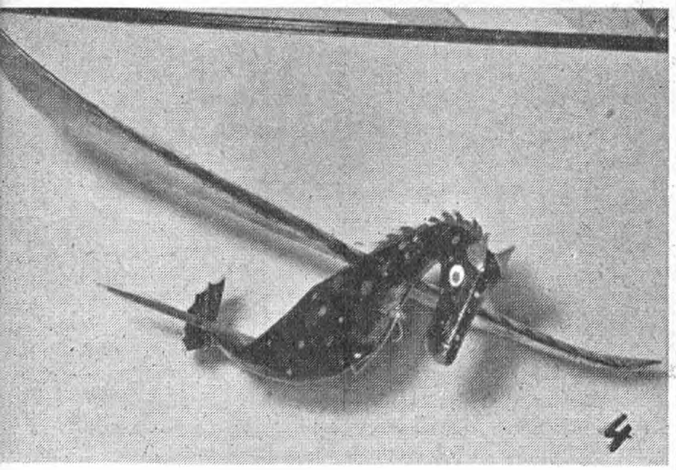


Pity Westway cannot provide such a service for the general public, the cost of production being prohibitive for the average individual purchaser.

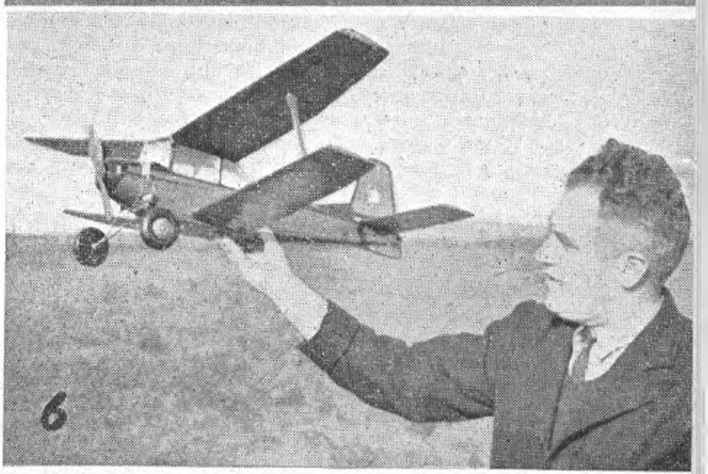
Now to current developments in the flying side of aeromodelling, and to ducted fans in particular, The Douglas X3 had more than a little influence on Pete Holland's lethal looking effort in 1: but even the unconventional Pete thought that the X3 could do with a larger wing, and a canard tailplane. Inside the small portion of fuselage at the wing root (see inset photo) is a Frog 150 with Newbold Fan and in spite of the general revolutionary appearance, we must confess that after personal examination of the incomplete model, this short length duct idea has possibilities. In photo 2 is another approach, F. Adcock's flying barrel, which has a Mills .75 driving a 6 in. × 8 in. prop inside a 6⅛ in. fuselage. The nose portion detaches for starting, and though tricky in windy weather, this 39 in. model flies well, as the inset photo shows.

By far the most ambitious ducted fan model to come to our notice, the Meteor, with twin E.D. 2.46 Racer diesels in photo 3 is by Dr. C. M. Marks of South Shields. 75 in. span, and with over 1,100 sq. in. wing area, the Meteor has pendulum ailerons, rudders in the slipstream of each nacelle (Newbold system is used), and in spite of an all-up weight of 6½ lb, maintains a steady altitude of head height for a distance of 200 yards. Inset view shows the short duct employed.

Christmas spirit and a flare for novelty doubtless inspired Bill Coomber of Eastbourne to make the flying Sea-Horse, otherwise known as the Nightmare, in picture 4. Bill, and photographer J. Banks assure us that construction is orthodox and that it flies!! Top time so far is 15 seconds! Number 5 hails from Troon in Ayrshire, and Jim Goudie is seen with his control-line B.29. Two Bees, a .75 and E.D. 2.46 go to make up the power quotient and though good enough for circuits and bumps, the power has since been stepped up by another 2.46 in place of the .75 for much better performance.

A biplane conversion of the APS Debutante with an added 31½ in. × 5½ in. lower wing is seen in the hands of H. N. Stubbs in photo 6. Consistent flight pattern for small field flying is even better, and flying speed considerably slower. Last but not least in 7, Fred Smith of Southern Cross shows off his 10 ft. 6 in. Satyr at his club's vast open site on the South Downs—Lucky people!

We understand that on a clear day, which is not altogether unknown on the South Coast, the Southern Cross boys can see the neighbouring Brighton M.F.C. group flying on their plot a mere seven miles distant!



February, 1954

Skyranger

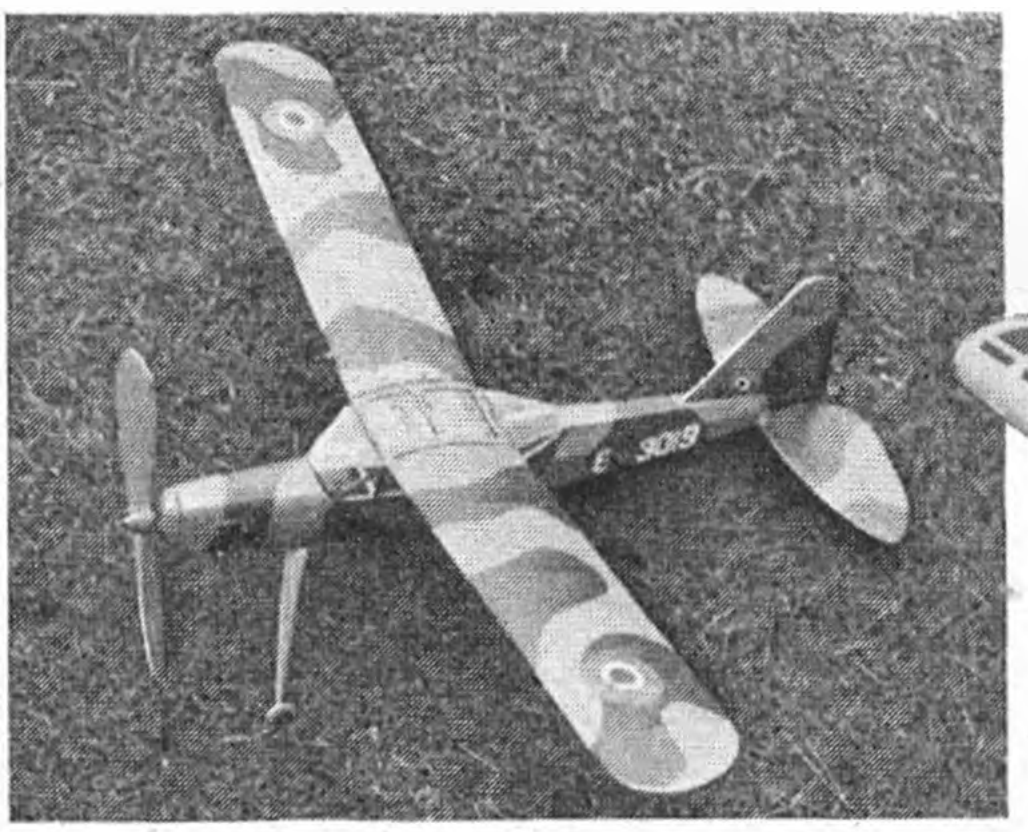
FOR nice appearance, an aeroplane normally needs, besides attractive fuselage lines, wing, tail, and fin shapes which harmonise nicely. However, to every rule there are exceptions, and Skyranger, whose wing, tail, and fin cheerfully "quarrel" with each other, is actually one of the sweetest little rubber models we have seen for years. The designer produced it as a change from power flying, and derived so much pleasure from the original that a second machine was constructed and now work has started on a third, floatplane version.

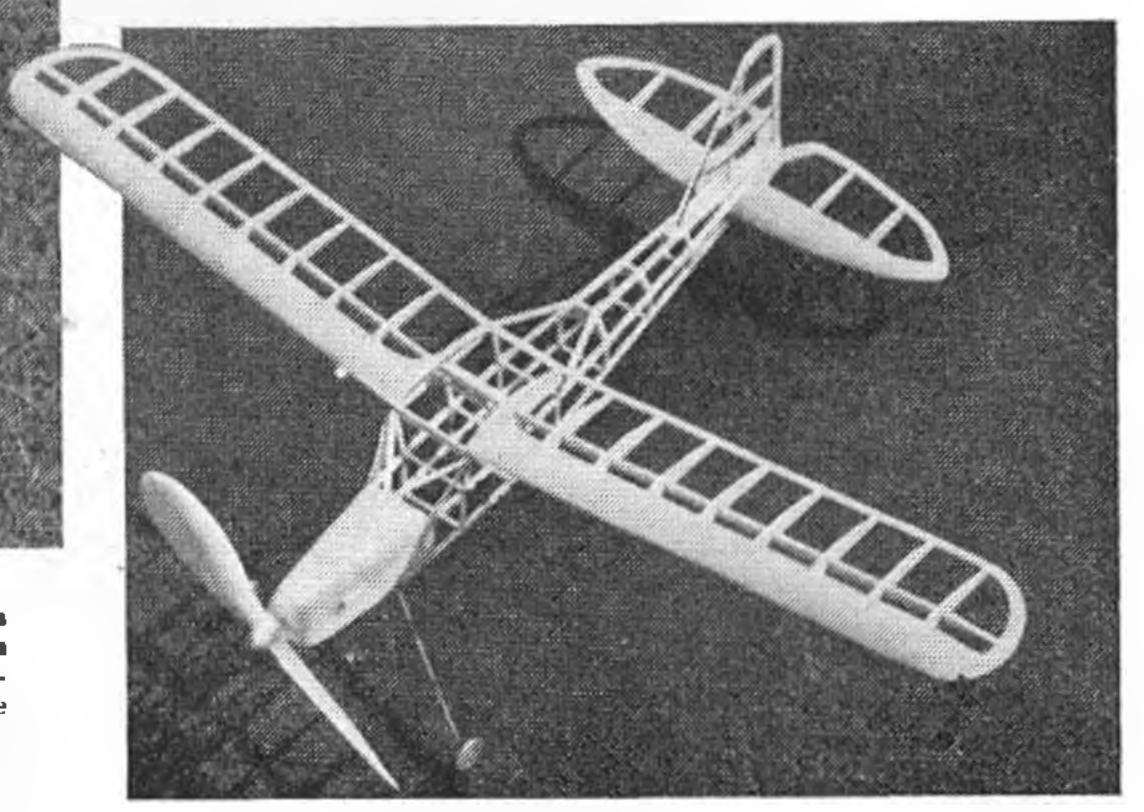
Average performance with the motor shown is a little over a minute, and the best official flight to date is 1 : 51. However, the glide is nicely flat and numerous long thermal flights have been made. The eight-strand motor gives a scalish take-off and a long climb with a 9½ in. prop., but both existing models have flown on 8, 8½, and 9 in. props without serious loss of performance. The all-up weight, colour-doped (silver, 2¼ oz., camouflaged, 2⅜ oz.) gives a wing loading in the neighbourhood of 3 oz. per sq. ft., which, coupled with the simple, rugged construction, makes this a long life, low-cost, easy flying model well suited to beginners.

When selecting the materials, pick medium soft strip and soft sheet, and when building keep the tail end light—it is easier to add a coat of dope to move the C.G. back than to try to move the C.G. forward. The fuselage is built as a normal box, with formers added on top. Frequent reference to the plan, and the use of scrap card formers, will ease the cabin construction and ensure accuracy of the wing seating. Add the stringers and bind in the undercarriage before sheeting the nose with soft 1/32. The fin is cemented to the fuselage after assembly and the cabin celluloid, dowels, etc., fitted before covering.

Wing and tail are of conventional construction, the glazing of the wing centre-section being carried out after completion of all sheeting and detail work. Check all joints and sand the completed model before covering with lightweight Modelspan. Apply one coat of clear dope, and, if desired, a thin coat of colour. When adding the celluloid undercarriage fairings, incidentally, two or three bulldog clips will come in handy.

Make test flights on a calm day, and check the C.G. (with rubber installed) and look for warps before trying a hand glide. Use packing or ballast until the glide is right, then put on 150 turns, when a gentle straight climb or wide right circles should result. Increase turns 100 at a time (600 is the top limit) and use very slight movement of the trim tab to obtain the best flight pattern. Stability is adequate in either direction, but it will be found best to use slight left rudder, applying it by stages, 1/32 in. at a time. Skyranger, once trimmed, will prove extremely consistent and capable of taking

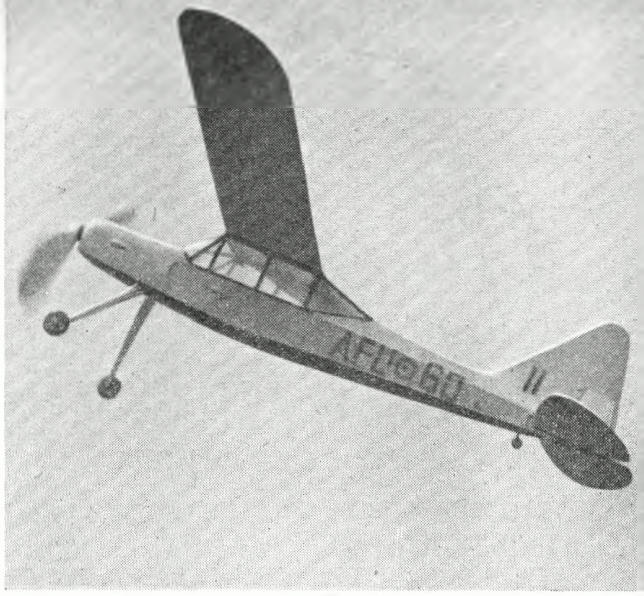




Two views of this attractive semi-scale Army Observation Post 'plane reveal simplicity in structure coupled with commendable realism. Model is sturdy enough for all-weather flying, yet capable of consistent flights of more than a minute.

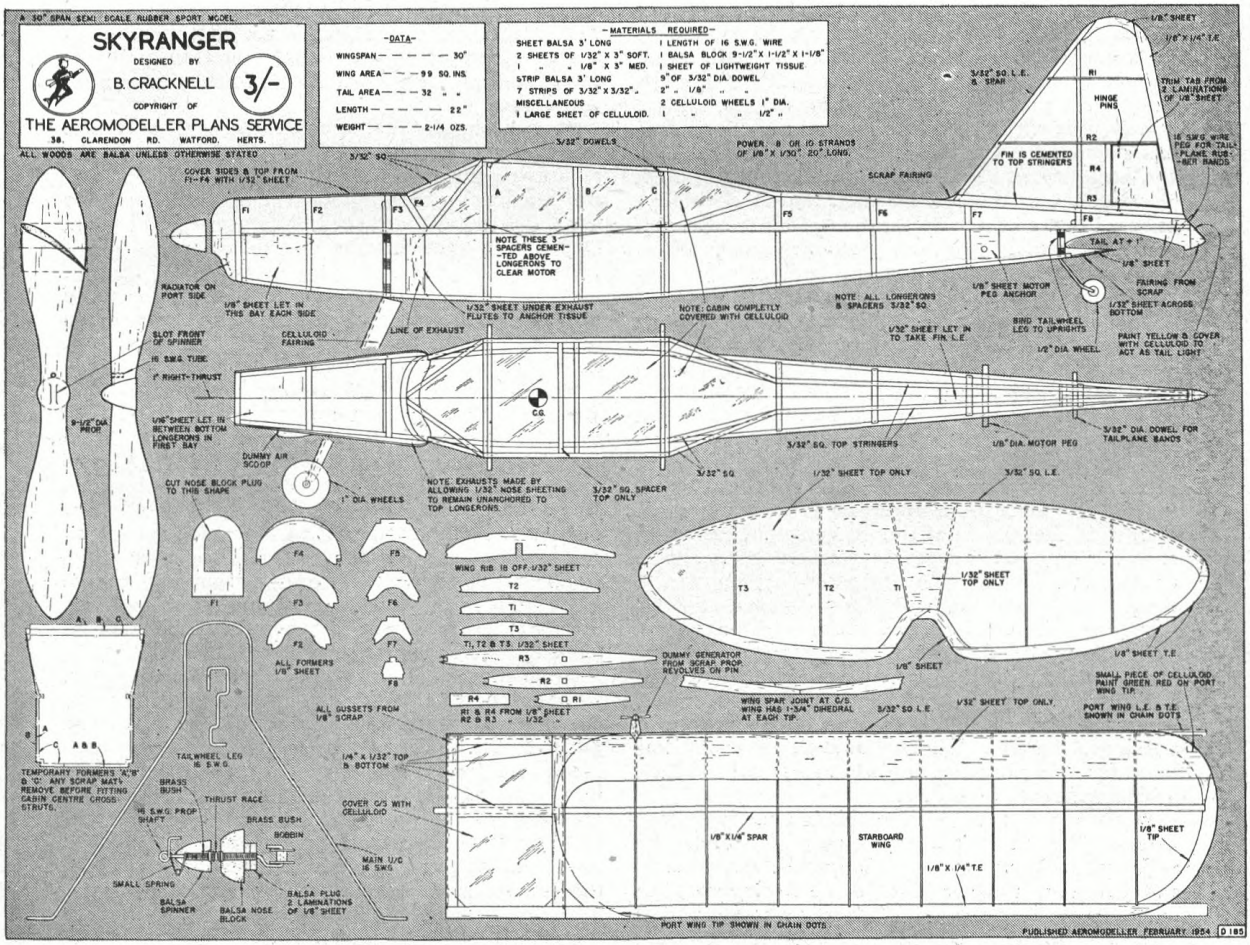
A semi-scale 30 inch span rubber model, perfect for sports flying or "one-design" club contests

. . . . by BRIAN CRACKNELL



Aged 21 . . . An apprentice Dental Technician . . . member of the newly formed Lewes M.F.C. . . . builds all types of model and endeavours to introduce young brother to the hobby . . . other interest is table-tennis.

more than the average knocks that most models receive. In flight, the resemblance to the spotter liaison aircraft upon which the design is based is very strong, both in appearance and in the actual performance. We foresee many hours of pleasure for those builders who spend the few pence and few evenings needed to build this most attractive little rubber powered sports design.



Full size copies of this ¼ scale drawing can be obtained price 3/- post free from Aeromodeller Plans Service.

Gadget Review

READERS PRESENT THEIR NOTIONS FOR BETTER MODELLING

GEORGE WOOLLS of Bristol is never lost for a new idea in aeromodelling, and is one of the regular contributors to this feature. Idea **A** is another from his workbench, and we venture to predict that it will become standard equipment for all exacting modellers. The problem of accurately tapering wingspars with the customary steel rule and razor blade is well-known to all of us. George solves the difficulty by building an adjustable jig to do the job, and instead of cutting away the taper, uses a rubbing block of sandpaper. Taper angle can be set precisely by screw adjustment, and of course, this enables a pair of spars or leading edges to be given identical taper. As with all such devices, the accuracy of the finished product is in direct relationship to that of the tool, and it should be ensured that all three strips, the outside guides, and centre adjustable strip, are true and parallel. Now, what about tapered leading and trailing edges and maybe tapered fuselage longerons as well?

What do do with a timer that has no fuel cut-out arrangement? In **B**, H. Blott of Newcastle shows a simple cut-out made up with brass strip and a length of valve rubber tubing. This can be arranged to bolt onto the engine or front bulkhead and a connecting wire led from the clockwork or air-draulic timer to the sliding portion. The valve rubber is of course replaceable and cannot be expected to last for more than three or four flying days. Whilst on the subject of timers, gadget **C**, is worth studying and comes from 14-year-old John Harris of Marston Green. The timer connecting wire to the cut-out, has an additional peg attached and this in turn is a limiter for a pendulum elevator control. When the model flies off on its power run, any dive is corrected by the forward swing of the pendulum, but down elevator is prevented by the stop. Then, when the timer is "in", the pendulum is free to operate in the glide. There should be more applications for this principle, and doubtless we shall be hearing of them in future.

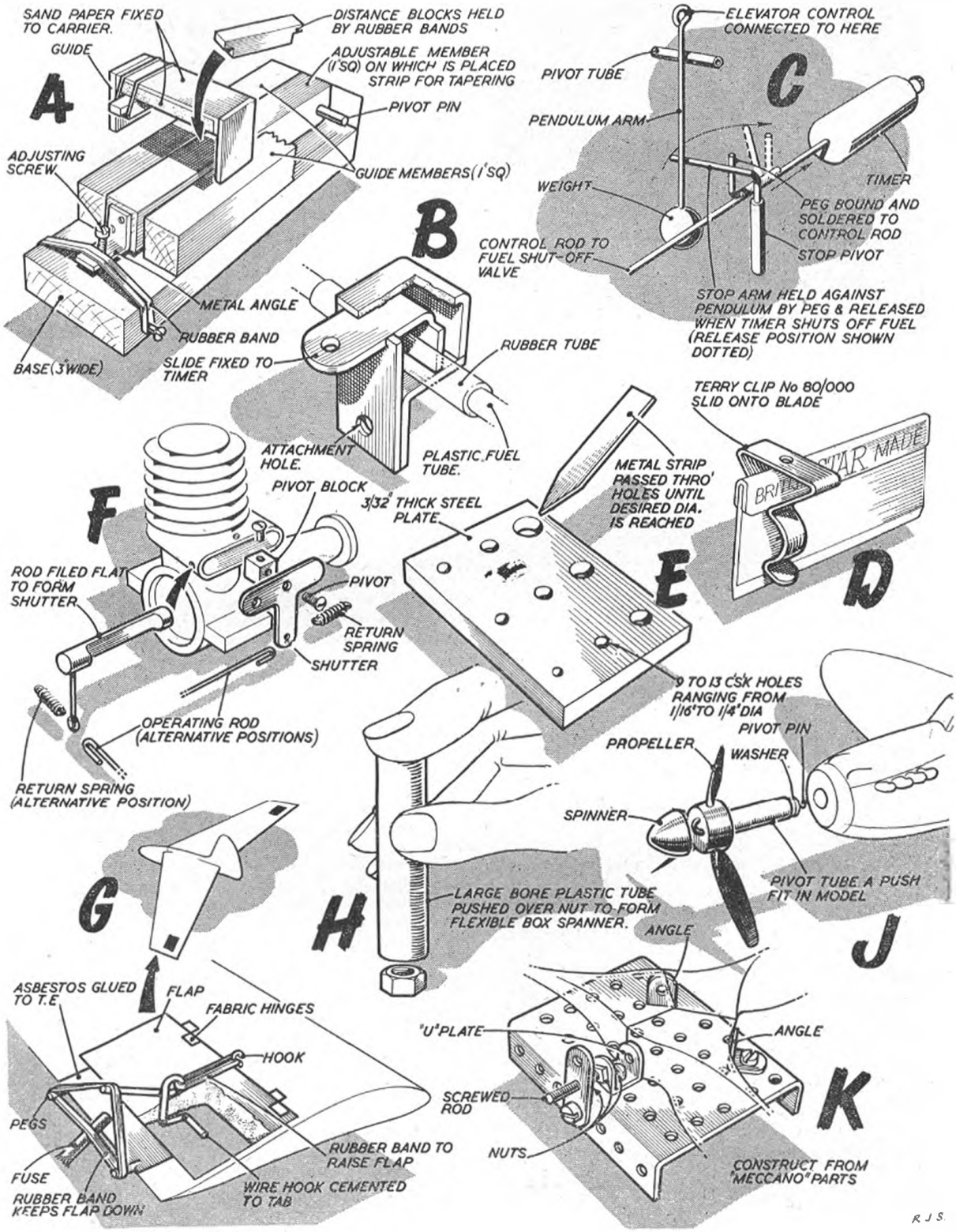
D is one of those simple things that make one wonder why it hasn't been thought of before. Just a Terry spring clip, on top of a backed razor blade, and you have a cutter that can be forced through the hardest sheet balsa. D. Youers, who submitted this one, suggests a Terry 80/000 clip is best. Another really bright idea is **E**, from R. C. Brown of Leagrave, Luton. This tells you how to make tubing, so those with an eye to economy had better pay special attention. Drill steel plate with a selection of sizes ranging from $\frac{1}{16}$ to $\frac{1}{4}$ in., and countersink all holes. Then, point a piece of soft strip metal, and pull through one of the larger holes to start a curve in the metal. Pulled through successively smaller holes, tubing is easily formed, while the bore of the tube is governed by the thickness and width of the original strip. Jumping our alphabetical order, idea **J** also comes from Mr. Brown, who is obviously a "solids" fan, and shows a simple way of using tubing to get a spinning prop on a non-flying scale job.

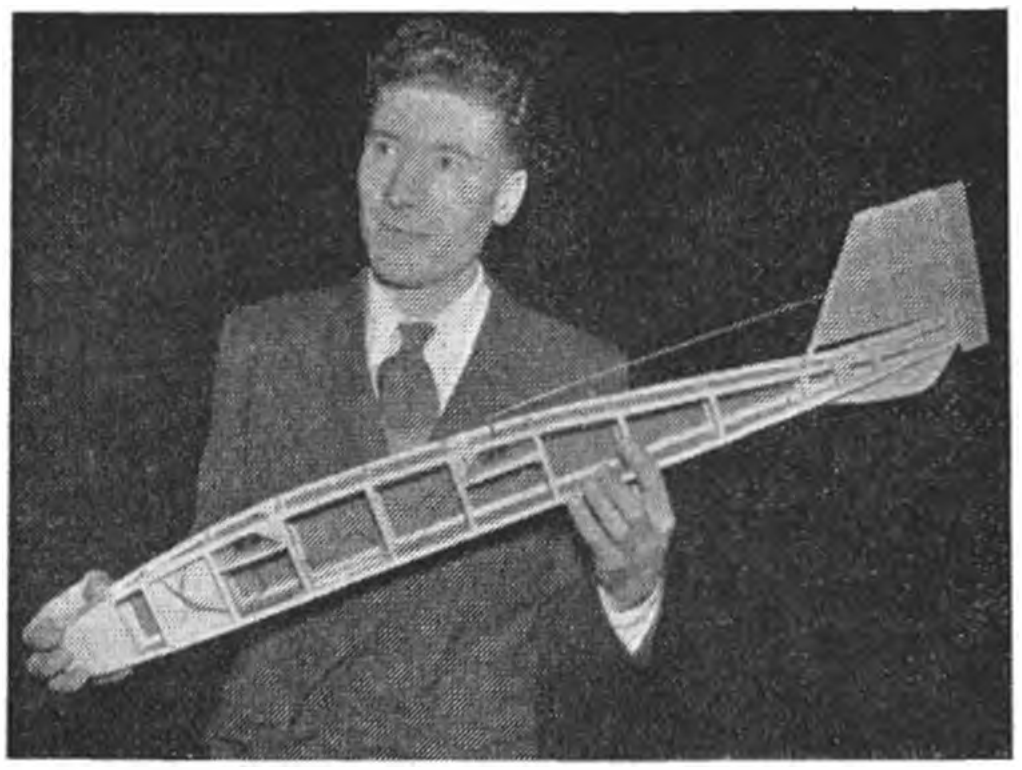
Back to **F** sent in by R. J. Applin of Norwich, we have two forms of exhaust restriction for motors with side exhaust stacks, which can be effectively employed for two speed motor control, particularly for glowplug engines. The idea should fit very well on a Frog 500 for example, and we gather that it is used extensively in the U.S.A. following the example of Jim Walker over there. The "Tee" bar fitting is self explanatory, while the rod shutter device is offered as an alternative for engines using a central web in the exhaust stack. Since this method of engine control does not directly interfere with the carburation, it should find favour with radio control enthusiasts.

G is a simple dethermaliser for tailless types. The d/t flap is arranged to pop up when the retaining rubber band is burned through by fuse, and the drag on the wing tip will cause the model to flat spin around that tip. B. Allsey of Chaddesdon, Derby, who thought this one up after losing his tailless model at 14 : 06 in the Lady Shelley contest, says this scheme is very effective, while for those who dislike the prospect of a flat spin descent, the same flap could be used on both tips for stalled dethermalising action.

W. A. Pollard of Wimslow, designer of that attractive PAA-day winning design in the "AEROMODELLER" payload design contest, suggests **H** as an easy way out when trying to fit 6 or 8 B.A. nuts in the usual confined space under engine bearers. Just a short length of plastic fuel tubing of sufficient diameter is all that is required. Jam the nut in one end, paring away a notch or two if the tube is too small, and the flexible box spanner is ready for use. Final tightening will have to be done with an ordinary spanner, but the heartbreaking task of starting the nut is now solved.

Scale models often call for three-bladed props, whether they be for a solid or flying model: but they are not always easy to make. The most difficult part of the construction comes in setting each blade at a precise 120° angle to its neighbour, and in sketch **K** G. Young of Plymouth shows his approach to the problem. Take a Meccano plate, and fit two permanent angles as stops. These must be placed to get the right blade angles, and the third, adjustable stop, added to act as a clamp. The three blades can be clamped in place whilst the glue is drying and all angles accurately set with a transparent protractor.


A
SAND PAPER FIXED TO CARRIER.
GUIDE
DISTANCE BLOCKS HELD BY RUBBER BANDS
ADJUSTABLE MEMBER (1"SQ) ON WHICH IS PLACED STRIP FOR TAPERING
PIVOT PIN
GUIDE MEMBERS (1"SQ)
ADJUSTING SCREW
METAL ANGLE
RUBBER BAND
BASE (3" WIDE)
SLIDE FIXED TO TIMER
B
CONTROL ROD TO FUEL SHUT-OFF VALVE
RUBBER TUBE
ATTACHMENT HOLE.
PLASTIC FUEL TUBE.
C
ELEVATOR CONTROL CONNECTED TO HERE
PIVOT TUBE
PENDULUM ARM
WEIGHT
TIMER
PEG BOUND AND SOLDERED TO CONTROL ROD
STOP PIVOT
STOP ARM HELD AGAINST PENDULUM BY PEG & RELEASED WHEN TIMER SHUTS OFF FUEL (RELEASE POSITION SHOWN DOTTED)
D
TERRY CLIP No 80/000 SLID ONTO BLADE
E
METAL STRIP PASSED THRO' HOLES UNTIL DESIRED DIA. IS REACHED
3/32" THICK STEEL PLATE
F
PIVOT BLOCK
ROD FILED FLAT TO FORM SHUTTER
PIVOT
RETURN SPRING
SHUTTER
OPERATING ROD (ALTERNATIVE POSITIONS)
RETURN SPRING (ALTERNATIVE POSITION)
9 TO 13 C'SK HOLES RANGING FROM 1/16" TO 1/4" DIA
G
ASBESTOS GLUED TO T.E
FLAP
FABRIC HINGES
HOOK
PEGS
FUSE
RUBBER BAND KEEPS FLAP DOWN
RUBBER BAND TO RAISE FLAP
WIRE HOOK CEMENTED TO TAB
H
LARGE BORE PLASTIC TUBE PUSHED OVER NUT TO FORM FLEXIBLE BOX SPANNER.
J
PROPELLER
WASHER
PIVOT PIN
SPINNER
PIVOT TUBE A PUSH FIT IN MODEL
K
ANGLE
"U" PLATE
ANGLE
SCREWED ROD
NUTS
CONSTRUCT FROM "MECCANO" PARTS
R J S.



AUTO-PILOTS...

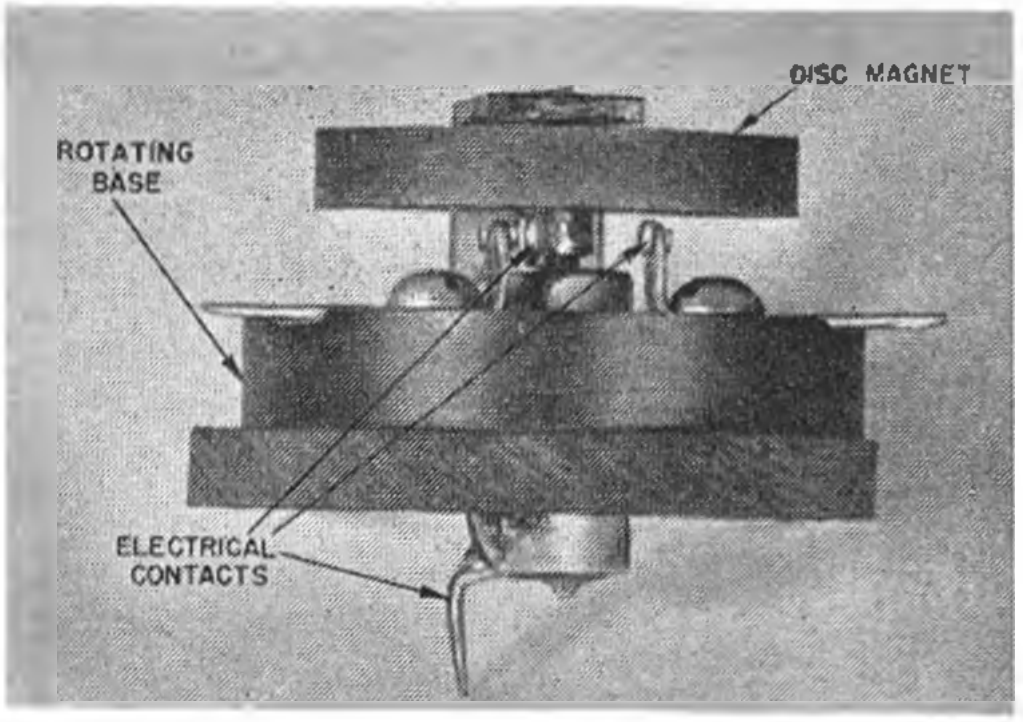
COMPASS STEERING

THERE have been many attempts to control the flight path of gliders by automatic switch gear, among them photo-electric cell steering, thermal sensitive variometer bottle rudder control,—and compass steering. The latter, by far the most practical approach, has attained popularity in Switzerland where annual contests are held for steering a straight flight course across a valley.

Strange to relate, the new "Pathfinder" compass unit developed and manufactured by Mr. E. H. Coppard of Woodside Model Aircraft Supplies, (*above*), is the result of an entirely independent line of thought. We quite surprised the "Pathfinder's" enterprising inventor when we told him of continental efforts—it was rather like telling Sir Frank Whittle that the Russians invented Jet engines! After all great minds are said to think alike, and here we have no exception to this age-old adage, for this all-British unit is lighter, less complex, and just as effective as the Swiss commercial product. The principle is the same, the application slightly different.

Mounted on a square fibre base is another fibre plate, circular in shape and which can be rotated through 360°. This is the compass switch mounting, and it can be cemented on a balsa sheet insert

Below : The Compass Switchgear.



anywhere near the C.G. of a glider. Through the centre of the two fibre plates, there is an electrical connection to a jewel bearing, while a second jewel bearing is fitted to the extremity of a "U" shaped non-ferrous strip. Between these bearings, and free to swing through a radius limited only by two further electrical contact points, is a disc Alnico magnet. Now, when the circular fibre disc is rotated in the square fixture, the compass is being "swung" and a magnetic North homing is easily located by watching the movement of the disc magnet.

Assuming the fuselage is pointing due East, then the unit will be swung 90° to the left, or thereabouts, so that the magnet has a North heading and its electrical contacts are clear on either side. Swing the *fuselage* to the right (South), and the magnet maintains a North heading but closes its electrical contacts on one side. Similarly, the magnet remains stationary if the fuselage is turned to the left, only the opposite pair of contacts are closed in this case.

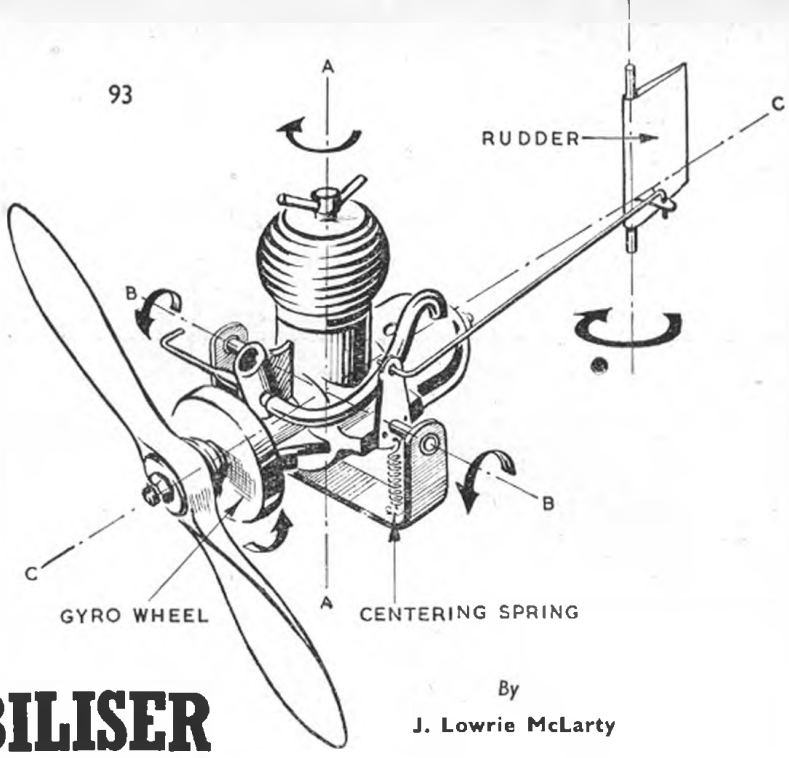
This electrical switch system is linked with an electro magnetic actuator mounted further aft in the model, while serving a double purpose as ballast and power source, a 4.5 volt dry battery is fitted in the nose. The circuit is simple, with one common lead back to the actuator from the battery, and the other switched by the magnetic compass to whichever of the coils is required to select appropriate rudder. Quite the most illuminating point about the "Pathfinder," is the positive action of the magnetic actuator. Bonk!—the rudder fairly slams over, and no amount of slipstream short of a speed of Mach 2 could possibly fetch the rudder off position. Yet, as soon as the fuselage heading resumes the preset direction, the rudder neutralises itself automatically. So now it is possible to set up the "Pathfinder" unit for a flight, say, straight into wind, and should the model deviate either right or left, corrective rudder is applied automatically and the glider progresses forwards on a zig-zag course.

In Switzerland the usual application for this ingenious auto-pilot is for slope-soarers, and gliders (as opposed to sailplanes) designed for the purpose of flying on steady descent across a valley.

Mr. Coppard's experiments have been with tow-line gliders, an additional switch on the towhook being arranged to prevent operation during the launch, and also to switch off the battery on landing. Every experiment made in the development of his unit helped to prove its satisfactory operation under all conditions, and now that he is able to offer it as a commercial production, it will be welcomed by small-field fliers everywhere. In all ways it fulfils the purpose for which it was designed,—to combat wind-drift, and to control sports glider flight.

FOR MODELS

& GYRO-STABILISER



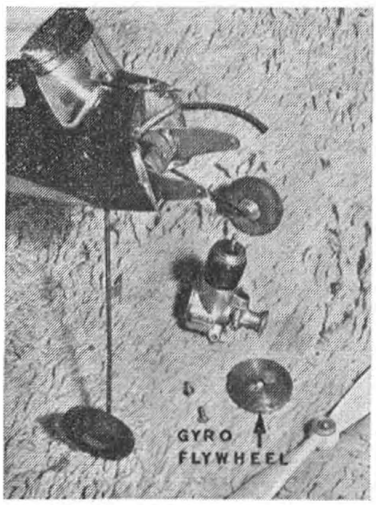
By
J. Lowrie McLarty

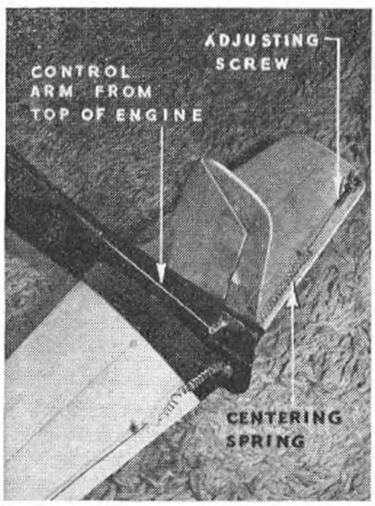
ONE of nature's most interesting phenomena is the simple gyroscope, which has two distinctive properties. The first of these, called "rigidity in space," does not really concern us here. The second property, "precession," concerns us, however, and it is simply that a gyro's reaction to a force applied will be at 90° to the direction of that force. This factor is employed in many aircraft instruments, and is noticeable in free-flight models in respect of the gyroscopic effects of the airscrew.

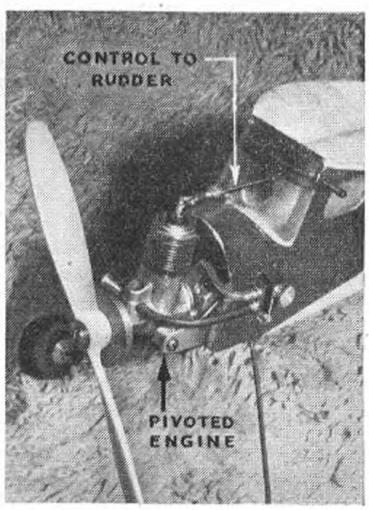
The "auto-pilot" shown here is a development of this idea, and employs a gyro wheel to accentuate the air-screw precession. The engine is mounted in gimbals and any turn about the vertical axis will cause precession to tilt the motor either up or down in proportion to the rate of turn; an arm built on the moving part of the motor mount will thus swing backwards and forwards and operate the rudder by means of the conventional push-rod and horn. Flight will therefore be straight or, if rudder bias is used, in a predetermined, controlled turn in either direction. Note that a damping spring is incorporated to centre the mount and reduce undulation or pheugoidal oscillation.

A further adaptation of this basic scheme is to mount the gyroscope in the fuselage, providing it with an independent source of power. In the case of a large power model or sailplane, a simple electric drive would present few difficulties; the motor could pivot with the gyro (its armature adding to the gyroscopic effect) or a flexible drive so arranged as to absorb the slight movements likely to be experienced. Alternatively, a bucketed gyro wheel can be employed, driven either by the motor exhaust gases or by the controlled emission of gas from a carbon dioxide capsule. The gyro would need to be mounted in a gimbal ring set up in the same way as the motor illustrated, and provided with an actuator horn and damping spring.

Mr. McLarty has used engine and fuselage-mounted gyros in various models over the last two years, and every model has flown dead straight or in pre-determined circles, as set, regardless of gusts or engine torque. We feel that many experimentally-minded modellers will enjoy the opportunity of trying out this system of control.

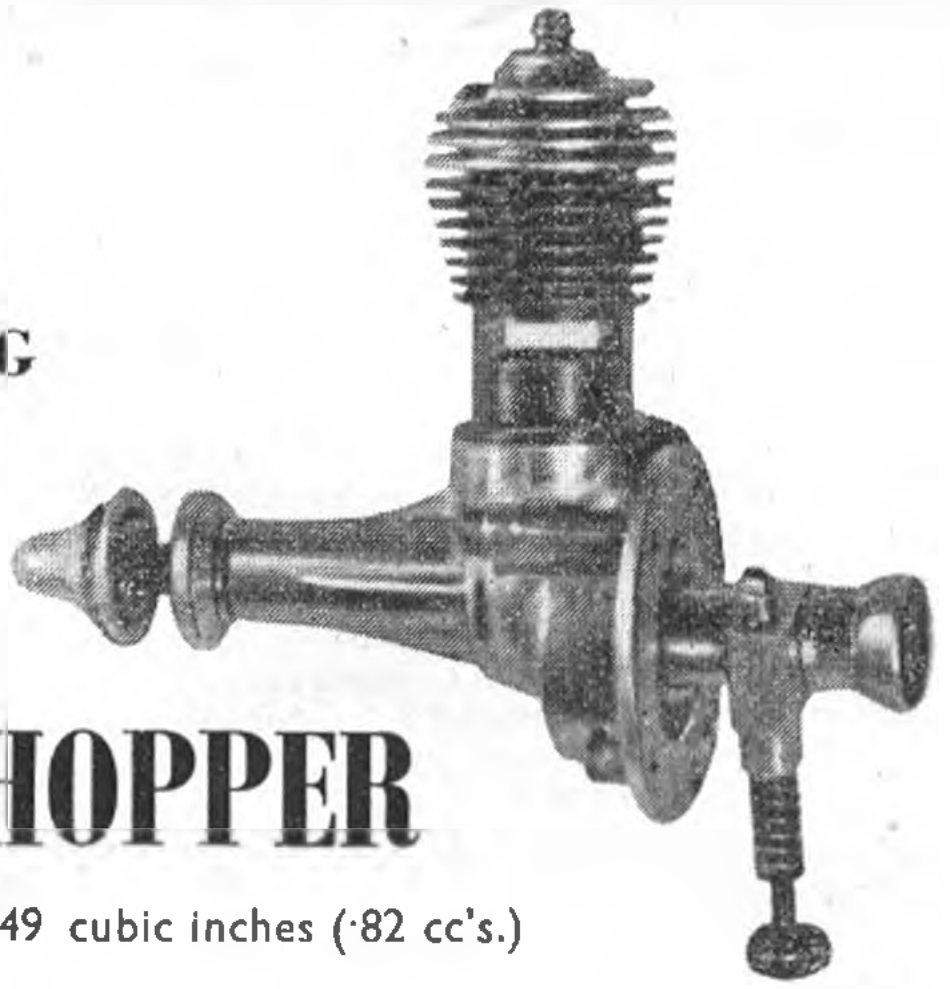




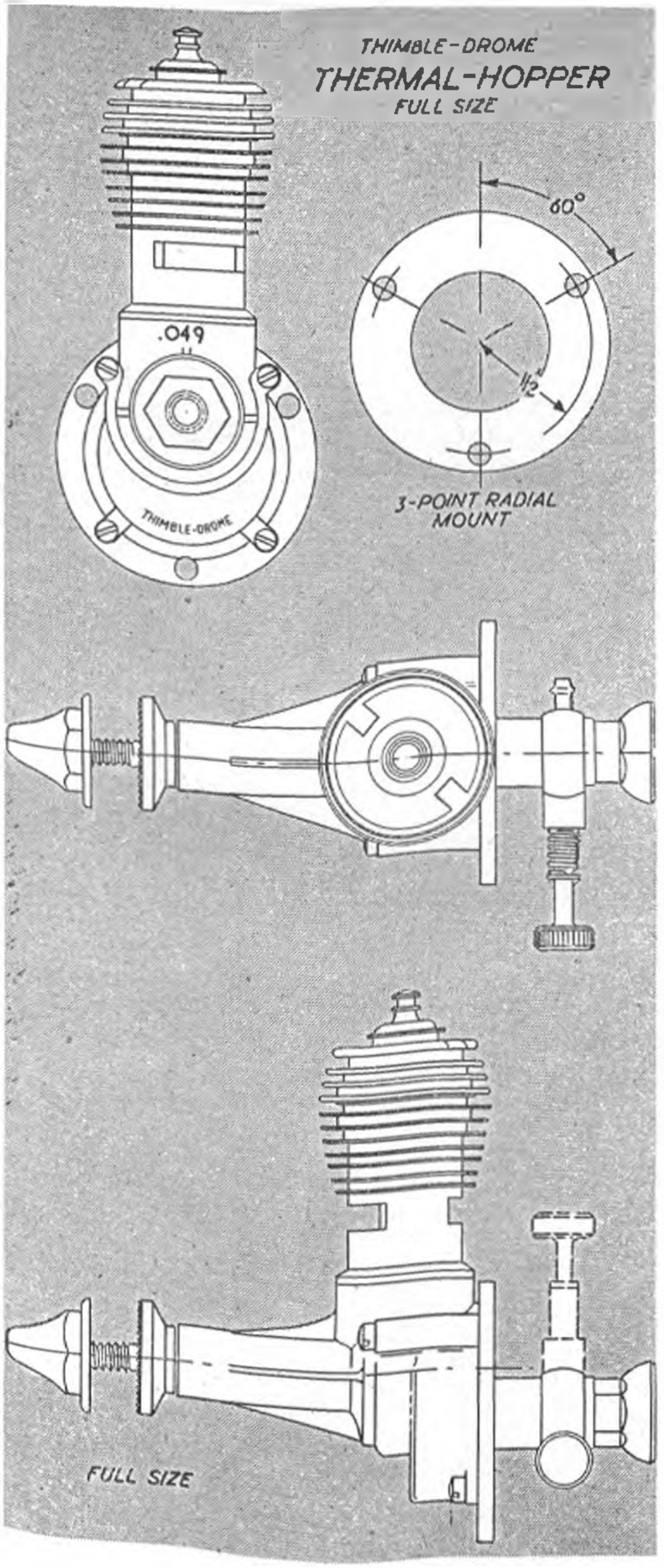


A Review by **RON WARRING**
Of the First Commercial

REED VALVE MOTOR THERMAL HOPPER



·049 cubic inches (·82 cc's.)



THE Thermal-Hopper came in for test with quite a reputation behind it. In the first place it is a novelty from the design point of view in employing crankcase induction controlled by a reed valve. In the second place quite fantastic r.p.m. figures are claimed by the manufacturers and, thirdly, it is claimed as the fastest starting engine in its class. Like the majority of American production engines it has glow plug ignition.

Now, after handling diesels the absence of "feel" with a typical glow engine is disconcerting. There is often little appreciable compression pulling the cylinder past top dead centre and so starting is usually a case of "it does or it doesn't." Diesels are not too fussy about fuel mixtures. Glow motors, on the other hand, often are. In this particular case we used standard British commercial fuels (Mercury Nos. 4, 5 and 7), whereas the manufacturers specifically recommend Thimble Drome fuel.

This preamble is all leading up to the fact that we first found the Thermal Hopper a little horror to start—on dry batteries. We exhausted one U 14 cell in the process without getting any consistency in starting—1.5 volts did not produce a hot enough element for the British fuels used.

Lacking time—and patience—at this stage, we changed over to an accumulator for a booster battery and we had, believe it or not, "the fastest starting glow motor in its class." Just that simple difference in technique, but what a change it produced.

Unfortunately the 1.5 volt glowplug just will not stand up to 2 volt loading and so, as has happened several times before, the plug burnt out in the middle of the tests. In the Thermal-Hopper the element is made as a part of the detachable head,—not in the form of a conventional glow plug, and so a burnt-out element means a replacement head—cost to an American modeller 65 cents, or about four shillings. It means, however, that a British modeller operating a Thermal-Hopper cannot replace an American glow plug with a British type designed to take 2 volts.

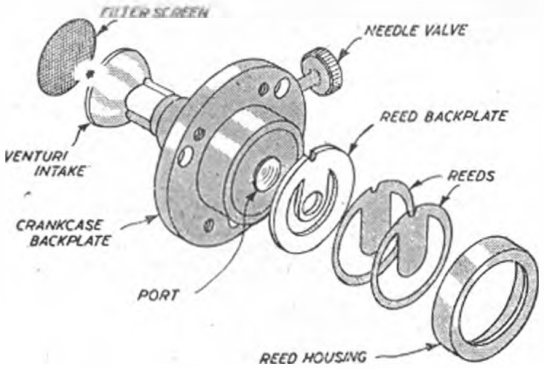
Actually it is quite a simple matter to "drop" half a volt between an accumulator and 1.5 volt glow plug. The Thermal-Hopper element actually takes a fraction under 3 amps. of current. To "drop"

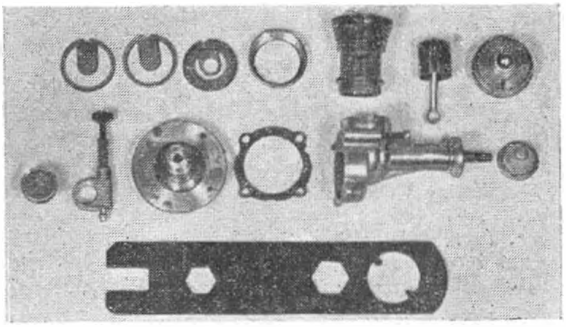
0.5 volts from a 2 volt battery requires a resistance in series between battery and plug of .16 ohms., which can be done by using leads from the battery of the right size and length to give this resistance, or incorporating a resistance coil of this value in one of a pair of short, low resistance leads.

Having so far had little but certain criticism of the Thermal-Hopper, now to offer words of praise. It is a really first-class production job, light and compact. Furthermore there is no doubt at all that the extremely high r.p.m. figures claimed by the manufacturers can be achieved. Our own test figures produced rather low values because only the one size of American propeller was available (6 × 3) and the fuels used did not, obviously, approach the ideal for this particular motor, which has a particularly high compression ratio. Stant propellers used for the other test runs have blades appreciably thicker (and thus higher drag) than those of the American counterpart. It was noteworthy that the engine did not run so well with oversize propellers, *i.e.* at lower speeds.

The fact that the Thermal-Hopper is such a high speed engine introduces other problems. The engine itself appears nicely balanced, with a lightweight piston and "floating" ball and socket little end bearing. A crescent shaped balance is machined onto the crankshaft disc. this disc also being tapered in thickness, presumably again to assist high speed running. Unless an accurately balanced propeller is used, however, vibration is very bad. Suitable propellers must, obviously, be individually balanced on knife edges before use—a point which is stressed in the manufacturer's leaflet—and the small propeller shaft size ($\frac{1}{8}$ in. diameter) really demands that suitable propellers must have this size hole drilled through the hub—and not a larger one—as a starting point.

The most interesting design feature of the Thermal-Hopper is undoubtedly the reed valve system employed for induction. This assembly is contained in a 0.7 inch diameter housing—of appreciably larger diameter than the crankshaft disc and thus accounting for the swelling at the rear end of the crankcase. The principle employed is extremely simple. The intake tube finishes as a hole in the centre of the crankcase backplate whilst





the metal reeds are held over this hole, acting as a spring loaded flap valve, opening on internal suction to allow fuel mixture to enter the crankcase and closing on compression to prevent blow back and produce the necessary crankcase compression to transfer the inducted mixture to the cylinder head.

Needless to say the reed valve assembly is a critical part of the engine. Being so simple there is little that can go wrong with it, except perhaps a spot of dirt or grit getting under the reeds and preventing them closing properly. The risk of this happening is minimised by a filter screen fitted to the open, venturi-shaped end of the intake tube.

Like most modern American motors, radial mounting is employed on the *Thermal-Hopper*, mounting flange diameter being quite generous and with just enough material to ream out the three mounting holes to take British size 6 BA screws. As mounted, however, the intake tube projects beyond the mounting flange, hence necessitating an open compartment behind the bulkhead or former acting as the mount to reach the needle valve and the end of the intake tube.

One very welcome feature of the *Thermal-Hopper* is the fact that it requires little or no running-in period. One minute's rich running is adequate, say the manufacturers, which undoubtedly will appeal to those modellers who like to mount a new engine straight into a model. This characteristic is achieved by producing to extremely close tolerances, with precise fitting and fine finishes on all wearing surfaces. In other words the necessity for running-in is eliminated by the production technique involved. The proof of this lies in the fact that new engines will speed up to revs. in excess of 16,000 r.p.m. right away—which can be considered as a very real tribute to a most interesting small motor design.

Speed Tests

6 ×3 American Wood Propeller, Mercury No. 5 Fuel—16,250
Stant Wooden Propellers—Mercury No. 5 Fuel as below.

6"×3"	6"×4"	6"×5"	6"×6"
15,500	14,700	12,600	Inconsistent

Specification

Displacement:	.0499 cu. m. (.82 c.c.)
Bore:	.406 in.
Stroke:	.386 in.
Bore/Stroke Ratio:	1.05
Bare Weight:	1.35 ounces
Manufacturers:	L. M. Cox Manufacturing Co., Inc., Poinsettia P.O. Box 476, Santa Ana, California, U.S.A.

Readers' Letters

From little acorns . . .

DEAR SIR,

We formed a model aircraft club in this school about a year ago, when the suggestion was brought up by some of the boys who were interested.

There are about 350 children (boys and girls) here, who are either partially sighted or physically handicapped (or both). A few small kits were obtained and built. These were quite successful, and the craze soon spread. Now we have 25 members, and this club is very popular throughout the school. About two months ago, we drew an allowance of three pounds from school funds, which was added to what little money we had already got. With this, an E.D. "Bee", materials and a plan of the A.P.S. "Tomboy" were purchased.

When building commenced, we made a few alterations to the plan instructions, the main one of these being the use of ¼ in. square balsa strip in the construction, instead of the $\frac{3}{16}$ in. square as stated on the plan. We completed the "Tomboy" about 10 days ago, and on Sunday (29 Nov.) it had its maiden flight. The teachers who help us run the club went with us to a large playing field behind the school, where the "Bee" was primed and started. Our woodwork instructor launched our "Tomboy" into the wind, (which was not very strong) and it climbed to about 45 feet, turned, and headed towards the field gate, climbing steadily. On that flight, its very first, it covered over a mile, got up to 150 feet, and was up for five minutes. I feel we all, in this club, owe our thanks to Mr. Victor Smeed for a sound design for a first power model. We hope to get on to C/L flying later on, and in the distant future, to R/C, (if we win a comp.!). We buy the "AEROMODELLER" every month, and I think it is the best magazine available on the subject of model aircraft.

Coventry. D. HANCOCK (16)

½A Team Racing

DEAR SIR,

In my opinion the 1.5 c.c. team race class as proposed by the High Wycombe club (June 1953 issue) would become very popular if it were included in some of the big galas and rallies next year.

Firstly everybody is well aware that 1.5 c.c. engines do not stand a chance against the modern 2.5 c.c. engines in the same class, therefore I think a special class should be formed for the 1.5 c.c. engines.

Secondly as this type of engine is very popular especially amongst juniors the separate class would encourage them to take up team-racing.

What do other readers think about this?

H.M.S. Conway. Cadet I. G. WATSON.

Anglesey.

Correction . . . No. 1

DEAR SIR,

I was pleased to see J. Barnfathers "Catalina" featured as Model of the Month in January issue. Your description tends to imply that it is control-line, whereas in actual fact it is *free-flight*. I can vouch for the fact that it is terrific, as will anyone who saw it perform at Rufforth, York on September 27th last, its long scale take-off being most impressive.

York. R. FIRTH

Many thanks Mr. Firth for this additional information, it makes this 86 in. model even more deserving of its honoured place in Model News.—ED.

Correction . . . No. 2

DEAR SIR,

Accurate reproduction of construction details is undeniably difficult and I quite understand your errors in reproducing my HA 12 airfoil (P.748, December issue) since the same mistakes are given in "Thermik" to whom you give credit.

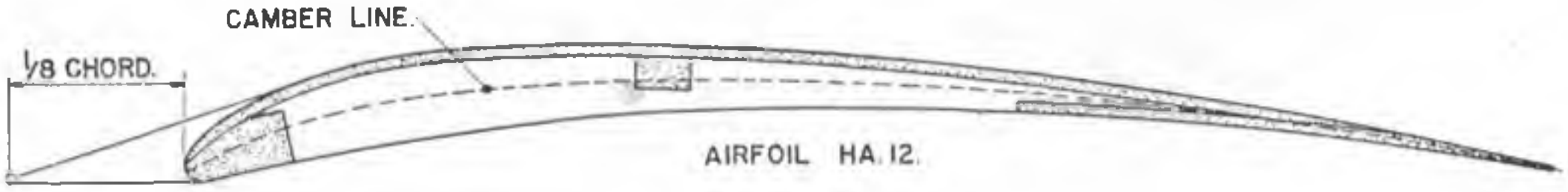
Principle alterations to the airfoil are, (1) the Trailing edge angle should be greater (We have also gone through the same development as the Danes). (2) The T.E. is not sharp: but is 0.5 mm. thick at the rear, in fact it does not matter if the sheet is continued in full thickness, since the boundary layer leaves the top surface a good deal earlier than at the T.E. (3) Nose detail is different. (4) The turbulator is not Nylon, but round rubber as used for hat elastic.

The ordinates are given here:—

Chord %	0	2.5	5	10	20	40	60	80	90	100
Camber	0.38	1.85	3.00	4.62	6.23	7.15	6.19	3.85	2.12	0.15
Thickness	0	3.62	4.77	5.77	5.93	4.62	2.89	1.23	0.77	0.38

Recently we found a good formula for approximate calculation of our airfoils for artificial turbulators and the formula shows the great influence of the trailing edge angle to the base line; in the case of HA 12, it is 12°.

Munchen. M. HACKLINGER



Trade Notes

IN welcoming back to our advertisement columns Messrs. **British Model Aircraft Manufacturing Co. Ltd.,** we recall with pleasure a recent visit to their Mitcham works, during which we made a thorough study of their extensive factory and the goods produced therein.

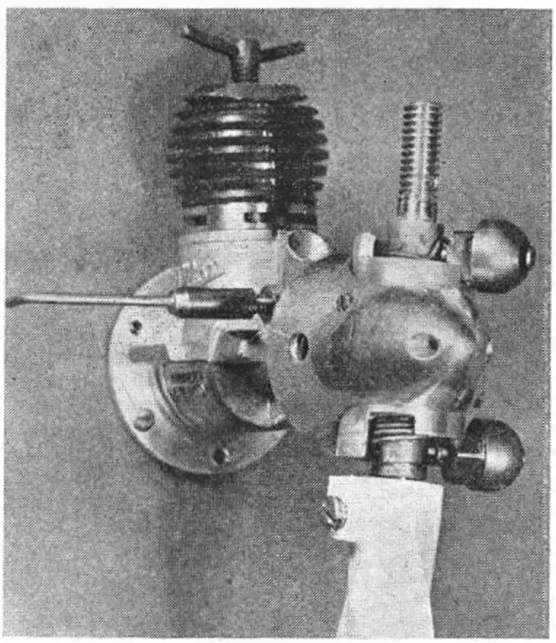
As with most firms dealing with the model aeronautical industry, expansion of business is crowding the available floor space, and every inch of room is in use for either production or storage—though the latter is occupied by any one parcel for a very short time in the effort to catch up with demands. A very fully equipped machine shop is in the process of re-planning, though even in its present form we were favourably struck with the efficiency with which rough logs of balsa were turned into some of the finest sheet and strip material we have handled.

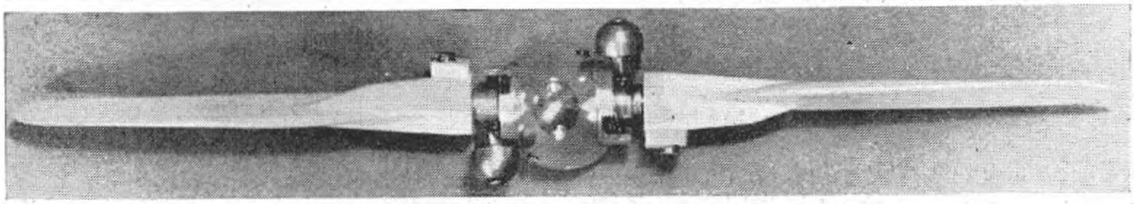
This is not remarkable when one considers the wealth of experience put into the works by Mr. Hugh Paterson, whom we welcome back from retirement following a very hard spell of activity during the war years. In conjunction with the able Mr. Arthur Pinder, many more up-to-date kits are both under development and in production, despite a range of designs that would satisfy many manufacturers.

One of their products is the accurate scale kit for the D.H. Comet airliner, with provision for mounting a Jetex 100 in a fuselage trough. We had considerable pleasure in making up this model, finding every part an accurate fit with its neighbour, and wood of top quality. Flight tests were made with a Jetmaster, and after satisfactory circuits using a half charge, ventured a full charge and promptly witnessed an 80° climb that would not have disgraced a contest design! Intending builders of this value-for-money kit at 8/6 including P.T., are warned to keep to half charges!.

Constancy is a Virtue

One of the radio man's troubles is that when he spirals his model down the propeller receives "windmill" assistance and the engine overspeeds, and, frequently, cuts. For any model, in fact, there is only one speed at which any given airscrew pitch, turning at any given revs. is efficient, and since engine and aircraft speeds continually vary, the propeller is seldom working at its highest efficiency. The answer is a constant speed airscrew, and **Messrs. Elmer and Co.,** 20 Clarence Street, Gloucester, have produced just that, for a price of 18/6d. Fitted with a gleaming spinner, which screws straight on to most 2 BA crankshafts in place of the normal nut, and complete with plastic blades and brass bob-weights, the airscrew makes a very handsome addition to the nose of any aircraft. Sufficient material to tap out for a larger shaft is allowed, but as sold the unit will fit a wide range of motors, and the initial pitch is adjustable to allow the selection of an efficient pitch for peak b.h.p. revs. At the end of the power run the blades automatically feather, thus considerably reducing glide drag. The blades are replaceable in the event of damage. Operation and maintenance are extremely simple, and our only criticism—that the blade locking screws were too small—no longer applies, since the makers have now modified these. We found that the prop. worked very efficiently and have no doubt that it will prove of interest to a great many modellers.





Armchair AERONAUTICS

Inside Information

The Shape of the Aeroplane, by James Hay Stevens, (Hutchinson and Co.), 302 pages, Illustrated 12/6d.

Only such an enthusiast for aeronautical affairs as James Hay Stevens could possibly have amassed so much information within one volume. This is a "gen" book that will be eagerly read from cover to cover by all with an interest in aviation, and though the more censorious will find a minor fault or two, it will still teach every reader something new in the great story of the evolution of the aeroplane. From the Wright Biplane to the latest Aero-Isoclinic wing, we are taken by Mr. Stevens' lucid style through fifty years of changing shapes. Interspersed with factual detail are many anecdotes that come for public digestion for the first time, and throughout the volume we are treated to a hundred or more full page sketches of the many phases in aircraft development. We learn why the De Havilland 82 Tiger Moth has sweep-back, why the Lockheed Lightning came to have twin booms, how the Germans gained an early example of our airborne Radar, and why the official nomenclature for the many Mosquito variants runs from Mk. I to XIX in Roman figures and then from 20 upwards in Arabic.

The story of the unfortunate Manchester bomber and its Handley Page counterpart which became the Halifax and the correct attribution of American Delta and swept wing fighter designs to German war-time developments are but two of the many revelations.

Author J. H. Stevens takes care of any accusation of omission in his preface—we would have preferred to see some note on the latest French SO-4050 "Vautour" in this respect—and brings the book right up-to-date with mention of the Douglas X.3. Written by a modeller (he created the pre-war range of "Skybird" solids which set the standard for todays scale kits), "The Shape of the Aeroplane" is to be thoroughly recommended.

Gas Turbine History

Jet. (The Story of a Pioneer), by Sir Frank Whittle, K.B.E., C.B., F.R.S. (Frederick Muller Ltd.); 312 pages, 9 plates.

For the first time, this book presents a completely authentic and candid account of the history of jet engine development, seen from the standpoint of the man who first conceived the idea of employing a gas turbine to produce jet propulsion rather than to turn a shaft. The mechanical details are of very great interest, though rather overshadowed by the accounts of the various Ministerial policies which appear to have added tremendously to the difficulties of bringing the engines to a production stage. The earlier chapters of the book will appeal more to readers concerned with entertainment only, but every one interested in aeronautics will find fascination in these pages of history through which most of us have lived.

For the Spotter

The Observer's Book of Aircraft, by William Green and Gerald Pollinger (Frederick Warne, 5s.), 287 pages, Drawings and Photo illustration.

This revised edition of what has become a standard textbook for all spotting enthusiasts, contains descriptions of no less than 171 aircraft Among them we learned for the first time that the swept wing version of the Vickers type 508, the 525, is to be delivered to the Fleet Air Arm and though it retains the side by side Avon turbojets, it will have an orthodox tail unit. The Prentice is still erroneously quoted as a three seater and the Otter silhouette appears to have lost a little of its wing chord. Latest additions include the Short Seamew and Cessna L.19 Bird Dog, two of many accurate three view drawings that will make this pocket size book attractive to flying scale fans.

Pictorial History

Fifty Years of Aviation, by Alkmaar, Holland, (Anglo-French Literary Services, 5s.).

Printed in Holland, this 72 page potted history of flight in pictures was obviously influenced by the number of pictures available from local airline offices and the American offices of Information. Some of the choices for the 1940-45 section could certainly have been bettered, and the omission of any reference to the Gloster E28/39 is hurtful

(*Continued opposite*)

Those Were the Days

14th July, 1929 HALTON AERODROME: Result of the first contest for the Sir Charles Wakefield Cup was a "fly-away" victory for England. Mr. R. N. Bullock had the honour of making the best rise-off-ground duration of 70.4 seconds, which counted as the actual winning flight and secured for him the cash prize of £10 .... Four of the remaining five British competitors could have secured the trophy for England, the second best duration of 67.6 seconds being made by Mr. D. A. Pavely, flying a compressed air driven monoplane, the machine being only completed the previous day ... Mr. Juste van Hattum, representing Holland, appeared to be unlucky in his "get-offs," hence his short duration of 22.6 seconds. His model was a low-wing monoplane of excellent design, and a much better performance was expected. Mr. Bullock's machine was also a low-wing, and it climbed alright, so there must be some other reason why a low-wing monoplane will not climb satisfactorily .... Three boys from the United States were J. S. Culver (Indoor Champion), D. C. Burnham (Outdoor Champion), and L. H. Proctor (Scale Model Champion). It was the general opinion that, given the conditions, America would lift the Cup by means of exceedingly light models made of balsa wood and Japanese tissue paper. This is the second year that young Americans have visited this country with their feather-weight models, and after July 14th, they must now know without any doubt that ultra-light-weight model aeroplanes as they construct them, will not do in England(!). The weather was as perfect as England can make it, but their models flew too slowly to overcome any slight disturbance of the air. A little puff of air upset their "stability" and they fell to the ground .... All was spic and span for the arrival of the great crowd, estimated at 3,000 and we may all feel quite satisfied they were given full value for their money. There were about 100 cars on the aerodrome(!) ....

R. N. Bullock	G.B.	67.2/5	68.2/5	70.2/5	best	70.2/5
D. A. Pavely	G.B.	58.4/5	67.3/5	59.	,,	67.3/5
T. H. Newell	G.B.	61.1/5	7.4/5	66.3/5	,,	66.3/5
J. Pelly-Fry	G.B.	43	54	61.2/5	,,	61.2/5
W. J. Plater	G.B.	51.2/5	53	54.1/5	,,	54.1/5
J. van Hattum	Holland	22.3/5	6.3/5	retired	,,	22.3/5
S. R. Bradley	G.B.	failed ROG	14	21.4/5	,,	21.4/5
D. C. Burnham	U.S.A.	disq. push	15	retired	,,	15.
L. H. Proctor	U.S.A.	3	5	retired	,,	5.
J. S. Culver	U.S.A.	3	broke prop.	retired	,,	3.

19th July, 1929 London: At very short notice, R. N. Bullock and J. E. Pelly-Fry were invited to give a demonstration of model flying at the Royal Aero Club Ball, held at Grosvenor House. It is understood that the model flying was quite successful and created much interest. The fliers returned home in the early hours of the morning and would have felt happier if they had been properly dressed for the occasion, instead of performing in grey flannels and white cricketing shirts.

New Duration Records On the day of the International Cup at Halton, the following new British records were established:—

By Mr. T. H. Newell—Fuselage R.O.G. duration of 85 seconds. Judges: Dr. A. P. Thurston and R. Langley.

By Mr. D. A. Pavely—Compressed air fuselage R.O.G. Duration of 67.315. Judges: A. F. Houlberg and S. H. F. Crouch.

Olympia Aero Show, 1929 Interesting models on show included Louis Proctor's ultra-lightweight monoplane (American) span 53 in. length 43 in., power 10 strands ⅛ rubber. Made of bamboo and balsa wood, covered with Japanese tissue paper. Joints glued with "Ambroid," a nitrocellulose cement .... Mr. Bullock's low wing racing monoplane. Span 34 in., chord 4¼ in., length o.a. 26 in., 4 gears with propeller spindle geared up 3 to 1. Weight 35 oz., estimated speed 40 m.p.h.

ARMCHAIR AERONAUTICS CONTINUED

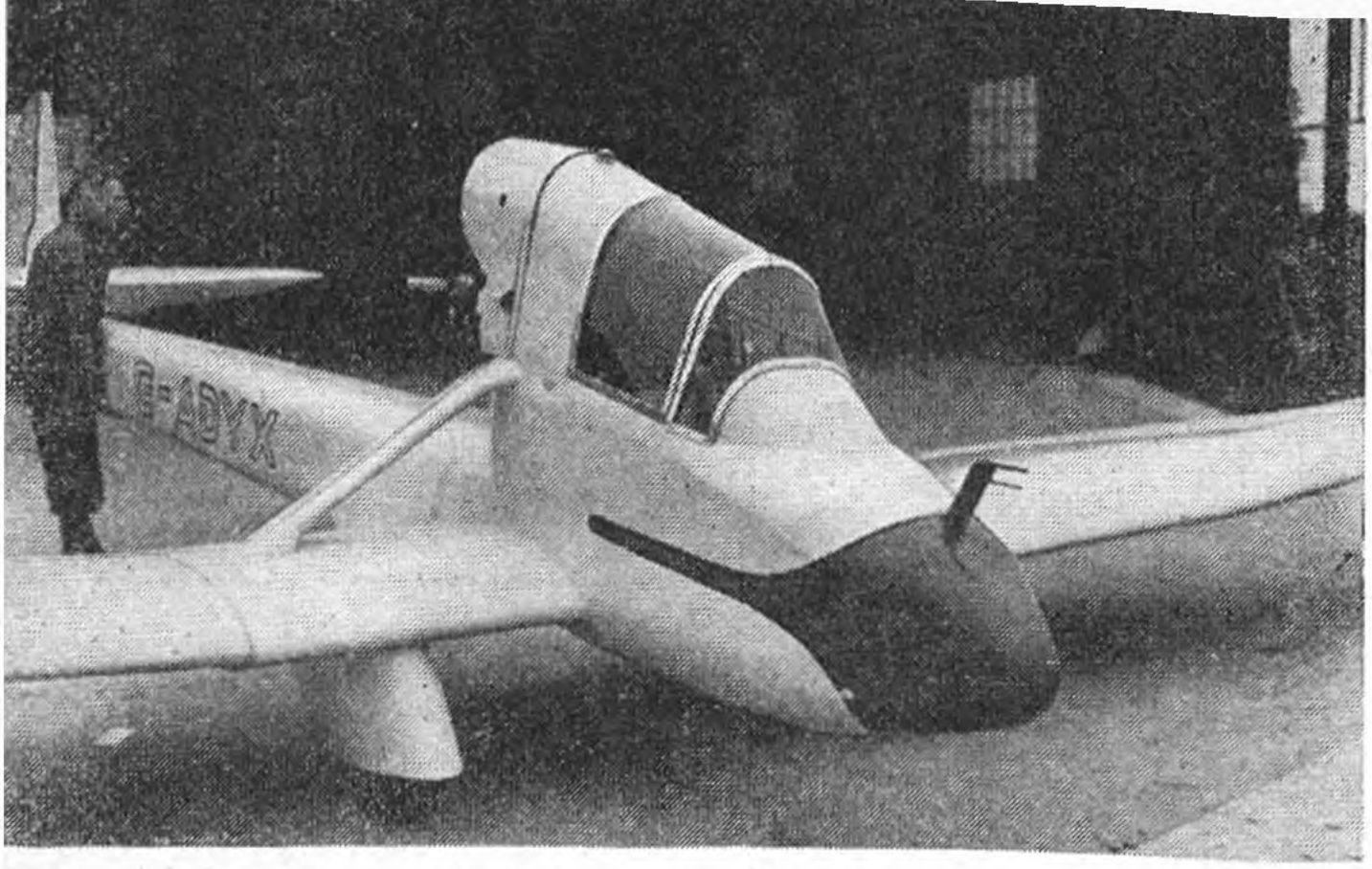
to our prestige as leaders in Jet development. All in all, this is a good picture book, written with tri-lingual captions.

Collectors' Piece

The Aircraft of the World, by William Green and Gerald Pollinger (Macdonald, 25s.), 160 pages, Fully Illustrated.

As glossy in quality of reproduction, accuracy of content and standard of make-up as its attractive cover, this large volume ably fills a gap left by the war-time "Fighting Powers" series. The pages abound with interest. Scale enthusiasts will revel in the pages devoted to lesser known types,—:he Yugoslavian M-452 jet prototype and Italian Alaparma A.M.75 Baldo for example and spotters will enjoy the neat adaptation of lay-out for three-view silhouettes.

Although received too late to include it in our heading illustration this work is none the less deserving of special recommendation, particularly in view of its incredible value for money.



The "Buzzard" Mk. II's cabin was a feature seldom boasted by an ultra light aeroplane.

February, 1954

AIRCRAFT DESCRIBED

No. 60 BY C. A. CULL

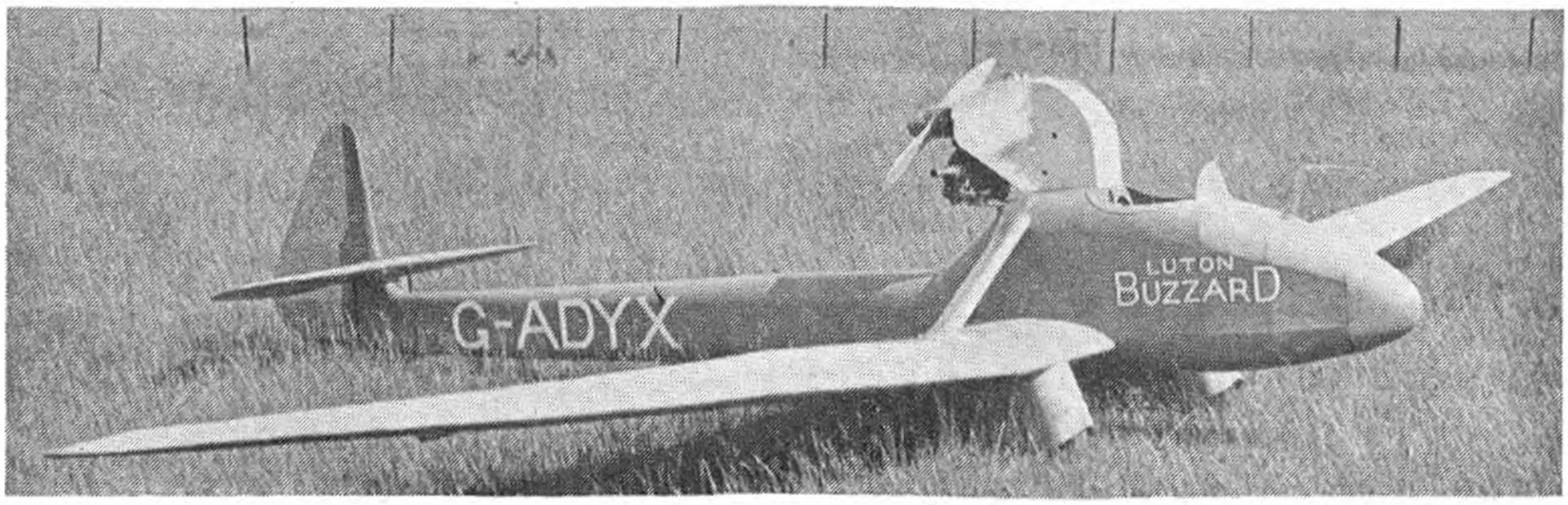
The LUTON BUZZARD

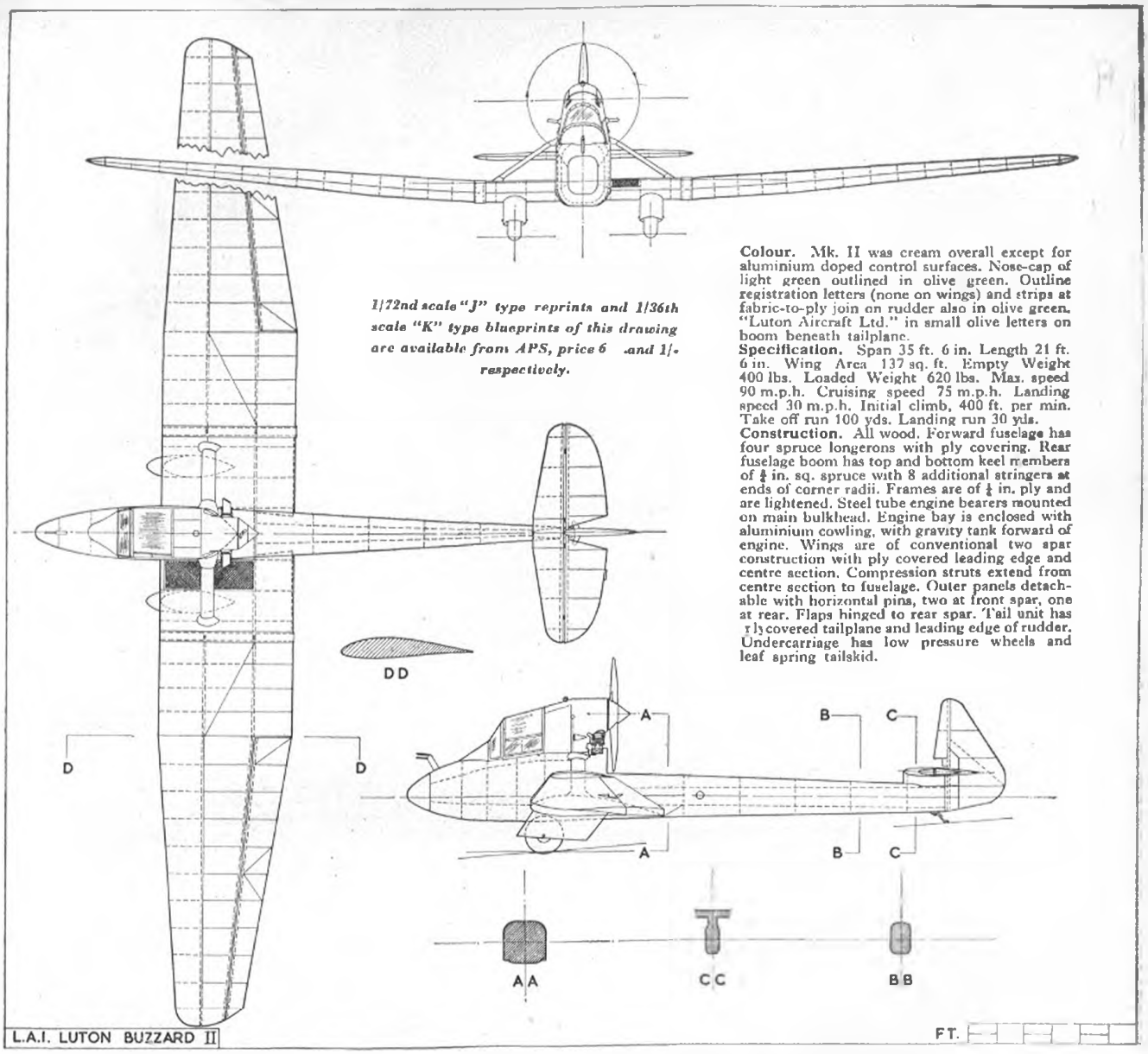
ALTHOUGH best known for their "Minor," Luton Aircraft Ltd. had previously designed and built another very light aircraft, and this was the "Buzzard." Like the "Minor," the aim was a machine which would provide powered flying at minimum cost, but the approach was different.

It is logical that to sustain flight, a glider's efficiency should require the addition of only a low-powered engine, and with gliding being the cheapest form of flying, it follows that a glider so enlivened would result in powered flying at its cheapest. This is the idea, in brief, from which several ultra-lights were born, best known of which were the "Drones," but the "Buzzard" was a greater refinement of this theme and in its final form may be regarded as a "de-luxe" specimen.

C. H. Lattimer-Needham designed the Buzzard and it was built during the winter of 1935 at the now defunct aerodrome at Barton, in Bedfordshire. Originally the Buzzard was an open cockpit machine, clearly built on sailplane lines but with the wing placed low down to accommodate the undercarriage, and a distinctive feature was the single strut bracing the centre section on either side. This largely relieved the centre section of bending loads from the long outer wing panels and also took landing shocks. Only one horizontal tail surface was employed to do the work of both tailplane and elevator; a clean arrangement now coming back into fashion at the opposite end of the speed scale! The engine was the 30 h.p. Luton Anzani inverted aircooled twin, modified for the pusher layout by the addition of a further thrust race, and was mounted on a roughly cowled pylon which also carried the gravity tank. An unexpected luxury was the manually operated, split flaps beneath the centre section. The glider-type wings were of great span for a small aeroplane but the outer panels were easily detachable, and on replacement the aileron push-pull control rods engaged simply and required no adjustments.

Registered G-ADYX, the Buzzard was not destined to remain in this form and it was later transformed from a sparse but sporty looking machine into a far more elegant cabin aircraft. The building up of a cabin, with canopy hinging to starboard, and raising of the instrument panel was the major modification, but the rebuild went further than this and much other work was done. At the tail, a conventional tailplane and elevator of greater area were fitted, the rudder's horn balance was decreased and the tailskid fairing was deleted. The engine was given a new cowling and a large spinner was fitted to the prop., more roomy trousers enclosed the wheels, wing fairings were cleaned up and the span was reduced from its original 40 ft. Re-doped, the Buzzard II, as it now became, was a smart and sturdy machine but progressed no further than this stage, as has been the undeserved ill-luck of many small company projects. Instead, Luton Aircraft went ahead with the cheaper and simpler "Minor" which had a wider appeal, being eminently suited for amateur construction.





1/72nd scale "J" type reprints and 1/36th scale "K" type blueprints of this drawing are available from APS, price 6 and 1/- respectively.

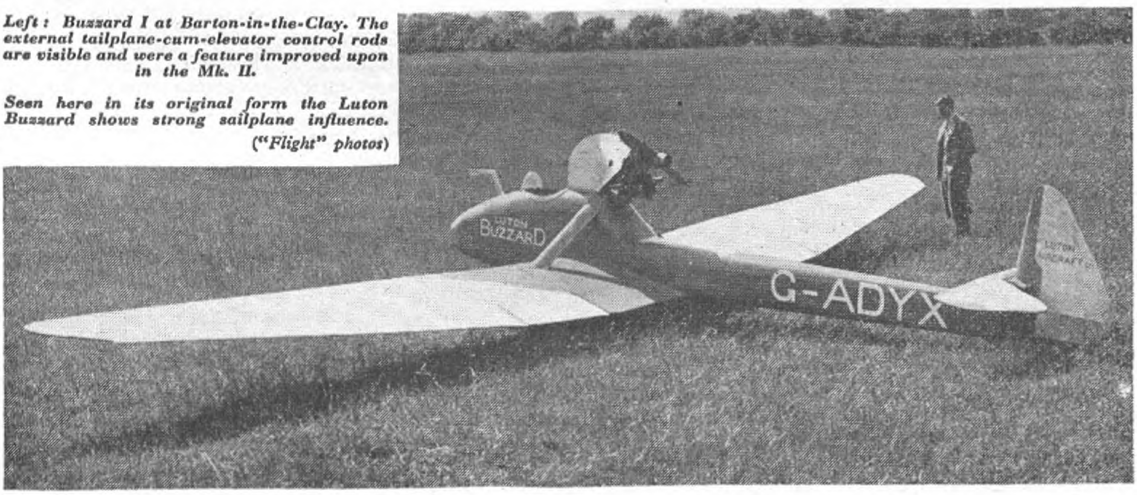
Colour. Mk. II was cream overall except for aluminium doped control surfaces. Nose-cap of light green outlined in olive green. Outline registration letters (none on wings) and strips at fabric-to-ply join on rudder also in olive green. "Luton Aircraft Ltd." in small olive letters on boom beneath tailplane.

Specification. Span 35 ft. 6 in. Length 21 ft. 6 in. Wing Area 137 sq. ft. Empty Weight 400 lbs. Loaded Weight 620 lbs. Max. speed 90 m.p.h. Cruising speed 75 m.p.h. Landing speed 30 m.p.h. Initial climb, 400 ft. per min. Take off run 100 yds. Landing run 30 yds.

Construction. All wood. Forward fuselage has four spruce longerons with ply covering. Rear fuselage boom has top and bottom keel members of ¾ in. sq. spruce with 8 additional stringers at ends of corner radii. Frames are of ¼ in. ply and are lightened. Steel tube engine bearers mounted on main bulkhead. Engine bay is enclosed with aluminium cowling, with gravity tank forward of engine. Wings are of conventional two spar construction with ply covered leading edge and centre section. Compression struts extend from centre section to fuselage. Outer panels detachable with horizontal pins, two at front spar, one at rear. Flaps hinged to rear spar. Tail unit has ply covered tailplane and leading edge of rudder. Undercarriage has low pressure wheels and leaf spring tailskid.

L.A.I. LUTON BUZZARD II

FT.



***Left:* Buzzard I at Barton-in-the-Clay. The external tailplane-cum-elevator control rods are visible and were a feature improved upon in the Mk. II.**

Seen here in its original form the Luton Buzzard shows strong sailplane influence.

("Flight" photos)

CLUB NEWS

One model club commemorating the golden jubilee of flight is the Cheltenham M.A.C., who have put on this smart cinema foyer display. Some of the models and photographs were kindly lent by the Gloster Aircraft Co., Ltd., and "Flight."

A LITTLE BIRD (well, quite a big one, actually) whispered some news to us the other day which we feel will be of interest to quite a lot of modellers. The committee and trustees of the Queen Elizabeth Cup have decided to abandon the idea of calling for a special model to compete for this magnificent trophy, and in 1954 *all* F.A.I. power models will be eligible. The one difference is that this year up to 5 c.c. motors may be used, with F.A.I. loadings, etc., which means that Q.C. jobs built to the 1952 rules are still suitable. Bonus points, etc., will still apply, and rumour has it that an alternating system may be introduced—gliders for 1955, rubber for 1956, power again in 1957, or something on those lines, to give all modellers a chance of winning the Cup. We'll give the official details as soon as they are received.

While on the subject of contests, readers may like to know that voting is taking place on the S.M.A.E. flight procedure. Seems likely that contests will return to the three-flight basis, but that maximum flight time will be raised to four minutes. The five-round contest is not very popular, judging from reports. Full details will be published at the earliest opportunity, when the result of the vote is known.

Southern Area

The last of the **BOURNEMOUTH M.A.S.** trophies have now found their resting places for the next twelve months, and, in the case of the Heap Seaplane Trophy, for life, since this cup has been won outright by the third consecutive top place of R. L. John. The same flier also took home the bacon for General Reliability (Power Duration); the Harmer Cup (Junior Glider) went to P. Manville with a creditable 7:08, and S. Eastick returned 4:00 to secure the Junior (Rubber) Cup.

Every now and then an A.P.S. model gets picked as the subject of a "one design" contest. Latest proposal in the **WEST HANTS A.A.** is that such an event be run for the **Skeeter.** Sounds quite an idea, but how would you run it? Duration on a fixed motor run (1 min.?) would seem the only answer. The outcome should be interesting.

East Anglian Area

Indoor chuck gliding in the low ceilinged **WARE D.M.A.C.** clubroom amused members recently. R. Hornsby's 15:2 secs. aggregate proved highest; his all-sheet model employed balsa less than .001 in. thick. Lightweight structure is also a feature of E. Barks' promising new 53 in. pylon glider, which is very rugged but weighs only 4 ozs. Low flying complaints are expected from local residents whenever D. Ling flies his realistic ducted-fan **Sabre.**

Perfect weather attended the **NORWICH M.A.C.'s** Annual C/L day held on Nov. 29th, at R.A.F. St. Faiths. Thirty-seven entries flew, a very good figure for one club. E. Greebe finished the "A" team race well ahead of A. Coe, who, despite five broken props, was only 40 laps behind. G. Davie also had a clear win in "B" and Davie Jnr. emerged triumphant in "A" combat. "B" combat was quite a carve-up, and the ground was pock-marked with small craters before R. Applin won the day. The last-named won speed, too. As dusk slowly fell and the fliers left the field, an irate figure was discerned still stumping up and down the runway. Among blasphemous threats and curses could be distinguished the low mutter "Not allowed to . . . . and just because of a 40 c.c. tank . . . . . "

A large number of new juniors and several new seniors have resulted from publicity given to **CAMBRIDGE M.A.C.** in the local daily newspaper. A new hall, more suitable for R.T.P., will be coming into use in the New Year, and meanwhile outdoor flying, with one eye on the "Bill White" event and the other on this season's contests, takes place each week-end.

North Western Area

At the **SUNDERLAND D.M.A.C.,** A.G.M. a new measure—combination of secretary and treasurer into one job—was voted for a trial period. The club has enjoyed an active season but new members are, no doubt, always welcome.

South Western Area

Good news for many modellers must be the re-forming of the **LEWES M.A.C.** The town is situated on the Sussex Downs and must come second only to Salisbury Plain for wide open space. All types of modellers are catered for, including the R.T.P. fans, who can enjoy the freedom of the club-room at the regular Friday night meetings.

An analysis of the results of the six **SOUTHERN CROSS A.C.** members who competed for the club's Arthur Mullett Trophy is interesting. Average span of the sailplanes entered was almost twelve feet, and of 26 flights made during the day 21 were over three minutes, the average of these being 4:06. Eventual winner was R. Smith with three maxs. plus 4:49.

CONTEST CALENDAR

Events for March and April

March 14th	**Gamage Cup.** Unrestricted Rubber. **Pilcher Cup.** Unrestricted Glider.	D/C.
March 28th	**S.M.A.E. Cup.** 2nd 1954 A2 Eliminator. **Farrow Shield.** Team Rubber. **Women's Challenge Cup.** Unrestricted Rubber/Glider. **Jetex Challenge Cup.** Jetex.	Area.
April 25th	**Weston Cup.** 2nd 1954 Wakefield Elim. **Astral Trophy.** 2nd 1954 Power Elim.	Area.

North Western Area

Indoor (rubber) team-racing seems to be catching on, and **SHARSTON D.M.S.** have so far swept the board in the two inter-club events with the Cheadle boys. Racing, on a 6 ft. line, means being timed over 30 laps, including all winding etc. E. Helliwell and G. Crichton are the top men so far. The club reports that the **Seraph** is proving very popular and is expected to make its mark in coming contests.

CHEADLE M.A.S. are concentrating on rubber team-racers to avenge their previous defeats by Sharston, and Tuesday evenings see the club-room a hive of activity. Novice outdoor contests to attract new juniors have met with very limited success; one such event saw only four entries, all seniors, and a much publicised comp. with a £2 prize list attracted only three entries, from which P. Hartigan's well-built model came out top. Contest men in the club are concentrating on F.A.I. power, and Harrison's three maxs., etc., placed him third in the Area 1954 eliminators.

Spurred on by the success of their 1953 rally, **HYDE M.A.C.** are planning a bigger and better "do" in '54. Barton aerodrome is the possible venue, and the subscribed prize list will comfortably exceed £100. Details are promised as soon as everything is settled.

South Midland Area

The winter programme of the **READING D.M.A.C.** started well with 70 members and friends enjoying the annual dinner and dance. Rubber R.T.P. speed (28 m.p.h. top so far) and a design contest are enlivening meetings, while small team racers (0—.7, .7—1, 1—1.5) give every indication of future popularity, especially since the proportion of juniors in this club is very high.

With six months now behind them, **HODDESDON M.F.C.** members number close to fifty and interest increases all the time. President W. Bedford presents a kit each month to the member adjudged "modeller of the month," and one group is getting together to explore the radio field. A recent Jetex speed event was won by junior D. Carter with 81.7 m.p.h. and a big hand went to 10-year-old R. Crowther for his fourth place Jetex 50 job which achieved 48.6.

Northern Area

The swish of razors slicing through balsa is almost the only evidence of activity in the **CRESWELL WELFARE M.A.C.** and a whole host of new jobs are in various stages of completion, including A2s, F.A.I. power, and unorthodox efforts in the tailless line. These latter are no doubt inspired by the member who broke his **BG44** fuselage but used the wings and a shortened old kit body, plus a few trimmings, to produce quite a creditable flying wing. R. Ray's errant **Paageboy,** lost again, turned up two weeks later, and after a thorough drying out, was flying again within two days. The owner's only grouse is that during the model's absence he had built a second one and bought a new motor for it!

Results of the five 1953 **BRADFORD M.A.C.** contests, when totted up, gave the following prize-winners: Power Trophy S. Lanfranchi, Silvio Cup (glider) S. Eckersley, Driver Cup (rubber) C. P. Miller, Adcock Trophy (top junior) and Cripps Cup (H. L. glider) J. S. Oxley. The Brown-Muff Championship Trophy went to S. Eckersley and the Coultas Trophy, for the best unplaced competitor, to T. Lanfranchi. Financially, the club has had a better year, even making a profit on the annual dinner, for the first time on record.

HALIFAX M.A.C. also report a good season with a slightly better financial position; membership now stands at 31, and interest in contests has shown an increase. Five members flew in the International Trials in '53, and four have established good positions in the first '54 eliminators. Biggest achievement over the season was the winning of the Northern Area Knock-Out Trophy for the second time.

Midland Area

Prizewinners for the year in **RUGBY M.E.S. (A.S.)** were W. Eales (all round), J. Andrews (rubber), K. H. Sansom (glider) and B. C. Westaby (power). M. Underwood's o.d. glider which raised the club record to 27:31 o.o.s. also earned for him the cup for the longest flight of the year. Indoor flying is now the club's programme, and new members are assured of a warm welcome at any time.

LEICESTER M.A.C. have a winter schedule, published well in advance, which includes two film shows, indoor duration and R.T.P. comps. and even a "bring and buy" sale, which is quite a thought for other clubs. The popular one-design building and flying comp. is again being staged this year; the model is chosen by popular vote, and, as last year, judged uncovered, covered, and in flight.

F.A.I. power is favourite with **WOLVES M.A.C.,** and the 1954 programme meets with unanimous approval among the members. The seasonal appearance of indoor models, notably chuck gliders, is taking place, and vague threats of microfilm have been heard in the back-

"The Optimist"

ground. Tentative Jetex speed flying has disclosed the fact that to be fast the model has to be much smaller than anticipated; there is also some thought about R/C—thought only, so far.

East Midland Area

Winter contests in **FORESTERS M.F.C.** are proceeding to plan, though weather has affected entries. So far J. Weston has won stunt and D. Bolton scale stunt, the latter using a three-year-old **Dauntless.** These two also won "A" team-race. Latest effort is W. Ward's object which looks like a space rocket with an Eta 19 buried amidships. First tests showed race-car proclivities, and numerous feet came close to amputation.

Scotland

From **MONTROSE M.A.C.** comes news from north of the border. A.P.S. gliders appear to fascinate these boys, for, apart from innumerable **Seraphs,** mention is also made of **Scylla, Lulu, Jinx, Quickie, and Hadrian;** one prize should go to K. B. Whyte, who has made a good start to married life by making **Snark, Fugitive,** and **Seraph** in quick succession, and another to A Tasker, who has produced his **Seraph** despite being encased in a plaster jacket. D. L. Petrie proved the first winner of the Oberbeck Memorial Cup, which is awarded to the club's highest point-scorer in league competitions and was instituted after the tragic death of 24-year-old founder member C. F. S. Oberbeck, last September. Club Championship (Hendry Cup) also went to D. L. Petrie, and the Annual Competition Cup (this year for rubber duration) was won by C. G. Campbell.

The Scottish Model Engineering Society's annual Glasgow exhibition saw many interesting jobs in the aircraft section. These were entered by members of the **GLASGOW M.A.C.** and the **S.A.S. AUCHENHARVIE M.A.C.,** and J. McMaster's **Toreador,** fitted with a lightened Frog 500, acquired first prize, followed by J. Bell's 3.46 **Clubman** and W. Meechan's Fox 29 **Juggler.** I. Allen had on show a ½ in. scale **Viking** built entirely of cardboard and featuring split flaps, fully detailed undercarriage, etc., while J. Felloni entered a nice **Vortex,** the only glider in the show.

No pen-pals or models found means that without further ado we can move our typewriter off the building board, so, for another month, adoo.

The CLUBMAN

NEW CLUBS

DRIFFIELD D.M.A.C.
I. Holmes, 18 Northfield Crescent, Driffield, E. Yorks.

LEWES M.A.C.
T. D. Davis, 3 Spences Lane, Malling, Lewes, Sussex.

SECRETARIAL CHANGES

WRAITHS M.F.C.
A. Bassett, 106 Orchard Rise West, Sidcup, Kent.

BARNSLEY D.M.A.C.
D. McCrum, 32 Whilthorpe Avenue, Barnsley, Yorks.

SHARSTON D.M.S.
E. Helliwell, 10 Stancliffe Road, Sharston, Wythenshawe, Manchester.

BRADFORD M.A.C.
I. T. London, Upper Reap Hurst, Mount Tabor, Halifax.

TOTTENHAM M.F.C.
A. E. Wheelton, 151 St. Mary's Road, Edmonton, N.9.

GRIMSBY D.M.A.C.
N. Ashton, 160 Highgate, Cleethorpes, Lincs.

HESWALL M.A.C.
R. Smith, 86 Milner Road, Heswall, Cheshire.

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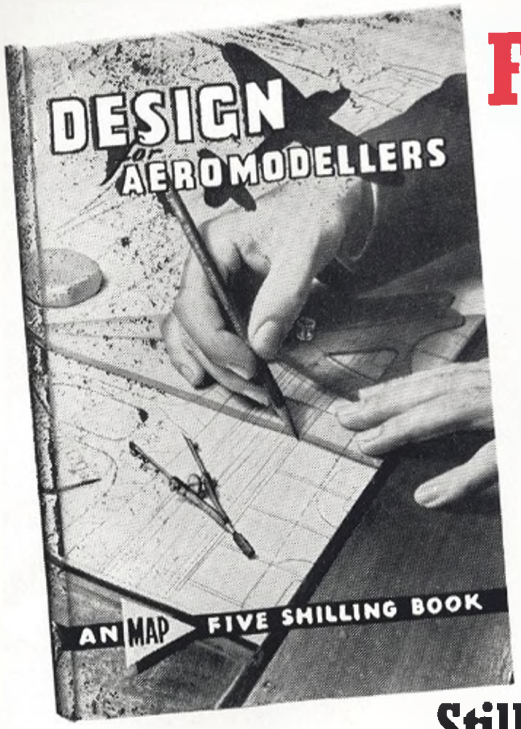

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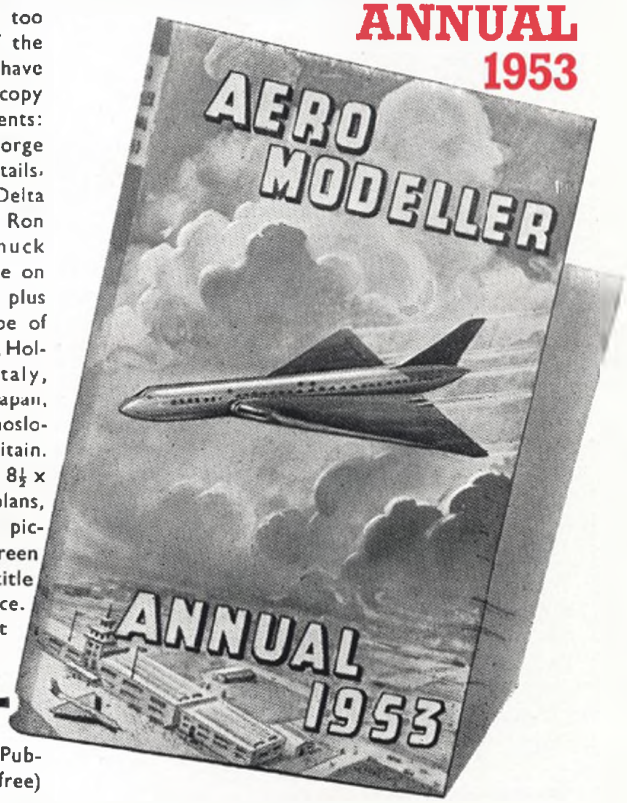

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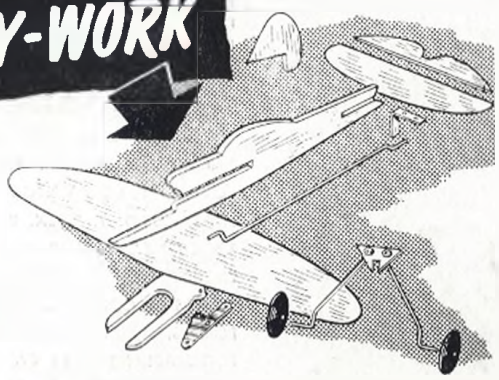

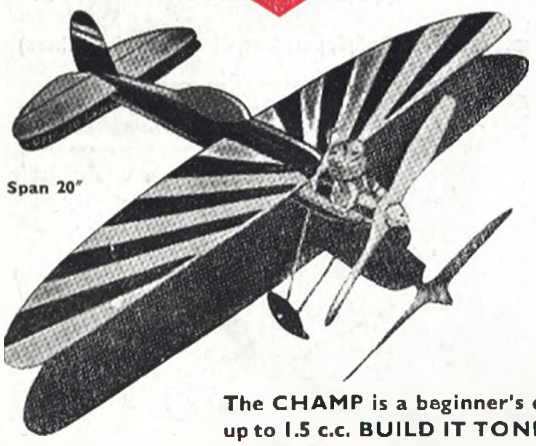

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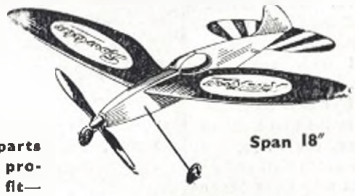

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