AERO MODELLER

MAY 1953

INTERNATIONAL POWER FEATURE INCLUDING WHEELER'S "ELIMINATOR" & SCHMID'S "KOMET" ● GLIDER TRIMMING & NEW RULE WAKEFIELDS ● O'DONNELL'S WAKEFIELD "BORDERLINE" ● R/C GIPSY MOTH ● NEW BOLTON Rx.

1'6

REDHEADS
for
RELIABILITY

Performance, the most quoted yardstick of model engine virtues, is an unreliable criterion unless backed by the reliability of an engineer designed and manufactured product.

Stressed to endure many years of trouble free running under the rigorous conditions imposed by the average aeromodeller, the Davies Charlton Allbon range guarantees performance, quality, and long life, plus a degree of finish not often found in such a reasonable price class.

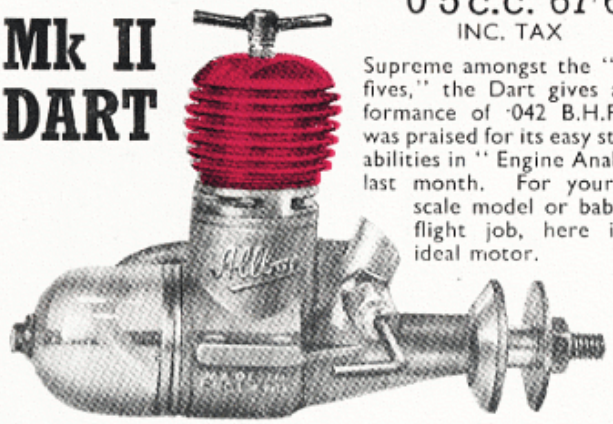
Whatever your need you will find in this range a motor to suit. A motor that is guaranteed ; a motor which has been thoroughly tested before leaving our works; a motor in fact that will last a modelling lifetime.

Remember ! Redheads for reliability ! Not forgetting the D.C. 350, which although without a redhead, has a heart of gold.

Mk II DART

0·5 c.c. 67/6
INC. TAX

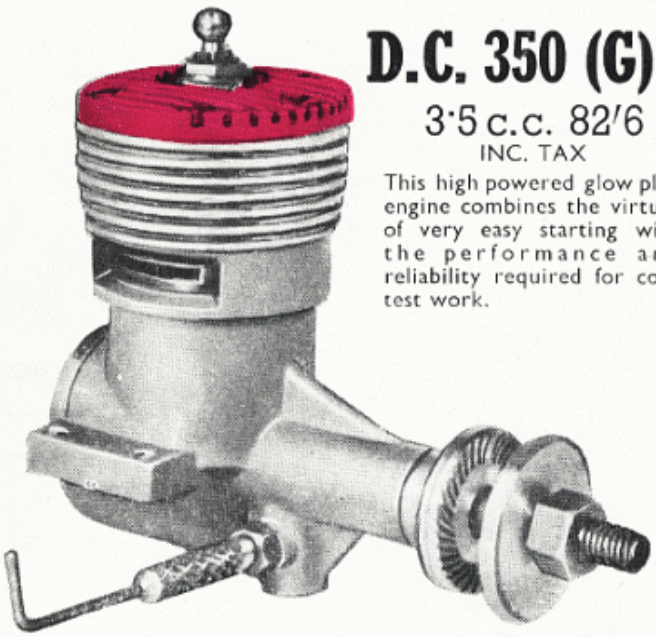
Supreme amongst the " point fives," the Dart gives a performance of ·042 B.H.P. and was praised for its easy starting abilities in " Engine Analysis " last month. For your next scale model or baby free flight job, here is the ideal motor.



D.C. 350 (G)

3·5 c.c. 82/6
INC. TAX

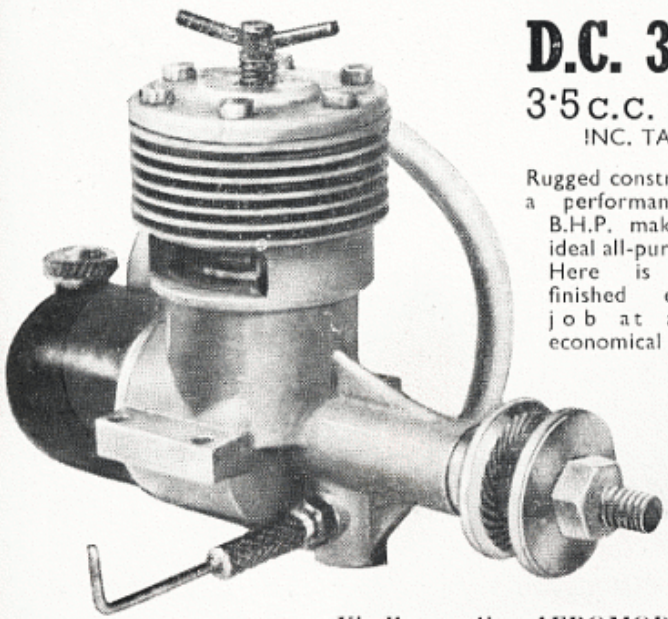
This high powered glow plug engine combines the virtues of very easy starting with the performance and reliability required for contest work.



D.C. 350

3·5 c.c. 82/6
INC. TAX

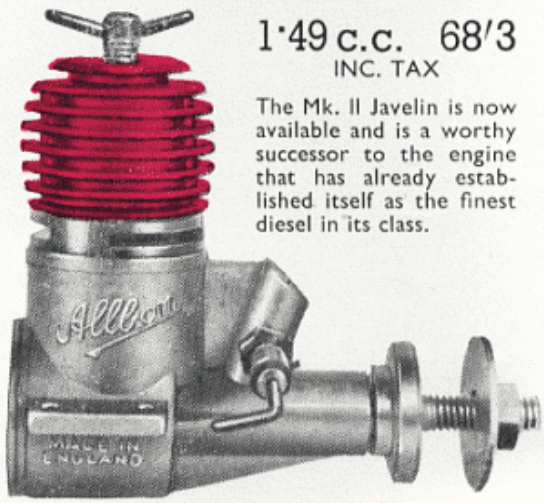
Rugged construction and a performance of ·28 B.H.P. make this an ideal all-purpose diesel. Here is a really finished engineering job at a truly economical price.



Mk II JAVELIN

1·49 c.c. 68/3
INC. TAX

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



Special Announcement!

Look out next month for full details of the new Allbon ***Spitfire.*** *A 1 c.c. motor, designed especially for the beginner, that starts first time, every time ! Supplies will be in your local model shop shortly, so place your order now to avoid waiting.*

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

NORTH SOUTH EAST WEST

GREGORY'S

Service is the Best

RADIO CONTROL

WHY NOT AN R/C BOAT FOR A CHANGE

Wavemaster Cabin Cruiser, all hardwood, pre-cut. 34" long, 11" beam. Suitable for 2–7 c.c. 60/0+12/10 P.T.

E.D. Mk. II, 3-valve unit. Complete transmitter and receiver only. 297/6+72/6 P.T.
E.D. Mk. III Miniature (Hivac) Unit. Complete transmitter, receiver and escapement. 159/6+38/5 P.T.
E.D. Mk. IV Tuned Reed. 3 channels unit. Complete 400/0+100/0 P.T.
Any of the above can be purchased as separate items.
E.C.C. Transmitter unit. 500/+12/6 P.T.
E.D. III Hivac receiver. 60/0+14/5 P.T.
E.C.C. 951A hard valve receiver. 70/0+17/6 P.T.
E.D. escapement, compact and normal type. 18/6+4/5 P.T.
E.D. polarized relay. 30/0
E.C.C. 5A relay. 25/0+6/3 P.T.
E.D. Standard relay 22/6
E.D. Reed Unit (high or low frequency, state which). 60/0
Hivac Valve. 15/0+3/4 P.T.
Milliameter, 0·5 M/A. 15/0
Batteries stocked for any of above.

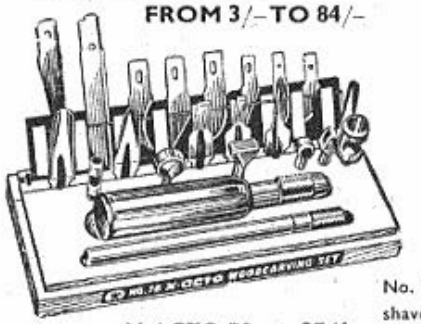
VENNER ACCUMULATORS. Leaflet on request.

KITS FOR R/C	P.T.
K.K. Junior 60 ...	39/6+ 8/9
Ver. Skyskooter ...	25/0+ 5/6
Ver. Stentorian ...	69/6+15/6
K.K. Falcon, 96" ...	107/6+23/11
E.D. Radio Queen	78/6+6/6 P.T.

ORDERING INSTRUCTIONS

HOME CUSTOMERS. Cash with order or C.O.D.
POSTAL INSTRUCTIONS. All orders under 10/– add 9d., 25/– add 1/1, 40/– add 1/6, over 40/– post free. For overseas according to postal service requested and destination. Postal information concerning dispatch to any country given on request.
NOTE. Will all customers requiring information please include a S.A.E. or if overseas International Reply Coupons.
Cash with order or C.O.D. See last month for list of countries.
Customers resident outside United Kingdom, including H.M. Forces, buy free of Purchase Tax.
Correct rates of exchange given.
FORCES CLUBS. Recognised Clubs can buy on a credit account. Details on request.
Model Shops overseas supplied, write for terms.

THE AEROMODELLER'S CHOICE
X ACTO TOOLS
FROM 3/– TO 84/–



X ACTO 78 37/6

No. 86 Tool Chest, 84/0 ; No. 82 Tool Chest, 30/0 ; No. 78 Wood Carving Set, 37/6 ; No. 77 Wood Carving Set, 23/0 ; No. 1 Knife (with No. 11 blade), 3/0 ; No. 2 Knife (with No. 22 blade), 3/6 ; No. 5 Knife (with No. 19 blade), 6/6 ; No. 51 Knife Set (No. 1 knife and 6 blades), 5/6 ; No. 52 Knife Set (No. 2 knife and 6 blades), 6/9 ; No. 62 Knife Set (No. 1 and 2 knives with 12 assorted blades), 12/3 ; No. 50 Plane, 5/6 ; No. 55 Spokeshave, 3/6.; No. 58 Stripper, 5/0.

An X ACTO illustrated leaflet will be sent on receipt of S.A.E. Contains full range, prices contents of tool chests, spare blades, etc.

ENGINES

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

E.D. MILES SPECIAL
5 c.c. Diesel (Hand built)
Air Cooled 170/0+5/0 P.T
Water Cooled 195/0+15/0 P.T.

	P.T.
Amco B.B. 3·5 ...	92/0+23/0
Allbon Dart 1·5 c.c. II	54/0+13/6
Allbon Javelin ...	55/0+13/3
Allbon Arrow G.P....	55/0
D.C. 350	66/0+16/6
E.D. ·46	45/0+10/0
E.D. Bee I c.c. ...	47/6+10/0
E.D. 2·46 Racer ...	72/6+10/0
E.D. Mk. IV 3·46 c.c.	72/6+10/0
E.D. 1·46	52/6+ 7/6
E.D. 2·46 Watercooled	98/6+16/6
E.D. 34·6 Watercooled	98/6+16/6
Frog 50, ·5 c.c. ...	36/9+ 8/3
Frog 150 Diesel ...	40/6+ 9/0
Frog 500 Red Glow...	61/8+13/4
Frog 500 Petrol ...	69/9+15/3
Mills P.75	60/0+10/9
Mills S.75	55/0+11/9
Mills 1·3	75/0+16/1
Elfin ·5 c.c.	54/0+13/6
Elfin 1·49 c.c. ...	47/6+12/0
Elfin 2·49 c.c. ...	56/0+14/0

JETEX TAILORED

Hawker Hunter. 15/6+3/5 P.T.

We have no hesitation in saying that this sets a new standard in British Kits. A model all scale enthusiasts will want to build.

OTHER TAILORED KITS

	P.T.
Voodoo (50)... ...	6/5+1/4
M7 Kit only ...	4/1+11d.
M7 (complete with Jetex 50B motor, fuel, etc.) ...	8/7+1/11

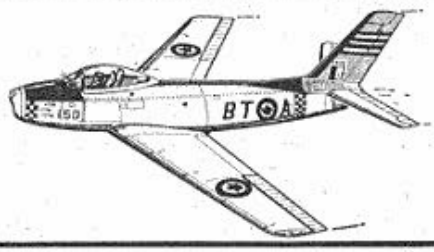
JETEX MOTORS

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

K.K., Veron and Skyleada. Jet kits as advertised. Solids by Veron, Keilkraft and Bateman.
K.K. "Solids" Stand 1/6+4d.

NEW E.D. R/C OUTFITS

Boomerang Unit comprising Transmitter, Receiver and Escapement completely wired and ready to install in your model. Receiver supplied in hard or soft valve type.
Complete unit as above **£10/0/0+£2/8/1 P.T.**
Receiver set (including Escapement) wired ready for use **£5/9/6+£1/3/10 P.T.**



A NEW "IMP" SCALE MODEL
Plans show full colours for U.S.A., Canada and Great Britain. 25/0+5/6

VERON'S SABRE
34" span. For Dart, Elfin ·5, Frog "50" and Mills 75 engines.

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

P. E. GREGORY & SON
(ALTON) LTD., ALTON *TEL. 3376* HANTS

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

WORLD WIDE MAIL ORDER Service

ALL LINES IN STOCK AT TIME OF ADVERTISING

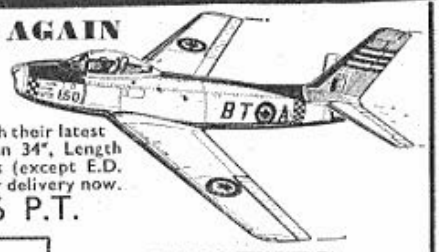
FIVE STAR REASONS why customers overseas prefer my mail order service PLUS ONE NEVER PREVIOUSLY ADVERTISED

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

Plus that I have been sending goods C.O.D. all over the world for years as my friends and customers long know. Now you know, and can enjoy the same facilities.

VERON DO IT AGAIN

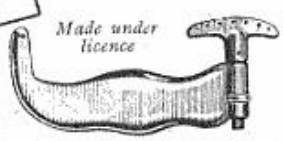
DUCTED FAN SABRE



Veron score again with their latest Ducted Fan kit. Span 34", Length 30½". For all motors (except E.D. .46) up to 0·9 c.c. For delivery now.

25/- + 5/6 P.T.

FOR C/L FLYING— IT'S "AM-PULL" EVERY TIME



This is what more and more keen C/L flyers are finding out daily. The adjustment lug on the trimmer enables angle and tension of wire to be varied, ensuring a keener degree of flight control than ever before. Stove enamelled with shaped grip and trimmer.

(Plus 1/3 P/Tax) **5'6**

KITS

BY KEILKRAFT

		P.T.
Gliders		
Topper, 40"	8/6	1/11
Cadet, 30"	4/0	11d.
Soarer Baby, 36"	5/0	1/1
Soarer Minor, 48"	8/0	1/9
Soarer Major, 60"	11/6	2/7
Invader, 40"	6/6	1/5
Minimoa, 50"	7/0	1/7
Chief, 64"	18/6	4/2
Dolphin, 30"	4/0	6d.
Rubber Powered		
Achilles, 24"	4/0	11d.
Eaglet, 24"	4/6	1/0
Ace, 30"	5/0	1/1
Senator, 32"	5/6	1/3
Ajax, 30"	6/0	1/4
Competitor, 32"	7/0	1/7
Gipsy, 40" (W)	10/6	2/4
Contestor, 45" (W)	23/6	5/2
Flying Scale Series	3/0	8d.
Free Flight Power		
Slicker Mite, 32"	9/6	2/1
Southerner Mite, 32"	10/6	2/4
Skylon, 38"	10/6	2/4
Pirate, 34"	12/0	2/8
Slicker, 42"	17/6	3/11
Slicker, 50"	25/0	5/6
Slicker, 60"	35/0	7/9
Southerner, 60"	40/0	8/11
Junior, 60"	39/6	8/9
Bandit, 44"	18/6	4/2
Outlaw, 50"	22/6	5/0
Ladybird, 41"	18/6	4/2
Flying Scale Power		
Piper Super Cruiser	18/6	4/2
Cessna 170, 36"	18/6	4/2
Luscombe, 40"	18/6	4/2
Control Line		
Phantom Mite, 16"	11/6	2/7
Phantom, 21"	18/6	4/2
Scout Bipe, 20"	22/6	5/0
Ranger, 24"	10/6	2/4
Pacer, 30"	15/0	3/4
Skystreak 26	9/6	2/1
Skystreak 40	10/6	2/4
Stunt Queen	21/0	4/8

BY JETEX

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

Fuels and Spares always in stock.

BY MERCURY

		P.T.
Gliders		
Magpie, 24"	4/0	11d.
Gnome, 32"	6/0	1/4
Norseman, 58"	24/0	5/3
Martin, 40"	7/6	1/8
Marauder, 65"	14/6	3/3
Grebe, 49½"	12/3	2/9
Rubber Powered		
Mentor, 36"	9/0	2/0
Free Flight Power		
Jr. Mallard, 34"	15/0	3/4
Mallard, 48"	18/3	4/0
Flying Scale Power		
Stinson, 42"	28/6	6/1
Aeronca Sedan, 65½"	57/0	12/6
Monocoupe, 64"	57/0	12/6
Monocoupe, 40"	22/9	5/1
G.H.3. Skyjeep, 45"	28/6	6/1
D.H. Tiger Moth, 33"	28/6	6/1
Control Line		
New Jr. Monitor	19/3	4/3
Monitor	18/3	4/1
Mk. I T. Racer, Cl.B	23/0	5/1
Mk. II T. Racer, Cl.A	19/0	4/3
Midge	5/3	1/2

BY VERON

Gliders		
Verosonic, 46"	10/6	2/4
Vortex, 66"	18/6	4/1
Rubber Powered		
Rascal, 24"	5/6	1/2
Sentinel, 34"	10/6	2/4
Hi Climber, 38"	25/0	5/6
Fledgeling, 24"	7/6	1/8
Free Flight Power		
Streaker, 32"	19/9	4/4
Skyskooter, 48"	25/0	5/6
Cardinal, 37"	14/6	3/2
Lavochkin, 37"	25/0	5/6
Control Line		
Bee Bug	12/0	2/8
Midget Mustang	22/6	5/0
Sea Fury	23/6	5/2
Wyvern	23/6	5/2
Philibuster	23/6	5/2
Spitfire	27/6	6/1
Goshawk	79/6	17/8
Focke Wulf	21/0	4/8
Minibuster	15/0	3/4

"ALL-IN" OUTFITS

HAWKER HUNTER

Magnificent scale Jetex Kit with transfers, pre-formed fuselage, die-cut formers, wheels, cockpit, cement, with Jetmaster Unit and Augmenter Tube.

44/6 + 9/10 P.T.

LAVOCHKIN 17 by Veron. Ducted fan model with Allbon Dart Mk. II.

59/0 + 19/0 P.T.

ENGINES

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

		P.T.
Allbon Dart ·5, Mk. II	54/0	13/6
Allbon Mk. II Javelin 1·49 c.c.	55/0	13/3
Allbon Dart Mk. I, 0·5 c.c.	52/1	13/1
E.D. Baby ·46 c.c.	45/0	10/0
Elfin ·5 c.c.	54/0	13/6
Frog ·5 c.c.	36/9	8/3
Mills 0·75 c.c.	50/0	10/9
Mills 0·75 c.c., with cut-out	55/0	11/9
E.D. Bee I c.c.	47/6	10/0
Mills 1·3 c.c.	75/0	16/1
E.D. 1·46 c.c.	52/6	7/6
Javelin 1·49 c.c.	55/0	13/9
Frog 150 1·5 c.c.	40/6	9/0
E.D. Comp. 2 c.c.	57/6	7/6
E.D. 2·46 c.c. Racer	72/6	10/0
E.D. Mk. IV 3·46 c.c.	72/6	10/0
D.C. 350 3·5 c.c.	66/2	16/4
Amco 3·5 B.B.	93/0	23/0
Glo Plug		
Frog 500	61/8	13/4
Frog 500 Spark	69/9	15/3
D.C. 350 (G)	66/2	16/4
Fuel Cut-off Valve	3/6	10d.

All leading fuels stocked

Full range of kits by leading makers; accessories, materials, engines, fuels, dopes, tools, etc., etc., see my latest list, *sent free on application to me personally.*

If you cannot reach the model-shop you want, order in confidence from my Mail Order Department. Satisfaction guaranteed. ***All goods in stock at time of advertising.***

RADIO CONTROL

E.D. COMPONENTS

			P.T.
4-pin Plug and Socket	2/6	Potentiometer	5/6 + —
2-pin ditto (polarised)	2/3	Mk. I Clockwork Escapement	47/6 + 11/5
2-pole Switch	3/0	Mk. III Escapement	18/6 + 4/5
On-off Single Pole Switch	3/0	Compact Escapement	18/6 + 4/5
On-off Double Pole Switch	3/9	Polarised Relay	30/0 + —

E.D. TRANSMITTERS AND RECEIVERS

Mk. II.	Transmitter and Aerial	112/0 + 28/0
Mk. III	Transmitter and Aerial	92/6 + 23/0
Mk. IV.	Transmitter, Control Box and Aerial	160/0 + 40/0
Mk. II.	Receiver	184/0 + 46/0
Mk. III.	Receiver complete	60/0 + 14/5
Mk. IV.	Three Channel Receiver	240/0 + 60/0
Mk. II.	3-valve Outfit, complete	£14 . 15 . 6 + £3 . 14 . 6
Mk. III.	Miniature Outfit, complete	£7 . 19 . 6 + £1 . 18 . 5
Mk. IV.	Tuned Reed, Three Channel Outfit, Complete	£20 . 0 . 0 + £5 . 0 . 0

ARTHUR MULLETT

16 MEETING HOUSE LANE

BRIGHTON - SUSSEX - ENG.

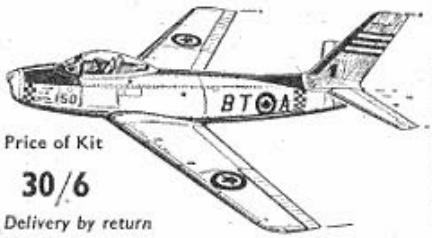
BUD MORGAN

The Model Aircraft Specialist

THE MAIL ORDER HOUSE

All orders in U.K. post free over 20/– ; under send 1/– for postage and packing. MY NEW 1953 MODEL AIRCRAFT PRICE LIST, price 3d., includes up-to-date prices of KeilKraft, Veron, Mercury, Skyleada, Jetex, E.D. KITS, ACCESSORIES, ENGINES, etc.

OVERSEAS ORDERS FREE FROM PURCHASE TAX, deduct approximately 20 per cent. C.O.D. ORDERS WELCOMED



Price of Kit

30/6

Delivery by return

NEW SABRE F.86.E.

IMP. propelled, a worthy successor to the Lavochkin 17. The model is 34" span, and construction is similar to the L.A.17. suitable for the following engines:—Frog 50, Allbon Dart, Elfin ·5 c.c. Mills ·75 c.c.

NEW KEILKRAFT " TOPPER ", 40" span Glider 10/5

JETEX TAILORED KITS

Hawker Hunter	18/11
Voodoo	7/9
Voodoo complete with type B. Jetex 50 Motor and Fuel, etc.	15/–
M7 kit only	5/–
M7 kit (complete with Jetex 50b Motor)	10/6

KITS FOR JETEX MOTORS

Skyleada Avro 698, Avro 707A, MiG 15, Gloster Javelin. Keil Grumman Panther, Swift, Attacker, Venom, Hunter, Sabre, all for Jetex 50 motors. All one price 3/8 each, postage 6d.

FREE FLIGHT POWER KITS

KeilKraft, Skylon 38"	12/10
Pirate, 34"	14/8
Bandit	22/8
Ladybird, 41"	22/8
Outlaw	27/6
Southerner Mite, 32"	12/10
Slicker Mite, 32"	11/7
Skyleada, Point Five	9/6
SE.5a Flying Scale, 27"	17/6
KeilKraft Cessna 170, 36"	22/8
Luscombe Silvaire, 40"	22/8
Piper Super Cruiser, 40"	22/8
Frog Zephyr, 33"	10/6
Firefly	17/6
Powervan, 48"	17/6
Cirrus, 48"	17/6
Veron Cardinal, 37"	17/8
Lavochkin 17, 37"	30/6
Skyskooter, 48"	30/6
Mercury Flying Scale Stinson	34/7
Aeronca Sedan, 65½"	69/6
Monocoupe	27/10
Monocoupe, 64"	69/6
Skyjeep, 45"	34/7
D.H. Tiger Moth, 33"	34/7
KeilKraft Handbook in stock	1/6

NEW VERON SOLIDS

Valiant 7/6, Comet 6/8, Dragonfly 3/9, Swift 2/9, D.H. 110, Javelin, Sea Hawk and full range of Veron solids in stock.

FULL RANGE o fKeilKraft, Silverwing and Bateman SOLIDS in STOCK. Send for full price ist.

CONTROL LINE KITS

Frog Vandiver II, 27"	15/–
Vantage Class B	21/–
Vanfire, 40" Stunt	29/6
KeilKraft Ranger	12/10
Pacer	18/4
Phantom	22/8
Veron Beebug	14/8
Panther	30/6
Focke Wulfe 190	25/8
Wyvern	28/8
Midget Mustang	27/6
Minibuster	18/4
Skyleada Auster	9/–
Hornet	10/11

SECOND-HAND ENGINES

E.D. Baby	37/6
Amco 3·5 c.c.	50/–
E.D. Comp. Special, 2 c.c.	35/–
E.D. Racer, 2·46 c.c.	60/–
D.C. 350	45/–
Frog 500	50/–
Frog 150	35/–

I buy Second-hand engines for Cash.

RADIO CONTROL

E.D. Mk. II 3-valve unit, comprising Transmitter and Receiver
Price complete **£18 . 10 . 0**
Receiver **£11.10.0**, Transmitter **£7**
E.D. Mk. III Miniature R/C unit.
Price complete **£9 . 17 . 11**
Transmitter **114/9**, Escapement **22/11**, Receiver **74/5**
E.C.C. 951a Hard Valve Receiver, 87/6
E.C.C. Relay 31/3
Escapement 21/11
Send for price lists of E.D. Radio Control Equipment—free

ENGINES

Frog 50	45/–
Frog 150	49/6
Frog 500 Glowplug	75/–
Allbon Dart, ·5 c.c. Mk. 2	67/6
Javelin Mk. II, 1·49 c.c.	68/3
Elfin ·5 c.c.	67/6
Elfin 2·49 c.c.	70/–
D.C. 350	82/6
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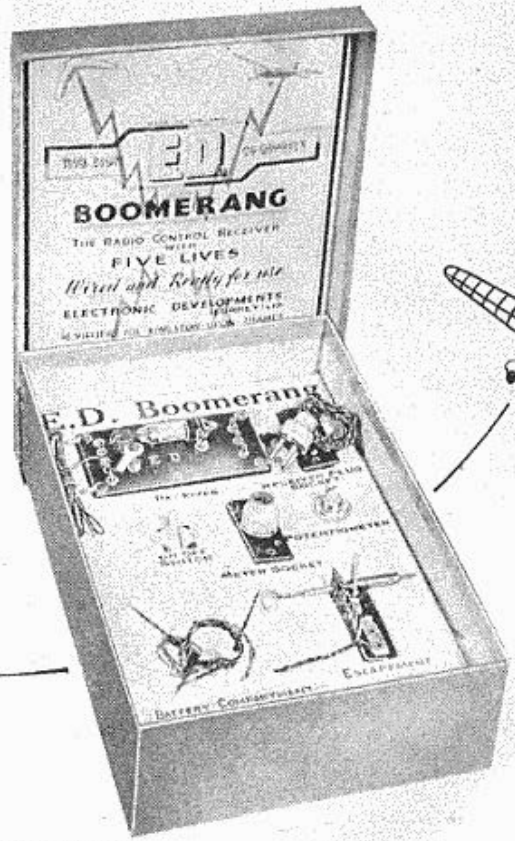

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Contents

Editorial and Advertisement Offices :
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A Fine Start

AS this is written, bright, sunny weather still graces the most extraordinary March experienced in over 60 years—a month that has proved a boon to aeromodellers all over the country, though farmers and gardeners are inclined to a gloomier view of the situation!

This unusual leniency on the part of the Clerk of the Weather has allowed the most pleasant start to a contest season in living memory, for the days devoted to the Gamage and Pilcher Cups, and the Farrow Shield and Women's Cup, with, even more important, the first Area Eliminators for the A/2 contests, proved ideal for model flying in almost every part of the country. What a decided change from "normal" conditions, which tagged the start-of-the-season contest with the title "Damage Cup".

In one respect this fortunate weather has proved something of a boomerang, for the recently introduced "handicap" rules have not received a proper test. With many competitors scoring treble-maximums, a fourth no-limit flight proved the deciding factor—thus destroying the sole purpose of introducing the shorter line length for gliders, i.e., the elimination of long cross-country chases after straying models, with the attendant liability of trespass and damage by anxious owners. With this experience in mind, the S.M.A.E. Council have immediately modified the "fly-off" rules, limiting such additional flights to a maximum of five minutes, such deciding flights to continue until a competitor fails to reach the stipulated maximum.

It seems fair to prophesy that 1954 will see the International F.A.I. rule of five three-minute flights adopted for general competitions, for such a requirement must by the law of averages reduce the numbers reaching a maximum score. Thus the rules introduced in an endeavour to contain models within reasonable territorial boundaries will serve their purpose, instead of as at present only meeting the situation half way.

Such a welcome start to the season makes us even more optimistic that Coronation Year will be a real highlight in British aeromodelling. 1953 sees the greatest International Meeting yet staged in the annals of the movement, for Great Britain has the honour of organising a double World Championship event in August.

Through the good offices of the Senate of the College at Cranfield, this magnificent site will again be the venue for the Wakefield Cup contest for Rubber-driven machines, and in addition the Championship for Power-driven models will be held, both individual and team awards being made in each event.

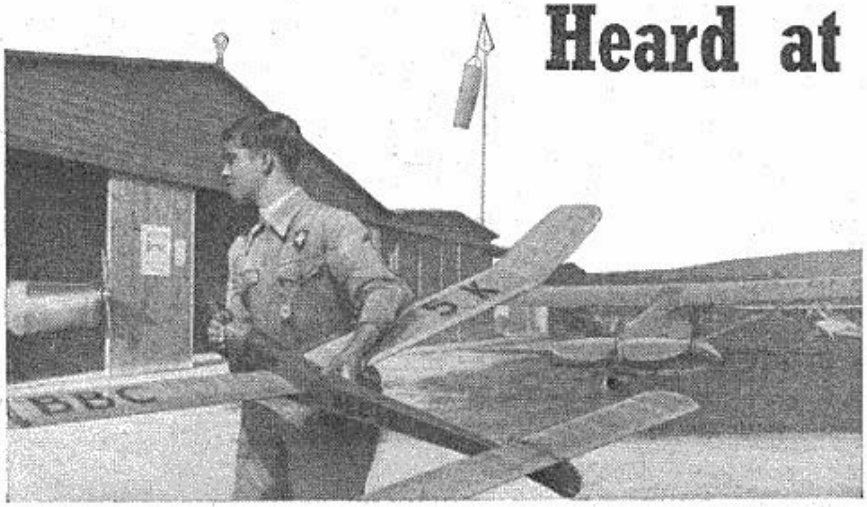
Cranfield and its unique facilities became a byword amongst the aeromodellers of the world following the 1949 Wakefield, and the high standard reached at that meeting is talked of wherever top-line modellers meet. We predict an even more memorable meeting this year, and only trust that the Weather Man will repeat his March efforts for that date. It is unfortunate that the one factor that cannot be organised can totally wreck the most detailed arrangements—but we can only keep our fingers crossed!

To our many overseas friends and readers, we extend a hearty welcome to Great Britain in 1953, in the assurance that Coronation Year will provide them with many happy memories to take back home with them, plus our firm conviction that the Cranfield International Meeting will exceed anything that has gone before.

Cover Picture . . . .

from Finland shows 14-year-old Lars Liljestrom about to release his "Tikka", 33 in. Finnish kit model fitted with own-design floats. The model design is by professional aeromodelling instructor Olavi Lumes, for the Suomen Ilmailuliitto—Finland's Flygforbund Nordic C.1 (small rubber) job class, in which it holds the record of 7 : 30. "Tikka" also holds the C.4 (rubber hydro) record of 1 : 18, a time which may not stand for long in view of the increasing interest in hydro-models in Finland.

Heard at the Hangar Doors



Wakefield News

We have just received a letter from our old friend John Royle, formerly of the Littleover club and a noted Wakefield flier, now resident for a term in the Argentine. It is quite probable that a Government sponsored team will be coming from that country for the International meeting at Cranfield in August. May we look forward to some of those mythical Porterhouse Steaks as part of the equipment of a Team from the pampas ?

Incorrect information seems to get into print in many places, and we hasten to correct the impression given in a recent edition of the American " Model Airplane News ". In a general news column, the impression is given that with the Wakefield being held in England this year, the S.M.A.E. has taken the opportunity of altering the rules to suit ourselves ! Nothing is further from the truth, for the 1953 rules are the same as for last year; the proposed limitation on rubber weight—which we presume is the item referred to—is very definitely not an English proposition.

At the December F.A.I. Conference, Belgium proposed this modification to the Wakefield specification, obviously with the view to putting some limit on the distance covered by present day models, with their super performance capabilities. Countries will have the opportunity of voicing their support or otherwise at the next F.A.I. Meeting in May, when the December proposals come up for ratification.

We would like to make it clear to our many overseas readers that, whilst technically the S.M.A.E. has the final word on Wakefield rules, the granting of World Championship status to this event places the affair under F.A.I. jurisdiction, and the last thing we in Great Britain would do is to alter the rules to suit our own convenience. It just is not the British way of doing things !

Whilst writing on Wakefield matters we cannot resist quoting from the well written " Northern Area News " " We were just putting the finishing touches to our latest Wakefield, which has a 10 oz. motor and an airframe weight of 1·7 ozs. at a temperature of 72 degrees and relative humidity of 50 per cent. (we can only fly it in those conditions, otherwise it warps) when a sweating courier arrived with the news that the rubber and lubricant in 1954 will be limited to 2·82 ozs. The involuntary shudder we gave broke three longerons . . . We just thought we'd remind the rubber-twisting fraternity that the first 1954 eliminator is a bare five months off. And it's no use sticking pennies and bits of plasticine on your old job, either. You've really got to design them now ".

Lolly on the Line

An interesting national competition is being staged by the *News Chronicle* newspaper, running from June 1st to August 30th. Classed in Junior (under 13 on Jan. 1st, 1953) and Senior (over 13 but under 17 on Jan. 1st), prizes in each class are 10, 7 and 5 gns., 2 gns. extra if any of the winners is a Redskin, and 5 *gns. to the model club providing a first prize winner.* Contest is for sailplanes, one flight, flown roughly to S.M.A.E. rules. No entry fee and one score per week may be returned. If a 3 min. maximum is recorded, a further flight or flights should be made until less than a max. is returned, the winners being those with the highest aggregate, *i.e.*, total of consecutive maximums (if any) plus fly-off. Timers must be S.M.A.E. or club officials, or two persons over 17 not related to the entrant. 10 secs. must be deducted if no stopwatch is used.

Full details and official entry forms are available from Big Chief I-Spy, *News Chronicle* Wigwam, London, E.C.4.

"G" and the Chameleon

A few days ago some of the boys of the Herzlia (Israel) branch of the Aero Club of Israel were flying a 40-inch span glider, when they came upon a small chameleon. They decided to teach it what they knew to be the finest feeling there is—that of flying in a glider, and put it in the cockpit. After a few straight, though not steep, towline launches, it seemed that the little animal got used to the sensation.

But the wind shifted, and on one flight the model climbed in a rather sharp curve, banked steeply to the outside of the curve and cast off. The model glided to a normal landing, and on inspection it

was found that the chameleon had fainted! After half a minute or so it recovered and started to escape at high speed—some six inches per second.

The above incident was clearly a case of negative "G", and the conclusion drawn from it might be that a slow-moving animal like the chameleon is affected—to the extent of fainting—by negative acceleration "g" forces which would not affect faster moving animals. An equivalent motion of a full-size aircraft moving in an inverted (outside) loop, along an arc of the same angle as that in the case stated, would perhaps not even start to cause a red-out to its pilot.

At any rate, in order to enable a chameleon to enjoy its flights even under "g" conditions, it would be advisable to wear a negative g-suit over its upper part, including the brain (both parts). Zoologically minded readers please note!

5th Northern Models Exhibition

Entries at this year's Manchester Exhibition were not as numerous as in previous years, but the general standard of the aircraft exhibits was much higher than on any previous occasion. It is obvious that the Northern lads have caught on to the fact that slicked-up utility models cannot hope to compete for the prizes against models especially prepared for the show, and in consequence more really first-rate examples of the aeromodellers' art are appearing.

Paramount model this year was the beautifully detailed model of the "Fokker E.III" exhibited by F. D. Ward of the Ashton club, staunch and regular supporters of this type of show, and he receives the AEROMODELLER Exhibition Challenge Trophy for 1953. A very close contender was the excellent example of the "B.G. 44" built by G. Aitken of Bredbury, the application and finish of sheet balsa being outstanding.

A. S. Bailey of Cheadle again took top honours in the Power section, whilst fellow-clubmate Bill Archer gained similar status in the Rubber class, the well built Wakefield model carrying his name being a rather surprising entry from this avowed power modeller. Other winners were C. K. Beckett (Sale) who showed a finely finished "Sea Fury" in the scale C/line class, and E. A. Horwich of Whitefield whose "Calamity Jane" was best in the general C/line class.

Special credit goes to the winner of the Junior section, B. Mackintosh of Stockport. His black and red sailplane was the equal of many senior exhibits, and the degree of finish obtained on the sheet covered fuselage gained him many points with the three-man team of adjudicators.

The A2 Trials

News has just been received that permission has been granted for the use of Kidlington Aerodrome for the A2 Trials on May 3rd. The AEROMODELLER R/C Trophy will also be flown off at the same time and place. Kidlington is relatively easy of access, being approximately 7 miles N.N.W. of Oxford, lying alongside the main Oxford–Stratford-on-Avon road, A 34.

Junior Artist Required

A keen and versatile junior artist tracer is required for the Aeromodeller/Model Maker drawing office at Watford. Finished lettering ability will be a definite asset. Applicants should apply in writing with details of experience but should *not* send specimens in first instance. Mark envelope "Junior Artist" in top left corner.

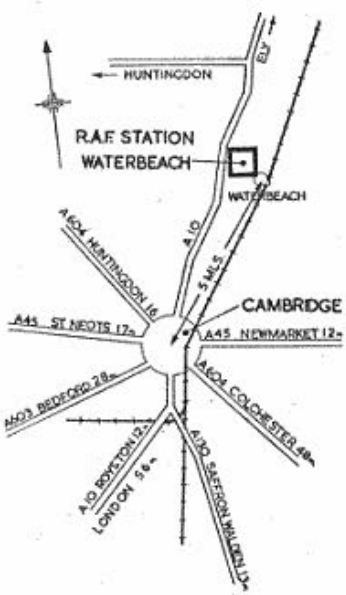
British Nationals

The Nationals will this year be held at the R.A.F. Aerodrome at Waterbeach, approximately six miles N.E. of Cambridge, just off the main Cambridge–Ely road. There is a rail service to Waterbeach village. Since in many quarters Whitsun Bank Holiday is being considered as a normal working day (the holiday being moved a week to tie-in with Coronation Day), the Nationals will be on Saturday and Sunday, May 23rd and 24th only. Saturday's contests are: Model Aircraft Trophy (Rubber), Sir John Shelley (Power), C/L Speed, Gold Trophy (C/L Stunt), and Team Race Class "A". Sunday's contests: Thurston Cup (Glider), Short Trophy (PAAload), S.M.A.E. R/C Trophy, C/L Speed and Team Race Class "B".

Pre-entry is essential for all contests. Entrants should send their entries, together with Name, Address, Club, whether Senior or Junior, not forgetting the names of the contests they wish to enter to the S.M.A.E, Competition Secretary, Londonderry House, Park Lane, W.1. Entry fees **must** be enclosed and entries will not be excepted if they are post-marked later than 10th May.

Camping facilities are available for tents and caravans and a limited number of marquees are available for hire at a nominal charge. Beds are included but no bedding.

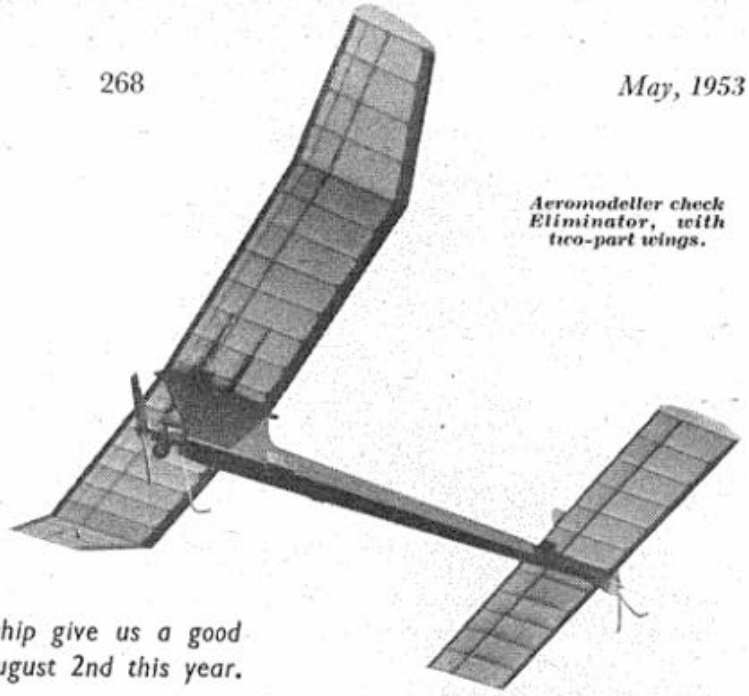
For further information write to the Accommodation Officer, British Nationals, 4 Hale Street, Cambridge, enclosing a S.A.E.



London trains run from Liverpool Street direct to Waterbeach (Sat. 5.50, 8.20, 10.0 a.m., Sun. 8.20 a.m., ret. Sun. 5.15 or 9.57 p.m., 18s. 2d. return, approx. 2 hours' journey) but a better service, hourly from Liverpool Street or Kings Cross, exists to Cambridge, 16s. 4d. return, 1¼ hours journey, with frequent Sunday evening trains back (up to 9.12 p.m.)

Spotlight on . . .

International Power



Aeromodeller check Eliminator, with two-part wings.

Reflections on the 1952 World Championship give us a good idea of what to expect at Cranfield on August 2nd this year.

THREE factors govern the design of an F.A.I. class power job. The engine must be no more than 2·5 c.c., the wing loading must exceed 3·93 ounces per square foot of total area, and the power loading must be at least 7·06 ounces per c.c.

Simple enough isn't it ? . . . a model for a 2·49 must weigh at least 17½ ozs. and a 1·49 model more than 10½ ozs. . . . if you build to *minimum* power loading weights, then the biggest area allowed for a 1·49 is 384 sq. ins. for wing and tail, and for 2·49 c.c. we can jump to 646 sq. ins. Don't forget these are *maximum* areas for *minimum* weights . . . if you increase the model weight, you can certainly add on to the area and still be within the rules.

In actual fact, these rules are so flexible that few average models come outside of them. At the 1952 World Championships, only one model out of over sixty came sufficiently close to the borderlines to warrant a second check on the scales, suffice to say that it was one of the British team models—built to minimum wing loading.

Now, if it is easy enough to keep within the specifications, what kind of a model will give best performance ? Although last year's event was considerably influenced by thermal activity, it would be hard to get away from the fact that Barry Wheeler's "Eliminator" and Heinz Lauchli's version of Schmid's "Komet" took best advantage of the prevailing conditions, for after all, they finished first and second. Yet two more contrasting approaches to the F.A.I. specification could hardly be found ! One, the smallest, the other the largest in the field ; one a pylon, the other, low-midwing, one a 1·49, the other 2·49, they have but one common denominator—both are near to the wing loading minimum.

Take a look at the table of the top sixteen in 1952, and the popular size of model soon becomes apparent. Fourteen of them used the largest engine size, and doubtless, if the rules *had been* extended to include 3·5 c.c. then the majority would have gone one size up to take advantage. (Fortunately, the foresight of O.K. Engines in the U.S.A. in producing a special 2·5 motor for the American market has probably now set the seal at 2·5 c.c. top limit for ever.) Yet the smaller engine brought home the bacon last year. Why ? Because

1952 TOP SIXTEEN

Place	Name and Country	Engine (c.c.)	Wing (Projected dimensions)			Tailplane & Wing Area	Total Area (sq. ins.)	Weight (ozs.)	Wing Loading (ozs./sq. ft.)	Power Loading (ozs./c.c)
			Span (ins.)	Average Chord (ins.)	Area (sq. ins.)					
1	**Wheeler (Gt. Britain)**	Elfin 1·49 ...	45·27	6·5	292·5	52·0	446·4	12·75	4·11	8·83
2	**Lauchli (Switzerland)**	Castor 2·49 ...	78·75	7·7	607·6	31·0	795·1	25·92	4·69	10·04
3	**Castiglioni (Italy)**	Super Tigre 2·46	57·48	7·2	413·85	33·7	543·35	18·9	5·0	7·6
4	**Schnabel (Switzerland)**	E.D. 2·46 ...	68·5	6·6	452·6	40·0	632·4	22·74	5·16	9·3
5	**Prohaska (Yugoslavia)**	Elfin 2·49 ...	44·48	9·8	440·2	38·0	606·05	21·0	5·0	8·4
6	**Rupp (Germany)**	Webra 2·46 ...	57·48	6·1	350·3	28·3	447·95	18·65	5·95	7·58
7	**Lange (Germany)**	Webra 2·46 ...	53·54	6·5	347·2	29·4	449·5	19·1	6·1	7·77
8	**Bergamashi (Italy)**	Super Tigre 2·46	52·37	7·0	365·8	34·5	492·9	17·95	5·25	7·3
9	**Lippens (Belgium)**	E.D. 2·46 ...	57·11	6·1	347·2	41·0	491·35	28·0	8·22	11·4
10	**Teunissen (Holland)**	Typhoon 2·47	58·26	6·5	379·75	28·0	486·7	18·4	5·45	7·5
11	**Skalla (Austria)**	E.D. 2·46	67·32	8·0	436·3	26·0	677·35	21·16	4·47	8·6
12	**Kempen (Holland)**	Typhoon 2·47...	51·18	8·1	418·5	48·0	620·0	19·53	4·55	8·0
13	**Barth (Germany)**	Castor 2·49 ...	67·70	7·48	408·4	27·0	644·0	19·21	4·27	7·65
14	**Monks (Gt. Britain)**	Elfin 1·49 ...	44·48	6·69	351·05	47·0	435·55	11·88	3·93	7·95
15	**Ferber (Belgium)**	Elfin 2·49 ..	57·08	8·0	455·7	38·0	629·3	22·32	5·08	8·88
16	**Maret (Switzerland)**	Super Tigre 2·46	67·0	7·36	492 9	25·0	613·8	17·77	4·35	7·2

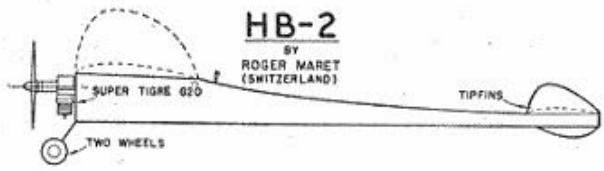
it took a lighter model higher, faster by having a superior thrust/drag ratio and then it caught three thermals in a row.

On the other hand, discounting design for climb, the larger 2·5 c.c. model has it all its own way when it comes to gliding angle and rate of sink. The ideal is of course, to have the fastest, steepest climbing model with the finest glide. Roger Maret of Switzerland had that of course, but ran off the rails somehow on his second (17 secs.) flight. The Swiss are divided into two camps. French-Swiss use smaller Glo-plug engined jobs, German-Swiss have large diesel powered designs. But both parties design for the glide, and sort the climb out later.

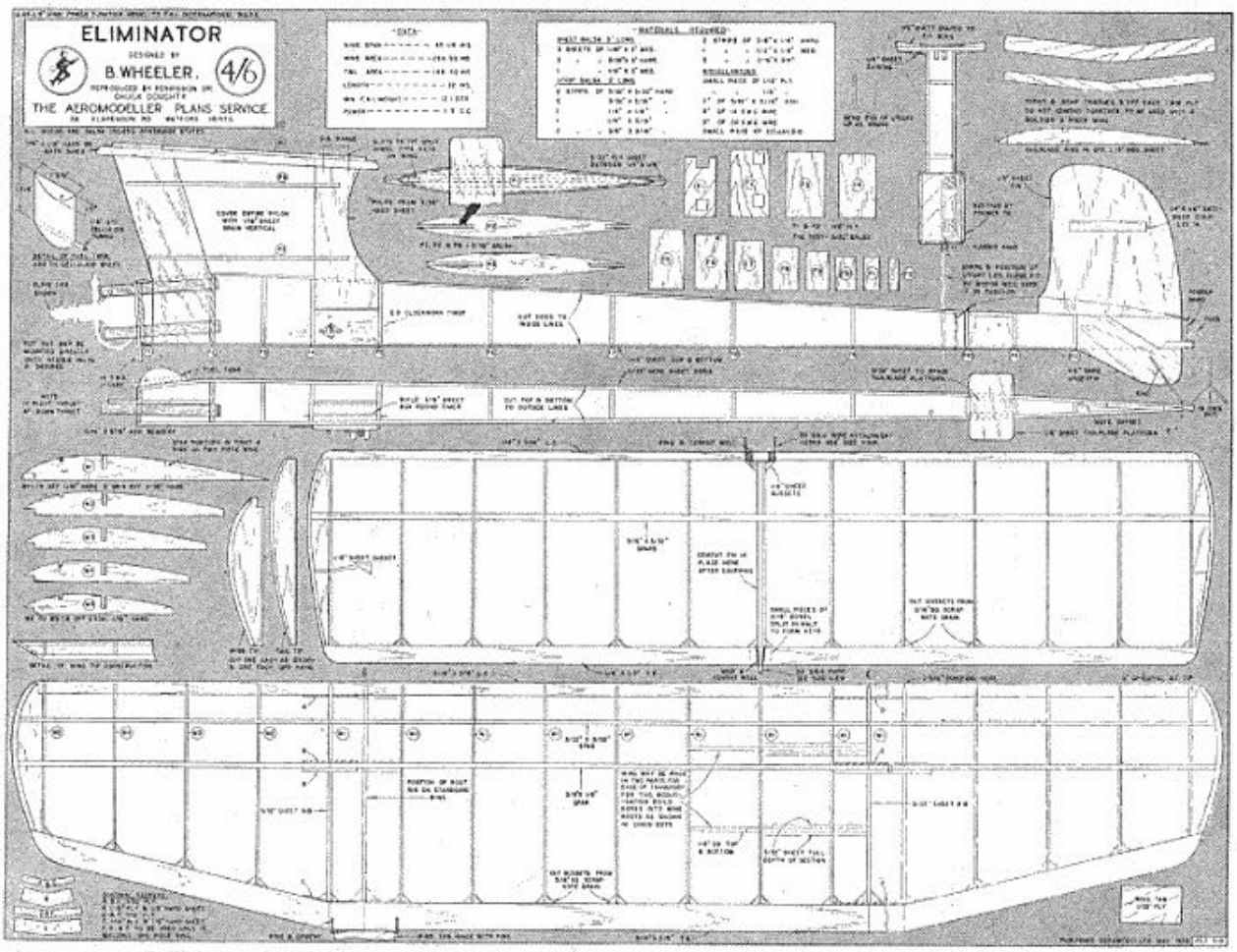
In this country we seem to take the view that he who gets highest in the allotted time gets the greatest chance of catching a thermal.

Thus, we tend to get the climb first, then try for the best glide. Hence the prevalence of the pylon—the constant demand for more and even more powerful motors—and we might add, the high rate of crashery.

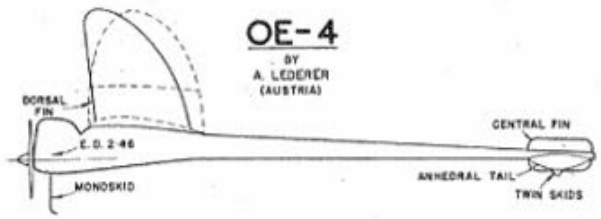
Is there another way of tackling the problem? Charles Hampson Grant in his "Design for Flight" told us that for spiral stability, the centre of gravity should lie approximately on a horizontal line



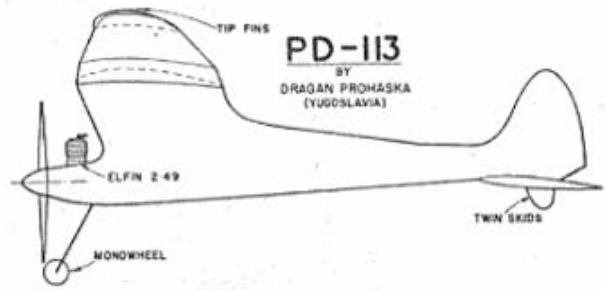
passing through the centre of lateral area. That didn't save Roger Maret's HB-2 from spiralling in at Dubendorf; but Grant also said that a *low* C.L.A. is a good thing for flight stability, and this was borne out by the revolutionary designs of Bragaglia (Italy) and Kempen (Holland). Both these models climbed straight ahead, perfectly stable and at a commendable rate of climb. On the other side of the fence, some European exponents, doubtless inspired by Italian Ing. Di Pietro's dorsal fin designs, favour a wing close to the thrustline,



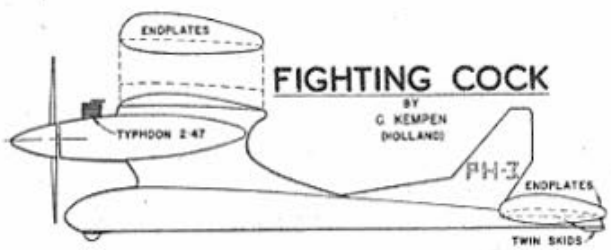
Full size copies of this plan can be obtained from the Aeromodeller Plans Service, price 4/6 post free.



and what would have been pylon area, in the form of a huge forward fin. This *high* C.L.A. layout was used by the Austrians, Lederer and Dejaco at the World's Championships, and they coupled the idea with enormous tail moment arm fuselages. Motor trouble and poor stall recovery are not conducive to good performance, so we were not given the desired opportunity to check the exact value of the " Cock's Comb " fin. Perhaps the fact that one of these boys refused to fly after the fin had been broken off, is indicative of its usefulness.



One should not forget, however, that the popular pylon layout is also a *high* C.L.A. form of design, and if we are to make an example, then Prohaska's Yugoslavian entry last year, was the only model to gain two maximums, and this in spite of its relatively heavy loadings. Bearing the stamp of Leon Shulman's " Zoomer ", with negative longitudinal dihedral, PD–113 climbs in a steep spiral that looks perfectly safe, and the use of tip fins probably aids in this direction. The best models of Great Britain, France, Italy and Germany, were all of pylon layout.



Without *really* knowing the value of the " Cock's Comb " fin, the recommendation for 1953 design would be—if you favour the pylon, stick to it—if you've had little luck with the pylon, try a high thrust-line and low centre of lateral area and play safe. Keep off the toothpick tail moment, use a mechanical timer and shut-off valve, keep the appendages (wheels, etc.) down to a minimum and concentrate on the glide.

Barry Wheeler, top man in '52 Power Tables and holder of the World Championship.

The Top Two

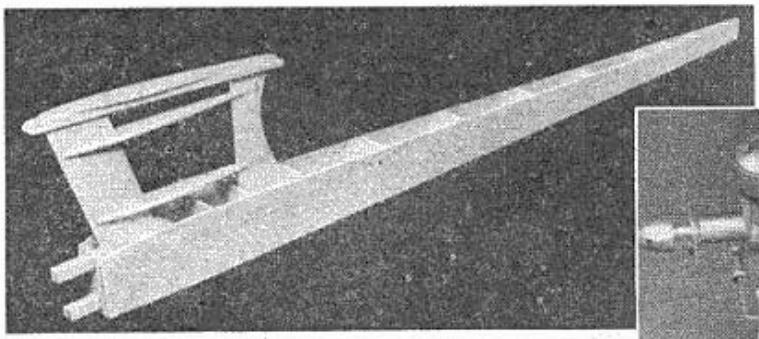
Barry Wheeler's " Eliminator " is the Birmingham club's development of the very successful " San de Hogan " American design. In planform it closely follows Bill Winter's " All-American ", and it incorporates a Denny Davis drag tab for glide trim. Add to these features, a sheeted box section fuselage, tip-up tail d/t, skid undercarriage, offset underfin, side-mounted 1·49 motor on side and downthrust pre-set bearers, flat bottomed sections, 52% tail, and you have a potent model.

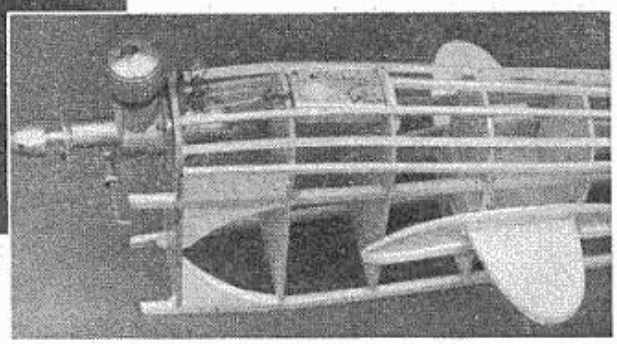
The APS plan will be found perfectly self-explanatory, needing no further comment. We have added detail for detaching the wing halves as an aid for transport, this is used in our own test model, (built from Chuck Doughty's kit), and the whole model can now be carried in a box measuring only $8 \times 8 \times 33$ ins.

As with the " Komet ", the " Eliminator " can use a little wash-out on each wing tip panel. Barry Wheeler recommends that the C.G. should be between 85% and 95% of the root chord, and that glide tests should be made with tail packing to trim for a long and fast glide. Then set the clockwork timer for 6 seconds, add an extra 1/32nd trailing edge packing under the tail, and launch with the engine at low revs. Best trim is for a 100 ft. right hand spiral climb, followed by 100 ft. left hand circles in the glide, the offset underfin taking care of this and also helping to stabilise the spiral climb. To increase forward speed, that extra piece of 1/32nd tail packing can now be removed. To tighten the glide turn, add plasticine ballast weight to the drag tab, and for best climbing performance, fit an $8d \times 6p$ wooden prop.

The Kit

The speed with which Chuck Doughty produced his 19/6 kit for the " Eliminator " after its success at the 1952 World Championship and win of the Frog Senior cup, deserves comment as the fastest piece of kitting yet.

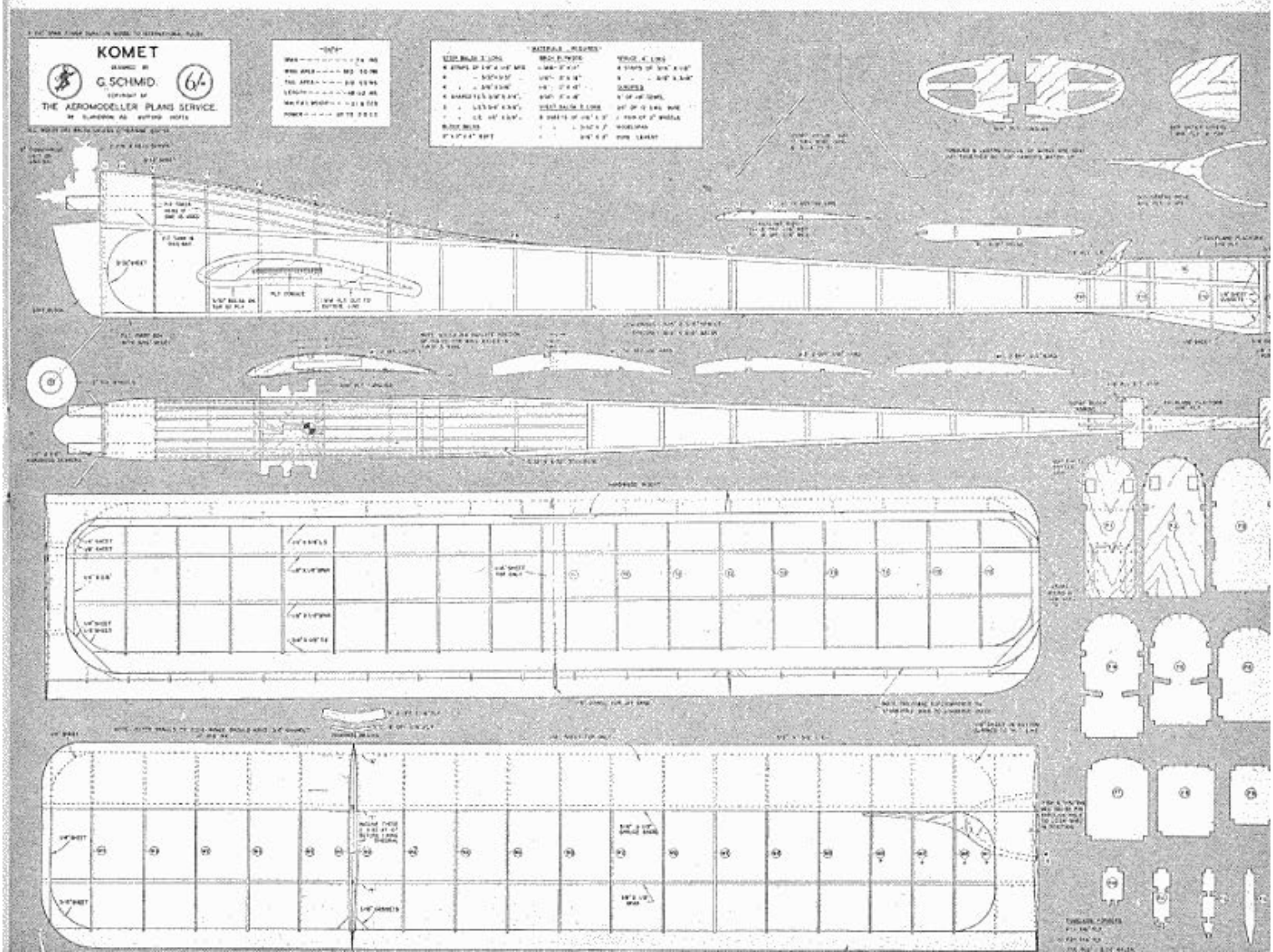


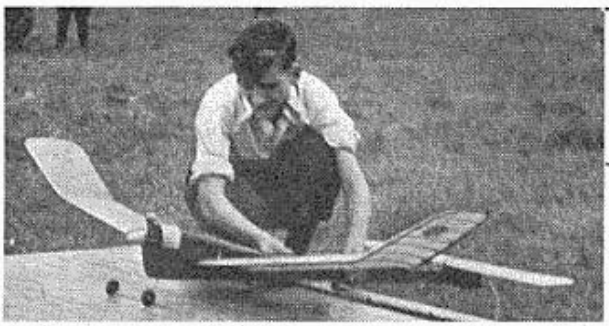


Eliminator and Komet fuselages show two entirely different constructional methods. Timer installation, with shut-off tank and radial motor mount is seen on the Komet.

However, if the kit builder wishes to build a *true* replica of the Wheeler prototype, he had better proceed with caution. There are many cut-out parts in this complete kit, and for the ribs, there are metal templates. Each should be checked *carefully* against the plan, as required for construction. We had to alter the bearer slots in the ply formers, file down the rib contours, trim the pylon parts, and space the 4th and 5th formers wider apart to take the E.D. Timer. But lest we give the wrong impression, let us hasten to state that each of these parts erred on the favourable side, and after all, it is a kit for the contest man, who will undoubtedly have his own ideas as to detail construction. In the instructions, a number of typographical errors bring forth a smile or two, but these too, may be attributed to hasty production. Verdict: A full kit for a very good model, and at the right price.

Full size copies of this Komet plan can be obtained from the Aeromodeller Plans Service, price 6/- post free.





Gerhard Schmid about to launch his Komet R.O.G. in a Swiss contest. Outer panels of polyhedralled wing have 3/8 ins. washout, original model had straight dihedral only. Gerhard's model does not have leading edge covering ; but this is advised on lighter version in A.P.S. plan.

Komet

Spelt with a " K ", thus avoiding confusion with the slightly larger De Havilland product, Gerhard Schmid's second place model is a totally different approach. Virtually a glider, with engine mounted at safe high thrust line, the Komet represents Swiss design and construction, with mixed balsa, ply and spruce parts. This version, with balsa taking the place of ply formers, can be built right on to the minimum wing loading weight. We venture to suggest that its slow climb, but magnificent glide will put it right up with the best in British power events. Now for the development of the design, we turn to Gerhard Schmid :—

" For a year I had been a member of the Model Aeroplane Group of the Apprentices at Brown Boverie and after having built a beginners model and Bruno Bachli's A/2 ' Sperber ', I gained an interest for power-driven models. Clubmate Kurt Speck had already built two models similar to the model by Fritz Strub's F.19 (A/Annual 1949, APS drawing PET 353), and in the spring of 1950 we had the idea of developing a new model. To avoid loop climb, we put the wings low down and raised the thrustline. Motor was the Micron 10 c.c. Wingspan was to be 90½ ins. and the total area was to be 1,240 sq. ins., while the outline was similar to the Komet. In Autumn 1950 the model was completed, but it proved to be very disappointing. The glide was very good but the climb extremely unstable—I thought the fault lay with the very powerful motor. At the same time I won a new motor in the Club contest, similar to the Swiss Castor 2·5 c.c. diesel. I immediately made it my business to build a new model, with the same shape, but somewhat smaller. I reduced the dihedral to 9° while I increased the side view by 1/10th.

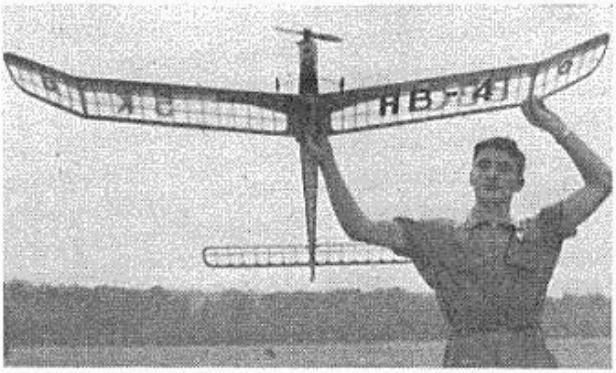
I christened this model Komet. In the spring of 1951 it was finished and test flights made. The results were astonishingly good. The thrustline was altered to 5° downthrust and now the model soared in a beautiful left spiral. The gliding was similar to the ' Sperber ' A/2 glider.

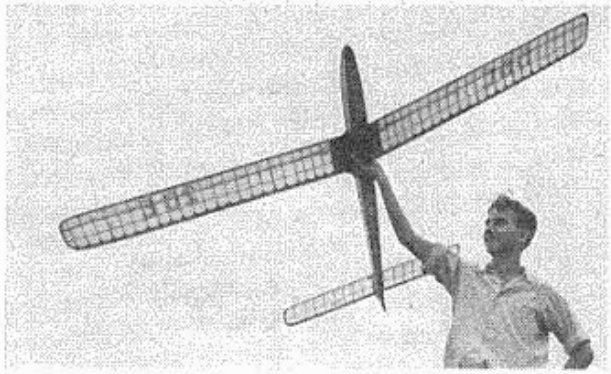
May 1951 I participated for the first time in a contest with the Komet, on the occasion of the Swiss Power model event at Frauenfeld. I got 4th place and in June 1951 with my clubmate Heinz Lauchli who had also built the same model, went to the World Championship in Paris and took first place. During a light wind we found that the climb was slightly unstable and inclined somewhat to right spiralling. To rectify this fault Mr. Degen, model expert of the Swiss Aero Club, advised me to raise the outer part of each separate wing 20° and to have polyhedral instead of dihedral. I took his advice and the result was excellent, and stability left nothing further to be desired. The successive results are doubtless known to you.

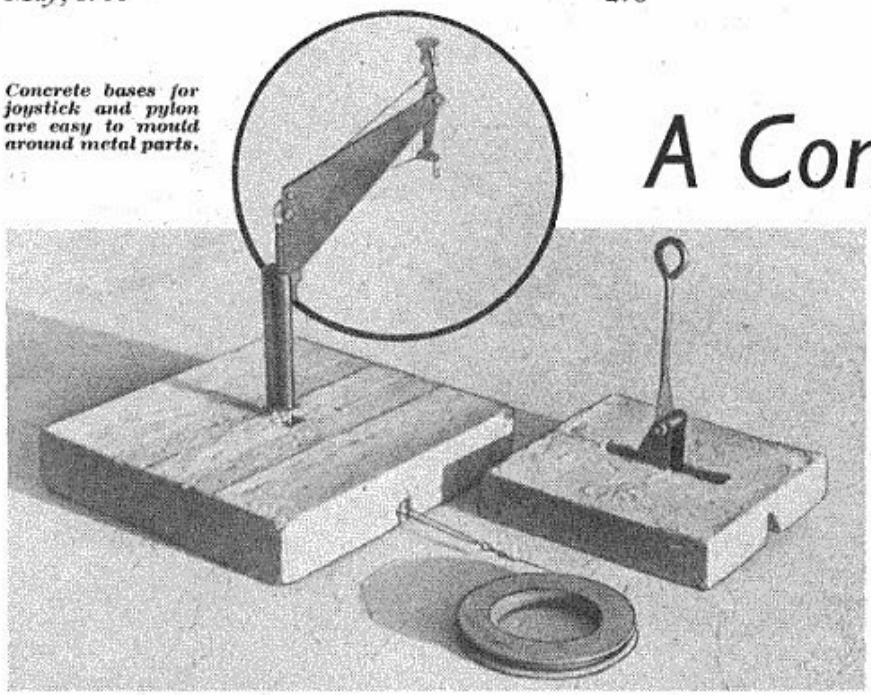
Last December, at Dubendorf, in Switzerland, Heinz Lauchli placed second in the 1952 World Championship with an average of 4 : 08. I need hardly add that the Komet owed much to its gliding angle and slow sinking speed to place so high in two successive World Championship events."

There we have the two best models in the International class of 1952. Check models of each have been made by the AEROMODELLER staff, and we hope to issue a comparative report of their performance in a future issue. Timers will be set at identical settings, the models launched together and timed over a lengthy series of flights.

At left : Heinz Lauchli, in the Swiss power team for the past two years, and who placed second in 1952. He uses leading edge covering and tail rib gussets. We reproduce the view of Gerhard Schmid's glider at right, to show how the Komet is designed primarily for its super glide. Note the strong resemblance to his Komet design, polyhedral being one of the few differences.







Concrete bases for joystick and pylon are easy to mould around metal parts.

A Control line PYLON

FOR OUTSIDE THE CIRCLE FLYING

By Group Captain
A. G. Dudgeon, D.F.C.

WHEN I flew my first control line model, I got giddier and giddier as I spun round until I fell flat on my back. This did the model no good, and made the local aeromodellers laugh immoderately. I accordingly decided that the only way for me to enjoy flying a control line model was to sit outside the circle, and I therefore devised and built this control pylon, operated by a small joystick, flying my models in the same way as one flies a real aircraft.

There are several advantages in using a pylon. You can start, set and release the model yourself, whilst still being within easy grasp of the stick. As the circuit is rigidly fixed, you can fly the aircraft indoors, missing obstructions by inches and taking full advantage of the available space. I have even flown a model in a drawing-room, on 7 foot lines, though I had to answer later to my wife for the oil spots on the carpet. Mainly however, " indoors " refers to flying it inside a hangar on 60 foot lines. It is fascinating to do aerobatics with the aircraft a few feet in front of your face.

There are disadvantages, of course. The pylon in its present form will not " take up the slack " in windy weather, but I do not see why this should not be overcome with spring loaded line-reels.

The pylon and stick are very simple to build. Mine, designed as I went along, took me under two days. There is a joystick, mounted on a small concrete block, which pulls a single line running to the central pylon. This single line runs up the centre of a rotating arm, via a swivel and two pulleys, and pulls one side of a control arm. The control arm (and the line) is pulled back by a spring. The aircraft control lines are attached to the control arm (which takes the place of the operator's hand) and the model is flown in the normal way. Having only a single line running to the pylon gets round all the difficulties of twisting lines and of having to put in concentric double swivels. The rubber band keeps the line taut, and ensures that control is always positive. The sketch shows the principle, and most of the main detail of construction.

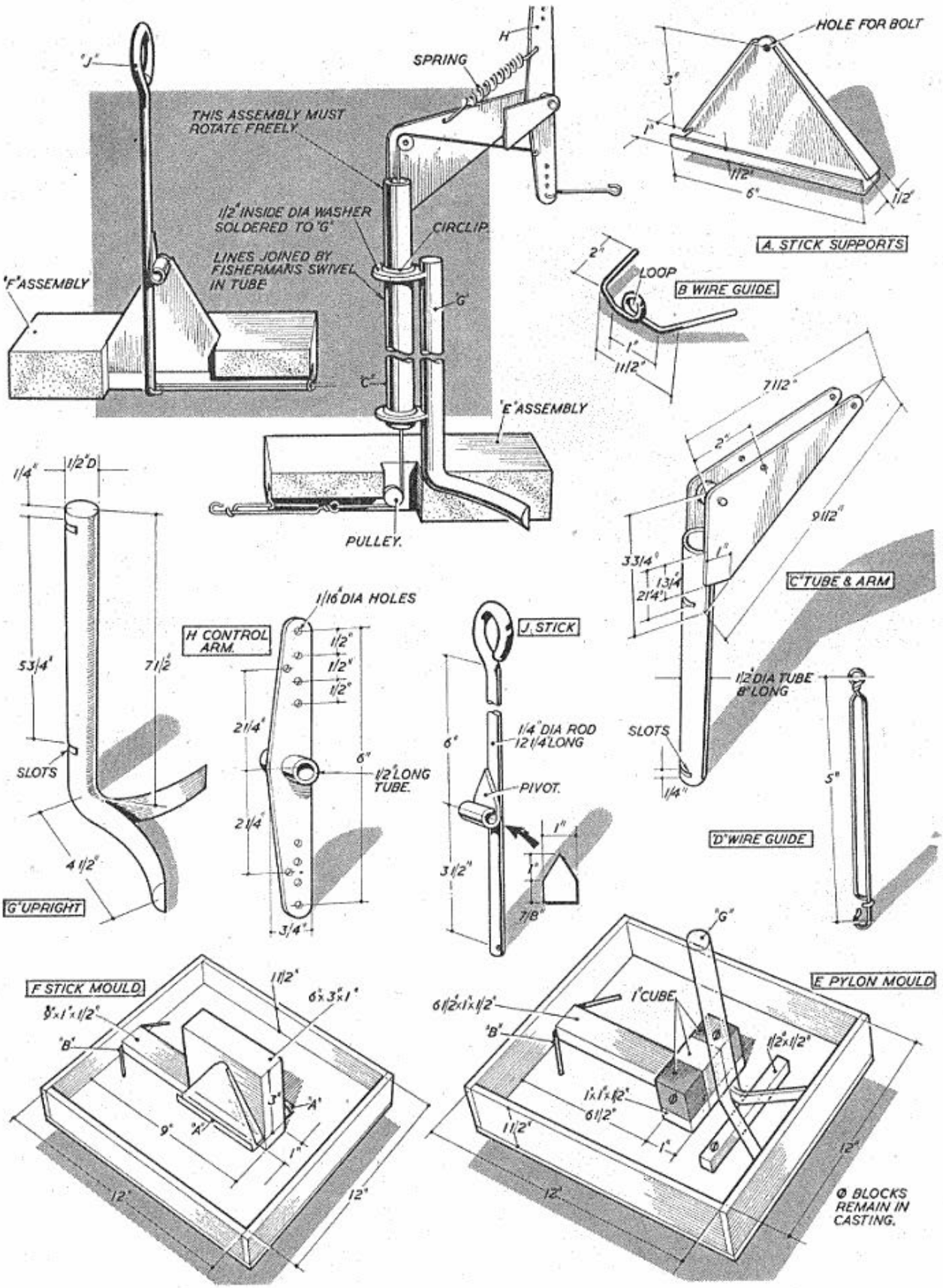
All metal parts of my own model were made from brass scrap material that I had available under my work-bench ; it was easy to work and to solder. As brass is expensive, modellers may prefer to accept the greater labour of using mild steel or some other metal. Also, as will be seen, the dimensions are by no means critical.

Construction

First I made the pylon upright and the stick supports. The upright " G " is made from ½ in. rod, 12 ins. long, bent and cut as shown. Cut two pieces of sheet metal, about 18 gauge brass or 16 gauge aluminium, as " A " stick supports. Bend as shown by the dotted lines so as to make two rigid pyramids which will set firmly in the concrete. Next make two wire-guides " B " to the shape and dimensions shown and one stick-line guide, " D " like an elongated safety-pin. You are now ready to make the moulds and cores for the concrete bases.

Each mould is a flat, square tray, 1½ ins. deep and 12 ins. square, internal measurements. In one is cast the base for the pylon, and in the other the base for the stick. The cores are made of wood, lightly tacked in place and removed after the concrete has set, with the exception of the two shaded blocks in the pylon base which are used for a pulley mounting. When the cores for the pylon base are in place, put the upright in place. Stand it on some scraps of wood, ½ in. thick. Pack it up as necessary, so that the upright is vertical within a degree or so.

For the stick base, " F ", two cores are required. One a strip 1 in. by ½ in. and 9 ins. long. This, too, goes from the centre of one side across the centre of the mould. The wire stick-line guide must be


"J"
SPRING
H
THIS ASSEMBLY MUST ROTATE FREELY.
1/2" INSIDE DIA WASHER SOLDERED TO "G"
CIRCLIP
LINES JOINED BY FISHERMANS SWIVEL IN TUBE
"F" ASSEMBLY
G
C
"E" ASSEMBLY
PULLEY.
HOLE FOR BOLT
3"
1"
1 1/2"
6"
1/2"
A. STICK SUPPORTS
2"
LOOP
B WIRE GUIDE.
1"
1 1/2"
7 1/2"
2"
9 1/2"
1"
3 3/4"
1 3/4"
2 1/4"
C" TUBE & ARM
1/2" DIA TUBE 8" LONG
SLOTS
1/4"
1/4"
1/2"D
5 3/4"
7 1/2"
SLOTS
4 1/2"
G" UPRIGHT
1/16" DIA HOLES
H CONTROL ARM.
1/2"
1/2"
1/2"
2 1/4"
6"
1/2" LONG TUBE.
2 1/4"
3/4"
J. STICK
6"
1/4" DIA ROD 12 1/4" LONG
PIVOT.
1"
1"
3 1/2"
7/8"
5"
"D" WIRE GUIDE
F STICK MOULD
1 1/2"
6" x 3" x 1"
8" x 1" x 1/2"
"B"
3"
"A"
9"
"A"
1"
12"
12"
"G"
E PYLON MOULD
6 1/2" x 1" x 1 1/2"
1" CUBE
"B"
1 1/2" x 1 1/2"
1" x 1" x 1/2"
6 1/2"
1"
1 1/2"
12"
12"
Ø BLOCKS REMAIN IN CASTING.

inserted before tacking into place. On top of the strip, mount a core, 1 in. thick and 3 ins. high, 6 ins. long at the base. On either side of the core, mount the two stick supports as shown.

The moulds are now ready for concreting. The concrete should be made of one part cement to four parts sharp sand or gravel. Mix well, and then add water till it is the consistency of porridge. Fill the moulds up level with the sides ; running a strip of wood along the top will remove the surplus concrete. Then stand aside to set; this will take about 24 hours.

The tube which rotates in the bearings on the pylon upright should be not less than $\frac{1}{2}$ in. diameter. It is 8 ins. long and has two hacksaw cuts, $5\frac{1}{2}$ ins. apart, the cuts should go about a quarter of the way through the tube. To the tube are soldered two sheet metal webs which are trimmed from triangles $9\frac{1}{2} \times 7\frac{1}{2} \times 3\frac{3}{4}$ ins. Three holes are to be drilled in each, one to take the bearing for a pulley, one for the bearing for the control arm and one for an anchorage for the spring. I have not shown sizes, as it depends what bearing you intend to use, or what sort of pulleys you can get easily.

When you have settled on the diameter of the tube, get two washers with the hole the same diameter as the outside of the tube. These will be the bearings for the tube, so make sure that they are a nice running fit.

Cut the control arm " H " from sheet metal. Drill the holes as shown ; those on one side will be for the control lines, and on the other for the stick line and the spring. By selecting different pairs of holes, any degree of movement can be obtained. For a sensitive model, use the holes nearest the pivot ; for a sluggish model, use the ones at the end of the arm, so as to obtain maximum movement. To avoid wobble in the control arm, solder a bearing in the centre, consisting of a $\frac{1}{2}$ in. length of tube of appropriate diameter.

The " J " stick is made from a $12\frac{3}{4}$ ins. length of $\frac{1}{4}$ in. rod. Bend one end round into a circle to make a comfortable handle (it makes for better flying) and drill a small hole at the other as an anchorage for the stick line. Make the stick bearing from a small piece of sheet metal, and roll it round a rod to make the bearing itself. Solder the bearing into place on the stick, $3\frac{1}{2}$ ins. from the hole which will take the stick line.

Lastly, make several small " S " hooks and get a fisherman's swivel that will drop easily inside the tube, and you are ready for assembly.

Assembly

When the concrete is absolutely dry, break away the mould boxes, and tap out the cores from the top. Remember that concrete is fairly brittle, so treat it with respect. Clean up the edges round the wire guides.

Push the penny washers into the hacksaw cuts in the pylon upright. They should be one above the other, and the centres of the holes should be over the centre of the hole in the concrete block. Solder them into place. Turn the block over, and mount a pulley between the two remaining wooden blocks, so that the stick line will pass from the wire guide, over the pulley and up through the centre of the tube. Return the block to the upright position and put the tube in place. See that it spins easily. Two short lengths of wire, wrapped round the tube and located by the hacksaw cuts will stop it sliding up and down. I made two little circlips, from piano wire, but such trouble is not essential. Mount the upper pulley, the anchorage for the spring and the control arm. Thread one wire of the stick-line guide through the loop in the wire-guide in the base and clip up ; the stick-line guide is essential because it prevents any twist from the pylon being passed down the stick line, and jamming the works.

Then by measurement, connect the stick line guide to the control arm, via the fisherman's swivel and pulleys, with thin string. The lengths must be such that when the centre of the stick line guide is in the loop of the wire guide and the control arm is central; the fisherman's swivel must be half way between the circlips on the tube. Connect up the other end of the control arm, via spring or rubber band, to the anchorage.

Test for smooth and positive operation. When you pull the stick-line guide it should move the control arm freely. The same amount of pull should move the control arm the same amount in any position, and spinning the tube arm round should have no effect on the control arm.

Next, mount the joystick between its supports. Run a short length of thin string from the base of the stick through the wire guide to an " S " hook. Make the string just long enough to allow full travel of the stick when the " S " hook is up to the wire guide.

For the stick line itself, steel control line cable is best. It has an " S " hook at one end, to fasten on to the stick line guide on the pylon, and loops every 10 ft., up to 90 ft. in all, to cater for any length of control lines, I just hook the required loop on to the stick assembly " S " hook.

" Wow,— that's hot fuel! "

A Scale Radio Control Biplane for Motors from 3·5 to 10 c.c.

A 2 inch to 1 foot Scale Power Model

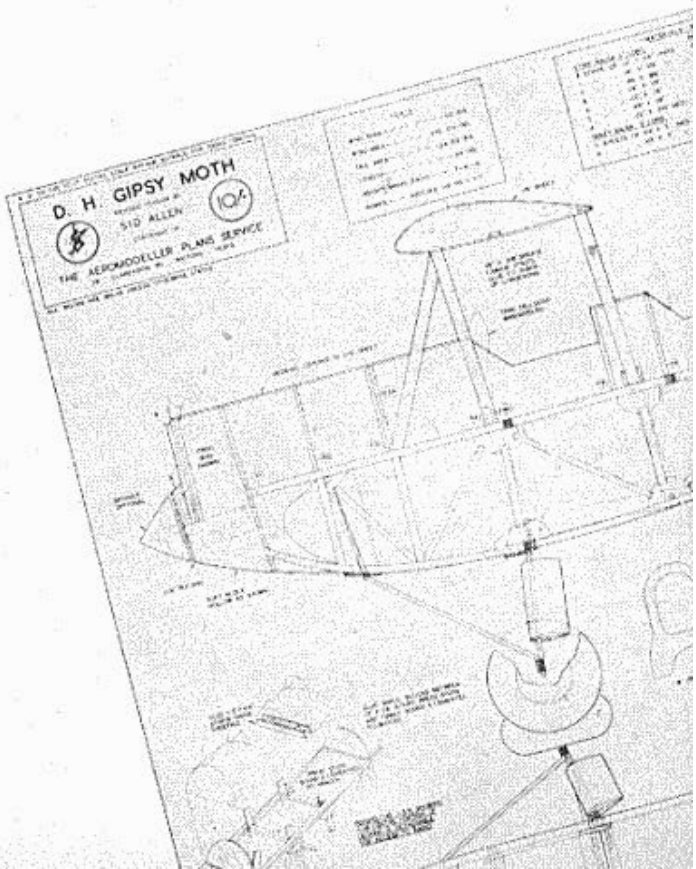
GIPSY MOTH

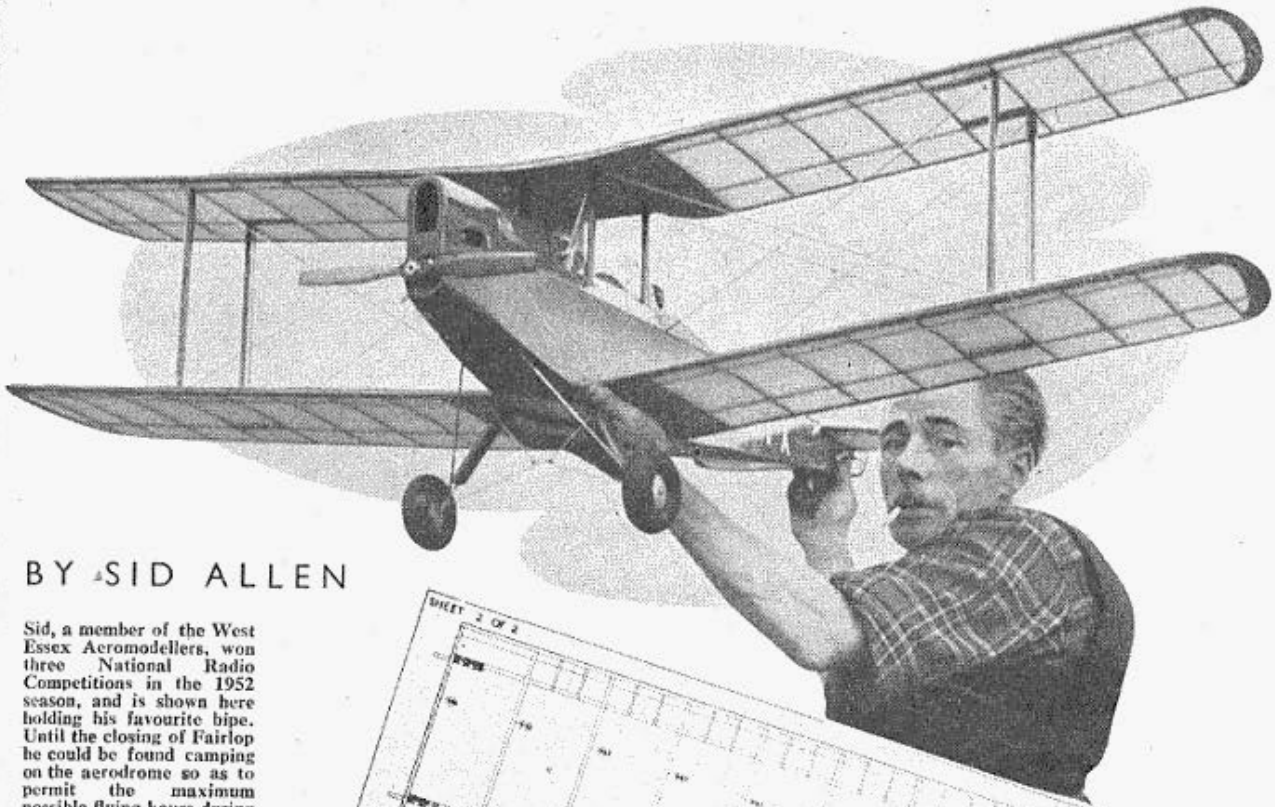
TOP R/C man of 1952, Sid Allen of Battersea, will also be remembered for his large-size (scaled-up) " Sporty " entered in the 1950 Bowden Trophy. The pleasure derived from this model and its predecessor, also a " Sporty ", but of normal size, prompted Sid to look around for a scale biplane and one which, furthermore, could be used with radio control. He eventually settled on the A.P.S. " Gipsy Moth," which, although only 60 in. wingspan, has a total wing area of just over 1,000 sq. ins., making it the largest scale model in the Plans Service. The original plan as issued (1943) required some slight structural modifications, both to improve strength and to correct one or two small deviations from true scale ; the resulting model flew successfully from the very first and, as will be appreciated from the photographs, draws many an admiring remark for its realism, both static and in flight.

The Atwood " Triumph " (8 c.c.) used by Sid gives more than sufficient power for excellent performance, and we have, in fact, seen a sport version of this " Gipsy " flying quite well with an E.D. Comp, so that any motor from 3·5 c.c. up should prove entirely suitable. Since making its début in August, 1952, the original has made dozens of impressive flights without damage, although it must be stressed that it is primarily a fair-weather machine and is not really suitable for rough conditions or contest work. For flying in moderate breezes, an ingenious device is included for changing the incidence of the lower wing ; this is a gadget which really works.

The re-issued plan contains all the modifications found necessary by Sid Allen, and is guaranteed to possess the high fidelity to scale for which the A.P.S. is well-known. Construction is straightforward and trimming no problem, so if you have been waiting for a large scale R/C model or just a sizeable sport-flying biplane, this should be your choice.

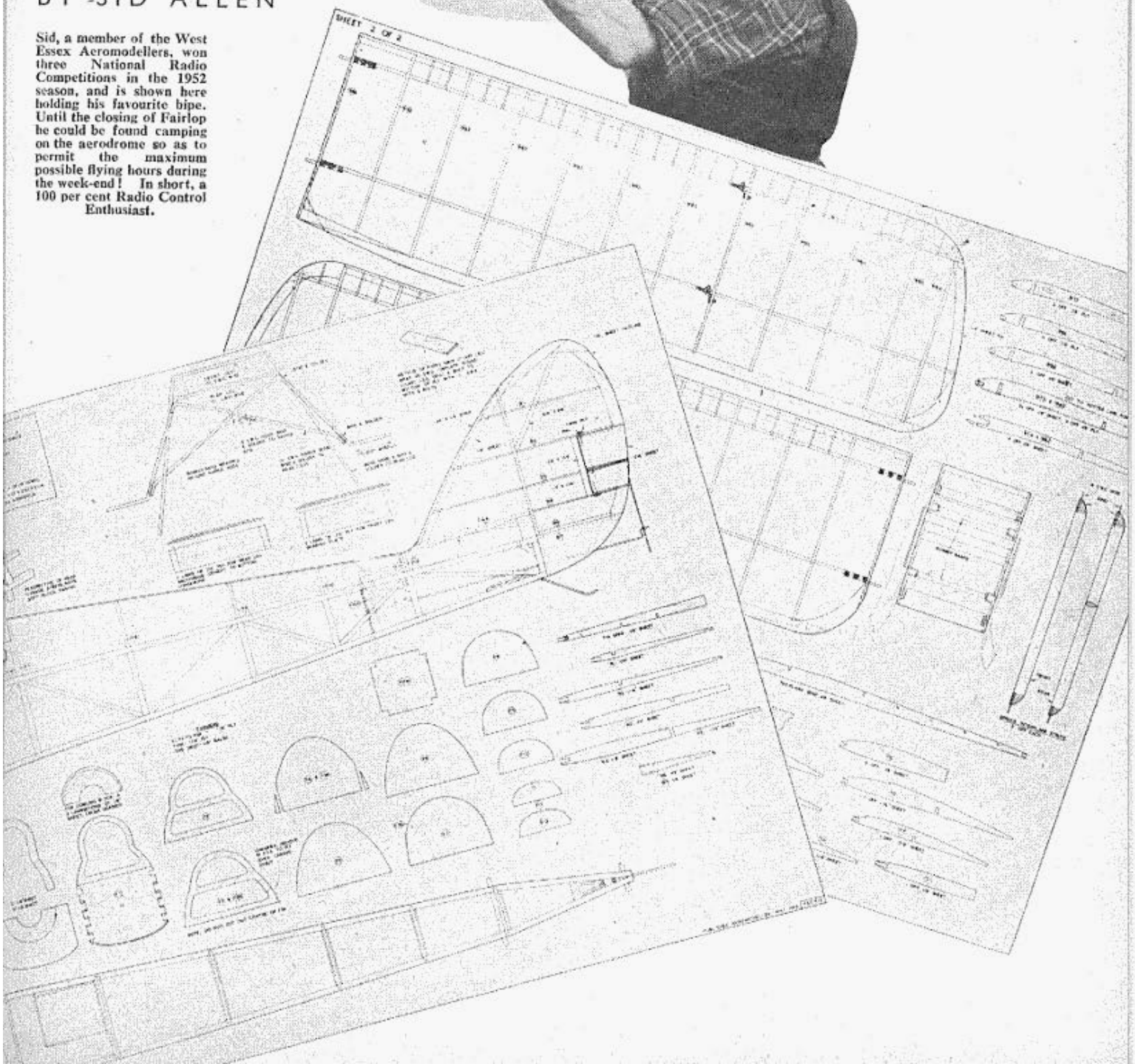
Full size 2-Sheet plans together with building instructions are available from A.P.S. Price 10/–.





BY SID ALLEN

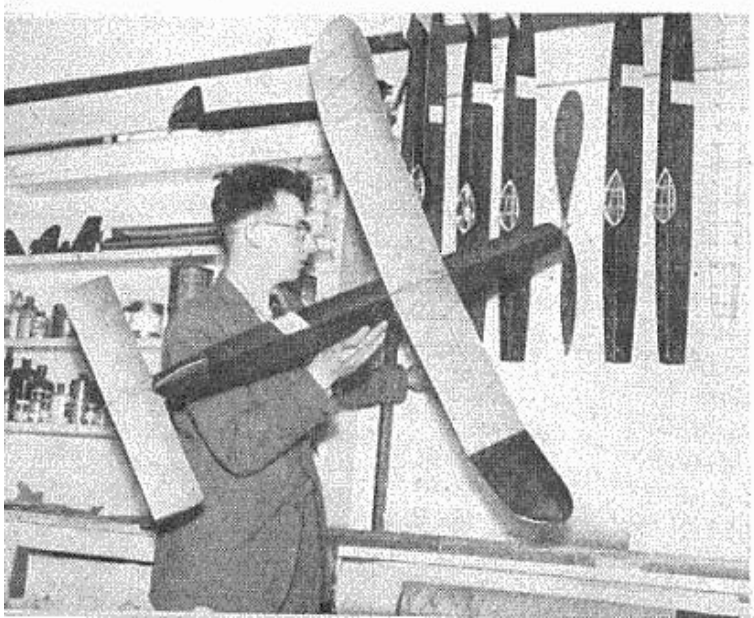
Sid, a member of the West Essex Aeromodellers, won three National Radio Competitions in the 1952 season, and is shown here holding his favourite bipe. Until the closing of Fairlop he could be found camping on the aerodrome so as to permit the maximum possible flying hours during the week-end! In short, a 100 per cent Radio Control Enthusiast.



We visit the . . . Home

THE very first room that you come to as you enter the O'Donnell household at Pendleton—in Manchester's suburbia—is a huge room entirely devoted to aeromodelling. The walls are literally papered with models of all sizes, shapes and types. To the left, a pair of full size kitchen dresser/cabinets represent the dope store ; ahead there are work benches, a Wakefield fuselage jig and a pile of fascinating accessories, while to the right, there's just more and more aeromodelling.

What could one expect with three boys absorbed in the hobby to the point of obsession ? Hughie, the 14 years old 1952 Junior Champion, at present attending De La Salle College; Mike, his elder brother also at the same College—the chief retriever of the family flying party ; and 20 year old Johnny, currently studying for his B.Sc. Maths and Physics at Manchester University and British Senior Champion for 1952. All are members of the Whitefield M.A.C., second in the Plugge last season and intending to be one better in 1953.



In a smaller room (wonderful how aeromodelling takes first place in this family !) we meet Mr. and Mrs. O'Donnell, and soon begin to appreciate their encouragement of the boys . . . Mrs. O'D. can even remember when aeromodelling was just a hobby ! Now it's a full time occupation. She has to cope with wet feet and meals at all hours and takes everything with a smile. The O'Donnells are early risers when necessary and a dawn trimming session is all part of the regular routine. Keenness is the keynote. We went out the following day in sub-zero temperature to watch John fly his latest " Maxie " in conditions sufficient to keep the most ardent aeromods indoors. There was Johnny winding nearly full turns every time, setting the job off with a five minute d/t and rushing off to retrieve while the model disappeared in the overcast at 2 : 15, the huge 24 inch prop. still wafting round on power. Johnny returns, another wind-up, and away again with a piece of 1/64 here or there to make that slight difference. Next time it's the $\frac{1}{8}$ rubber weight 1954 new Rule Wakefield that takes its turn. Now this *is* something. Shallower and slower climb, less height, shorter flight ; but definitely close to that 3 minute maximum in spite of the snowbound fields and icy gloom. And so it goes on through the day !

After a couple of hours our toes are ready to crack off and we confess to a strong natural inclination towards the bus back to civilisation and warmth. " I'm on my way Johnny," we admit. " O.K., someone'll turn up to hold for me later on," comes the highly optimistic reply ! " What are you trying to do anyway Johnny, you're nearing the maximum every flight." " Trimming out that stall," quips John. Funny : but we just couldn't see any stall ! !

Back at the household we settle by the table to ask John and Hughie a few questions, while Mike practises his other hobby—sleight of hand (watch out contest organisers : he can do wonders with a pack of cards !)

We start with John.

Us.—" *You were British Champion last year—did you go all out for the title ?* "

J.O'D.—"I like to have a go at everything, can't resist entering a contest, so once I found myself well in the running for the Championship after the Weston Cup, I decided to press on for the Championship points."

Us.—" *How about you, Hughie ?* "

H.O'D.—" Just the same situation. In the running at the beginning of the season, so I had a real try for the other comps.'

Heading shows the O'Donnell hardware collection of 1952. John and Hughie are holding their respective Senior and Junior Championship trophies. Large centre bowl is I.C.I. Challenge Cup.

Which shall I pick ? John, holding his '53 Wakefield, checks his line-up of completed spare fuselages ; one in hand can have side-by-side geared skeins or straight motor. 24 in. prop.

# of Champions...

Us.—" *You don't appear to enter power contests, John ?* "

J.O'D.—" I try to leave power alone. No modeller usually has sufficient time to be good at all three classes, so I drop Power and concentrate on Rubber and Glider."

Us.—" *What have you got ready for '53, and will you have a try at retaining the title, John ?* "

J.O'D.—" Well, I hope I won't be called up for National Service during the season. I'll have a try at all the comps. At the moment, model stock is three A/2 Gliders, four Wakefields, plus one on the way, two Open Gliders and miscellaneous jobs, not forgetting the Jetex contest models. In brief I am building new Wakes, but am going to fly last year's Gliders.

Us.—" *What's your stock, Hughie ?* "

H.O'D.—" I've one Wakefield, plus another on the way, a 12 foot Glider, two A/2s, Chuck Gliders and, of course, the Jetex jobs."

Us.—" *I've seen your flying field, and it must limit your trimming considerably—it's only* 400 *yards across.*"

J.O'D.—" Yes, we have to use a d/t every time: but if we fly early morning (5 a.m.) and late evening we get calmest air."

Us.—" *You'll approve, then, of the new* 164 *feet Towline ruling ?* "

J.O'D.—" Yes, it's O.K. providing the flight limit is reduced accordingly. With a 5 minute maximum, as in the A/2 Eliminator and Trials, there'll be too much luck attached, the new S.M.A.E. 3 minute rule should be satisfactory pending glider development."

Us.—" *What about the new Wakefield rules for* 54 *?* "

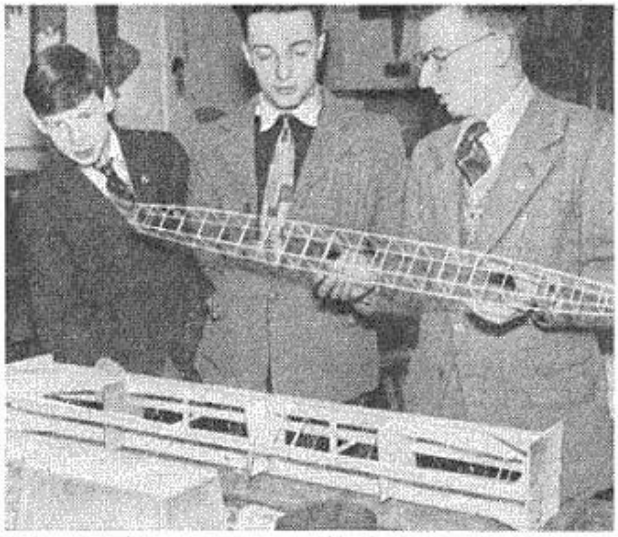
J.O'D.—" It's nothing new to our Area. We've had two Area rallies featuring 33⅓ per cent. rubber rules and a 3 minute max. Wakefields to those rules should average 3 minutes or better in good weather and really, the '54 maximum should be set at 3½ to 4 mins. allowing for the slight extra amount of rubber. Snag is that *really* good rubber will be essential."

Us.—" *What design changes can you forecast for the '54 Wakefield ?* "

J.O'D.—" Firstly, stronger structures will come; gears will fade out. Fuselages will probably settle around 45 ins. with tight motors, and the folding prop will become more common. Prop design will have to be developed; but all we know at the moment is that 24 ins. is better than 18 ins., at least it is on my models."

Us.—" *And for Gliders ?* "

J.O'D." There'll be more emphasis on glide than towline stability, though every foot of tow height will count. I'd build one like Hughie's 7 footer with high aspect ratio as a try out, that is if I lose any of my other three first.



Trio of Hughie, Mike and John examine another Wakefield fuselage. Hughie's next one is already in the family jig.

Us.—" *And Airfoils ?* "

J.O'D.—" We'll stick to the Whitefield wiggle, at least, for the present."

Us.—" *You seem pretty keen on the reduced maximums in the new S.M.A.E. programme.*"

J.O'D.—" I am, but where unrestricted rubber is allowed, for example the Gamage Trophy, we are likely to have a whole lot of triple max's and a heap of models lost in fly-offs.* That's a waste of time. Everything will depend on the timer's eyesight on that last flight and the principle of the maximum, i.e. to reduce luck, is lost. If max's are reduced, then the rules must be altered to suit."

Us.—" *How about these '54 Eliminators to be held in September this year ?* "

J.O'D.—" Frankly, I don't see the point. The '54 eliminators will be spread over 6 months and in that time a below-average modeller can become expert and a poor performance on his part in the September event could wash him out. Again, the new rules will apply, and there's too little time for us to develop the new models unless we are expected to double up and fly both '53 and '54 Wakes this season, one seriously and one for practice. We need a clear contest-free winter to thoroughly work out the new-rulers. N. Western Area Wakefielders already have 33⅓ per cent. rubber restriction experience: but others will have a heck of a lot to find out and spade work to do."

Which, we think is quite a frank, unselfish attitude to take; but we have little doubt that with or without experience, these O'Donnell lads will be pressing on with new and old rule Wakefields both at the same time, and with a keen Mum and Dad to back them up will still be up at the top of the contest lists at the end of 1953.

* John O'Donnell's times in the Gamage were, three maximums and a 4 minute 12 second fly-off. There were 15 other triple max.'s!

From British Champion, and 1952 British Wakefield team member

JOHN O'DONNELL,

Borderline

"The simple Wakefield with a contest pedigree"

DEVELOPED over two seasons, this is one of the most reliable and consistent contest models in the country. It is also a Wakefield without frills and easy both to build and fly. Mk. I featured a thinner fuselage 2½ ins. square—and very small fin area. Flying with the then standard 16 strand × 48 ins. long motor it performed well from the duration point of view but had insufficient rubber room. Next version had a fatter fuselage (3 ins. square) but suffered from instability on launch. Despite this it did 12 : 16 in the Gutteridge 1951 to place top in the N.W. Area and second in the country. Increasing and rearranging the fin areas cured the troubles on launch—first contest with the finalised design was the Swansea Nats, flying with a 4 min. fuse, the model went o.o.s. after 3 : 02 and that was that. Five weeks later it was found on a rifle range 4 miles downwind. It was dewarped, repaired and flown on 12 strands, 72 ins. long. This gave bunch trouble if not very carefully wound. However, performance was much better than with 16 strands ; as it did 12 : 10 in the Flight Cup '51, won the club "Currington Cup" contest with 8 : 58 in poor visibility (3 min. max.!) and finally placed 2nd at the N.W. Area Winter Rally '52 with two o.o.s. flights to total 5 : 59. This last comp lost the model permanently.

Various examples were built by several members of the Whitefield club during 1952 with featherers, retracting undercarriages, etc. John placed third in the Wakefield Trials using a "Borderline" for the first two flights, doing 4 : 32 and 4 : 20 o.o.s. The latter flight D.T'd at 5 : 30 and went over a wood on the skyline at 8 mins !—it was found by a farmer cutting corn ten weeks later ! A hurriedly built lightweight version was used for the last two flights in Sweden doing 3 : 50 and 2 : 42 (down-draught !)

Other club members had success with the design. A. D. "Dekka" Bennett flew one in both Wakefield Eliminators, the Trials and the Flight Cup—placing 4th in the last with 12 : 13. Bob Askew built one as his second Rubber Duration model (and the first to fly) and did his "C" Certificate Rubber flights with it ! Recently John Potts won the club "Freshmans Trophy" with 10 : 17 aggregate (3 : 05, 3 : 17, 3 : 55).

Construction

Fuselage. Build sides on board in usual manner. As longerons are ⅛ in. sq. and spacers are 3/32 in. sq., ensure spacers are flush with outsides of longerons. Join sides. Add nose sheeting, motor peg anchorages and all bracing at rear of fuselage (before cutting top longeron away). Fit pylon formers. Make left and right hand pylon laminations and stick together at L.E. and T.E. When dry, fit on formers, and adjust till incidence is correct. Fit L.E. and T.E. of pylon and add 20 s.w.g. hooks and either binding or gauze to strengthen. Then fit 1/32 and 1/64 scraps round edge of pylon (for covering). Finally, add stringer on first bay of pylon, add u/c box, underfin and add 1 mm. ply keys after tail and underfin are built.

Wings have orthodox construction. Remember to pack up front of T.E. and to pack up the tip laminations ⅛ in. Use dihedral keepers on L.E. and spar, and gauze on T.E. The gussets at the T.E. dihedral joint are to prevent the dihedral ribs acquiring more undercamber, not to strengthen the joint. **Tail** is orthodox. Ensure the tubes for fin dowel are central and stuck to L.E. and T.E., not just to ribs.

Fin and Underfin. Build outline on board, together with piece that joins L.E. and T.E. next to largest rib. Remove, then add ribs, then spars. Underfin spars run through fuselage. Add tapered bamboo pegs on top fin to match tubes in tail, add hooks and oddments. Stick underfin to fuselage before covering either part.

Propeller. Carve from block shown, to undercamber template and to be ⅛ in. thick (*not less*) at largest chord. Assembly as per sketch. Freewheel is a Garami type and is best to date. Solder the cup washer to shaft properly. Drill noseblock straight. Use an "S" hook or bobbin.

Cover Fuselage with Lightweight Modelspan, Wings, Tail, Fins with same, or Jap if you have it, and the prop with Lightweight Modelspan. Give at least two coats of fairly thin dope on everything —extra coat on wings and fuselage is advantage. Use banana oil or fuel proofer if you like them.

Motor. Best average motor is 14 strands × 56 ins. long pretensioned in usual manner.

Rigging.—C.G. 50-70 per cent. chord ; Wing Incidence 3° positive ; Tail Incidence—Build at

0°, then add 1 mm. ply piece at end of fuselage.

Trimming. Check line-up in front and top views and correct where necessary. Adjust dethermaliser to approximately 30-40° tip up. Remove all warps except :— Port wing top panel—Washout (less incidence) ; Starboard wing tip panel—dead flat or slight washin (not washout).

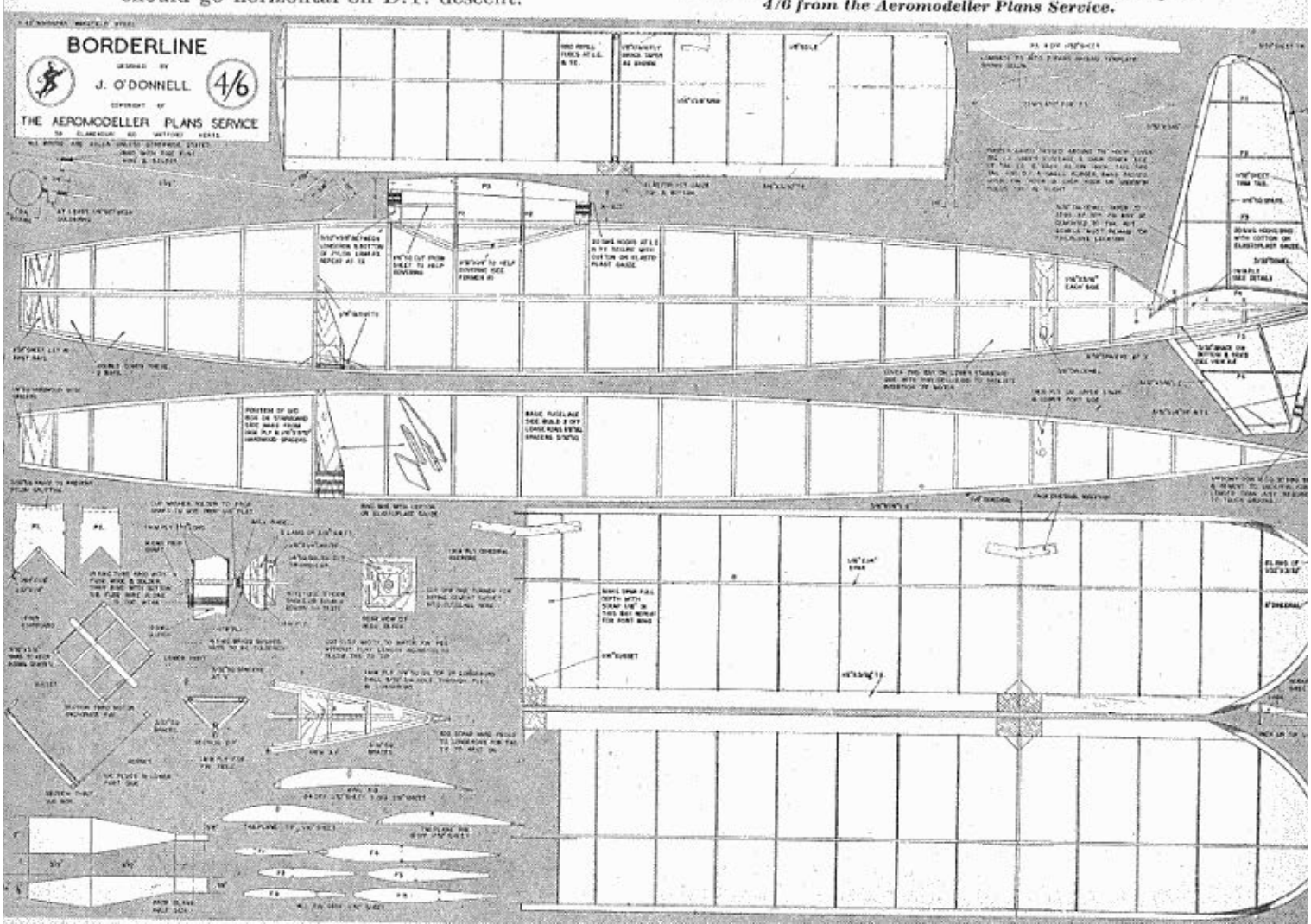
Stick 3/32 in. packing on port upper side of fuselage nose. This gives down and right side-thrust. Fin should be straight (parallel with centre line of fuselage). Use 30-45° right turn on trim tab.

Flying. Start with 150-200 turns on motor. Trim the glide by altering tail incidence, glide turn by trim tab, power by noseblock. The model should be capable of being trimmed at half turns and then retaining that trim up to full turns. It should NOT require extra downthrust on full turns ! Also, do not be tempted to add 1/32 in. positive on tail *in wind*. It is unnecessary as the model will fly in any weather.

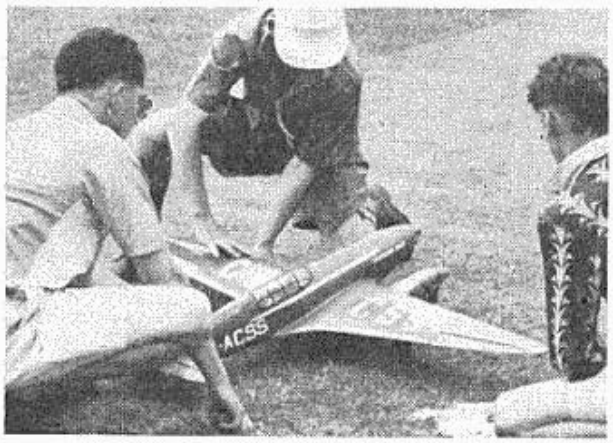
R.O.G. should give no trouble provided plenty of turns are used—don't try to R.O.G. on half turns. In general, fly without the undercarriage unless required to R.O.G. Adjust tensioning and nose block so prop knocks out before it breaks. If the model descends too fast on D.T. (i.e. damage results on landing) decrease angle of tip. The prop should go horizontal on D.T. descent.

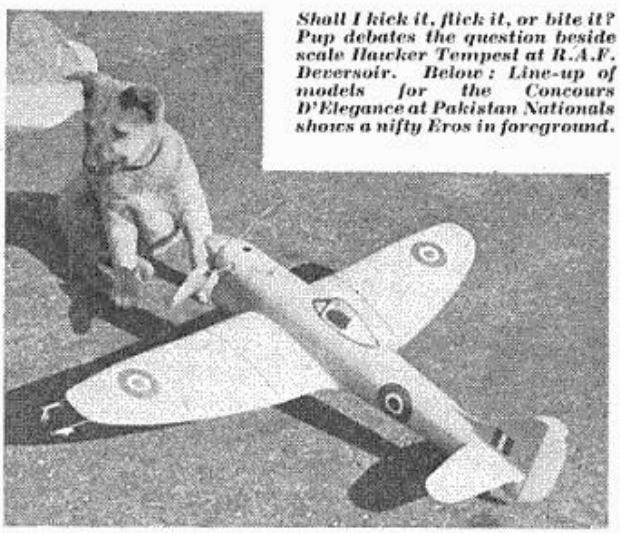
Complicated criss-cross construction and Bilgri type feathering prop, plus forward retracting support stick are mods for John's 1953 Wakefield though main lines are still the same as successful Borderline. Offset thrustline allows gears or straight motor.

Full-size copies of this 1/5th scale plan can be obtained price 4/6 from the Aeromodeller Plans Service.



Above: Newtown M.A.A. "Demons "strators, a control-line circus now famous in Queensland. Seen here at the Queensland Ambulance benefit show. Below: One of two superb control-line D.H.88 Comets entered in the New Zealand Nationals. A good subject for a scale twin.





Shall I kick it, flick it, or bite it? Pup debates the question beside scale Hawker Tempest at R.A.F. Deversoir. Below: Line-up of models for the Concours D'Elegance at Pakistan Nationals shows a nifty Eros in foreground.

WORLD NEWS

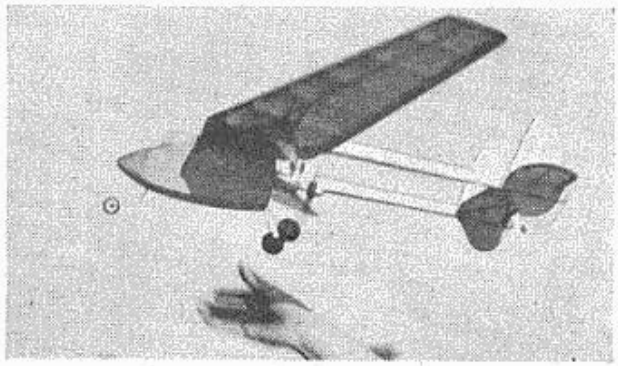
OUT in **CYRENAICA,** The Royal Scots Greys M.A.C. are pressing on despite the fact that the rain season has converted their flying pitch into a sea of red mud; sounds strange for a Middle East club to have poor conditions; but the weather is only a secondary consideration out there, the supply problem being much more acute. Imagine being thousands of miles from the nearest model shop! Thanks to the mail-order dealers and good old forces mail these boys keep the flag flying in the desert.

In **PAKISTAN,** aeromodelling takes on a high social atmosphere when the All-Pakistan annual comps. take place at Karachi. Over 500 guests went to the events in February, including high Civil Aviation Officials, and Senior Air Force Officers who granted permission for the loan of the field. Though small in numbers, and flight times are comparatively low, the aeromodelling movement in Pakistan is certainly on its way to encouraging air-mindedness for the country's future air strength.

In **AUSTRALIA,** much the same activity goes on, particularly where that man Arthur Gorrie, of South Brisbane, Queensland, is concerned. We've mentioned before that his Newtown M.A.A. control-line "Demons "strators have been hard at the "cash for charity shows" business, and this time we have a picture to show what they look like (top left). Arthur appeals to lone-hand Queenslanders to get after the "leading State" AEROMODELLER shield, to be awarded at the 7th Australian Model Aircraft Championships at the end of the year. The very idea of Victoria winning it again should spur the Queensland aeromods into action, he says! Also from Aussie, the State of Victoria in fact, we have news of the City of Heidelberg A.C., a control-line stunt and team-race club. We wonder if they could arrange an inter-city contest with other Heidelbergs in Germany, South Africa, and the one that must be somewhere in the U.S.A. A bird whispers that Champion Australian stunt men, Don McLaren and Monty Tyrell, are making every effort to come over to Europe this season. Hope they make it, they will certainly be welcome.

Remember we mentioned a new World Record for

Below: L.A.C. Coatsmore's twin boom free flight pusher at R.A.F. Deversoir in the Canal Zone, bears strong resemblance to one recently featured on Scottish page.

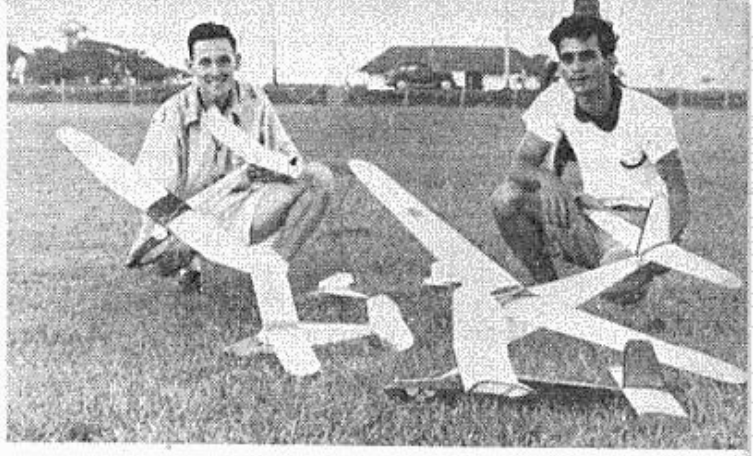


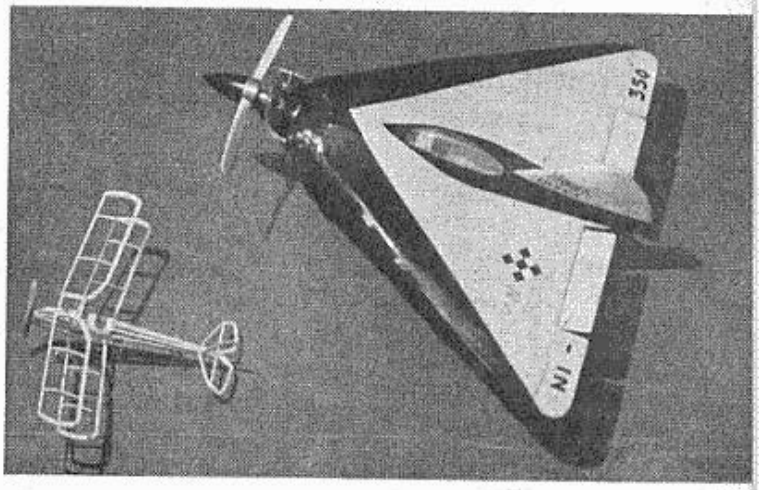
radio control duration ? The record application has now been passed by the Royal **NEW ZEALAND** Aero Club to the F.A.I. for ratification and will stand at 60 minutes 9·4 seconds, providing of course, that no other attempt beats this figure in the meantime. Model, an 80 in. slope soarer weighing 4 lbs., was by Frank Bethwaite. Radio, a three hard-valve relay-less outfit with special escapement, by Les Wright. Venner accumulators and an 80 in. single strand of $\frac{1}{4}$ in. strip rubber were enough to give control for up to 20 hours of flying if need be !

Hand launched off a 100 ft. coastal ridge, the model was soared 100 to 300 ft. higher, where it remained for most of the hour it was intended to fly, then brought down under control to a point 70 metres from the launching site. It almost sounds as though this ridge could give indefinite durations ! A stout effort, Frank and Les—photo is at the foot of this column.

Where the Suez Canal joins with the north end of the Great Bitter Lake, near the wastes of the Sinai desert is R.A.F. Station **DEVERSOIR** and a thriving model club. Like the Greys boys in Cyrenaica, the lads in the Canal Zone depend on mail order for all supplies : but they also have two unusual hazards. Firstly, we learn that high durations are too *easily* obtained in the hot climate ; secondly, the local natives have a ransom scheme organised for lost models. 2/– for a K.K. Chief, and 12/– for a Skyskooter ! Expensive business, this aeromodelling !

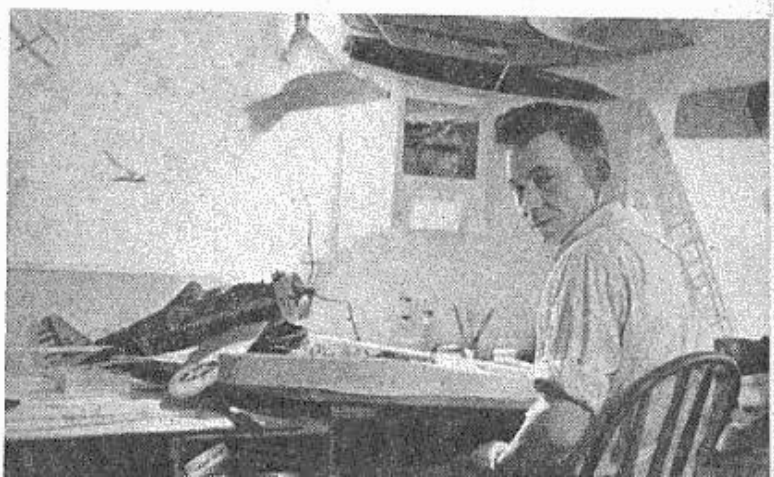
Brenton Neal, now established as a member of the Wetaskin (50 miles from his new home) club in Alberta, **CANADA,** still carries the West Middlesex banner, and will be flying the flag for them at the U.S. Nationals (5,000 mile trip). He also comes up with the bright suggestion that emigrant modellers from the old country should get together in Canada, there must be hundreds of 'em around the Dominion. Over the border in the **U.S.A.,** Doug Beagley, once of Chingford M.F.C., gives us a few alterations to the well-worn stunt schedule, that have official blessing and might well be considered here. The wingover pull-out should now be inverted, then after a half-lap, another wingover with normal pull-out follows. Loops, etc., must be below 45° line angle, and after three inside loops, one lap of inverted and three bunts should follow to complete the manœuvre. There's also talk of square horizontal eights to make things tougher ! !

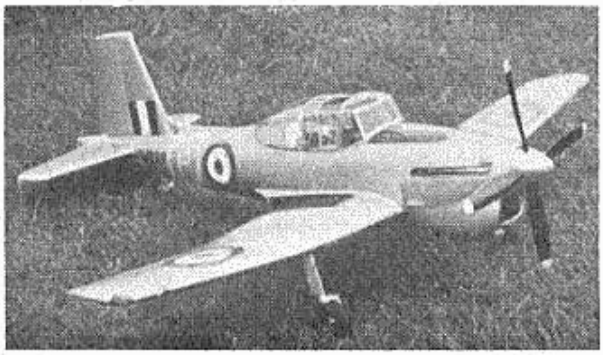




Top : In Georgetown, British Guiana where they live below sea level, rubber lasts for only one day and model fuels are hard to get, Lloyd Roberts and Robert Allison concentrate on gliders. Above : Delta for Webra 1·5 by Rolf Bortels in Germany, compared with 10 in. Tiger Moth.

Below : World duration record holding sailplane is quite a handful at 4 lbs. for young Christine Bethwaite. Model is a slope soarer. Above right : S/Ldr. Eric Cable of R.A.F.M.A.A. is active in Malta. Friend George Curmi sent this shot of Eric with 5 ft. Robot. Uses D.C. 350, hard valve set, weight 4 lbs. Bottom right : Workshop view of Canadian Bob McCall in Edmonton, sent by settler Brenton Neal. Bob is working on Neal's Koiler design (1st N. Heights Gala '52).

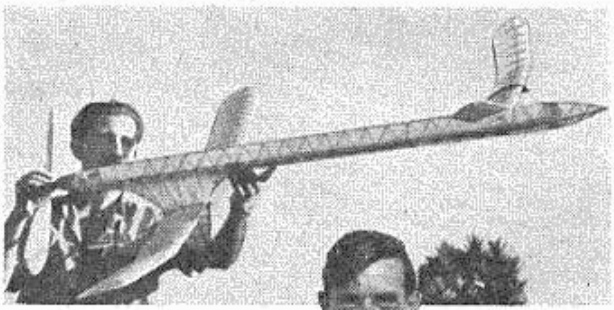




THE FIFTH

NEW ZEALAND ★ NATIONALS ★

BY FRANK BETHWAITE



Top : Pete Carter's beautiful B.P. Balliol, placed 2nd in C/L prototype class. Next : Canard Wakefield by Jim Maidens. Above : Pete Carter winner of F/F Prototype. Below: Champ of Champs. Noel Hewitson and Super Cruiser, 2nd in F/F Prototype.

HAWERA Aerodrome, a small country airfield on the windswept West coast of the North Island was this year's venue for the gathering of the faithful at New Zealand's 5th Nationals. Some 180 contestants arrived in buses, trains, aeroplanes, on motor scooters, powered push bikes, and cars of every size and vintage.

The Hawera Model Aero Club, with particular reference to Eric Terrill and his helpers, had worked wonders to provide camp-sites, accommodation and catering, after the buildings in which we were to have lived, were burned down a week prior to the meeting.

Flying competitions proper began on Sunday, 28th December, and to be understood, need a brief introduction. Hawera Aerodrome is a little more than six hundred yards long and the country on all sides is closely subdivided by high boxthorn hedges which are impassable except through infrequent gaps and gateways. The average rate of drift throughout the Nationals was 17 m.p.h. No more need be said to indicate to the experienced contestant the appalling recovery difficulties which plagued free-flight contests.

The A-2 glider contest, first to be flown, was also the trials to select the N.Z. Team for Yugoslavia. Weather at 9 a.m., starting time, was overcast and non-thermal, with a light surface wind stiffening through a turbulent area up to 100 feet, with a brisk westerly above. Flight times were in keeping with the conditions, and recovery difficulties in the downwind tiger country immediately made themselves felt. About 10.30 the sun broke through, thermals formed, and flight times in the second and third rounds improved markedly. This is the first occasion on which 100 metre lines have been used in a N.Z. Nationals in flyable conditions (last year a gale wreaked havoc).

The N.Z. team for Yugoslavia, and their times, are :—

F. D. Bethwaite	13 : 45·1	D. C. Hewit	9 : 11·2
W. T. Choy	10 : 09·2	D. R. Brain	8 : 56·8

Sunday afternoon saw the official opening with a novel twist. After delivering his opening speech, the President of the Hawera Aero Club was handed the transmitter key of Mr. Wright's airborne radio model. The ensuing aerobatics were a delight for all except Les Wright, as were the " pilot's " comments and the owner's frantic advice which came clearly over the P.A. system which somebody had thoughtfully left switched on. The model was retrieved.

Following this excitement, the lightweight rubber model and chuck glider events were flown in a drift which had decreased to about 13 m.p.h. Spectators numbered some 1,000 or more, but most gravitated towards a corner of the field where three R/C fliers were just flying for fun throughout the afternoon—their flying was of the non-stop variety, absolutely reliable and accurate to a degree, and a pleasure to watch.

All Monday was given to Control Line flying in an excellent track in the middle of town. It has become normal that the best weather of the Nationals should occur on C/L day and this year was no exception. The entries in Prototype (virtually scale) were a delight to see. Peter Carter's magnificent Boulton-Paul " Balliol " was even more perfect than his last year's " Spad " and it must have been the toss of a coin that enabled the judges to award first place to Noel Hewitson's Grumman " Goshawk ". Team race eliminations took all morning and early afternoon, and aerobatic models repeated the same manoeuvres with more or less precision. The Palmerston North and Kaiapoi teams proved that year-long practice pays off in team racing. Speed seemed in little hurry to get going, but when it did, commendable

speeds were recorded—87 m.p.h. in Class I, 109 m.p.h. in Class II and 124 m.p.h. in Class III. Jet was lamentable. Aubar Carmine did get his contrivance working while Trueman, last year's winner, is, as far as is known, still pumping.

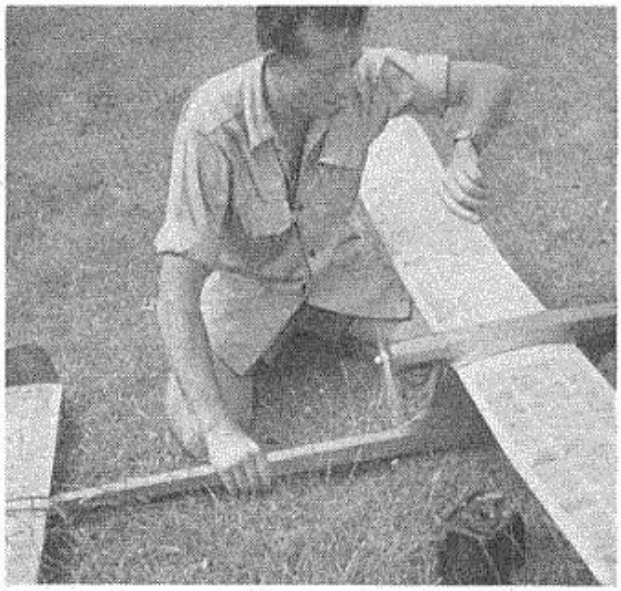
That evening Mr. L. H. Wright attempted to better Dr. Walter Good's R/C World Duration record of 40 minutes odd. During the day, two long-range wing tanks had been coupled to a standard model by an ingenious fuel system—the six ounces or so of fuel was reckoned to be a ninety minute supply for the Mills 1·3. By the time all was tested and trimmed, a little over an hour's daylight remained. The model R.O.G'd. with difficulty and for the next 40 minutes was allowed to climb gently in the clear sky, held right overhead all the time. It was up about two to three thousand feet and had exceeded the record, and was about to be spun down in easy stages when, utterly unexpectedly, it disappeared from sight. We now think that it must have flown into or over a thin cloud which had formed and was invisible against the grey sky in the twilight. Whatever the reason, although it was spun down as far as was dared, nobody was able to pick it up again in the failing light. We could hear the motor getting fainter and fainter downwind, responding to control perfectly, but . . . One hour and twenty five minutes after take-off a farmer heard, high in the night sky, a motor splutter and stop. Next morning, the inevitable small boy fished the model down from the inevitable high boxthorn hedge. A larger boy disputed possession, and by the time the fight was over both bore trophies. Days later, when we had tracked it down, imagine our feelings when we were told, " Mum's took the wing to town in a basket ".

For the Wakefield on Tuesday morning, weather was a repetition of the Nordic on Sunday. A 16 m.p.h. westerly, at first non-thermal, freshened and developed good lift in patches as the day warmed up. Drift was enormous, and recovery correspondingly difficult, and it is significant that of the first six place winners, two made two flights only. The New Zealand team for this year's Wakefield is :—

F. D. Bethwaite	8:22·6 (2 flights)
B. B. Marsh	8:17·4
R. N. Hewitson	8:02·9
F. A. Macaulay	6:51·7
J. Campbell	6:49·8 (2 flights)
J. Upton	6:12·9

By afternoon, the wind had increased to about 20 m.p.h. for the Power Duration contest. John Boyds is to be congratulated on flying so well to win the magnificent Tasman Empire Airways Trophy for the second year in succession. Apart from his outstanding flights, flying was of very average standard. It was noticeable that few models were lost during this contest due mainly to the efforts of a group who remained in the area where most of the models were flying, and were thus better able to locate them. An example of the difficulties is given by one model, watched down and heard to land just the other side of a big thorn hedge. It took twenty minutes to find the way into the field to pick it up. Remember that boundary hedges have no gaps, nor are fields necessarily laid out symmetrically.

Indoor flying that evening was restricted to tissue-covered models flying round-the-pole. Microfilm is hard to carry long distances without damage, and not all clubs have access to suitable halls for indoor free flight. Noel Hewitson was again in good form to win with a 3-flight time of 8 : 49·4. Honourable mention must also go to John Sheppard, a lone member (unattached to any



club), who put up creditable performances in this and other contests.

On Wednesday morning the Payload contest was held in a gusty 20 m.p.h. wind. Unconventional but sound was John Maiden's ETA 29 6-ft. span pusher, (*seen above*) whose spectacular unassisted take-offs earned applause. The model carried 25 ozs. payload.

In the afternoon the wind increased still further and the two final contests were run. Free Flight Prototype was making its first official appearance, wherein attractive little models which look like real aeroplanes are required to take-off, fly, and land in a realistic manner, and to land as near to a given mark as possible. In the gusty wind, often blowing at twice the flying speed of the model, the attempt to fly these delightful little models was often close to ritual murder.

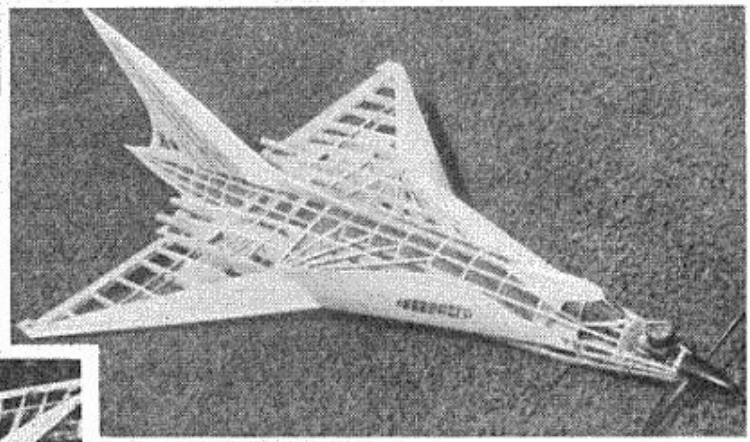
In Radio Control, only two contestants were willing to fly. Allan Rowe has spent the last year developing faster and faster models, until he has found that factors not concerned with model design such as visibility distance and " pilot " reaction time were the final arbiters of how fast it is practical to fly. The model he flew in the event cruises at about 30 m.p.h. After completing half the required manoeuvres it climbed into the stronger wind aloft and thereafter, despite attempts to lose altitude, it went slowly and steadily downwind —backwards. Les Wright's model, slower, went downwind faster.

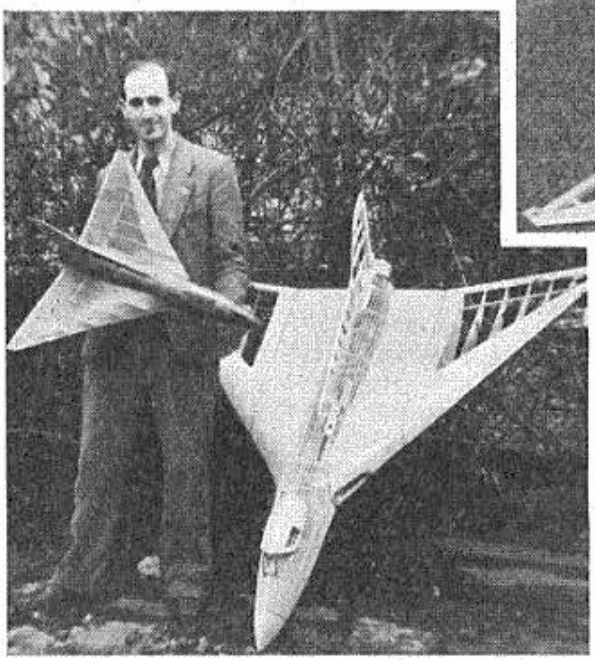
The Nationals officially ended with the prizegiving. National Champion this year is Noel Hewitson, a most popular win as Noel is a hard-working all-rounder.

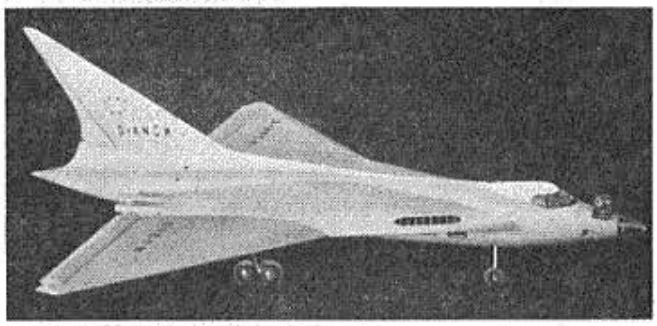
Unofficially the Nationals finished up some time the following morning—after all, it was New Year's Eve and we were off the chain. The " Nationals Orchestra " did their noisiest. Trueman finally got his jet to start in the main street—and a search party ran Hewitson to earth fast asleep in a milk bar.

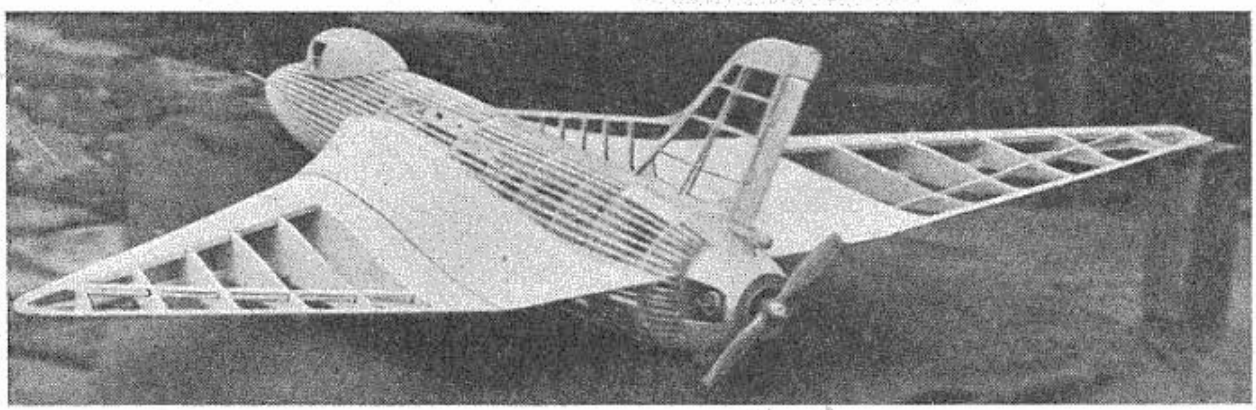
The Nationals were over. Those who had come for the camp and the company had enjoyed themselves. Those who had come in the expectation of good competition flying, spoke with another voice, and by resolution at the A.G.M. directed the Council never again to allot the site of a Nationals without consideration of those factors which affect the contestant.

DELTA Model News









THAT Delta series of articles in recent issues seems to have fired the imagination of aero-modellers all over the country. Among the dozens of photographs we have received of readers' own designs, we select some of the more ambitious *free flight* examples for your study and interest.

Top of the page, we start with well-known scale modeller P. E. Norman and his version of the Boulton Paul P.120 using ducted fan propulsion. Actual wingspan of this triangle is 36 ins. and though not altogether completed when Peter Donavour Hickie managed to get this candid view at Epsom Downs, the P.120 had already made a number of fast and promising test flights. If it travels as fast as P.E's other models, it should be very impressive; power unit is an Elfin 2·49 c.c.

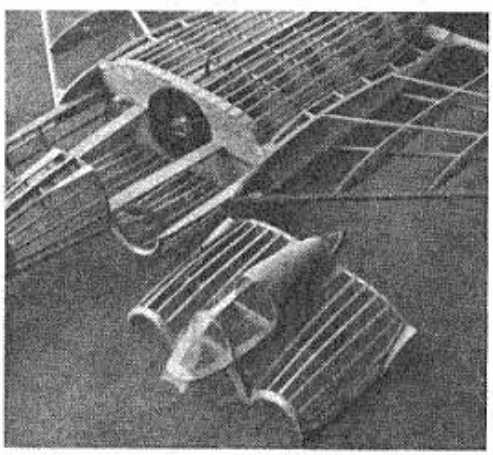
Below it and to the right, are two views of another model to be found on Epsom Downs. Smaller in span (33 ins.) but considerably greater in length (54 ins.), it uses an E.D. 2·46 mounted up front, driving a normal tractor airscrew. It's a " double-Delta ", by Michael Shepherd of Epsom D.M.F.C., an airliner project with dummy four-jet propulsion *à la* Vulcan, though this model was finished before the Vulcan was announced. So far, only 60 m.p.h. test take-offs have been managed with short ground hops lasting about 5 seconds. It would be as well to proceed carefully with a model of this type anyway, for although it has 396 sq. ins. the weight is no less than 3 lbs. 12 ozs. !

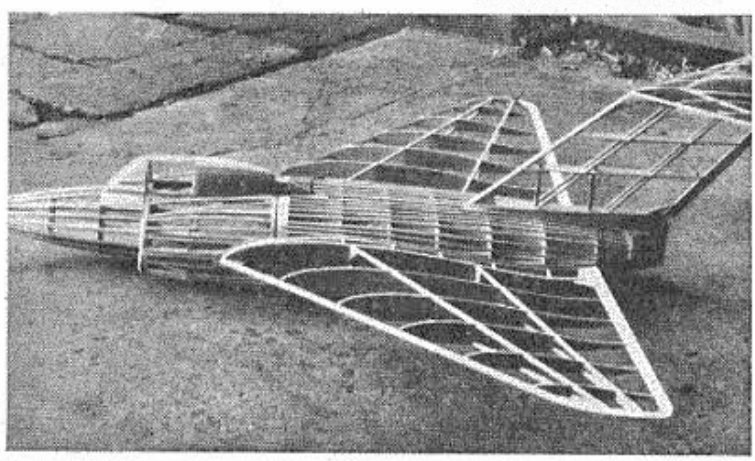
To the left, and across the bottom of the page, are examples from G. Elliott of Bristol, who has been developing Avro 707 models over the past two years. His first 707 Delta was fitted with a Jetex 200 unit and trim arranged through flaps on the slight reflex trailing edge. Not a complete success, due to C.G. variation and changes in thrust, the model provided sufficient experience for a radio controlled project to be planned. At that time, the ducted fan had seen little development, so it was decided to employ the rather unorthodox system of a diesel " pushing " at the rear. To experiment with this layout, Mr. Elliott made a half-scale version using an E.D. ·46 c.c., with slight dihedral and full reflex section increased in scale thickness to allow for radio in the larger model. No trim tabs were fitted, ballast taking care of final adjustment, and the only mod. needed was downthrust to obtain stable flight at 30 m.p.h. Span 32 ins., area 190 sq. ins. and weight 4 ozs.

The twice size (64 ins.) radio model (both are seen in the photo) has an area of 755 sq. ins., weighs 3½ lbs., uses ECC 951 equipment and an E.D. 2·46 diesel. Now covered and ready for radio operated flights, the larger 707A, passed first ballasted power flight trials with the minimum of bother. Congratulations to Mr. Elliott for his enterprise, and well designed scale models.

Also from Bristol, we have the beautifully constructed 40 in. scale Gloster Javelin for a ducted fan Allbon Dart at the foot of this page. Impeller is made from steel and is 3 ins. diameter exhausting through twin jet ducts like the real thing. Designed and built by Mr. Blagg, this model also uses a reflex section, and the high-mounted tailplane should be quite helpful in encouraging the Delta to a useful flying attitude.

Smallest, at 25 ins. span and with the baby Kalper 0·32 diesel, is E. Clutton's " Apex "; this one has similar engine mounting to Mr. Elliott's 707A, and once the best C.G. location had been found, and an alarming amount of ballast added, perfectly safe left-turning flights result without warping or engine offset. Like all other Deltas here, its principal characteristics are terrific strength, and very high flying speed.





SABRE

A SIMPLE - TO - BUILD SCALE CHUCK GLIDER

BY

BILL DEAN

HERE'S a model that even a beginner can build in a couple of hours—a profile of the famous **Sabre** jet fighter. We chose the F–86D version because of its long radar nose and easier-to-make *flat* tailplane. All patterns are shown full size, so just trace or pinprick them on to medium weight $\frac{1}{16}$ in. and $\frac{1}{8}$ in. balsa sheet. Cut out with a sharp razor blade and make two wing panels.

Sand all parts smooth and (with the exception of the wing roots, fin base and the portion of the fuselage where the tail-surfaces sit) round off the edges. Trace or sketch the canopy, USAF insignia and control surface outlines on to the various parts —in pencil. Then carefully fill these in, using a black or blue ball-point pen. The speckled portions of the insignia should be in red. The letters USAF appear on the upper surface of the right wing (looking forward) and the large insignia on the left panel.

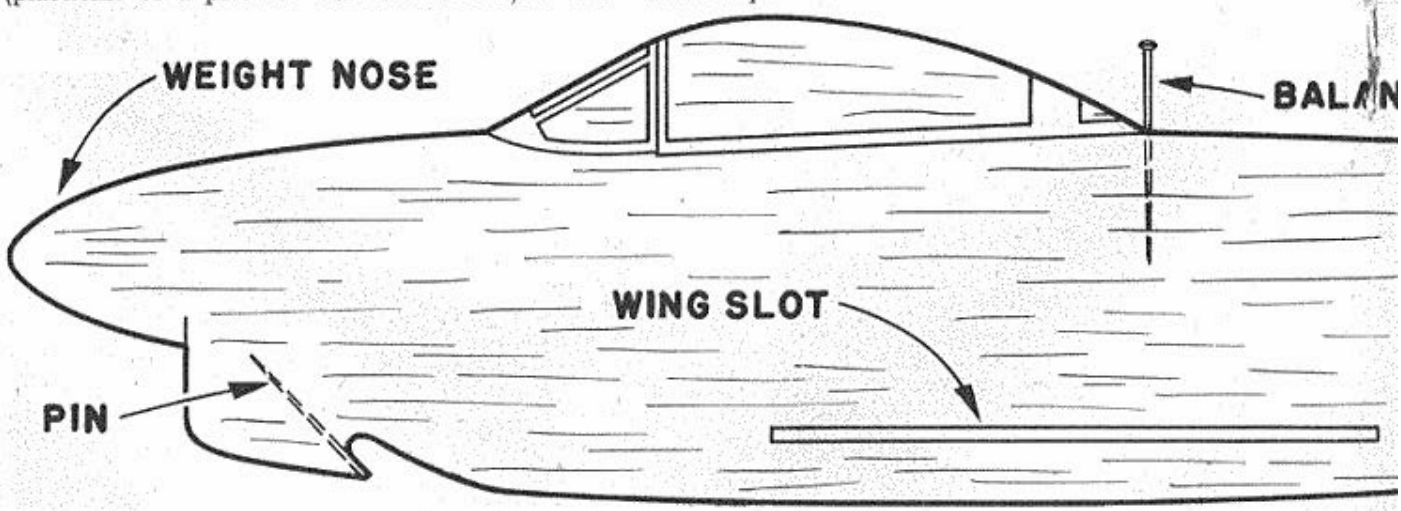
Taking care not to smudge the ink, sand the wing roots to a slight angle and cement together—pinning one panel flat on the building board and packing up the other $1\frac{1}{2}$ in. When dry, push into the slot cut in the fuselage and well cement—carefully checking alignment. Now cement the tailplane in place, followed by the fin. Push a pin into the fuselage just behind the canopy and add weight (plasticine or a piece of old cement tube) to the nose until the model balances level when held by the pin.

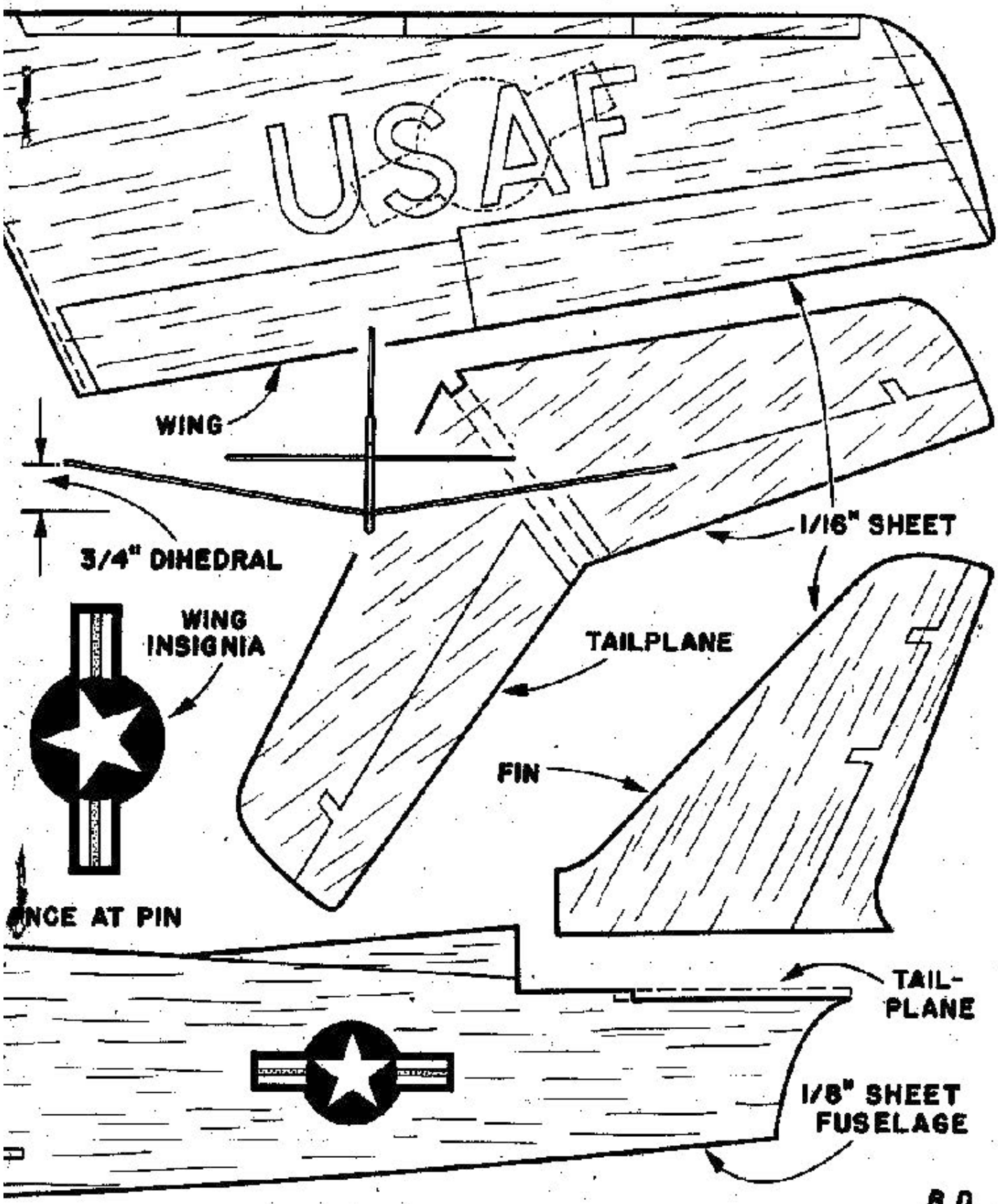
Flying

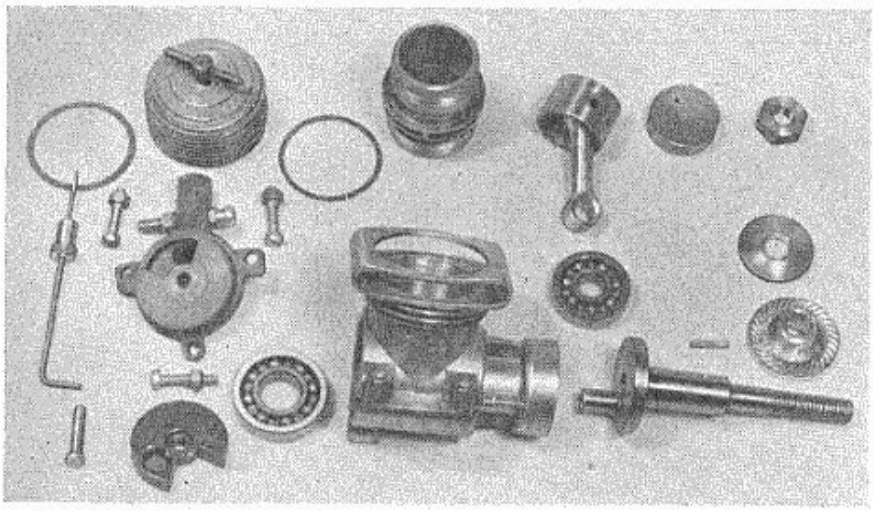
Check that the flying surfaces are unwarped and choose a fairly calm day for first flights. Launch gently from shoulder height on a slightly downward flight path and a glide of some 20 feet should result. If the model dives, gently twist up the trailing edges of the tailplane. In the case of a stall, add a little more weight to the nose. A slight turn in either direction is required, otherwise the model will loop straight ahead.

When trimmed correctly, launch upwards at an angle of about 30°, with the wings inclined towards the natural direction of turn. Put all you have into heaving the model skywards as the performance depends largely on a good powerful launching technique.

An alternative method of launching is to use a catapult made up from three 10 in. strands of $\frac{1}{8}$ in. flat rubber stretched between two wooden pegs set in the ground. Cut a slot in the underside of the fuselage and reinforce with a pin (remove head) as shown. This method of launching should only be used after perfect trim has been obtained, as any sharp turning tendencies will become violent in a catapult launch.




USAF
WING
3/4" DIHEDRAL
1/16" SHEET
WING INSIGNIA
TAILPLANE
FIN
NCE AT PIN
TAIL-PLANE
1/8" SHEET FUSELAGE
B.D.



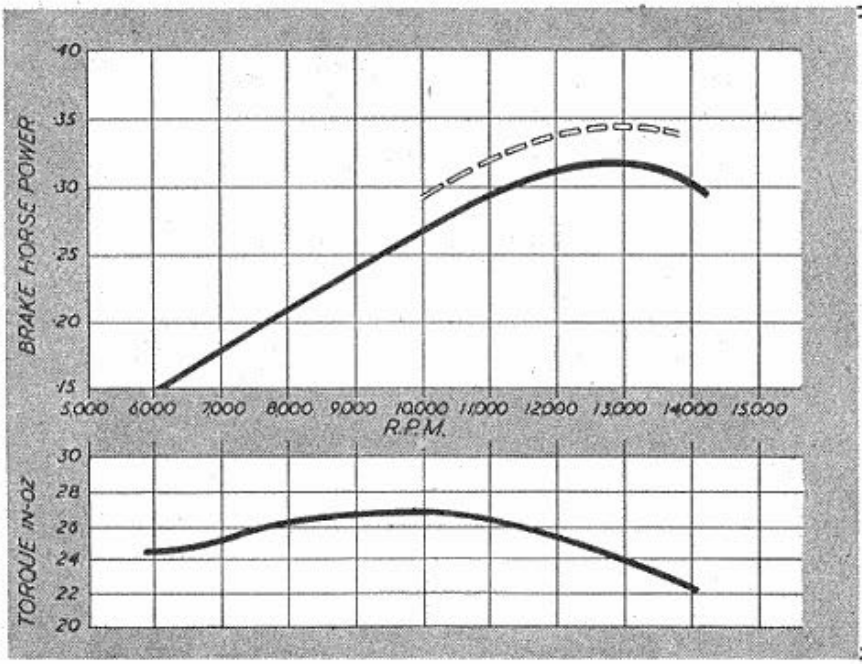
ENGINE ANALYSIS

The AMCO BB 3·5 cc

A MOST welcome addition to the range of present production motors is the Amco B.B. 3·5, now manufactured by the Aeronautical Electronic and Engineering Co. Ltd. The original Amco B.B. 3·5, introduced towards the end of 1951, established for itself the reputation of having the highest power–weight ratio of any contemporary motor in its class and was at least directly comparable in power output to many of the 5 c.c. glow motors, both British and American.

The original Amco B.B. 3·5 went out of production simply because the manufacturers, the Anchor Motor Company of Chester, has so many other commitments on Government contract work that they found it impossible, or impracticable, to devote the necessary proportion of their production capacity to the manufacture of miniature motors. Accordingly the designs, tools, dies, etc., were offered for sale and shortly afterwards taken up by the present manufacturers. Inevitably this meant a temporary cessation of production and so, to all intents and purposes, Amco motors disappeared from the market. Now they are back. The B.B. 3·5 is the first, and there will be others. For the present the B.B. 3·5 will suffice, for it is really a delightful motor, unchanged from the original, even to material specifications and with the same astounding power output.

One of the most remarkable, and pleasing, features of the B.B. 3·5 is its delightfully easy starting and consistent running at all speeds. Despite the fact that it is a very powerful motor, and a large-capacity diesel at that, starting is accomplished simply by leaving the controls alone, giving one or two choked turns to the propeller—and then a flick or two and it is running. This, of



AMCO B.B. 3·5

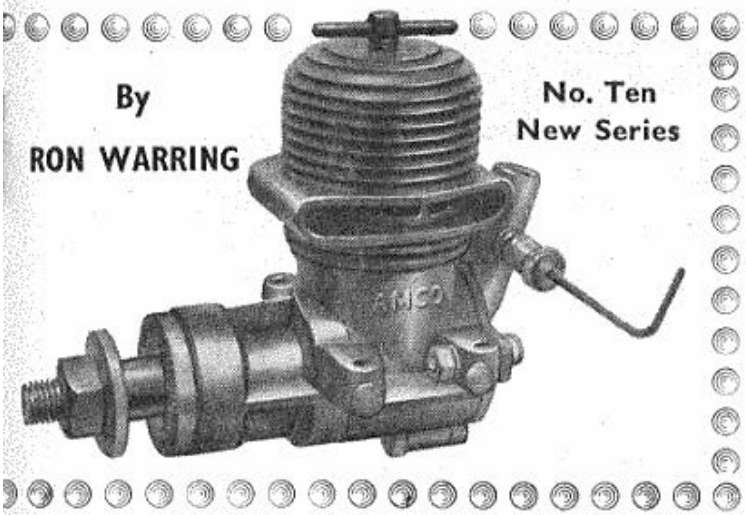
Displacement : 3·43 c.c. (2·09 cu. in.).
Bore : 11/16 in.
Stroke : 9/16 in.
Bore/Stroke ratio : 1·23.
Bare Weight : 5¼ ounces (less propeller and tank).
Mounting : Beam (or radial) (upright, inverted or side-winder).

Material Specification

Crankcase : LAC–112A silicon alloy, pressure die cast.
Cylinder : S.14 steel. Hardened, ground, honed and lapped.
Piston : Mechanite, ground and honed.
Connecting rod : Duralumin.
Bearings : Two Hoffman high speed ball bearings.
Crankshaft : S.11 steel. Ground.
Rotary disc valve : Laminated plastic.

Manufacturers

Aeronautical and Electronic Engineering Co., Ltd., Sunleigh Works, Alperton, Middlesex.
Retail price : £5. 15s. 0d. (including purchase tax).



course, pre-supposes that the control settings are right in the first place. Actually these are quite easy to find. The needle valve is essentially non-critical. If the motor starts on prime and then fades out after a short run, then the needle valve is closed down too much. If it is open too far, then the engine will continue to run, rather more roughly than before and throwing out an appreciable volume of unburnt fuel from the exhaust. On test the engine did not stop when the needle valve was opened up three turns beyond the optimum running position. The optimum setting is " critical " to the extent of a quarter of a turn either way. The motor would start and run over a range of four turns on the needle valve.

To find the best compression setting, normal diesel practice can be adopted. Prime generously and slacken off the compression until the propeller can be turned over without "hydraulic-ing" or with an appreciable " hard spot ". Then flick until the motor fires, slackening off compression still further if increasing resistance is felt rather than the mixture firing. When running, increase the compression until all signs of missing have disappeared and that will be very near the best compression setting. You can make small adjustments later, if you feel this to be necessary, to smooth the running. Once satisfied with the compression setting for any particular propeller size and fuel (i.e. a particular speed), you can then leave it alone. The starting technique employing finger-choke appears almost infallible and so priming through the exhaust or pouring neat fuel in the intake should never be necessary. Hence there should never be any occasion to over-prime the motor during starting—and no need to re-adjust the compression.

Actually, this is as well it is so. The compression lever is small and located close to the cylinder head. Whilst it can be reached reasonably easily and compression can be slackened off readily with the engine running, increasing the compression with the engine hot and running is *not* so easy. It demands quite a bit of effort—and the chance of your fingers getting burnt or slipping off the lever into the propeller disc.

The same criticism could not be levelled against the needle valve, for with the intake at the back of the motor (and angled up sharply), this can be adjusted with nonchalant ease, whilst finger-choking is just as simple. What we would criticise about the needle valve is the method of locking. A split sleeve may be satisfactory for small, low power motors but is not positive enough for a power unit of this size and performance. Normally there is very little vibration with the B.B. 3·5 (another excellent feature) but a slightly-out-of balance propeller may well set the needle valve gyrating madly on its fitting.

Another feature of the B.B. 3·5 is the delightfully " free " feeling of the moving parts, due largely to the fact that the crankshaft is mounted in two Hoffman high speed ball bearings. This, coupled with the fact that the piston and cylinder were, without doubt, a most excellent fit, made it difficult to judge whether the particular example sent for test had been run in or not. We decided that it had, but gave it further " bench time " to the extent of about half an hour at around 10,000 r.p.m., when the speed had not measurably increased at the end of this time. Not at any time did the engine show any signs of seizing or stiffness. R.p.m. figures were maintained consistently and re-starting was a matter of seconds. It did seem, however, that the B.B. was gobbling up an awful lot of fuel ! This point, of course, will not worry anyone but the team race enthusiast.

Hand starting was employed throughout the tests. Even without the " flywheel effect " of large diameters, starting remained just as easy. With propellers of 9 in. diameter or more, in fact, it seemed almost enough just to turn the propeller over rather than flick it smartly to get the motor bursting into life. With the smaller propellers, prudence reasoned that the second blade would be following round pretty smartly when the engine fired, so fingers did not remain in the propeller disc any longer than was necessary to impart a quick flick !

On the whole, there was virtually nothing to quibble about in the way the B.B. ran throughout the tests. It is undoubtedly an engine with a terrific contest potential, on account of its high power, and equally suitable for " sports flying " large models, or radio control models, on account of its ease of handling and consistency. What criticisms there are are levelled mainly against design details.

In mounting the motor on the test rig it was extremely annoying to find that whilst the holes in the front lugs passed 6 B.A. screws comfortably, the rear holes did not. The mounting screws had to be turned through with a screwdriver. It seemed improbable that the rear holes were drilled different sizes, so we checked on this apparent anomaly. The cause was that the top screws fixing the rear

crankcase assembly had actually broken through and protruded slightly into the holes in the rear fixing lugs. Here, in fact, would appear a source of potential weakness in a crash landing. Nor does the design of the fixing lugs themselves inspire all that confidence. A solid connection between the front and rear lugs instead of the present thin web connecting the two would appear a rather better solution.

Radial mounting is a possibility, but would mean a large cut-out in the bulkhead to accommodate the induction tube. Incidently, this tube is ideal for extension with aluminium or paxolin tubing to cowling level for easy control. The length will also permit the inclusion of an additoinal needle valve for two speed engine control for radio control work.

Incidentally, it would be appropriate here to stress a point mentioned by the manufacturers (but not, unfortunately, explained in their instruction leaflet). The B.B. 3·5 should *not* be dismantled, otherwise the performance may be adversely affected. Certainly on no account should the crankshaft be withdrawn as the ball bearings stretch the housings and make it impossible to make the bearing a tight fit again. In other words, the whole crankcase unit must then be replaced.

A final note on the effect of different fuels is also worthwhile. Actually this subject is well covered in the instruction leaflet supplied with the B.B. 3·5. In conformity with our other tests, the torque curve was plotted on Mercury No. 8 fuel, which is not the ideal mixture for the B.B. (but to the average modeller a " ready-mixed " fuel is a considerable advantage). A fuel with a higher ether content is actually better, with the manufacturer's own recommendation for maximum power being :—2 parts ether, 1 part gas oil, 1 part Castrol " R " (castor oil), plus 1 per cent. amyl nitrite.

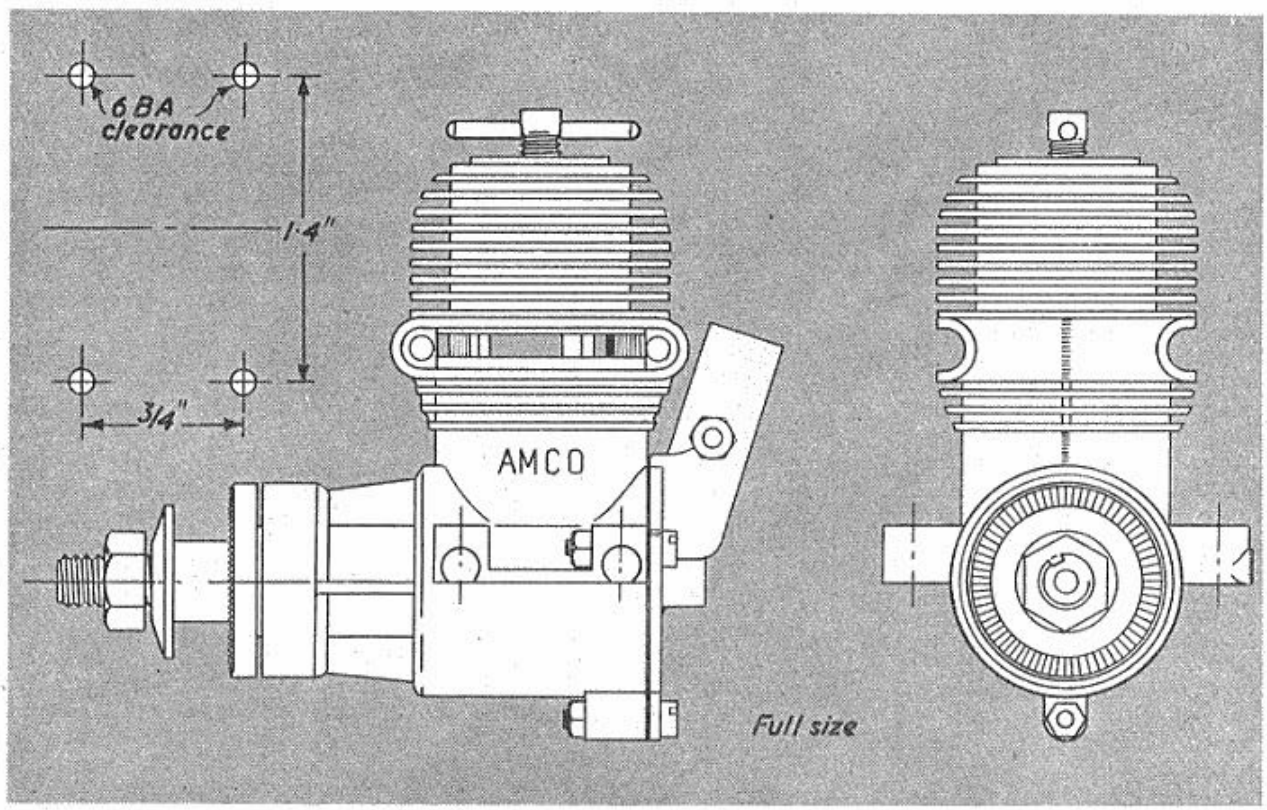
The effect of using a fuel with a low ether content (or ether equivalent) is to produce an excessively oily exhaust, which was noted on Mercury No. 8. For general running a very suitable mixture is 2½ to 3 parts ether to one part Castrol XXL (Essolube 50, Triple Shell, Mobiloil D or Mobiloil DD) or, alternatively, Mercury No. 3. Actually, however, we had no difficulty in getting the B.B. 3·5 to start and run well on quite a variety of different fuels tried. From the difference in torque output obtained by experimenting with different fuels, but without making full scale tests, it would appear probably that the peak power curve could be raised as in the broken line on the graph.

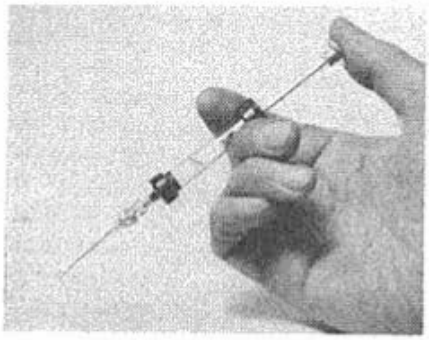
Prop. Tests

(Mercury No. 8 Fuel.)

Propeller Dia.	Propeller Pitch	R.P.M.
9	4	11,450
9	5	10,650
9	6	10,000
10	4	11,100
10	6	9,750
11	6	7,950

Recommended propellers :—Free Flight Sports (or R/C) 11 × 6 or 11 × 5 ins. ; Free Flight Duration 10 × 4 ins. ; Control Line Stunt 6 ins. pitch 9–10 ins. dia. ; C/L Speed 8–8½ ins. pitch 6½–7½ ins. dia.





Trade Notes

MANY modellers use a hypodermic syringe for filling small tanks or metering exact amounts of fuel. The main snag is the expense of such a syringe, so that the advantages of using this accurate means of measurement have not been widely realised. Our first review item this month, the **"DERMIC" OILER,** fulfils exactly the same functions as a hypodermic, but costs a modest 4s. 11d., and is particularly attractive to owners of ·5 c.c. motors. It comes complete with a detachable needle, allowing fast filling or fine injection, and is also most suitable for oiling, greasing or dropping a spot of soldering flux exactly where it is wanted. Spare needle tubes and leather washers are available for a few coppers, and very full care and maintenance instructions are included with each oiler. A very useful addition to the tool box, available from most model shops or, in case of difficulty, from the manufacturers, S. & B. Productions, 3, Orton Buildings, South Norwood, London, S.E.25.

Talking of soldering flux, the makers of the well known "Fluxite" soldering paste have recently put on the market **FLUXITE SOLDERING FLUID.** The fluid is especially suitable for large areas and long joints, and to this end contains a special wetting agent which ensures that it stays put. Modellers will probably be far more interested in the fact that it is *the* flux for soldering piano wire, making this occasionally trying job child's play. The new fluid is clean, quick and very economical—a 4 oz. tin at 1s. 10d. will literally last for years. Of course, if you have a *very* heavy building programme, larger sizes—up to 40 gallon drums—are available.

Interesting to a great number of readers will be the announcement that, in response to numerous requests, the *plain bearing* **Amco 3·5** will shortly be back on the market, manufactured by the Aeronautical Electronic & Engineering Co. Ltd., who, as is generally known, are already turning out the BB version of this popular engine.

Thoughtful aeromods may have wondered about the possibilities of **DAY-GLO** colour paints for that extra visibility; it can, as a matter of fact, be seen roughly four times further than normal colours. The opportunity to try it now exists, for **HALFAX MODELS LTD.** are introducing a range of these colours in model makers' sizes. Five colours will be available—Fire Orange, Signal Green, Arc Chrome, Neon Red and Saturn Yellow—and it is suggested that a panel or wing-tip be treated with one of these for simplifying retrievers' problems. The colours must be applied on a white undercoat, and may possibly introduce weight questions; they also tend to lose intensity after some weeks. Nevertheless, the keen contest fan (particularly sailplane) will welcome the chance to use these really bright colours, even if it means freshening them up a couple of times a year.

Another finish likely to interest modellers is **STARLON** plastic enamel paint. This is a quick-drying paint of very good covering power and extremely high gloss, available in white and twelve colours in ready-to-use *tube* form. Enough is contained in each tube to paint a complete bicycle—extremely good value for the price of 1s. 0d. Many modelling jobs can use a good brushing enamel, particularly if it is oil and petrol proof, and Starlon would certainly fill the bill.

Finally, this month, an interim report on the **WILMOT MANSOUR Hawker "Hunter" Kit.** This is one of the best kits ever to come into the editorial offices, the die-cutting and quality of materials being first rate, and the pre-formed fuselage sides an absolute masterpiece. Construction is simple to a degree, the pre-forming removing all stringer/bulkhead details and substituting one shaped piece of 1/16 in. sheet balsa, moulded out of the flat rather on the lines of an enlarged and elongated cockpit cover. A little over average price, the kit is still splendid value; a further report on finish and flying will be given in a future issue.

"What's he so mad about?"

'54 NEW RULE
Wakefields

VIEWPOINT BY
RON WARRING
BRITISH TEAM MEMBER 1949, 1950 & 1952

ALTHOUGH the "limited rubber" rule for Wakefields does not come into force until 1954 we shall be flying new-rule Wakefields in the Gutteridge Trophy on September 13th. This contest is the first of the 1954 Wakefield eliminators. The second eliminator will be flown early in 1954 and the top hundred (or perhaps fifty) qualifying for the final Trials, as in previous years.

June to September leaves only three months to produce, trim and get to top-level performance a model different from the present run of Wakefields. We have one advantage in that the weather over this particular part of the year offers more advantages for getting out with models for testing, although it does rather upset the traditional approach to model flying where the new models are built during the winter months, hoping that the relatively calm, if cold, periods common to early spring enable sufficient test flying to be got in to "prove" the new designs. Since the Gutteridge follows on so closely to the contest season where unlimited-rubber Wakefields will predominate, no doubt many of the Gutteridge entries will be "converted" '53 models.

The new-rule Wakefield must have an initial inferior performance, but since present-day Wakefields are so good, here is an immediate solution to 1954 design. Use the same models, with the same power (only shorter motors) and sacrifice power run (and ultimate height gained under power). The best of present-day Wakefields are 4½ mins. still-air models. Modified in this way they should still be capable of about 3 to 3½ mins. without thermal assistance. As a general rule, the all-season average of a consistent model is about 30 seconds or so less than its true still-air performance—so that, on this basis we can estimate a new top season average of around 3 mins. The main effect of lowering the still-air performance of the model will be to place greater emphasis on thermal flights, so that performance figures throughout the season may be more inconsistent than they are at present.

The present high-performance Wakefield carries a minimum of four ounces of rubber. Some use more—up to five ounces or in exceptional cases six ounces. If we take four and a half ounces of rubber as an average figure, replacing this with an 80 gramme motor to meet the new rules will leave some 1·7 ounces of weight "spare", assuming that the model was built right down to minimum weight in the first case. Actually few modern Wakefields are. Most weigh more than the permitted 8·115 ounces

Ron Warring assembling his '52 Wakefield. His '53 model is similar but has tail on top of fin to give rear fuselage access for 6 gear, four skein, 11 ounce motor which gives 7 minute power run.

minimum. An average figure of 8·5 ounces for the total weight is more usual. Thus the amount of "free" weight produced by fitting a 2·82 ounce motor would be about 1¼ ounces.

Now the obvious thing to do with this "free" weight is to use it to build stronger and more rigid structures. The obvious, however, is not always the best solution. Some of the leading Wakefield exponents have worked wonders of structural design in producing airframes with a total weight in the region of 3¼ ounces which are perfectly strong enough for contest work. Distributing extra weight all over the airframe by making every part that much stronger may produce an *aerodynamically* inferior model. Performance may well be better if the same "lightweight" construction is used and the model brought up to the required minimum weight with ballast added around the centre of gravity position. This will reduce the inertia forces and make the model more "live", as opposed to sluggish in reaction when disturbed from its normal flight path. A small point, perhaps, but it may pay dividends.

Actually there is a logical limit to applying this form of reasoning. In the writer's opinion a Wakefield airframe built down to 3¼ ounces must be on the weak side and places a premium on wood selection. The type of wood required for airframe weights of this order, retaining adequate overall and *local* strength is seldom available in this country. Four ounces would appear a much more satisfactory figure for airframe weight. It is not necessarily an

anomaly to say that building an airframe heavier than this will not produce a stronger structure. A four-ounce airframe can be built adequately strong for Wakefield flying in *all* conditions. The model composed of a 4 ounce airframe, 2·8 ounces rubber motor and about 1·2 ounces of ballast may well out-perform an identical design with identical power composed of a 5¼ ounce airframe and 2·8 ounces of rubber.

Quite a number of people are bound to jump to the conclusion that, with rubber power restricted, a premium will now be placed on aerodynamic design Again there is something of a fallacy in this direct assumption. The five ounce model with a three ounce motor (roughly) takes Wakefield design back to where it was some fifteen years ago. The pre-war Wakefields approximated very closely to this formula. Streamliners exhibited no marked superiority in those days and there is no justification in assuming that they will under a return to similar design standards. Expressed in performance, the increases resulting from aerodynamic refinements are generally very small. The modern Wakefields of the '51 and '52 periods have demonstrated that increased performance comes largely from increased rubber weight.

Taking the rubber motor and the aerodynamic design of the model, the former has a far greater effect on performance. So, in proper order, let us examine this aspect of new-rule Wakefield design first. The new rules allow a maximum of 80 grammes of rubber (lubricated), which is equivalent to just about 40 feet of ¼ strip. The exact length will vary somewhat with different batches and types of rubber, and made-up motors will have to be checked carefully by weight. Obviously designers will aim to use the maximum amount of rubber permitted, which may lead to some fierce argument as to the accuracy of scales used in checking! If you do allow a certain margin of safety, you do so at the direct sacrifice of performance. In other words, most people are going to work to an absolute minimum of difference.

Eighty grammes of lubricated ¼ strip will then make up into the following alternative motors :—

Strands	Made-up length (ins.)	Length when run in (ins.)
16	30	33
15	32	35
14	34½	38
13	37	41
12	40	44

The results of some tests made with these alternative motors are summarised in the next table. Here the duration of power run is determined with the different motors available, both with the same propeller (18 in. diameter, 30 in. pitch) and with a propeller with the pitch altered to obtain approximately the same efficiency in each case (i.e. same rotational speed). The propeller was originally designed for a 14 strand motor but the figures for maximum turns available are a nominal maximum, allowing a margin of safety of about ten per cent.

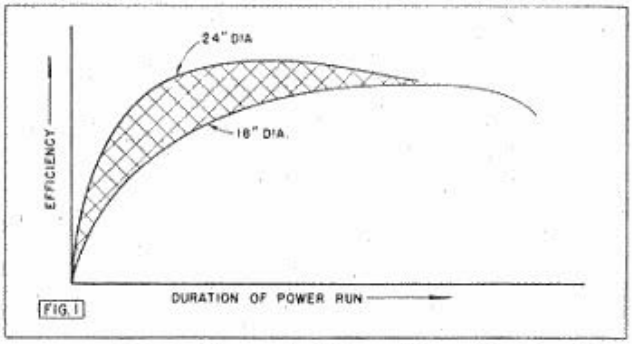


FIG. 1

Strands	Max. turns	Duration of power run (secs.)		
		same prop.	pitch adjusted	
16	720	45	50	↑ pitch
15	750	53	55	↑ increased
14	800	60	60	
13	900	70	65	↓ pitch
12	1,000	80	68	↓ decreased

A long discussion could centre around the result of these, and similar, tests. However, most of these would side-track the main issue. Two factors are of supreme importance. First, *consistent* high duration demands the use of a fairly long power run. The short duration, high-climb model may score out in thermal conditions. Over a season, however, it will also turn in some deplorably low durations. The model with a slower, longer climb will plod along to a higher, more consistent overall flight average. A minimum motor run of about 60 seconds

Left. Joe Bilgri, pioneer of the long fuselage has shorter, almost European appearance for 1953. Right. Frank Ehling on East Coast had a long model for '52 . . . a type now doomed to extinction. Note thick fin for cross section.

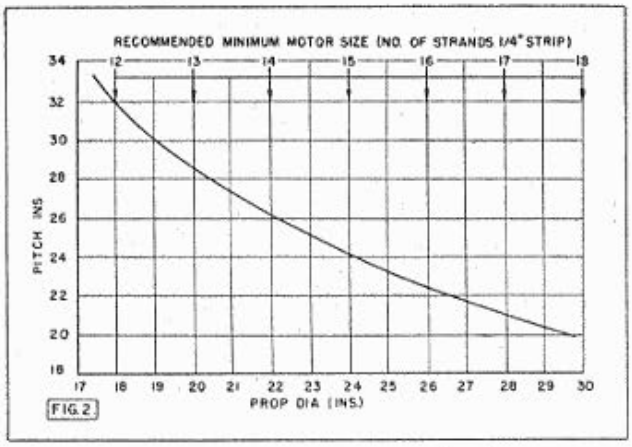


FIG. 2

would appear to be required, and preferably longer. (Theoretically, in fact, the most consistent performance should come when motor run is longer than the required flight duration.) To achieve a long power run with limited rubber, however, may produce an underpowered model which will not get away with it in poor conditions. The twelve strand motor, in other words, may be too marginal for most people to use with success. The 16 strand motor, on the other hand, demands a high pitch prop. to stretch the power run and may be inefficient in operation over part of the power run.

This introduces the second main argument in that from a given weight of rubber however you use it, short, high power or long, low power, if you use it as efficiently as possible each time you should get the same net results. In other words, if you have the optimum prop for the 16 strand motor you should get identical overall results using an optimum prop. with the 12 strand motor, and so on. No juggling with motor sizes is going to produce extra power from the rubber.

There are, however, two ways in which we may get more *use* out of the power from the limited amount of rubber. Increasing the propeller efficiency is one, and here the large diameter propellers show promise. What little evidence there is available points to the 24 in. dia. low pitch propeller being more efficient *on the same power* than an 18 in. dia. high pitch propeller, *both adjusted for about the same duration of power run.* In other words, the large diameter propeller is not used to stretch the power run, but to operate *more efficiently at the same rotational speed.* That is why the pitch of the large diameter propeller is so much lower—to produce a similar rotational speed. Two such propellers would appear to compare somewhat as shown in Fig. 1, the shaded area between the curves representing the gain in performance (climb) due to increased efficiency of the larger prop.

Possibly the optimum use of the large diameter propeller would be to use it to produce a slightly longer power run, using the increased efficiency to maintain a slightly better climb. Here, in fact, is considerable scope for experiment.

As a guide, and it can only be a tentative graph, Fig. 2 details the approximate relationship between pitch and diameter which appears to be an optimum for Wakefield motors of normal proportions. The rotational speed of the propellers can be controlled by the amount of blade area in each case. To be successful large diameter propellers are "stretched" in blade length only, not blade width, which should not exceed a maximum of $2\frac{1}{2}$ ins.

Now, another different approach to the apparent paradox of getting more power out of the rubber motor. That this is no paradox is clear when we understand we are seeking to get more *useful* power out of the motor, whilst the total power available remains unchanged. Most rubber model flyers are familiar with a typical torque curve of a motor, which takes the form shown in Fig. 3. In practical language, the r.p.m. figures of the propeller used, plotted against duration, takes an identical form. The torque output, and thus the r.p.m. of the propeller, undergoes an appreciable change during the first part of the power run and then straightens to a constant level.

At all other speeds its efficiency is less than its

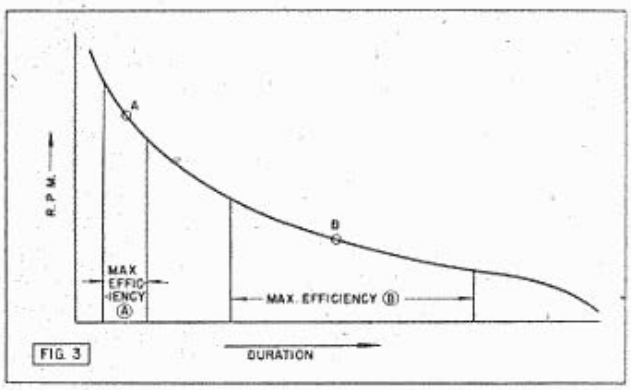
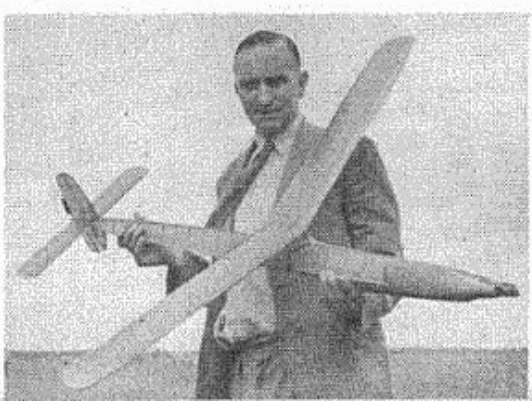
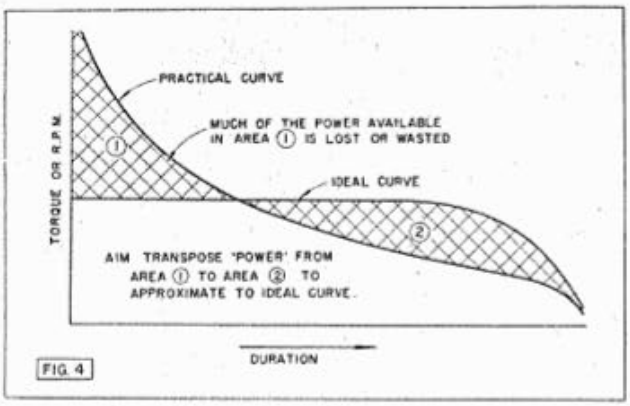


FIG. 3

***Below, Left.** Conventional winners, Sune Stark ('51) and Arne Blomgren ('52) have taken the cup twice for Sweden. Ted Evans with high power/weight model of medium length. Right. First published '54 Wakefield. J. O'Donnell and ballasted model, note ballast bulge.*

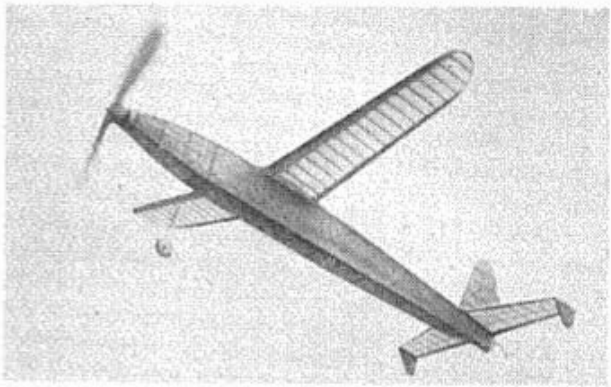
possible maximum, hence potentially useful rubber power is lost. If we aim to make the propeller most efficient around point A we may get an exceptionally good initial climb, but the time during which the propeller is most efficient is quite small. If we aim for maximum efficiency around point B we get a longer period of operating at maximum efficiency, but lose over the first part of the run.

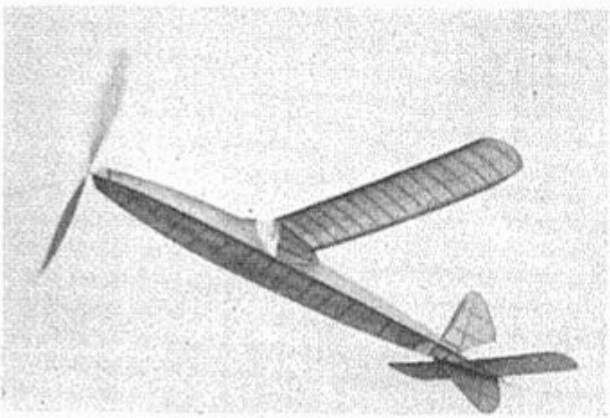
Of the two, designing the propeller for maximum efficiency towards the end of the power run is best since we have more than enough power at the beginning of the run. With unlimited rubber we can afford to waste some of the motor's energy here. With limited rubber, however, it would be an advantage if we could overcome this waste and use the " lost " rubber power shown in Fig. 4 over some other part of the power run.

Can this be done ? Well, return gears do just this in that they tend to give less initial torque from the motor and level out the first part of the power run. In other words, they tend to reduce the wasted power area of Fig. 4 and transpose it on the second stage of the power run, giving a substantially more constant climb over the first part of the power run. Eventually, the power output of the single skein and return geared motors blend into the same common curve. If, however, we consider the motor lengths involved under the new rules, return gears do not appear a particularly attractive idea. Other systems of gearing (e.g. gearing up the propeller) may produce similar or even better results.

An alternative solution is a variable pitch propeller—a propeller which alters its pitch automatically (controlled by the torque of the motor) so that a reasonably *constant propeller efficiency* is maintained over the whole of the power run. The theoretical change involved, however, is not favourable to trimming (e.g. low pitch at first, then progressively increasing). The practical V.P. propeller may well have to go through a change of high pitch—low pitch—back to high pitch.

There is one rather more attractive mechanical solution which has not yet been attempted on models—a *limited speed* propeller. In other words, the propeller is fitted with a governor or similar device which *limits the maximum r.p.m.* that the propeller can achieve. This would have the

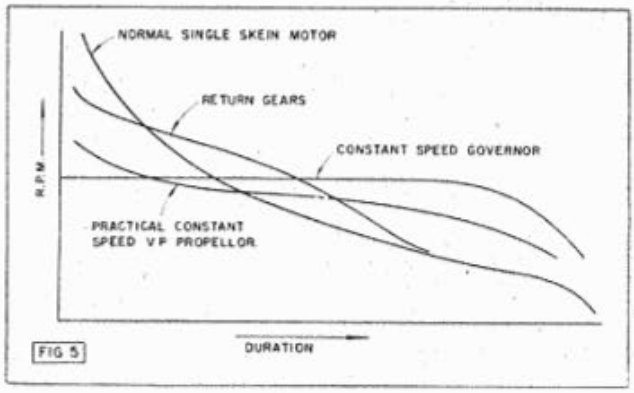




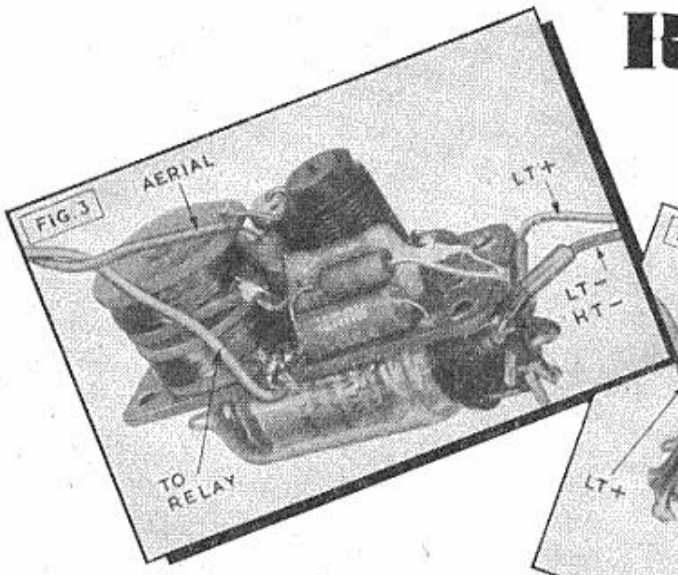
Above. Henry Tubbs' Red Swan, and John Gorham's Ghost are high performing medium length models capable of taking weight ballast for 1954 rules.

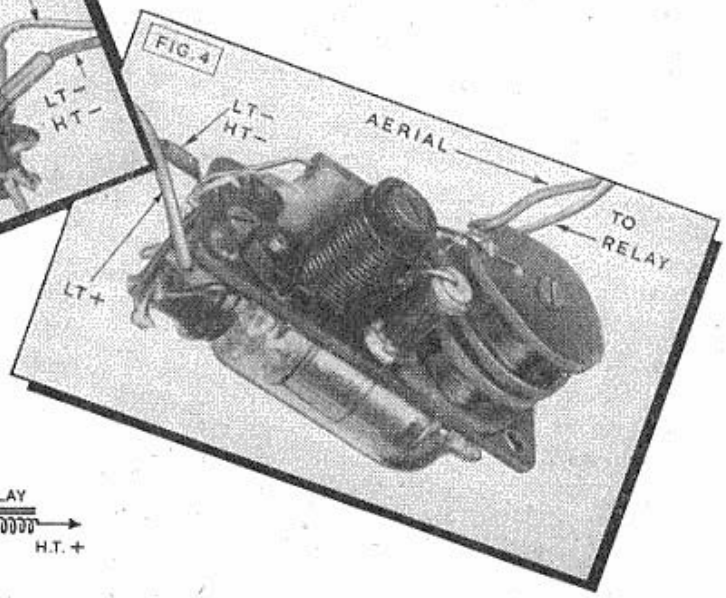
effect of holding back the initial power, as it were, and then re-allocating it over the second stage of the power run to maintain an appreciably constant r.p.m. propeller over a large proportion of the total power run. With a suitable mechanical device the advantages which could be gained would outweigh any mechanical losses in the governor. Using return gears, for example, losses in the gears themselves are negligible. The characteristics of these various methods of getting more out of the motor are summarised in Fig. 5. The nearest practical approach to the governor idea is the expanding-diameter propeller suggested by pre-war Wakefield flyer R. N. Bullock many years ago.

(To be concluded next month.)



Radio Control Notes . . . . .





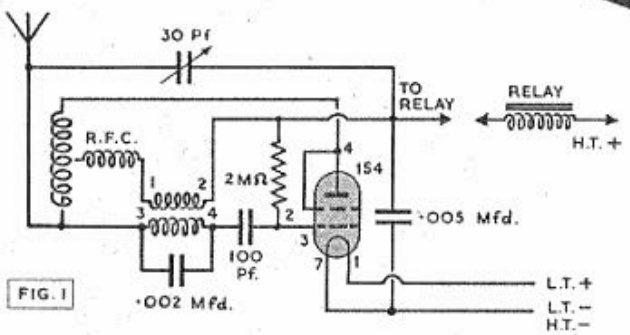


FIG. 1

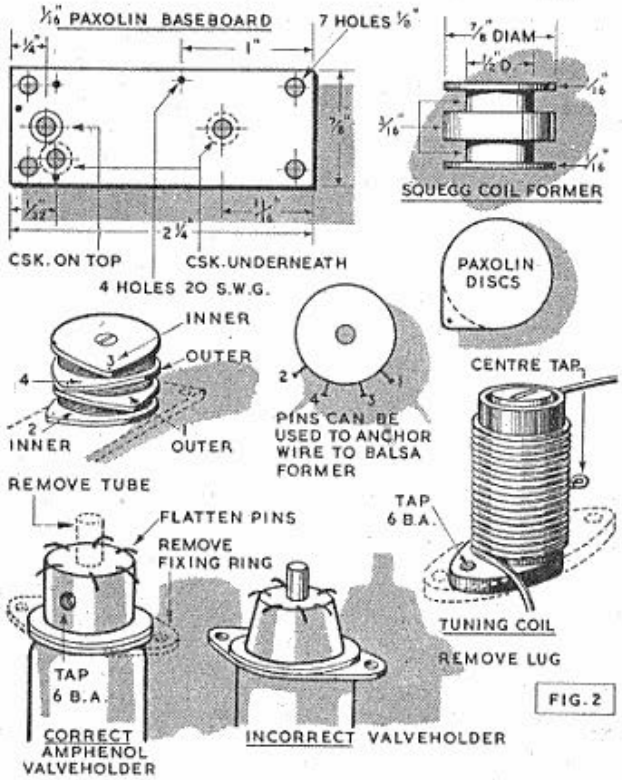


FIG. 2

By HOWARD BOYS

DOUG BOLTON has been at his experimenting again, and has sent along details of his latest receiver. This has been designed to use a separately mounted relay, a scheme which has been popular in America recently, and facilitates changing relay or receiver.

The circuit is that of the AEROMODELLER Hard Valve receiver with different component values. The weight is 1¼ ounces, and with 4000 ohm relay and 45 volts H.T. the current drops from 3 ma. to 1½ ma. at the limit of its range, and down to 1·1 ma. close up. Circuit diagram with component values is shown in Fig. 1, and Fig. 2 gives various details of the construction. The base board is made of good quality paxolin 1/16 inch thick and the squegg coil former can be made of either balsa or paxolin. If the latter, it can be made up from discs, and both types should be held together with a piece of celluloid tubing ⅛ inch outside diameter, 1/16 inch inside and 11/16 inch long pushed through their centres. Some ball pen refills are the right size. The tube is tapped each end, 6 B.A. for short bolts. Each section is wound with 600 turns of 38 s.w.g. enamelled wire both in the same direction.

The valve holder is tapped 6 B.A. through the side between the two pins widest apart, and is fixed underneath the baseboard using a 1/16 inch spacing washer. The coil former is the ⅜ inch diameter Aladdin type, one fixing lug being removed and the other cut short and tapped 6 B.A. The coil

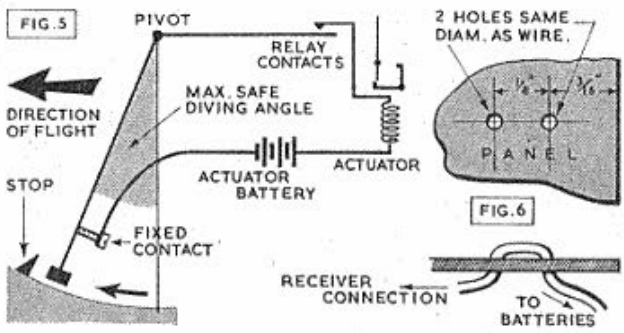
is made from 22 s.w.g. enamelled wire wound clockwise looking on the top. Loop one end over the lug leaving 3 inches spare, and wind on $7\frac{1}{2}$ turns, twist a small loop, and wind on another $7\frac{1}{2}$ turns, keeping it tight, and leaving 2 inches spare. Release and slide off. The R.F.C. can be made from about 100 turns of 40 s.w.g. enamelled wire on 3/16 inch diameter fuel tubing, closely wound. The ·005 and ·002 mfd condensers are Hunts 350 v. miniature and the 100 pf a silver mica, though ceramic tubular should do.

The order of assembly is as follows :—

Bolt the squegg coil and tuning coil former on top of the baseboard and screw the valve base underneath, using countersunk screws. Slide the tuning coil on to the former and push the bottom end through the baseboard, and solder it to the valveholder pins 2 and 4. Twist the coil tight and solder the top end to the top connection of the squegg coils. Solder one end of the 100 pf condenser to the middle pin of the squegg coils (No. 4) and pass the other end through the hole at the end of the baseboard, wrap once round, through the hole again, put on a piece of plastic sleeving and solder to valve pin No. 3. The ·002 mfd condenser is soldered between connections 3 and 4 of the squegg coils. The ·005 mfd is soldered between connection 2 of the squegg coil and valve pin 7, the wire passing through the baseboard. The R.F.C. goes between the squegg coil connection 1 and centre tap on the tuning coil. The 2 megohm resistor is connected between squegg coil connection 2 and the wire from 100 pf to valve pin 3. Valve pins 2 and 4 are connected together. It is usually bad practice to put the R.F.C. in line with tuning coil, but in this receiver it does not seem to matter. The 30 pf sensitivity condenser is a Philips " beehive " type and is mounted externally since it is more likely to need adjustment than any other item. Tuning is done with the dust iron core of the coil, and if it should need much unscrewing, it should be shortened by about 3/16 inch. The leads to the receiver should be plastic covered flex, L.T.+ to valve pin 1, L.T.— and H.T.— to valve pin 7, aerial to squegg coil connection 3 and lead to relay to squegg coil connection 2. A thin piece of rubber can be put down the side of the tuning coil core to prevent it unscrewing, and the sensitivity condenser is screwed up just enough to make the current rise with no signal. Figs. 3 and 4 are photos of the completed receiver.

Pendulum Safety Device

Mr. D. Paton of Fife has written to say that his desire to retain a radio controlled plane in one piece exceeds his desire to attempt aerobatics, and has suggested a pendulum arrangement to break the actuator circuit in the event of a dive steeper than a predetermined angle. The scheme is shown in Fig. 5. It enables fairly sharp turns to be made, but as soon as the nose drops too much the pendulum swings forward and breaks the actuator circuit and centralises the rudder, providing of course,



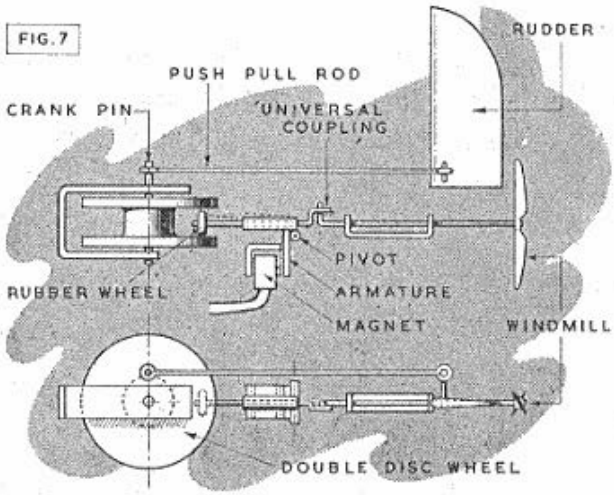
that the actuator is a self centering type and works reliably. It seems generally considered however that these actuators are the least reliable items of radio control equipment. A point that occurs to H.B. here is that a safe angle of dive with engine on, might be less than glide angle and so control would be lost on the glide.

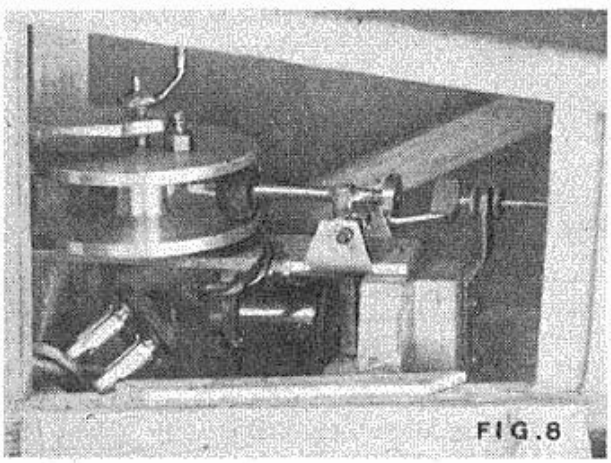
For anyone who wants to fly safely rather than aerobatically, the writer recommends that the rudder deflection should be limited so that the turn is gentle and does not cause loss of height. This was the method used by Roger Clark when making his first flights under the guidance of Syd Allen. It was almost unbelievable that Roger had only just constructed the model, a Junior 60 if memory is correct, and was making his first flights early one morning. Later that same day he entered the Taplin Trophy Contest.

If a model is fairly well elevated, or in other words, not trimmed for penetration, quite sharp turns can be made without losing height, sharp enough at least to keep the model within a hundred yards or so if there is not too strong a wind. Of course, if you fly for fun and safety, you don't fly in such a wind anyway.

Mr. R. H. Baylis of Poulton, near Cirencester, wrote in some time back in praise of the AERO-MODELLER Hard Valve receiver, and quoted results.

" Hindustani Radio Control "



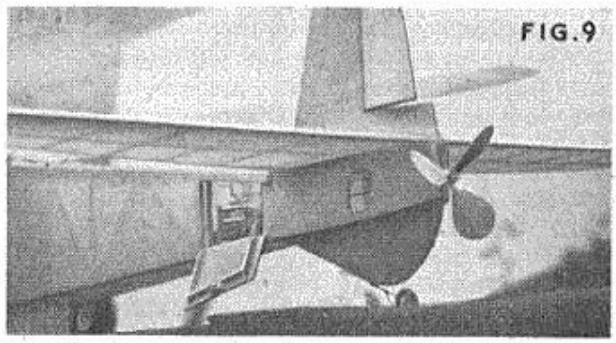


Using 60 volts H.T. and only half the filament of a 3S4 valve he got a current drop of 3·4 ma. down to 1·7 ma. at a quarter of a mile from a Flight Control transmitter. He anchored all the leads to the panel by the method shown in Fig. 6. Two holes are drilled, the same size as the wire, which is passed up through one and down through the other. This is a much more satisfactory way than soldering to tags at the panel edge.

An Unusual Actuator

Geoff Pike of Nottingham must be as well known to readers of these notes as his clubmate Doug Bolton. Both have contributed receivers and actuators. The item now to be described is an actuator of a most unusual type designed by Geoff Pike. It gives rudder one way without signal, and the other way with signal, and intermediate positions are obtained by pulsing, which need not be fast. A diagram is given in Fig. 7 and Figs. 8 and 9 show the actual works, and the tail end of the model with works installed.

Perhaps the most unusual feature of this actuator is that the power to move the rudder is derived from the airstream. A small windmill at the rear drives



a rubber wheel through a universal coupling. The wheel turns a disc to which is fixed a crank pin which moves the rudder by means of a push-pull rod. The direction of movement of the crank pin depends on which side of the double disc the wheel is touching. Without signal, the wheel is in contact with the bottom disc. With signal the magnet is energised, pulls the armature and lifts the wheel to contact the top disc. This disc is prevented from rotating too much one way or the other by some form of stop. In Fig. 7 the bracket is shown projecting so that the crank pin will rest against it, which is easier to illustrate than the actual method used by Geoff Pike.

This seems an appropriate place to mention that the writer has sometimes wondered about the possibility of keeping the ordinary escapement rubber band wound up by means of a small windmill. The scheme thought of was to have the windmill mounted from the side of the fuselage, and use a worm drive to keep quite a short band wound. The idea was to adjust the pitch and diameter so that the band was not wound too tight. The scheme has never been tried as the writer has not used the escapement type of actuator for getting on for four years.

NUMBER ONE OF A NEW INSTRUCTIONAL SERIES

Getting the best out of....

GLIDERS

Heading shot is of Laurie Barr, taken just after launching club-mate Pete Gilbert's A/2 glider in last year's eliminators.

THE MAN who builds and flies a model for the fun of it and not to take part in the sporting side of aeromodelling by entering contests is apt to overlook the best points of a duration model. There is a subtle difference between getting a model to fly and getting it to fly well. In the main, the duration model, properly trimmed, flies *well*. The non-contest model, or as it is rather anomalously termed, the " sports " model, may often be flown with marginal stability and suffer accordingly. By this we mean that it is probably less consistent than a first class duration model and, quite probably, is not flying as well as it *could*. Incorporate a few " duration " features, and it may well become a far safer and far more reliable sports model.

One might argue that the mortality rate of duration models is at least as high as that of sports models. Actually this is debatable, but even if it is, the prime reasons are not so much the fault of the model as in the relative frailty necessary for duration performance, the necessity of trimming to the limit and, more often than not, taking chances which would not be contemplated by the sports flyer. If you took a good duration model and *underpowered* it, it would almost certainly make an exceptionally safe sports model, and give more pleasure from its flight performance than a comparable " sports " design.

In presenting this new series, then, we are endeavouring to explain, in detail, the methods to adopt to get the best out of each and every class of model. On the face of it, this would appear to mean " how to trim duration models ". But getting the best out of a model goes farther than that. The same principles apply just as much to the sports model for the reasons we have just explained. Whether you fly with an eye on the contest results, or just for the fun of flying, therefore, it will be all the more enjoyable if you know how to trim your model to fly *well*—either at peak performance for contest work or with an ample margin of safety for sports flying. Trimming, of course, is the main part of this problem, but getting the best out of your model goes deeper than that. It is bound up with the design of your model. Thus, although this is essentially a series of " trimming " articles rather than " design " studies, design features must come into the discussion.

A well-known aeromodeller once said: " Any reasonably good modeller could get a cardboard box to fly by fitting it with wings and a tail—as a glider, rubber driven or power " model ". But who wants to see a boot-box staggering through the air more than once ? " The moral of this is, simply, that a well trimmed-model is a source of satisfaction. Getting a model to fly in the sense that it remains airborne for a short time can bring only temporary pleasure. Lasting satisfaction in our hobby comes from adapting model designs to fly as well as they possibly can, consistent with our individual requirements.

For the first subject we have chosen GLIDERS as the simplest of all types of flying models. Yet far from being a simple matter of adding or removing ballast weight, or adjusting the wing and tail settings to achieve a reasonably flat glide, there is more in getting the best out of gliders than might appear at first sight. If you want proof, just watch the performance of a number of model gliders on any flying field. Some will tow up straight and smoothly and then glide around in slow, lazy circles—effortless and graceful. Others may weave all over the place under tow, probably slipping off the line well before thay have reached the maximum launching height possible. Their subsequent flight may be anything but graceful—a series of stalls, perhaps a spiral dive, or even a fast straight glide which, by comparison with the first example, is

An A/2 that is different Peter Holland's latest is known as the "Min-sink" and boasts a remote fuselage pod and long tail moment.

more like a dive to earth. The more unfortunate modellers find a wing breaking off under tow, or have to deal with more severe damage after their glider has cavorted all over the place before finally diving to the ground on the line.

If nothing else, this latter example emphasises two of the main factors in successful, consistent flying—adequate structural strength and adequate stability. Tow-launching imposes an additional problem on the relatively simple problem of trimming a glider for free flight and so "adequate stability" in this case means stability under all operating conditions. As it so happens we can say in the case of gliders that these models should be designed for tow-launching conditions. If strong enough to stand up to tow-launching, they will be strong enough for free flight. If stable enough for satisfactory tow-launching, they will have more than ample stability in free flight. Good design aims at meeting these requirements without sacrificing free flight performance.

When we trim a glider, however, we go about the matter in the opposite way. First we trim the model to have a reasonable glide and then try it out on the towline. If the model is stable on tow, all well and good. We can make final adjustments to the glide trim, as necessary. Time will then show if the design is strong enough for tow-launching. For the purpose of explaining how to get the best out of a glider it is most convenient to stick to "trimming order".

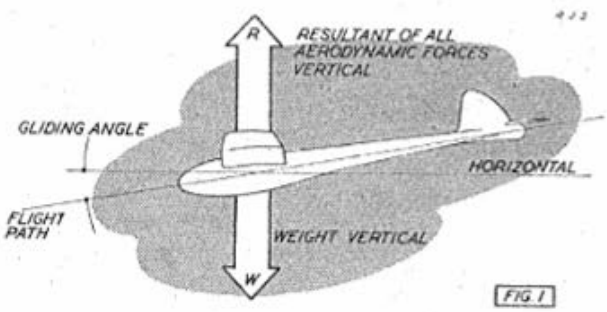


FIG. 1

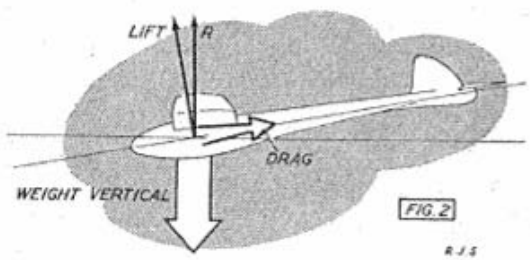


FIG. 2

As Fig. 1 shows, there are actually only *two* forces acting on a glider in stable flight—the weight of the glider exactly counterbalanced by the resultant of all the aerodynamic forces acting on the model. As a matter of convenience, however, we seldom think of the resultant aerodynamic force acting on any aircraft but consider this as two separate forces resolved perpendicular to the flight path (Lift) and parallel to the flight path (Drag). Splitting the resultant aerodynamic force up in this manner we have Fig. 2.

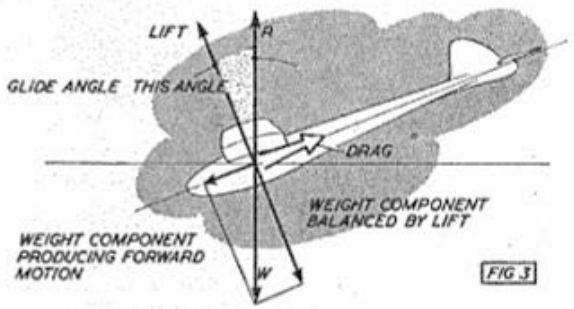


FIG. 3

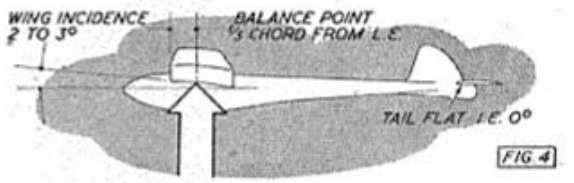


FIG. 4

Now Fig. 2 can tell us a lot about how a glider may be expected to behave in free flight. The flight path, for one thing, must always be slanting away from the horizontal. If it were not, then R and W in Fig. 1 would be in the same perpendicular line. There would be no force to move the model forwards, thus there would be *no* aerodynamic reactions generated, *i.e.*, R would equal zero. Hence the only force acting would be the weight, pulling straight downwards.

When the flight path is tilted away from the horizontal, however, we can consider the weight reaction split up into two components (just as we split the resultant aerodynamic force into Lift and Drag), as in Fig. 3. One part of the weight reaction is now pulling the model along its flight path—the other is now acting opposite to, and offset by, the Lift generated. We have established, in fact, the basic flight equations—

Lift—weight component perp. to flight path.
Drag—weight component parallel to flight path.

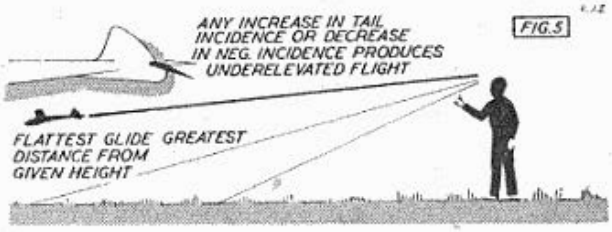
We can also find what the gliding angle of the model will be, since this will be the same as the angle between the Lift force and the resultant aerodynamic force, *i.e.*, the angle whose tangent is D/L. To avoid introducing mathematics we can say simply that the higher the ratio L/D the flatter will be the glide.

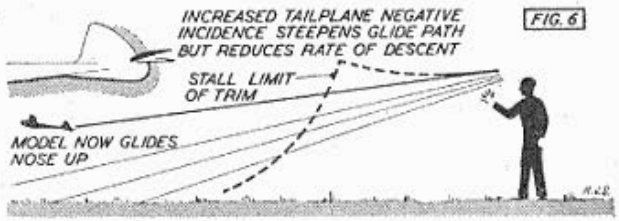
Now if duration flying is not our main aim, this forms a useful basis for trimming. We will presuppose a fact established later in the article that a forward centre of gravity position increases towline stability and rig the model, by adding ballast, until it balances at about one third chord—Fig. 4. If a number of hand glide tests are now made, adjusting the tailplane incidence a little at a time by packing (not more than 1/32 in. steps) we can find one particular tailplane setting which will give the greatest distance covered from the launch, *i.e.*, the flattest glide. It does not matter at what angle the wing is set. The resulting tailplane will be about two to four degrees less to produce this trim (depending on the sections involved and the design proportions).

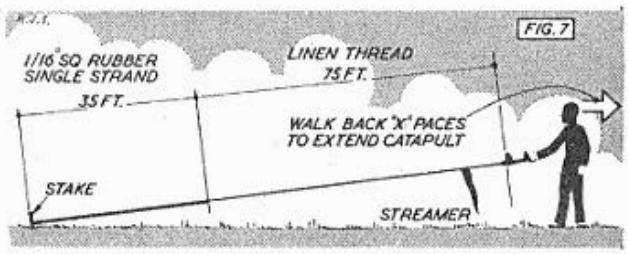
This trim represents *the limit for underelevating the model.* If tailplane incidence is *increased* from this setting the glide path will be both steeper and faster. Fig. 5. The model, in fact, will be tending to dive rather than glide and will not be flying efficiently. Under such conditions, too, the stability margin will be reduced since you are decreasing the angular difference or longitudinal dihedral between the wings and tail.

Now, having established the trim for the flattest glide, if you start to *decrease* the tailplane incidence a little at a time (*i.e.*, increase the angular setting between the wing and tailplane) you will find that although the glide path gets steeper again the model flies more slowly and actually takes longer to descend. Fig. 6. You will eventually reach a point where the model actually stalls. Just before this, if you could measure (and launch) accurately enough, you would find that the actual rate of descent of the model is its lowest.

To carry out these latter tests in a more scientific manner you should catapult launch the model each time, using a very weak catapult, say 50 feet or 100 feet long, as in Fig. 7, using exactly the same extension for each launch. Time each flight with the trim alterations and you will find that the longest duration results from

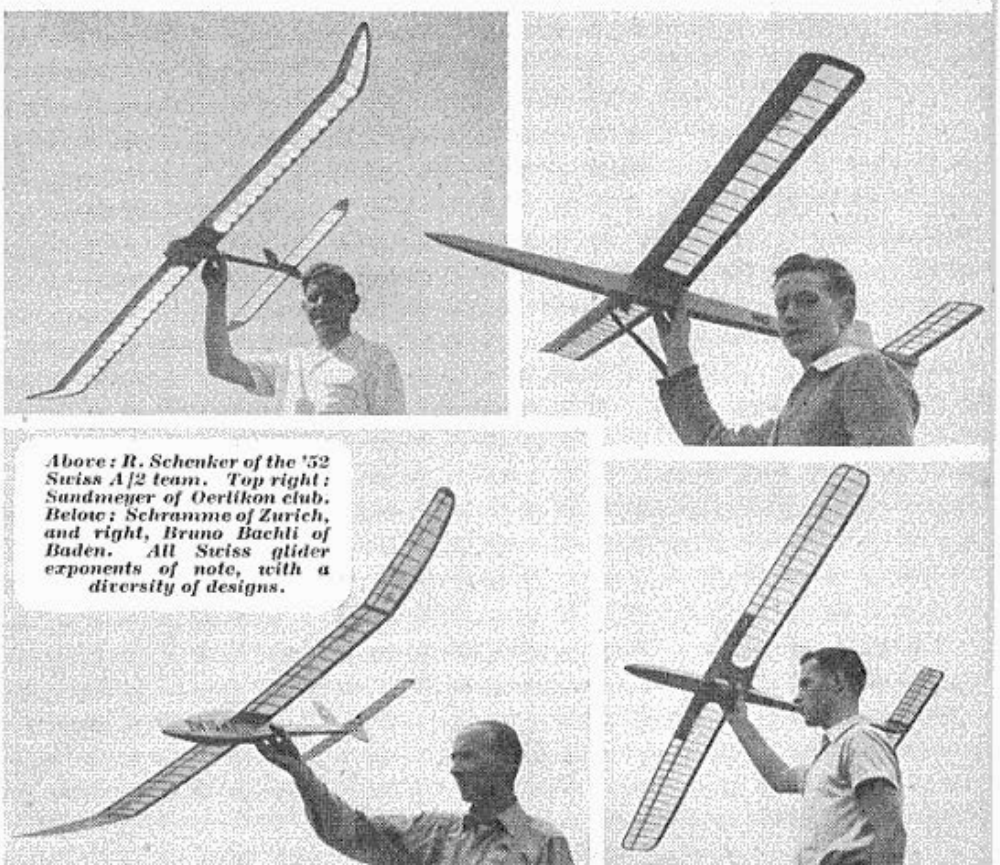




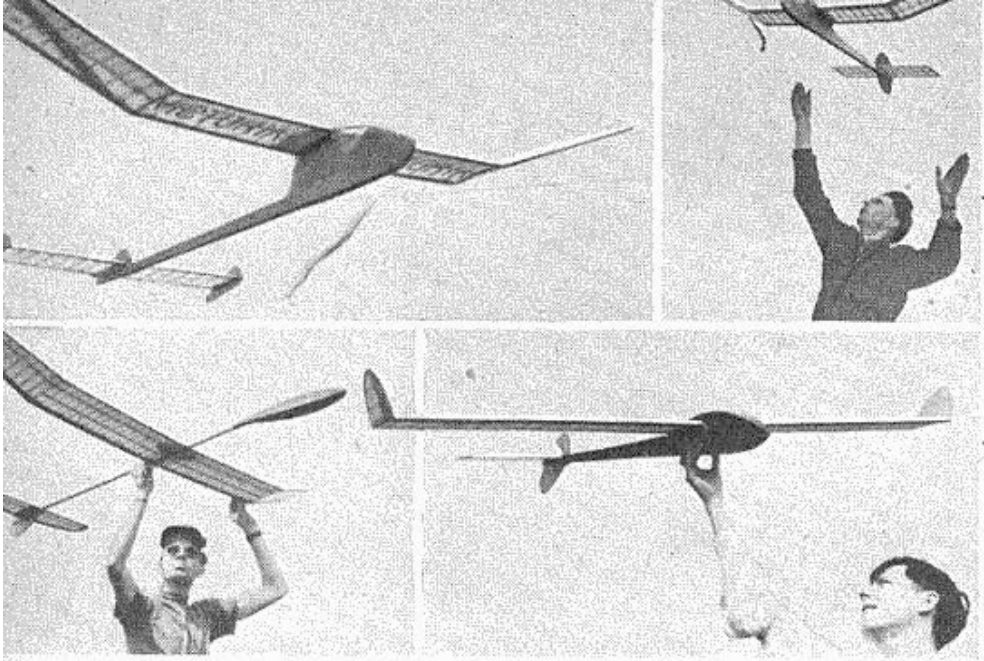


a trim just before the stalling point is reached.

Now obviously the upper limit of trim is reached when the model actually stalls. A trim which flies the model just below the stalling point all the time results in minimum sinking speed. The difference between this trim and the trim corresponding to the flattest glide *is the trimming range*



Above: R. Schenker of the '52 Swiss A/2 team. Top right: Sandmeyer of Oerlikon club. Below: Schramme of Zurich, and right, Bruno Bachli of Baden. All Swiss glider exponents of note, with a diversity of designs.



Extreme left: R. G. Harris's eight-footer with hatchet layout. Right: M. Wood launches Skipper Rowe's standard Mercury Norseman. Bottom left: German approach to the A/2 formula, now becoming popular. Right: Extreme tip dihedral in P. Wilkinson's A/2, designed among the waving palms of Egypt.

you can use on the model.

The sports flyer will probably be content to stick to the trim giving the flattest glide.

The duration flyer will aim to trim out his model at the other end of the scale—near the stall—for this will give him maximum flight time from a given height of launch. However, since the model is now flying quite near the stall, a sudden disturbance may well produce a stall and consequent loss of height before the model recovers again.

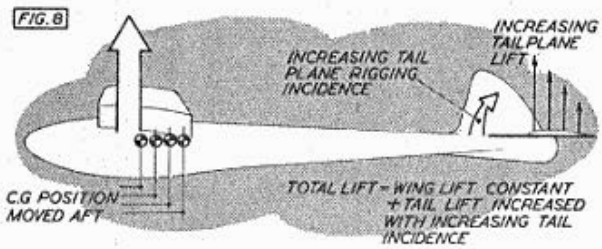
One of the best methods of evercoming this, and, incidentally, a quick method of trimming for minimum sinking speed, is to set the model to turn. A turn automatically reduces the effective incidence of the wings and thus if a model meeting a gust which might otherwise stall it, *turns* as it meets the gust, the turn should cancel the stall.

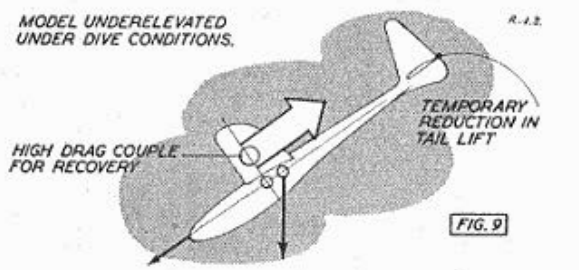
To use this in trimming, the model is trimmed for straight flight and adjusted until it is just flying in a series of moderate stalls—but not over—elevated to the point where the stalls go on increasing in magnitude. If the model is now adjusted for circling flight, the stall can be ironed out completely with the right degree of turn, at the same time not putting on so much turn that the model is now appreciably underelevated.

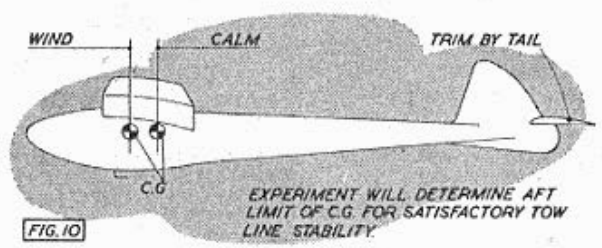
Such a trimming technique, tow-launching the model each time off a short line (or by means of the catapult) is the one used by most duration experts in trimming a model for contest performance. In *every* case of trimming a glider it is better to have the rudder or trim tab adjusted for circling flight—wide circles in the case of the sport's flyer (then he is not likely to run into the danger of underelevating his model by turn adjustment); and turning circle adjusted to kill any incipient stall in the case of the duration model and maintain a turning radius consistent with an ability to keep within, and not fly straight through, thermals.

Getting the best out of a glider from the duration point of view, however, may produce a different set-up to Fig. 4. Where the specification of the model is restricted, wing area, and thus wing lift, is restricted. The original trim of Fig. 4 assumes that little or no lift is contributed by the tailplane. The tailplane, in fact, is used as a stabiliser. If we re-rig the model with the centre of gravity farther aft, however, tailplane incidence must be readjusted so that this component is contributing a proportion of the total lift to balance—Fig. 8. The resultant drag increase is not as high as the increase in total lift obtained and so the arrangement is more efficient. Over a range of C.G. positions from the original one third chord position back to the trailing edge, or beyond, the same two trimming limits can be established.

However, the farther aft the C.G. (*i.e.*, the greater the proportion of tailplane lift demanded) the far more *critical* adjustment becomes and at the same time the longitudinal stability margin is reduced. Models rigged with an aft C.G. position are very prone to slow stall recovery. If upset by a gust of wind which causes a stall, followed by a dive to







recover, this dive may be prolonged by the change in airflow conditions over the wings in the dive modifying the effective tailplane incidence.

In some cases there may be no pull-out. The model just stays in the dive.

Models which do successfully employ an aft C.G. position often utilise a high-mounted wing so that in the event of a steep dive (and increased flying speed) there is a righting drag couple set up by the wing and mount to overcome the possibility just mentioned. Fig. 9.

On the bulk of evidence available it is extremely doubtful that seeking optimum performance in this way is worth it, particularly as tests have shown that, on most conventional glider layouts, towline stability deteriorates rapidly once an aft C.G. balancing position is used (*i.e.*, the tail is rigged to generate a proportion of the total lift). In fact where a model shows signs of towline instability, this can often be cured by moving the centre of gravity forward and re-trimming the model with negative tailplane incidence. Conversely, a model stable under two can be made *unstable* by moving the C.G. position back if you care to tackle the job thoroughly, this is an experiment well worth the time and trouble on a new duration design. Fig. 10.

The towhook position, too, has an important bearing on towline stability. It is difficult to give hard and fast rules as to where this should be on any particular design, but the old practice of " forward hook for windy weather, aft hook for calm " is not necessarily a good rule to follow. Ideally every new design should have a single adjustable towhook so that the best position for towing can be established, co-relating these experiments to the limiting aft C.G. position determined as above. Moving the hook forward to combat towline instability may well *decrease* the towline stability. One of the main reasons why we want a " more stable " hook position in windy weather is that rough air is more likely to upset the model by increasing the airspeed over the surfaces momentarily—and the stability margin is always narrowed by increased airspeed.

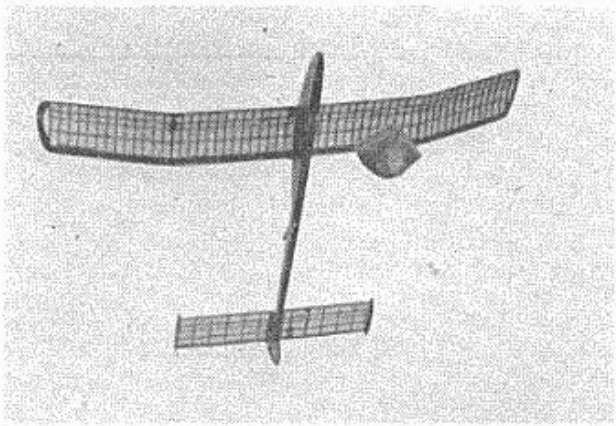


FIG. 11

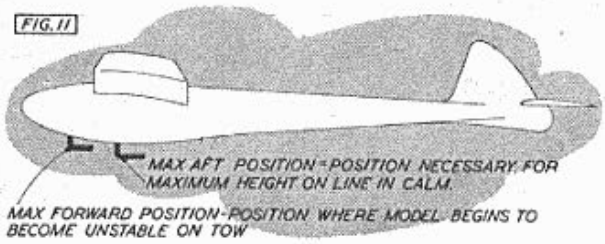


FIG. 12

For maximum height from a tow-launch the hook wants to be as far back as possible—and again you should be able to find the limiting forward position to achieve this. Fig. 11. A more forward position will mean that you cannot get the model to the top of the line in calm air—and may be no safeguard in windy conditions. If the model is stable enough it will tow in wind with the same hook position as in calm—except that you may have difficulty in controlling the increased flying speed and rapid rate of climb. Best practice, almost certainly, is to use the limiting forward position of the tow hook for satisfactory climb in calm and add additional ballast to the nose in windy weather, if necessary, to reduce the rate of climb.

Bad towline stability which cannot be cured by simple " trimming " methods must be regarded as a major design fault and the solution sought there. It may even be that the wing or tail fixings do not conform with the necessary standard of rigidity, allowing these components to shift during towing.

Adequate structural strength is a matter of experience and, unfortunately, not all commercial designs are satisfactory in this respect for " rough weather " flying. The wing is the most highly stressed component during tow-launching and is the one part where considerable strength must be built in—if you want to fly in all conditions. If your wing twists or flexes in the wind when held *before* launching, then it is more than probable that it will break during the actual launch. A glider wing designed for rough weather flying should be capable of being held by the centre at right angles to a wind of the same strength in which you anticipate flying. If it breaks in this test, be consoled by the fact that it would not have been likely to survive a two-launch under the same wind conditions—the difference being that you have not damaged any other part of the model.

With parachute instead of line pennant to keep the line taut and aid release, Pete Brown's (St. Albans) glider soars up for a high launch. Multi rib and spar structure is employed to maintain a good and even wing section.

MEET THE FETCHERMITES

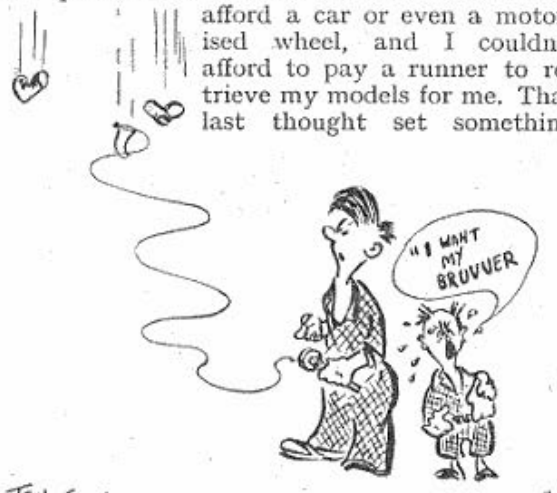
Introduced to you by PETER GASSON, illustrated by "RUSS"

I AM lazy. One might almost say my hobbies are laziness and aeromodelling. The two, you will say, hardly go together. You are wrong, there is nothing that really fervent indolence cannot achieve, and consequently I never chase my own models. I use Fetchermites. Allow me to let you into my secret.

One very hot day, after plodding three miles after a model which eventually landed in a tall fir tree, I sat down on a tree stump and gave way to a bitter flood of resentment over retrieving models.

"I will give up aeromodelling", I resolved. "I will collect train numbers, breed performing fleas, anything!" Head in hands, I contemplated a future without tangled towlines, snapping rubber motors, stinking diesel fuel and all the other things that make life worthwhile.

No! It was a dastardly thought. Give up my whole object in life? I could never give up aeromodelling. Feverishly I told myself to take an objective view of the problem of retrieving models without expending too much energy. Running after models was too exhausting, cycling was out of the question for the same reason. I could not afford a car or even a motorised wheel, and I couldn't afford to pay a runner to retrieve my models for me. That last thought set something in motion deep down in my inner consciousness. An idea started to push its way up through the tangled machinery of my brain, and burst with stunning simplicity.



The next day I took my second best Nordic out into a field behind a housing estate nearby and before I was half-way across the field, two small boys were tagging along behind. I stopped, hand-launched the model which glided gently to the ground twenty yards away. I turned to the two small boys who had watched its progress with awed admiration and subdued "Cor's".

"Go and fetch it", I ordered, and they stared at me with incredulous eyes. Usually they were told to go all sorts of places if they dared to go anywhere near one of my models. "Go on", I urged and they needed no more persuasion but rushed headlong. I closed my eyes in silent prayer and when I fearfully opened them again, one boy was grasping the wings with fingers which showed scant respect for the tissue, and the other, in the fight for possession, had won the fuselage which was decidedly battered and minus the tailplane.

I managed to control myself with an effort and explained to the little darlings that they mustn't fight for the model and furthermore, that although it was nearly as big as they were, they mustn't drag it along by the fin, or imagine it was covered with sheet tin. The sarcasm of the last remark was quite wasted on them.

These two small boys were the nucleus of my band of Fetchermites and I started to train them in earnest. The first few models they practised on became beyond human aid within minutes but that was a small price to pay for the energy kids were going to save me from then onwards. The thing caught on with the local child population which turned out to be greater than I had imagined and I could afford to be selective in my recruiting. I struck fear into the heart of any member who put his finger through the tissue, launched a model himself without consent or squabbled on duty.

My Fetchermites are now a celebrated and respected organization in the district. Woe is the householder who will not let them in his garden, and woe is the farmer who cuffs one of them for

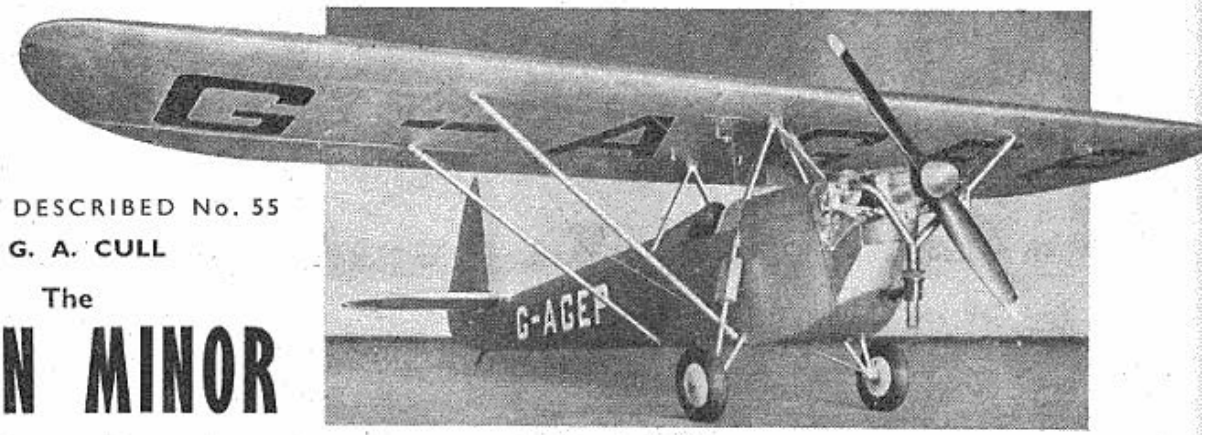
crossing his land, for the vengeance of my band will surely exact its toll of broken windows and appropriate names scrawled on the wall of the foolish person's house.

Of course my reader will immediately want to go out and recruit a band of Fetchermites himself, but he must realise that it entails certain responsibilities which he must be confident of dealing with. For instance, if one of the band falls into the duckpond it's no good taking it home to its mother with pneumonia. That's asking for trouble. Leave it sobbing outside the house of some kindly old maiden lady who will probably take it in, dry it out and give it a good feed into the bargain. Or again, if a power model with a 10 c.c. engine hits one in the head at full power, don't take the corpse home to its mother, bury it in the nearest ditch and forget about it.

Here are just a few golden rules on governing a band of Fetchermites :—

1. Remember your word is law. Institute punishments from a sound kick in the pants to expulsion for all aeromodelling crimes.
2. You cannot expect one very small boy to hold on to a Wakefield with an 18 strand motor extended five yards for winding. Either he will let go the model and be expelled, or hang on to it and be impaled on the drill hook. Hardly fair.

3. Never let one very small boy launch a ten-footer. He might go up with it. Very amusing no doubt, but the model might stall when he falls off.
4. Keep in good odour with the parents. If you put one mother's nose out of joint, vicious gossip will turn you into a scandal overnight. On the other hand mothers welcome their offspring being taken off their hands during the holidays and might even pay their fares to flying grounds.
5. Never sink so low as to resort to bribes of toffee or comics. This will undermine your authority.
6. Never give away old or smashed models, otherwise all your models will mysteriously become smashed even sooner than they used to.
7. Under no circumstances recruit a girl. Women are women even at nine years old.



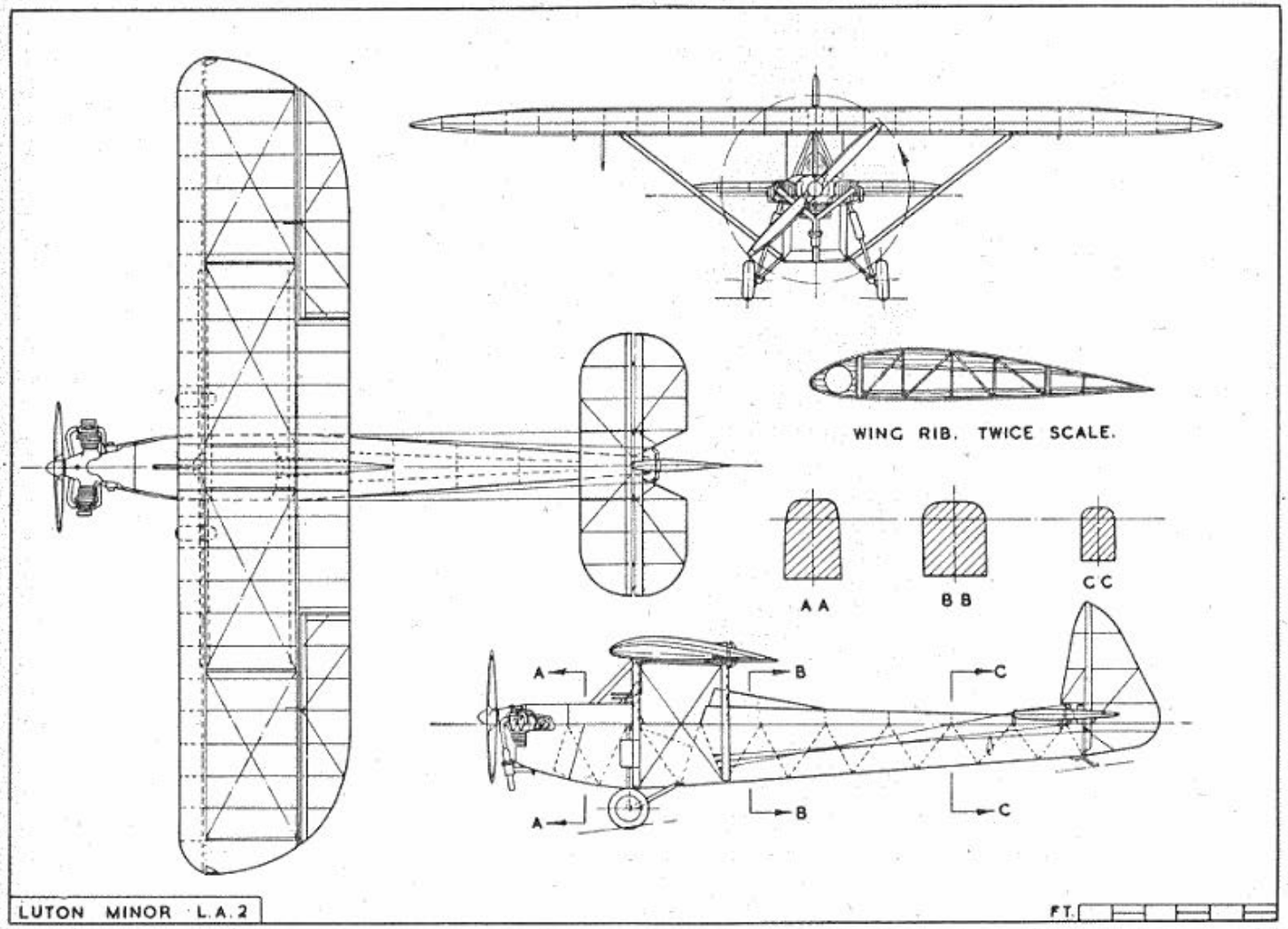
AIRCRAFT DESCRIBED No. 55

by G. A. CULL

The LUTON MINOR

THE Luton Minor originated in 1936 due to the many accidents which led to the banning of the amateur-built " Flying Fleas ". A replacement was needed for amateurs to build and C. Latimer Needham designed a machine with the Flea's tandem-wing layout with normal tail to ensure effective control. Trials spread over two months proved this arrangement still not ideal, so the design was revised and the prototype Minor was built by the small Luton Aircraft firm ; this was G-AEPD, with 35 h.p. Luton Anzani V-twin engine, fabric covered fuselage, V-struts and short undercarriage. Prior to coming on the market the design was further improved and all succeeding machines had a simpler tailplane, parallel struts, ply-covered fuselage and taller undercarriage. Complete with Anzani the Minor sold for £225 or a set of materials and drawings could be had for £115, and building instructions printed in a magazine popularised the Minor in 1937.

Naturally, the handful of Minors built reflected their creator's individuality in minor ways, although



one went so far as having an Austin Seven engine, with which its life was short! A works production prototype 'FBP had a 34 h.p. A.B.C. Scorpion engine but the 25 h.p. Sprite, 30 h.p. Carden Ford and de-rated 28 h.p. Scott were more usual.

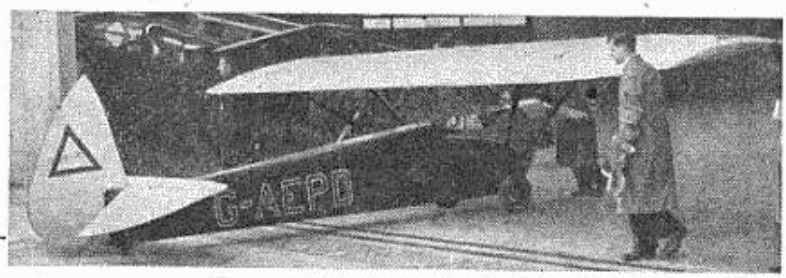
Of the pre-war registered machines, three are still with us. G-AFIR was home-built and flown pre-war with an Anzani but on force-landing in a cornfield had to stay put for three months until the corn was cut! After the war 'FIR was unearthed by Arthur Ord-Hume who completely rebuilt the entire airframe and fitted a French Mengin engine, though red tape prevented flying. Consequently a 37 h.p. JAP was substituted but, unluckily, a force landing broke 'FIR's back during tests. Repairs, including a new wing, are nearing completion and the machine is depicted in the accompanying drawing. 'FIU has likewise been fitted with a JAP and will soon be flying, while 'GEP has been completed by L. R. Miller who also favours a JAP, and this machine should also fly this year. A fourth JAP—Minor is 'HMO which is still being built, and another machine, as yet unregistered, is the work of D. E. Felce. This has a 34 h.p. Scott and Mr. Felce has persevered in overcoming many engine snags but is now well on the way to gaining official clearance for this installation, which has not previously been approved. Most active of the Minors is G–AMAW built by F/Lt. J. R. Coates, D.F.C., which has flown some 80 hours since being completed in 1949. This has the famous veteran 34 h.p. Bristol Cherub III driving a propeller carved by the owner, and this combination gives a rate of climb comparable with the Tiger Moth.

A most sound cheap aeroplane, each Minor is, like most ultra-lights, the result of much diligent uphill work by the most genuine flying enthusiasts of today.

Specification. Span 25 ft., Length 20 ft. (G-AFIR with JAP 21 ft.) Wing Area: 125 sq. ft. Empty Weight: 380 lbs. Loaded Weight: 600 lbs. ('FIR: Empty 340 lbs., Loaded 620 lbs.). Max. Speed: 80 m.p.h. Cruising Speed 70 m.p.h., Landing Speed 30 m.p.h. Take-off run 80 yds. Landing run 30 yds.

Construction. All wood. Fuselage has basic Warren-girder structure with $\frac{3}{8}$ in. sq. longerons and $\frac{1}{2} \times \frac{3}{8}$ in. spruce struts. Whole fuselage, including decking, covered with 1/16 in. ply. Wing has two plain spruce spars, lattice ribs with top and bottom ply webs. Wings may be made in one piece or in two halves detachable on centre line. In both cases each half has two bays, wire braced with spruce compression struts. Leading edge is ply covered, ailerons may have ply or fabric covering. Tailplane and elevator each have single plain spar and ply ribs with spruce flanges. Rudder is similar. Lift struts and wing pylon from steel tube. All metal fittings from mild steel sheet.

Colour. G-AFIR has fuselage and wing leading edge in bright red. Remainder is doped aluminium. Registration in red on aluminium and aluminium on red. Two trim lines down fuselage sides in aluminium dope. Cowling is bright aluminium. G-AGEP has saxe-blue fuselage with white letters, rest is aluminium doped with black letters outlined with white on wings. G-AMAW has light copper/bronze fuselage with scarlet nose trim line and registration. All flying surfaces are aluminium doped with scarlet letters. Name "Swalesong" in scarlet with white Yorkshire rose on rudder.



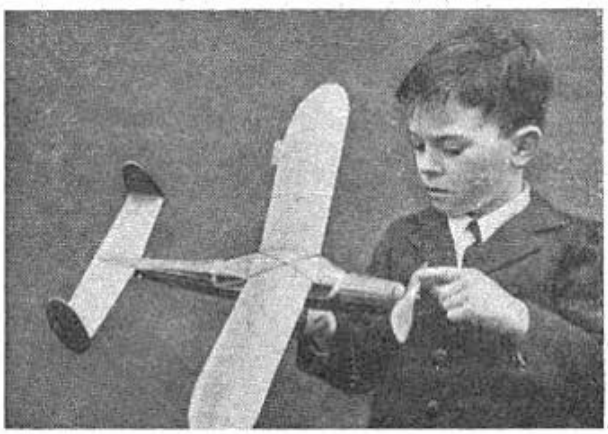
Heading photo: This Minor has a non-standard decking with three faces and was recently completed by L. R. Miller in Devon. Another Minor is being built in the Orkneys! *(Photo by courtesy of L. R. Miller.)*

Top right is the original pre-war 'FIR with Anzani engine and proud builder; below is the same Minor today with owner A. W. J. G. Ord Hume who rebuilt her since the war. *(Photos by courtesy of H. Kirby and A. W. Ord Hume.)* ***G-AEPD is the first Minor with words "Safety First" and insignia on rudder*** *("Flight" photo);* ***below, F/Lt. Coates taxies out to give a display on Battle of Britain Day, 1949.***

SCOTTISH PAGE

THE latest gen from the **WEST COATS AEROMODELLING CLUB** indicates feverish activity as the Club prepares for their afternoon display at West Coats H.G. School on April 25th. Here's some general information from Club Secretary J. W. McDowall. "The gym hall is just big enough to allow R.T.P. and indoor C/L flying. In the playground outside—weather permitting—we will have a full C/L flying programme. Aircraft already prepared for this include a Firefly IV with retracting under-carriage, bombs, arrestor gear, flaps and various other "secret" devices which I built as an experiment to see how many controls one could fit and still stay (a) sane, and (b) airborne. After the Exhibition in April, we hope to have more time to spend at our excellent flying field, about a quarter of a mile from the noble academic pile, and of the resultant record breaking flights, I might have more to say in the not too distant future."

Robin Taylor checks in now with **GLASGOW M.A.C.** club news and a report on another inter club contest at Lanark. "A very good time was had by all at the Club's Annual Prize-giving and Social, and on the same occasion the prizes for the various championships were presented as follows: Power—L. Blair; Rubber—R. Taylor; Glider—W. McConachie; C/L Stunt—I. Clark; C/L—R. Murdoch; R.T.P. — Duration — R. Taylor; R.T.P. Scale—W. McConachie; Club Champion—L. Blair. Perfect flying conditions on January 25th produced the high scores listed here in the competition at Lanark between G.M.A.C., the Barnstormers and Lanark M.F.C. Power—1st, J. McMaster, Glasgow, 8 : 31·6; 2nd, J. Clark, Glasgow, 5 : 7; 3rd, T. Harman, Lanark, 4 : 15; Rubber — 1st, W. McConachie, Glasgow, 7 : 6·6; 2nd, R. Taylor, Glasgow, 6: 27·6, 3rd, R. Colquhoun, Glasgow, 5: 48; Glider—1st, R. Colquhoun, Glasgow 9 : 49; 2nd, W. Meechan, Glasgow, 9 : 33; 3rd, J. Brattey, Glasgow, 8 : 33·6."



6 year old Ian Gray of Ratho, Midlothian, and A.M. Cabin Duration made with dad's assistance, from A.P.S. plans as their first attempt at aeromodelling . . flies well too!

Here's a few lines from Ian Gilroy on the first flying day of the recently formed **GALSTON & DISTRICT M.A.C.**:—"First job up was Allan Mier's Frog 500 Musketeer, and then on the free flight side, my own power job and my glider. Junior A. Collington's E.D. Bee powered Ladybird attracted attention for its semi-scale appearance, and his workmanship was really great for his first attempt. Best flight of the day was put in by another junior, J. Hood, flying a Mallard with a Frog 150 up front. Jim launched prematurely and had enough fuel for about 2½ mins. engine run, so the old Mallard was about out of sight upwards before the glide started. A hectic chase by car ensued, and the model was eventually retrieved. Club membership is increasing every week, and I think once we have been going for about six months, we will be a permanent feature of the local landscape."

PRESTWICK M.A.C. report on the silverware issue at their club A.G.M. Brian Harris was presented with the club championship, for the third year running. R. Sleight collected the new junior cup, and Bob Parsons got the Mitchell Trophy for power. Also from Prestwick comes the news that Heathfield airfield is now in the hands of the farmers except for the runways, so tread softly everyone!

EDINBURGH M.F.C. report that their proposed Spring C/L rally has been cancelled, but the Edinburgh Gala Day will be held this year, with date and details to be available later. Master Richard Carrick, Kayhews, St. Margarets Road, North Berwick, East Lothian is keen to see a club started in his locality. All interested should write or call on this lad.

HAWICK M.F.C. send in news of an exhibition held in local British Legion Rooms, which seemed to boost the club's finances greatly. Models on show ranged from two small balsa motor cycles to a six foot A.P.S. Kirby Kite. At the club A.G.M. office bearers were elected as follows:— Secretary, Treasurer—G. S. Renwick; Committee, T. K. Telfer, W. J. Armstrong and G. S. Benwick.

Now as space allows, here are reports on some of the top Scottish times in the Gamage and Pilcher contests. Glasgow—Gamage Cup, R. Taylor, 4 : 29. Pilcher Cup, W. McConachie, 6 : 42. S.A.S. Auchenharvie M.A.C. Pilcher Cup, I. Gilroy, 7 : 20. Bucksburn Aeromodelling Team, GAMAGE CUP (get a load of this) Bill Watson knocks up 3 : 21, 3 : 41, 12 : 15 and 2 : 45 to agg. 11 : 45, under the three min. maximum rule. Wow! that's 8 seconds better than last year's holder! MAC.

CLUB NEWS

J. Garfitt discusses his 2½ lb. Juggernaut-powered "VS" (which has clipped off 140 m.p.h.) with interested spectators at Leeds M.F.C. Exhibition, Trinity Hall, Leeds, on February 28th. Foreground models appear to be C/L Hawk 75, D3 Albatross, and a Nieuport 17c.

FLAT calm weather in February/March, and for the Gamage Cup? Very nearly the first time within living memory! Club P.R.O.s have obviously had to scratch their heads pretty hard, with the result that we can now definitely state that Sunday, March 8th, saw almost the entire British Isles covered by one enormous downdraught. Even so, many maximums were recorded, and first reactions suggest that modellers are taking to the rules without any fierce opposition.

Not so, however, the Wakefield, reception of which is very mixed. Northampton M.A.C. consider the rules-change the heaviest blow yet dealt to the increase of model aircraft performance, and ask what has the last six years' work by the top Wakefield men been worth? Must be a lot of flying space round Northampton . . . ! No-one will argue that the *performance* of models should be decreased *per se*, but if the only means of decreasing the *distance* flown is to limit the performance, what is more sensible than to impose such limitations? That British modellers are not the only ones affected by climatic conditions is shown by the fact that Belgium proposed the change in specification. Big advances were made after the last rules-change—and is it only in our fancy that we recall overhearing, a scant two years ago, three Northampton members muttering that the abolition of the old cross-sectional rule had completely messed up the Wakefield? What's the betting that the top twenty times in 1954 will be three-treble maximums?

Northern Area

BRADFORD M.A.C. report good conditions for the Gamage and Pilcher, with Norman Lees making a come-back to contests with a nice 8:43, using a 1954 rules Wakefield (!!?!?). Ron Calvert managed 6:12 with a new sailplane, while in a club power contest Silvio Lanfranchi turned in a 7 : 49 agg. with his scaled-down "Hogan". Lanfranchi Jr. followed up, flying an "Ascender" (3·5 Amco) for 6 : 38.

Western Area

Two entries in three free-flight categories, best total to win, is the score for the Western Area Championship Cup on May 10th (open, incidentally, to South Wales clubs), says **BRISTOL & WEST M.A.C.** Someone has been thinking pretty hard, and later this year a "rubber cargo" contest will be tried. The winner will be the model carrying the greatest weight for 30 secs. using ¾ oz. of rubber. A precision power event, three flights of over 30 secs., closest three times win, is also planned. For small flying fields such events sound most interesting and highly practical.

South Eastern Area

Grahame Gates was unfortunate and lost his chances of a Pilcher hat-trick when his 14-ft. "Halcyon" disappeared on its first flip after 19 : 45. Top **SOUTHERN CROSS** time in this event was R. Wigmore's 7 : 14, and in the Gamage R. H. C. Smith led with 7 : 26.

North Western Area

1953 has got off to a good start for the **WHITEFIELD M.A.C.** The Freshman's Trophy (mixed rubber and glider, 5 min. max.) went to John Potts with a three-flight aggregate of 10 : 17, flying a "Borderline" Wakefield (plans in this issue). In the Gamage (at Tilstock) J. O'D.'s 1953 Wakefield (24-in. featherer) turned in a nice three maxs. and a 4:12 fourth; E. Horwich's "Odenmann" A.2 went o.o.s. at 14 : 40 and finally disappeared overhead 4 miles away after 45 mins. plus.

Ninety attended the third Annual Dinner of the **BLACKBURN M.A.C.,** including the principal guest, Mr. R. F. L. Gosling, who, the news-sheet informs us, enjoyed himself no end, and—we quote—"may have one or two husbands on his track before very long". Tsk, Tsk. If we believe this, shall we be accused of "gull"-ibility? Sounds as though it was quite a party.

BLACKPOOL & FYLDE M.A.S. tell us that weather on the 8th was very reasonable for the second year (for them) in succession. M. R. Thomas and F. Marsden both did a double, first and second respectively in Gamage and Pilcher with 7 : 08 and 6 : 09, 8 : 50 and 8 : 30. Both used lightweight stick gliders for the Pilcher.

Midland Area

An idea which might be tucked away for the winter is that dreamed up by the **LEICESTER M.A.C.** This year the "Mentor" was picked as the subject of a comp. comprising three stages: (*a*) construction, uncovered; (*b*) covering and finish; (*c*) flying. Eighteen models are so far taking part, and, at the second stage, D. Hall leads the senior division and R. Sansome the junior. H. Hart used a "Quickie" when making three qualifying flights for his "B", two of said flights being over 6 mins. The proud owner was last seen as a speck vanishing over the hillside in the gathering dusk.

FORESTERS M.F.C. have recently burst into film shows and social evenings with great success, while Tom Woodward has raised the club rubber record with a 13 : 00 (o.o.s. into cloud) flight on a cold and overcast

GAMAGE CUP

1.	D. Sugden	Loughborough College	19 : 39
2.	E. Williams	Outlaws	18 : 15
3.	E. Taylor	Cheadle	16 : 33
4.	I. Dowsett	West Middlesex	14 : 15
5.	W. Rockell	Lincoln	14 : 02
6.	E. John	Grange	13 : 53

Top Junior C. Johnson Wigan 8 : 50

92 Clubs. 121 entries. 16 triple maximums scored.

PILCHER CUP

1.	G. Gooding	Hull Pegasus	18 : 24
2.	R. Yeabsley	Croydon	16 : 35
3.	G. Stott	Loughborough College	13 : 53
4.	G. Burton	Outlaws	12 : 27
5.	K. Hindle	Accrington	11 : 28
6.	E. Farrance	West Yorks.	11 : 23

Top Junior P. Jackson Littleover 8 : 46

92 Clubs. 309 entries. 11 triple maximums scored.

day. Model, to F.A.I. specs., was down to 50 ft. after 6 mins., but flew into a strong riser which took it up at an alarming rate.

Strong approval of the new S.M.A.E. fees was voiced unanimously at the recent A.G.M. of the **NORTHAMPTON M.A.C.,** which celebrates its coming of age this year. The club recalls with some satisfaction that the popular Midland Area Rally traces its origin to the first large meeting held by the N.M.A.C. Disapproval of the new Wakefield rules was also a feature of the A.G.M., as noted elsewhere.

BELPER D.M.A.E.C. have another internal contest system worthy of note. The club is divided into teams of four, and each team is allowed 7s. 6d. from club funds to build an " A " team racer ; races to follow when the models are completed. An exhibition, running for a week, was staged in aid of the R.A.F.A., and produced a great deal of publicity. Exhibits were judged by modellers from the Rolls-Royce club at Derby, and R.R.'s chief test pilot, W.Cdr. J. H. Heyworth, presented awards of 2 gns., 1 gn., and ½ gn. to B. Hobson (" Snark "), J. Winter (" Sporty ") and N. Owen (" Skystreak ").

Great activity is reported by **WALSALL M.A.C.,** and the club has recruited numerous juniors, among them one who arrived complete with a 48-in. scale " Mustang " built from a scaled-up kit plan. F. Bishop has raised the Jetex record to 3 : 57 with a " 200 " in a modified " Acc ". A 5-mile, 13 : 00 o.o.s. flight was recently made from a 20 sec. motor-run by A. Hazlewood.

Eight or nine airworthy R/C models are possessed by members of the **CHESTERFIELD D.M.E.C.,** who also go in for R/C boats, etc. A welcome is extended to all modellers to the technical film shows given by this club at Bradbury Hall, Chesterfield, on the last Tuesday of each month.

East Anglian Area

G. Davie of the **NORWICH M.A.C.** leads the growing radio group in this club with two " Super Brigadiers ", a " Junior 60 " and a 9-ft. glider. Also goes in for stunt with an Atwood Glo-devilled " Stuntwagon ". Not to be outdone, R. Applin has replied with a McCoy in an " Icarus ". Most exercise is being taken by A. Coe, who vigorously pumps a Decajet for half-hour periods. We were going to say " vigorously but fruitlessly ", but apparently the noises emitted—er, quite ! Wonderful what sawing 9 ins. off a resonant tube does to the resonance, isn't it ?

South Midland Area

Smaller clubs suffering from a dropping-off in members may like the idea of the new **WEST HERTS. GROUP,** which is a club formed in order that there will always be enough bods for team events and so forth. All members must remain active in one of the existing clubs, so that there is no danger of such clubs losing their best members. The group celebrated its formation by winning the inter-club friendly contest on Feb. 22nd at Nomansland Common, against **ST. ALBANS, LUTON** and **HATFIELD.** Results were :—

West Herts	1832 pts.	St. Albans	1621 pts.
Luton	747 ,,	Hatfield	301 ,,

A Concours d'Elegance wound up the winter programme of the **READING D.M.A.C.,** scale and semi-scale predominating. Most intriguing model was a f/f Miles M.35 " Libellula ". Aaaargh-h-h ! Further details would be appreciated. Weight-training and road-work are, apparently, the order of the day, as a continual chuck glider sweepstake and a scramble contest are slated for 1953. Masochistic, we call it.

Even Ron Hinks was drawn out of retirement for the Pilcher, topping the **LUTON D.M.A.C.** times in this event. The Gamage saw Roy Clements return a treble max., but the universal downdraught cut his fly-off to a modest two minutes.

Southern Area

Weather has smiled on all areas recently, and **GRANGE M.A.C.** members have taken advantage of the unusual clemency to test hordes of new models, many of them Wakefields, and quite a few of these up to 6 ft. in length. At that, best time returned in the Gamage was with a lightweight—E. John, who turned in a neat treble max. and a fly-off of 4 : 52.

East Midland Area

Much activity is also reported from **FAKENHAM M.A.C.,** notable f/f job being R. Cooper's o.d. fuselage with " Jaded Maid " wings and tail. The C/L half of the club is really getting in the team-race hours, E. Hall's B.B. Amco " Scramble " being among the fastest. Two models on one line were seen when Messrs. Tempest and Graham had a foul-up with their ½A team racers, Tempest's model snagging the other's lines with the prop. Both landed safely.

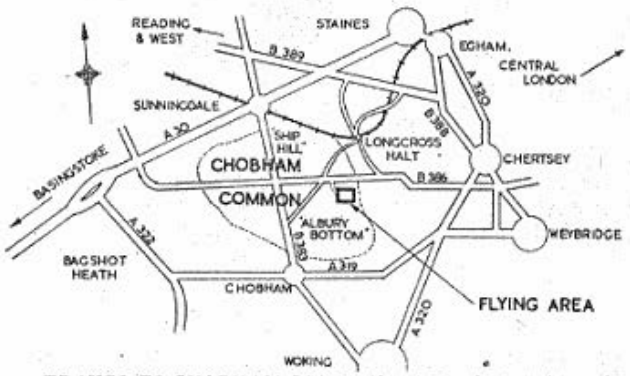
London Area

The loss of Fairlop has put a crimp in Area activities all round, including, apparently, club reporting. What about all club secretaries writing in and giving the location of their clubs' private flying grounds ? Many

CONTEST CALENDAR

Events for April and May

April	19th	**WESTON CUP** (1953 Wakefield Eliminator) (P). **ASTRAL TROPHY** (1953 F.A.I. Eliminator (P)	Area Centralised
	26th	**Croydon Gala.** Chobham Common.	
May	3rd	**A2 GLIDER** (1953 Trials). **AEROMODELLER R/C TROPHY**	Kidlington nr. Oxford
	10th	**Lady Shelley.** Tailless. **Jetex Cup.** Jetex.	Decentralised
		Western Area Championship Cup (open to S. Wales clubs).	Lulsgate Aerodrome, Bristol
	23rd/24th	**Thurston Cup.** Unr. Glider **M.A. Trophy.** Unr. Rubber. **Gold Trophy.** C/L Stunt. **Speed.** C/L Speed. **S.M.A.E. Trophy.** R/C. **Sir John Shelley.** Unr. Power. **Team Race.** C/L, Classes A and B. **PAA Load.**	British Nationals, R.A.F. Waterbeach, near Cambridge



TRAVEL TO CHOBHAM COMMON. A 30 minute train service from Waterloo to Longcross Halt runs at 24 and 54 minutes past the hour from 8.24 onwards. Return from Longcross Halt is at 3 and 33 minutes past each hour till 9.33. Earlier and later trains should be checked. Day return costs 6s. 6d. from Waterloo, but groups of modellers could take advantage of the railway "parties of eight at single rate" scheme. Within reasonable walking distance, the common is virtually tree-free, and covered with thick heather, guaranteeing soft landings. Undulating ground renders slope-soaring possible; biggest drawback is the lack of suitable R.O.G. and landing spaces for radio models and controliners.

free-lance fliers now affected by the Fairlop closure are just waiting to be roped into their nearest clubs, and publication of such a list would show these lone hands which club was geographically handiest for them to join. Yes ?

Two **BUSHY PARK M.F.C.** men decided to have a go at the Pilcher, but both were unlucky enough to lose their models first flight—P. Mason (Jader 60) 3 : 30 o.o.s., and D. Bishop (Marauder) 3 : 22 o.o.s. The club flies on Chobham Common, and also meets every other Tuesday (next is April 21st) at the R.A.F.A. Clubhouse, 71 Grove Road, Hounslow.

For the 8th, **CROYDON D.M.A.C.** also decided to try out Chobham Common, and also encountered good conditions. About 75 per cent. of the gliders did three minutes, and retrieving became a bit of a problem, since the models were covering a half-mile or so and recovery entailed scrambling through long grass, knee-high heather, bogs, and even rivulets. Three models were lost but have since been heard of. Roy Yeabsley showed that he still has the touch—three threes and 7 : 35 with an A2 for the Pilcher, and three threes plus 3 : 40 with a Wake in the Gamage. Desmond Yeabsley and J. L. Pitcher also recorded three threes in Pilcher and Gamage respectively, but couldn't catch Roy in the fly-off. Croydon Gala will this year be held on April 26th on this field ; rubber, glider, and power comps. to S.M.A.E. rules will be augmented by slope-soaring and chuck glider events.

Several of the 18 members of **KENTISH NOMADS M.F.C.** paid a "familiarisation" visit to Chobham. A2's and 1954 Wakefields are chief building projects, some having already reached the testing stage, among them new member J. Lower's A2, which performs with notable consistency.

7.30 Wednesday evenings, at the Cambridge Hotel, Woolwich, should be a date for all radio fans. The **SOUTH-EAST LONDON RADIO CONTROLLED SOCIETY,** newly-formed, invites anyone interested to come along to their regular meetings.

Ireland

C/L fans thinking of taking a holiday in Ireland will be interested in the meeting scheduled for the 21st June at Butlin's Camp, Mosney. Organised by the **DROGHEDA M.F.C.,** comps. include Open Stunt, A and B racing and Flying Scale. Engines, kits, and the Butlin Trophy are among the prizes ; pre-entry by June 10th is requested. Demonstrations of C/L flying will take place in this camp every Monday evening throughout the season.

An unusual new venture, the Flying Saucer Club, has been brought to our notice. Originated by a science-fiction enthusiast whose curiosity was aroused by continual reports of saucers, the club's aim is to collate and circulate all information, observations, etc., on a world-wide scale by means of a magazine. Hardly an aeromodelling project, but possibly of interest to some readers. Further information, badges, etc., can be obtained from the Secretary, F.S.C., 42 Rothbury Road, Hove 3, Sussex. Owners of souvenir teaspoons claimed to have fallen from the skies, and other bogus "saucerers" are not encouraged.

Finally, pen-pal seeker this month is 15-year-old J. H. Humphreys, 256 Bathurst St., Toronto, Ontario, Canada, who wishes to correspond with modellers in England, Scotland or Australia.

See you around,
The CLUBMAN.

NEW CLUBS

WEST HERTS. GROUP.
W. P. Holland, "Caswell," Bargrove Ave., Boxmoor, Herts.

WESTLAND APPRENTICE M.A.C.
P. G. Hiscock, 61, West Coker Road, Yeovil, Somerset.

INFANTRY BOYS BATTALION M.A.C.
22799849 Boy Tyler, 2 Platoon, I.B.B., Hildebrand Barracks, Harrogate, Yorks.

LOWER SCHOOL OF JOHN LYON A.C.
G. E. Harwood, Lower School of John Lyon, Middle Road, Harrow.

LENHAM M.F.C.
F. Wittake, 2, Cole Terrace, Lenham, nr. Maidstone, Kent.

SIDCUP A.S.
M. R. Bassett, 7, Selbourne Road, Sidcup, Kent.

SOUTH EAST LONDON RADIO CONTROL SOCIETY.
H. C. Frampton, 34, Stapleton Road, Bexleyheath, Kent.

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

SECRETARIAL CHANGES

BELPER & D.M.A.E.C.
J. Winter, 21, Green Lane, Belper, Derbyshire.

REDCAR M.A.C.
C. Skinner, 16, France Street, Redcar, Yorks.

WALLASEY M.A.C.
J. B. Hannay, 67, St. Andrews Road, Bebington, Cheshire.

SOUTHERN AREA.
A. C. Wemyss, "Glennifer", Wynter Road, Bitterne Southampton.

HORNCHURCH M.A.C.
L. Ranson, 155, Gorseway, Rush Green, Romford, Essex.

ST. FINNIBAR'S M.F.C.
Noel Barrett, 145, Bandon Road, Cork (affiliated to M.A.C.I.).

BRENTFORD & CHISWICK M.F.C.
David Bartlett, 1, Grove Close, Hayes, Bromley, Kent.

KNUTSFORD & D.M.A.C.
Geoff. Parker, High Morland Lodge, Leigh Road, Knutsford, Cheshire.

SOUTHPORT M. & E.C.
T. Nelson, 41, Hawkshead Street, Southport.

NORTH DOWN M.F.C.
T. Smith, 68, Brunswick Road, Bangor, Co. Down.

BOSTON & D.M.A.C.
S. C. Marshall, Fold Hill, Old Leake, nr. Boston.

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S. Tyson, 28a, Fisher Street, Workington, Cumb.

HASTINGS & BEXHILL M.A.C.
A. A. C. Heskett, 252, London Road, Bexhill, Sussex.

MEN OF KENT A.C.
M. Green, 31, Week Street, Maidstone, Kent.

STOCKTON & D.M.A.C.
A. W. Spurr, 9, Mosman Terrace, North Ormesby, Middlesbrough, Yorks.

NORTH-WEST MIDDLESEX M.F.C.
J. Bowerman, 40, Crundale Avenue, Kingsbury, London, N.W.9.

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B. Tempest, Bell Hotel, Norwich Road, Fakenham, Norfolk.

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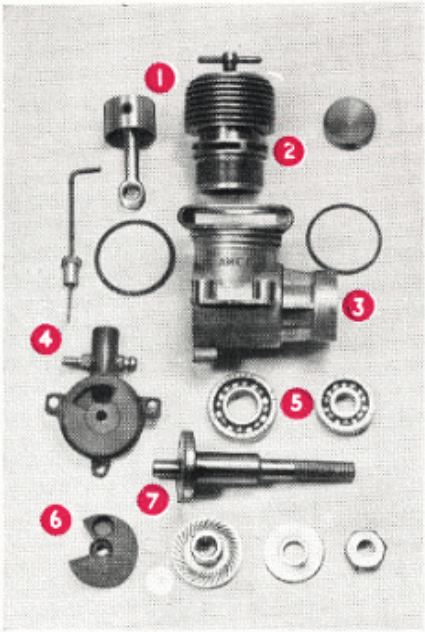

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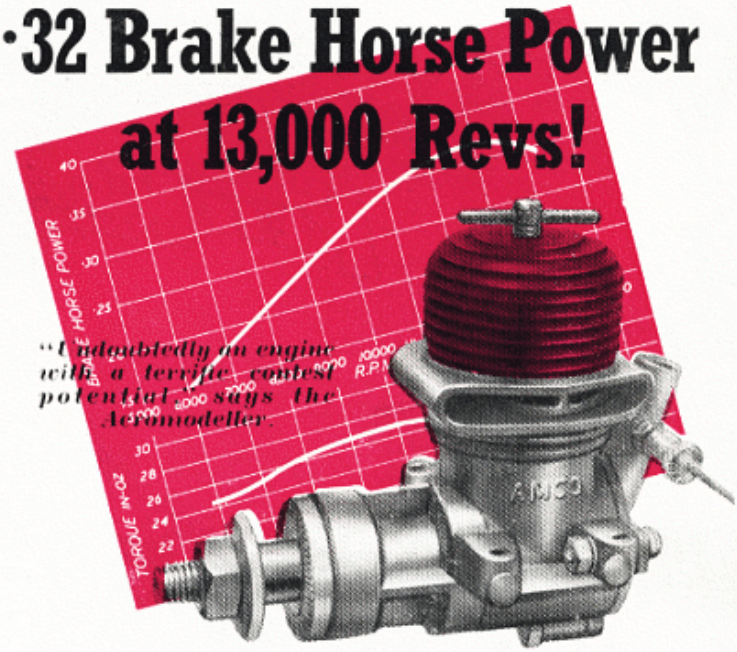

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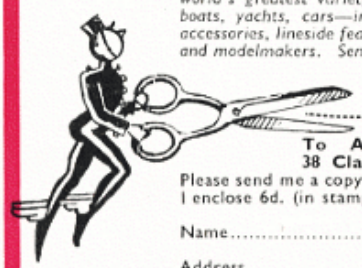

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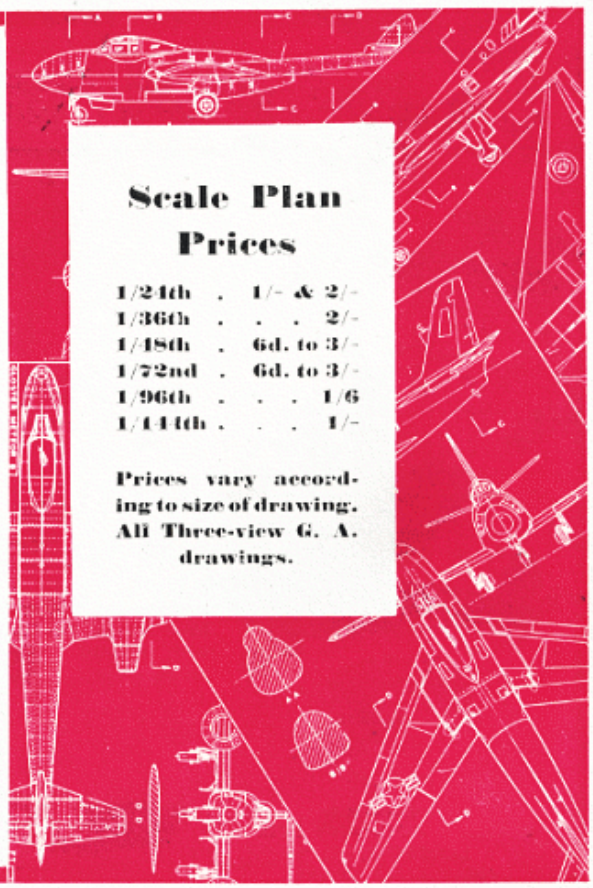

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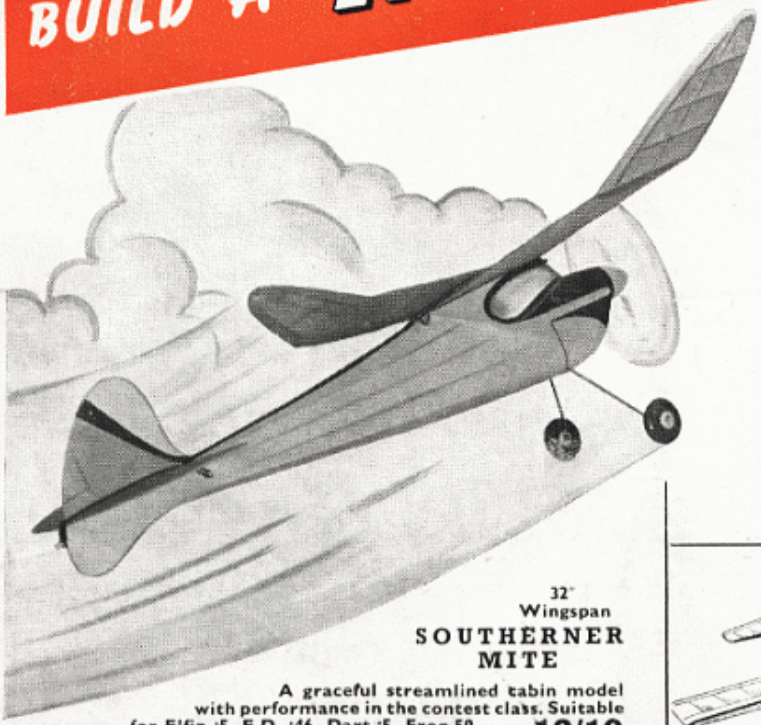

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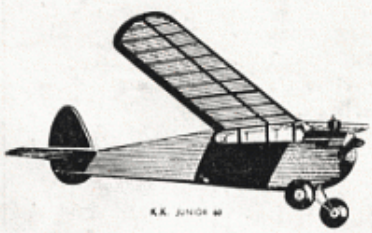

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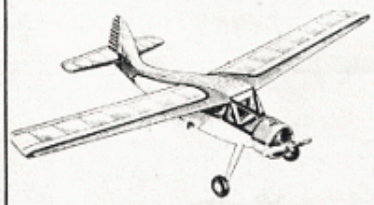

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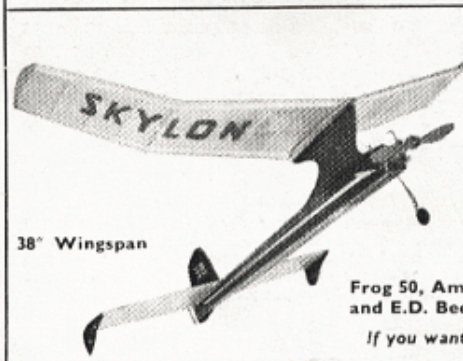

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