Aero Modeller

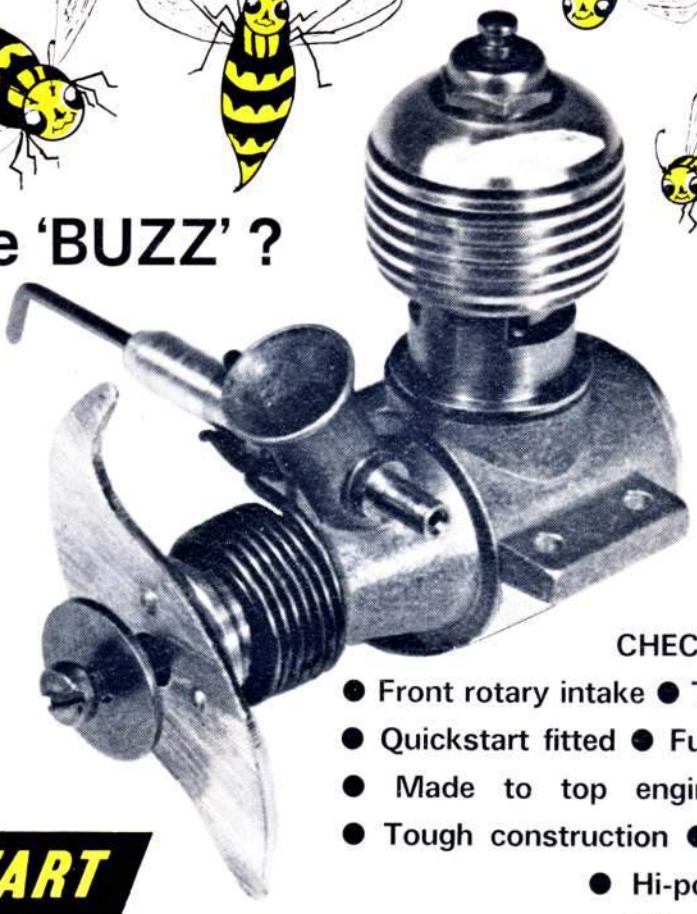
August 1971
15p
(USA & Canada 75c.)

INCORPORATING
MODEL AIRCRAFT

MAP **HOBBY MAGAZINE**

BRITISH NATIONAL CHAMPIONSHIPS
FULL SIZE PLAN FOR A/1 GLIDER

What's the 'BUZZ' ? A new engine arrives !



CHECK THE FEATURES!

- Front rotary intake
- Twin transfer ports
- Quickstart fitted
- Full accessory range
- Made to top engineering standards
- Tough construction
- Factory checked
- Hi-power and Lo-price
- Replaceable glow plug

THE QUICKSTART

WASP ·049

ONLY £2.99

see them at your model shop NOW !

accessories for the Wasp

Radial Tank/Mount **63p**

General Purpose Tank **31p**

Quick Glow Clip **36p**

Special Wasp Spanner **26p**

Exhaust Manifold (comes with collector) **60p**

DAVIES-CHARLTON LTD. **HILLS MEADOW DOUGLAS, Isle of Man**

LARGEST STOCKISTS IN THE COUNTRY, IF IT'S AVAILABLE WE HAVE IT

ISLEWORTH - LEICESTER

R.C.S. GUIDANCE SYSTEM Mk III
The best S/ch. outfit you can buy. 1 oz. Rx Airborne, wt 4 ozs. Excellent value **£12.0** Sup. **£19.50** Rx only **£5.50**, Tx **£7.0**

Compact Acc outfit	**£4.25**
Engine Control outfit	**£3**
Conquest Acc outfit	**£2.50**

BUY THE BEST! ONLY £12
Superhet Version £19.50
MORE SOLD THAN ANY OTHER MAKE

Merco Black Streak	**£21.14.6**
CS 19 R/C	**£9.4.8**
OS 30 R/C	**£8.18.0**
OS 40 Marine	**£15.9.1**
Super Racer R/C	**£10.5.0**

Merco 61 Series III	**£20**	OS 60 R/C Gold G.P.	**£25.28**
Merco 35 Glow R/C	**£11.20**	E.D. Racer 2.5 cc. R/C	**£8.42**
K&B 40 R/C 70F	**£18.97**	E.D. Sea Otter 3.49	**£12.75**
HP 61 R/C Rear	**£21.50**	E.D. Viking 5 cc. R/C	**£14.50**
Merco 61 R/C W/C	**£25.80**	Super Tigre G51 R/C	**£15.00**
Merco 49 R/C W/C	**£24.00**	Super Tigre 60 R/C	**£18.50**
Webra Glow Star R/C	**£10.90**	Super Tigre 71 R/C	**£30.00**
Webra Glow R/C W/C	**£13.60**	Super Tigre 60 latest	**£24.15**
K&B 40 RV R/C	**£19.50**	Enya 19 R/C	**£8.50**
HP 61F and Silencer	**£23**	Enya 15 R/C	**£7.60**
Merco 49 R/C III	**£20.65**	Enya 60 R/C	**£23.50**
Veco GT 19 R/C	**£15.40**	D.C. Spitfire Marine	**£6.00**
Veco GT 35 R/C	**£13.75**	D.C. Sabre	**£5.00**
Cox Babe Bee 8 cc.	**£3.60**	Ohesson-Rice 22cc. H.P.	**£28.00**
Cox Medallion .049	**£6.25**	Ohesson-Rice 22cc. ¾ H.P.	**£20.00**
Cox Medallion .09	**£8.40**	Veco 61 R/C	**£33.00**
Cox .02	**£3.97**	Taipan 19 R/C	**£11.50**
Sup Tigre G20/15 R/C	**£10.60**	Taipan 61	**£17.75**
Fox 36 x R/C	**£11.50**	Webra 61 R/C Black	**£39.25**
Sup Tigre G20/23 R/C	**£10.60**	Webra 61 R/C Bl. W/C	**£34.25**
Super Tigre G21/40 R/V R/C	**£18**	K&B 35 R/C with Kavan	**£9.97**
OS 40P R/C	**£14**	Kavan Carbs for all engines	**£4.25**
Webra 40 R/C	**£22.97**	Perry Carbs for 40/61	**£6.97**

R/C KITS

SINGLE CHANNEL

Matador **£2·70**; Schoolboy **£2·80**; Schoolmaster **£5·00**; Headmaster **£9·37½**; Mini Robot **£4·25**; Mini Concord **£6·80**; Mini Super **£8·95**; Junior Falcon **£4·75**; Gyron **£5·95**; M.F.A. Linus **£3·95**; Dazzler 36" **£4·95**; Dazzler 48" **£6·30**; Taxi **£10·18**; Planet Nipper **£4·75**; Jolly Roger **£13·20**; Yamamoto **£11·95.**

MULTI CHANNEL

KK Super 60 **£10·95**; Fleetwing **£10·95**; Dazzler 48" **£6·30**; Senator **£8·25**; Skyqueen 58" **£8·97**; Falcon 56" **£12·80**; Royal Coachman **£7·50**; Superbipe **£13·77**; Kwik/Fli **£19·50**; Concord **£18·75**; Robot **£7·25**; Intruder **£19·25**; Student **£12·60**; Chevron De Luxe **£24·00**; Senior Falcon **£23·50**; Vertigo **£13·96**; Consul **£9·95**; Tauri **£15·29.**

SCALE

Piper Cub **£8·12**; Skylane 42" **£6·72**; Skylane 62" **£23·50**; Piper Super Cruiser **£19·95**; Tiger Moth 33" **£3·50**; Ripman Eindecker **£14.27**; PT-17 **£27·95**; Cherokee **£17·95**; Twin Commanche **£14·37**; Spitfire, Mustang, King Cobra – all **£21·87**; SE5a **£27·95**; Tomtit **£22·00**; Shoestring **£18·62.**

GLIDERS

Amigo II **£7·67**; K10 **£9·62**; Zephyr **£8·95**; Elmira **£9·95**; Springbok 72" **£9·00**; Merlin 98" **£14·50**; Cirrus **£18·50**; Foka **£13·00**; Impala 52" **£5·85**; Big Eagle **£12·80**; Ivinghoe **£8·25.**

MULTIMETER

Ranges: D.C. 15, 1,000v. A.C. 15, 150, 1,000v. D.C. current 150mA. Resistance 100K **£3.25** Superior type with more ranges inc. D.C. current down to 50uv. Resistance tp 16 meg. **£6.50** illustrated).

Authentic scale instrument panels 4" x 2" or 3" x 1½". Private and comm. aircraft types 25p each.

SILENCERS			
Merco 49/61 Peak Power	**£335**	Super Tigre 60	**£3.70**
Merco 35 Spinaflow	**£2.10**	Super Tigre 71	**£3.75**
Merco 61	**£2.30**	OS 15/19	**£1.35**
OS 19	**£2.10**	OS 29/49	**£1.60**
OS 15	**£2.10**	D.C. Merlin	**60**
OS 58/60	**£2.15**	D.C. Sabre	**60**
H.P. 61	**£2.45**	Talpan 10	**£1.70**
Super Tigre 40	**£3.30**	Webra 61	**£2.45**
E.D. Power pipe No. 1	**£3.60**	E.D. Power pipe No. 3	**£4.76**
Manifold	**£1.65**	Manifold No. 3	**£1.50**
		E.D. Power pipe 2 com	**£5.60**

R/C ACCESSORIES

ENGINE MOUNTS: Metal 79p **60p**; 29/35 **90p**; 49/61 **£1**; MFA: 29/40 **75p**; 45/61 **87p.** Micro Nylon, 06/10 **36p**; 15/19 **41p**; 23/35 **45p**; 40/60 **49p.** **SQUARE KAVAN CLUNK TANKS** 4oz. **73p**; 6oz. **76p**; 8oz. **80p**; 10oz. **85p**; 14oz. **90p.** **FRANKLIN CLUNK** 10oz. **40p**; 12oz. **43p**; 8oz. **37p.** 6oz. **33p**; 1oz. **29p**; 4oz. **33p.** **FUEL FILTER 29p. FUEL TUBING 14p** pkt. **WHEELS: KK** Low Bounce or Standard 2½" **87p**; 2¾" **£1.10**; 25 **£1.35**; 3½" **£1.35**; 4" **£1.85.** **DUBRO WHEELS:** 1¾" **87p**; 2" **£1**; 2½" **£1.13**; 2¾" **£1.25p.** 3" **£1.63p**; 3½" **£2.** **WILLIAMS VINTAGE:** 3½" **£1.93**; 3¾" **£2.20**; 4½" **£3**; 35" **£4.** **WILLIAMS SCALE:** 2½" **£1.37**; 3½" **£2.23**; 5½" **£4.** **NOSE LEGS:** Fixed Single **16p**; Steerable Nylon Bearings **97p**; Rimmax **£1.13**; Micro 9cc. Brakes **57p** pkt **WILLIAMS GUN KITS** 2"—10" (6" length) Vickers, Lewis Spandau **80p.**

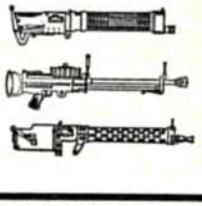
KWIK LINKS Sorocco Nylon **24p** pr. Micro Acc. Nylon **19p** pr. E.D. Nylon **12p**; Dubro Metal **24p**; MFA Metal **41p** pr. Link to Bowden Cable **37p** pr. **BELLCRANKS:** Dubro 120 deg. **33p**; Micro 120 **19p**; Micro 90 **25p.**

KAVAN SPINNERS: Nylon Chromed 1¾" **45p**; 2" **52p**; 2½" **59p**; 2¾" **66p**; K.K. 1½" **15p**; 1¾" **15p**; 1¾" **17p**; 2" **19p**; 2½" **57p**; 25" **65p**; Monokote **£1.25** sht. Super Monokote **£1.57** yd. Solar film **71p**; Special Iron **£4.35**; Nylon **37p**; Silk **46p**; Tissue **2p** sht. Charliecote **63p.** **PILOTS** : Williams Std. Racing Military 1" **37p**; 1½" **53p**; 2" **63p**; Mercury 2" **26p**; Nato **20p.** **CANOPIES** 8" **29p**; 11" **40p**; 14" **50p**; 17" **75p.** **GIANT TRANSFER SHEETS:** 2" **25p**; 3" **30p**; 4" **33p.**

PROPELLERS:

	Toronado	Top Flite
7 x 8	22	36
8 x 6	34	36
8 x 8	34	48
9 x 6	42	48
10 x 4	46	55
10 x 6	46	55
11 x 6	52	62
11 x 8	62	78
12 x 6	75	87

All Wood Types in stock



STILL POPULAR

R.C.S. INTER 6 OUTFIT
R.C.S. Inter 6 still very popular for Gliders, Boats and small A/C. Superhet **£40.** Super Regen **£30.**

MISCELLANEOUS

Kaco Relay **35/-**; 2v. Accum. **32/-**; Micro Switch **15/-**; Mini Type **22/6**; Bonner Sticks **£6.18.0**; 66" Aerial **27/6**; Short Swivel Type **12/6**; RCS 4 way Plugs and Sockets, Gold Plated **8/9**; 10 pin A.E.I. **8/6**; 6 way Mini **6/-**; 8 way Mini **8/-**; 2 Pole Slide Switch with Cover **9/6**; Xtals 27 mc/s **20/-**; Matched pr. **40/-**; 40" Tx aerial **12/6**; Short swivel End ideal for Boats **12/6**; 68" R.C.S. Tx Aerial **27/6**; Nylon Base for R.C.S. Type **6/6**; Battery Box 3 or 4 cell **7/6**; DEAC Snap connectors **3/6**; Ripmax Multi Tester **130/-**; MFA Styro Cutter and Transformer **119/3**; MFAWire Bender **59/11.**
ELECTRIC MOTORS: Micro Max 60-1 **126/-**; Micro Max T05 **82/6**; Gear Box 40-1 **31/-**; Gear Box 140-1 **37/-**; Milliperm **28/6**; Microperm **22/6**; Hecto Perm **65/-**; Taycol Std. **101/7**; Taycol DB/Special **165/-**; Taycol Super **135/11**
ACCESSORIES: Finger stalls **3/11**; 30" Bowden Cable inner/outer **5/11**; PTFE Type **9/11**; Kraft Snakes **10/-**; Swing Keepers **5/11**; Saddle Clips **2/6** pkt; Elevator Horn **6/6** pkt; M.F.A. type **3/5**; Kavan Plug on Kwik Clips **13/6**; Ripmax Plug on **17/6**; Small Type less Leads **3/-**; Complete with Batt. Plug and Lead **5/6**; Fibre Glass Pack and Materials **12/6**; E.D. File Right **15/-**; Xacto No. 1 Knife **4/6**; Xacto No. 5 Knife **8/10**; Xacto Knife Set **16/3**; Polyurethane Varnish **7/6** ½ pint; Polyurethane Paint **7/6** ½ pint; Large stocks of Wood, Dopes, Paints, Wire, etc., etc. **BOOKS:** R/C Manual **13/6**; Multi Manual **12/6**; Plans Handbook 1, 2 and 3 **2/6.**
All types styro Veneer poly. wings in stock.

DEAC RECHARGEABLE CELLS

	225	360	700
4.8v.	**£2.35**	**£3.30**	**£6.10**
6v.	**£2.90**	**£4.25**	**£7.60**
7.2v.	**£3.50**	**£5.10**	

All types stocked.

R.C.S. CHARGERS
New mini metered variable current Charger for most types of DEAC 240 volt A.C. Size 4" x 2" x 1½". Price **£4.00** illus. above 2v. Acc. charger (illust.) only **£2.50** RCS Metered and variable with 2v. Acc. output for simul. charge (illus. right) **£6.50** Chargers R.C.S. Metered with 2v. Acc. Output for Simul charge. Variable output **£6.50** Battery box 3 or 4 cell 37½

560 0473 **RADIO CONTROL SUPPLIES**
581 LONDON ROAD, ISLEWORTH, MIDDX
52a LONDON ROAD, LEICESTER
53 BRADFORD ROAD, WAKEFIELD. WAK 77363

"VERON" for VALUE

EXPERTS' CHOICE – FOR RADIO-SINGLE & MULTI & BEGINNERS' SPORT

MINI-ROBOT

36" span

For motors up to 1 c.c. Lightweight Single Channel for rudder only with rubber driven escapements. Ideal for **R.C.P.** Relayless – either Super-Regen or Super-Het!

KIT PRICE **£4·25**

MINI CONCORD

40" span

For 1 to 1.49 c.c. using Single Channel for Relay or Relayless with Rudder and Flip-up elevator or Pulse.
Ideal for **R.C.P.** Relay, Super-Regen or Het!

KIT PRICE **£6·80**

CHEROKEE C180

Designed for Intermediate (3 Channel 'Propo') giving Aileron, Elevator and Engine Speed and up to Full House (4 'Propo'). For '19' to '40' Motors. Just the machine for the **WEBRA 40**

56' span

KIT PRICE **£17·95**

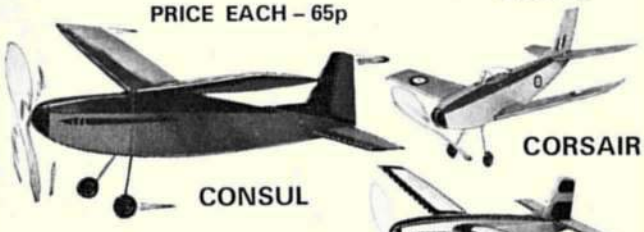
MAKES A VERSATILE TRAINER FOR SPORT FLYING!

QUARTET OF COMBI-KITS!

Neat and Spectacular foursome of Primary Rubber Duration models. All Die-cut formers and ribs, selected Stripwood. Ready Carved Propeller. Ideal for first ventures in free-flight!

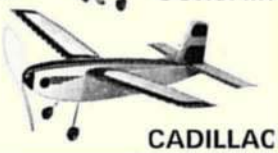
COUPE

PRICE EACH – 65p



CORSAIR

CONSUL



ALL 20" SPAN

CADILLAC

VERON are now Sole Distributors for

R.C.P. RADIO

Radio Control Products are pleased to announce a new range of Single and Multi Channel equipment. By using new techniques with a low component count we are able to manufacture Units, with increased reliability at a much lower cost.

No sacrifice has been made in quality. Transmitter and Receiver performance is more than adequate for all normal applications. The dimensions and weights of the equipment compare very favourably with other currently available products.

All units are carefully tested before sale and fully guaranteed.

ECONOMY PRICE – SUPERLATIVE PERFORMANCE

SUPER-REGEN (ABOVE)

RECEIVER – RELAYLESS 3.5 x 2.8 x 2.0 cm. Weight 20 grms.
RECEIVER – RELAY 5.5 x 3.8 x 2.3 cm. Weight 40 grms.
Supply Voltage 9 volts (P.P.3).
TRANSMITTER 10 x 13 x 5.5 cm. Audio-tone Frequency 600Hz.

PRICES

Transmitter	Rx. Relayless	Rx. Relay
£7.35	£4.60	£5.90

SUPER-HET (RIGHT)

RECEIVER – RELAYLESS 5.5 x 3.8 x 2.3 cm. Weight 40 grms.
RECEIVER – RELAY 5.5 x 3.8 x 2.3 cm. Weight 40 grms.
Supply Voltage 9 Volts (P.P.3).
TRANSMITTER As for Super-Regen above.

Tx's have colour-coding frequency tags on case.

PRICES

Transmitter	Rx. Relayless	Rx. Relay
£9.15	£11.85	£13.10

Harness: (for each) 90p.

Battery Box 38p.

Webra

THE FINEST ENGINES FOR YOUR MODELS

DISTRIBUTED BY VERON

40 RC

TWO BIG BROTHERS LEADERS IN RADIO CONTROL

The '61 R.C.' has earned a world wide reputation as one of the finest and most powerful 'big' engines. The '40 R.C.' is in every way comparable.

61 RC

WINNER OF WORLD CHAMPIONSHIP 1969

61 RC
STANDARD ... £34.84
MARINE £39.29
Silencer £2.87

40 RC
STANDARD ... £22.98
Silencer (with Bleed) £3.46

MODEL AIRCRAFT (B'MOUTH) LTD . NORWOOD PLACE . BOURNEMOUTH

DISTRIBUTORS IN CANADA: **ACADEMY PRODUCTS LTD., 51 MILLWICK DRIVE, WESTON, ONTARIO.**
DISTRIBUTORS IN AUSTRALIA: **PIZZEY LTD., 1 CLARK STR., RICHMOND, MELBOURNE.**

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

August 1971 Volume XXXVI No. 427

CONTENTS

HANGAR DOORS	421
BRITISH NATIONALS	422
'TRI-STAR'	434
FLYING SCALE MODELS – PART VI	436
LATEST ENGINE NEWS	440
TOPICAL TWISTS	443
GOLDEN WINGS	444
'DOUGLAS 0-38'	445
BOOMERANG	448
READERS' LETTERS	449
CLUB NEWS	450

Second-class postage rates paid at New York, N.Y. Registered at the G.P.O. for transmission by Canadian Post. American enquiries regarding subscriptions, news stand sales and advertising should be sent to AERO MODELLER, Eastern News Distributors Inc., 155 West 15th Street, New York, N.Y. 10011 U.S.A. U.S.A. and Canada direct subscription rate $6, including Index.

Advertisement and Subscription Offices: Model & Allied Publications Ltd., 13/35 Bridge Street, Hemel Hempstead, Hertfordshire. Tel. Hemel Hempstead 2501-2-3.

Direct subscription rate £2.35 per annum including December edition and Index.

CORRESPONDENCE anticipating a reply to addresses within the United Kingdom must be accompanied by a stamped and self-addressed envelope. News reports should be submitted to arrive not later than the 15th of each month for publication in the next immediate issue. Photographs should be accompanied by negatives where possible and can only be accepted for use on an exclusive basis for British Copyright.

AERO MODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication by:

MODEL & ALLIED PUBLICATIONS LTD.
13-35 Bridge Street, Hemel Hempstead, Herts
Tel.: Hemel Hempstead 2501-2-3 (Mon.-Fri.)

WORLD CHAMPIONSHIPS FOR FREE FLIGHT MODELS

Gothenburg, Sweden

2/3/4 July

Held in excellent weather conditions, with each contest separated into morning and evening rounds to avoid the period from 10 a.m. to 6 p.m., this biggest-ever meeting provided three new and well-experienced champions.

WAKEFIELD (Individual)
1. Josef Klima, Czechoslovakia, 1260+232
2. Vilim Kmoch, Jugoslavia, 1260+226
3. Robert P. White, U.S.A. 1260+214
4. Reiner Hofsass, W. Germany, 1260+210
5. Amedo Lonardi, Italy, 1260+199

Twelve entrants scored 1260 to qualify for the fly-off. Laurie Barr was highest placed British entry at 27th with 1216.

WAKEFIELD (Team)
1. Denmark 3762; 2. France 3726; 3. U.S.S.R. 3723.

POWER (Individual)
1. Rolf Hagel, Sweden, 1260+240+300+328
2. Thomas Koster, Denmark, 1260+240+300+321
3. Boris Onufrienko, U.S.S.R., 1260+240+300+289
4. Eugene Verbitski, U.S.S.R., 1260+240+300+287
5. John Foley, Canada, 1260+240+300+284

Nineteen entrants qualified with 1260, twelve with 1500, eight with 1800. Ray Monks was highest placed British entry at 30th with 1235.

POWER (Team)
1. Sweden 3780; 2. U.S.S.R. 3742; 3. Denmark 3741; (U.K. 6th, 3647).

A/2 GLIDER (Individual)
1. Ivan Horejsi, Czechoslovakia, 1260+168
2. Niilo Munnukka, Finland, 1260+156
3. Herbert Cmelik, Austria, 1235
4. Tony Young, U.K., 1251
5. Hugh Langevin, U.S.A., 1245

A/2 GLIDER (Team)
1. Austria 3619; 2. U.S.S.R., 3610; 3. U.S.A., 3577; (U.K., 3462).

on the cover

A minor sensation was caused at the Nationals, when German visitors Schwarz/Kaul beat all the 'local' opposition to win the F.A.I. team race event. Karl Schwarz (wearing the safety helmet and pressurised refuelling system on his left arm) performed a magnificent job of restarting and fuelling the Austrian HP 15 diesel engine, installed in the functional model, featuring glass fibre covered wings and tail surfaces.

next month

Fully illustrated report by John O'Donnell on the biggest ever **World Championship** for Free Flight Models in Sweden. Plans for **Jaguar,** a 61½ in. Thermal or R/C Soaring Glider. Scale drawings for **Kania,** a Polish Glider Tug/Trainer, which has ideal characteristics for flying scale. **Engine Test.** First report on **European Control Line Champs.**
On sale July 16th.

Made and printed in Great Britain by Graphic Art Services (Brighton) Ltd., Burgess Hill, Sussex, for the Proprietors, Model & Allied Publications Ltd., 13/35 Bridge Street, Hemel Hempstead, Herts. Published by Argus Press Ltd., 12–18 Paul Street, London, E.C.2, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

Announcing the BiC Regd. Trade Mark National Model Making Championship

If you have a few used ball pens and a creative mind . . . prove it!

Even when they are the world's finest ballpens, as Bic undoubtedly are, they have to run out of ink sometime! For years a further use has been sought for those empty barrels, destined after gallant service to end their days in sideboard or office desk, side by side with less worthy writing instruments.

And here is the answer!

Because Bic Crystals write first time every time there are far more sold in the U.K. than any other model. In fact, each year a Bic Crystal is sold for every man, woman and child in the Country with a few million more for good luck.

Where do they go to?

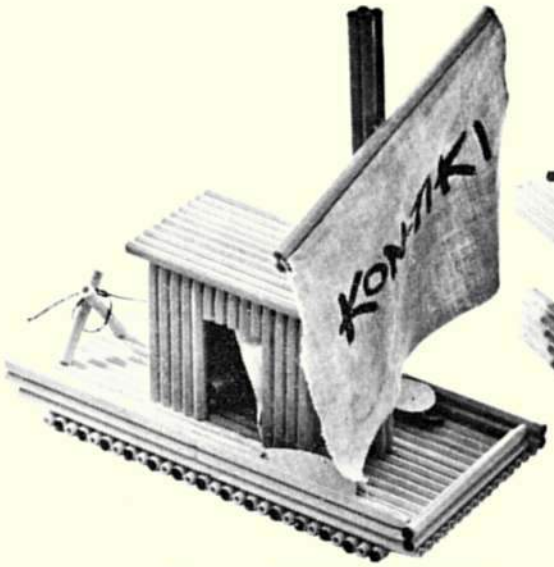
It is human nature to squeeze the last drop of ink from a ballpen or to believe that it may write again after a short rest. This is why you will probably find more than you expect in your own home. In offices and factories you should find them by the hundred.

All you have to do . . .

. . . is to start collecting used Bic Crystal medium and fine ballpens now so that you may complete a suitable model and enter the competition.

There will be cash prizes for the best models every three months, both senior and junior and finally the best modeller overall at the end of the year will be awarded a further cash prize of £250 and the handsome Bic championship trophy.

Take your time, read the rules overleaf, then send your model with coupon.



BiC Regd. Trade Mark

the pen they model on

BIC

Regd. Trade Mark

Model Making Competition

Start collecting your pens now but—
one word of warning—

make sure they are genuine Bic Crystal Medium or Fine Point ballpens carrying the Bic Registered Trade Mark because only these are eligible

RULES

1 The participants of the Bic Model Making Competition will be judged on their originality and technical model-making expertise.

2 The competition will be divided into two parts:
Junior: Participants, either sex, under the age of 16 at time of entry. Within this group no heat or flame technique for moulding may be used, but any other form of adhesion may be utilized.
Senior: Participants, either sex, over 16. Within this group, any form of adhesion is accepted. Heat to bend or shape the pens may be used.

3 Entries for the competition must be accompanied by the official entry form below.

4 Any number of BIC Ballpen barrels may be used. All models must be constructed utilising any part of BIC Crystal Fine (Yellow) and Medium (Transparent) ballpens.

5 BIC Crystal barrels may be cut to shape or size, but each barrel must clearly show the Registered trade name BIC (as imprinted on the barrel). Where models are moulded by heat, there must be at least 10 parts where the BIC Registered trade mark is clearly shown.

6 Accessories other than BIC parts may be used *only* to make the model functional or to infer final design, i.e., wheels, transfers, cotton, string, paper, etc.

PRIZES

7 Prizes will be awarded to competitors who, in the opinion of the panel of judges, produce the most creative, unusual or skilful entry for each quarterly competition.

8 **Quarterly prizes will be awarded as follows:**
Senior section—first prize £25.
second prize £15.
third prize £10.
10 consolation prizes of £5 each.
Junior section—first prize £15.
second prize £10.
third prize £5.
10 consolation prizes of £2 each.

9 Models winning any of the three prizes in either Junior or Senior levels of any of the quarterly competitions will automatically be entered in the BIC National Championship Competition and the individual competitor whose model is selected by the judges to be of greatest merit will receive an additional cash prize of £250 together with the 1971 BIC Model-Making Trophy.

10 **Entrants should send their models to:**
The BIC Model-Making Competition,
c/o Montague House, 23 Woodside Road,
Amersham, Bucks.
Should a model be considered delicate for conventional postage, then a photograph (colour or black and white) may be despatched beforehand. This will be used for preliminary judgement. Entry forms should be clearly attached to each model or photograph entered.

11 No responsibility can be taken for the damage in transportation of any model received. Judges will, however, take into account such unfortunate circumstances and the model will still be eligible for participation within the contest.

12 Should participants require a model returned, then return postage must be included by way of enclosing the appropriate stamps.

RESULTS

13 The 1971 competition will be held during 3-monthly periods and results will be announced during August 1971, November 1971, February 1972.

14 Participants should ensure that their models are despatched to arrive by 1st June (for August judging), 1st September (for November judging) and 1st December (for February judging).

15 Any model received after this date will not be eligible for the relevant Quarter but will qualify for the next Quarter's competition.

16 Any prize winning model will become the property of Biro-Bic Ltd., and may be used in any way they think fit.

17 Employees, relatives or direct associates of Biro-Bic Ltd., Model and Allied Publications Ltd., as well as their advertising agents will not be eligible for this competition.

18 The decision of the Judges is final and no correspondence can be entered into in relation to prizes awarded or decisions made.

I understand and abide by the Rules

Name_____
(BLOCK LETTERS PLEASE)

Address_____

_____

_____ Age_____

WHERE DID YOU COLLECT YOUR BIC PENS? _____

4A

NEW! PLANS HANDBOOKS

Aeromodelling

128 pages featuring hundreds of working model aircraft, illustrated almost entirely by photographic reproductions of the actual models, plus span, brief description and graded for ease of construction. Also selected engine list with tabulated data; index to illustrated plans, X List of vintage unorthodox novel plans, many other classifications, useful articles, order forms. Also good selection of trade advertisements.

Model Boats & Cars

96 pages of plans of scale and semi-scale ships, tugs, lifeboats, submarines, paddle steamers, period ships, racing yachts, hovercraft, cabin cruisers, mostly illustrated, fully described, and classed for ease of building. Working model cars and usual vehicles are included and a range of scale car drawings, racing cars, ancient and modern. Index of drawings; useful articles on building; waterline plans; trade advertisements.

Model Engineering

96 pages of working model drawings for steam locomotives, traction engines, steam engines, petrol engines, workshop equipment from LBSC, Westbury, Evans, Maskelyne, Bradley, Hughes. Plus useful model engineering information, screwcutting tables, standard threads, letter and number drills, wire and sheet metal gauges, miscellaneous information.

15p each

MODEL & ALLIED PUBLICATIONS LTD.,
13/35 Bridge Street, Hemel Hempstead, Herts.

Graupner

AT YOUR MODEL SHOP

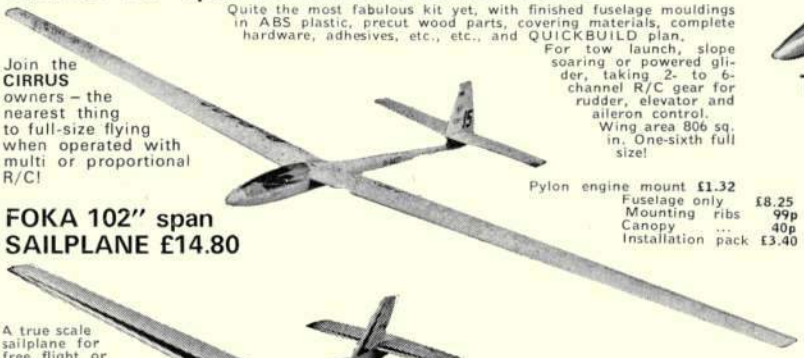
DANDY F/F or R/C GLIDER £6.90

Highly prefabbed kit for QUICKY construction! Super kit includes die-cut sheet, preshaped fuselage parts, 63" span. milled and slotted stripwood, canopy, cement, covering, decals, adhesives, etc. Takes 2- or 4-channel radio and adapts to pylon power. Pylon engine mount 92p.

CIRRUS 118" span SCALE SAILPLANE £18.75

Quite the most fabulous kit yet, with finished fuselage mouldings in ABS plastic, precut wood parts, covering materials, complete hardware, adhesives, etc., etc., and QUICKBUILD plan. For tow launch, slope soaring or powered glider, taking 2- to 6-channel R/C gear for rudder, elevator and aileron control. Wing area 806 sq. in. One-sixth full size!

Join the **CIRRUS** owners – the nearest thing to full-size flying when operated with multi or proportional R/C!



Pylon engine mount £1.32
Fuselage only £8.25
Mounting ribs 99p
Canopy ... 40p
Installation pack £3.40

True DE LUXE kits... with the accent on super quality... and COMPLETENESS

FOKA 102" span SAILPLANE £14.80

A true scale sailplane for free flight or R/C. Suitable for both tow launching and slope soaring. Wing area 710 sq. in. Weight 12-56 ounces

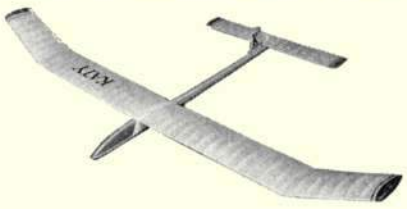
This outstanding kit includes a FINISHED ONE-PIECE FUSELAGE incorporating wing mounts and fairings moulded in high-strength plastic, with other parts in balsa and ply (mostly fully shaped), fully shaped wire parts, canopy, covering material, adhesives, decals, etc., etc.

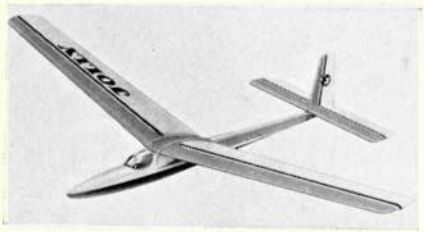
Foka canopy ... 63p
Foka fuselage only £5.20
Wing grommets (pkt 10) 99p

Note: although a scale model, performance of the FOKA is comparable with any other contest type – plus the added attraction of aerobatic capability with radio control.

BEGINNER ... £2.70

This 38" span 'quickbuild' model features die-cut balsa sheets, mouldings, dowels, ready formed wire parts, tissue covering cement, decals, etc. Makes an ideal model for junior club contests!





KATY A-2 SAILPLANE £8.15

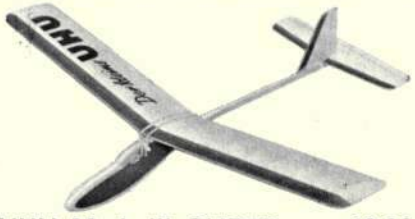
67" span free flight contest model. QUICKIE kit includes milled fuselage nose; wing fairing and other miscellaneous parts moulded in plastic, die-cut balsa parts and all other items needed to complete this superb high-performance model.

JOLLY A-1 SAILPLANE ... £3.55

Designed as a QUICKIE model for simple, fast assembly, this kit is extensively prefabricated and is very complete, including tissue, adhesives, decals, and pre-cut wood parts. Span 45". Pylon mount 92p

FILOU SAILPLANE ... £4.85

A classic Graupner kit complete to the last detail. The FILOU is a sports type glider of modern design for free flight or radio control. Converts to auxiliary sailplane with pylon engine mount (92p). 50" span.



Recommended engine for power flying Cox Tee Dee 051 or 049 or similar

UHU Mark III GLIDER ... £2.80

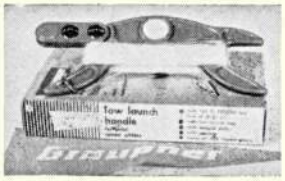
Designed as a beginner's glider, so all parts are extensively prefabricated and assembly has been kept as simple and straightforward as possible – but without sacrificing performance. Towline stability and soaring qualities are outstanding. Span 43¾".

NANCY A-1 ... £4.15

QUICKIE kit with milled and slotted fuselage nose, die-cut and printed sheet wood, milled strip wood, dowels, shaped wire parts, etc., etc. 48¾" span high performance model which includes a DETERMALISER and AUTO-RUDDER!

AMIGO II £8.30

Of conventional construction, this kit is very well engineered to produce a true contest type model which is also robust and docile enough for 'Sunday flying'. Pylon engine mount £1.19.



OTHER GLIDER KITS (not illustrated)

FOUGA SYLPHE 25¾" span ... £1.78
Scale type for Jetex power.

WEIHE 50 70¾" scale £6.6.0*
SCHLEICHER K-10 79" £9.12.6*
HS91 CLOU 74/96" span... ...£15.10.0*

* now out of production

GLIDER ACCESSORIES

TOWLINE HANDLE and LINE ... 36p
TEMPO GEARED WINCH ... £3.52½

U.K. DISTRIBUTORS

RipMax Ltd 80 HIGHGATE RD LONDON, N.W.5

other Graupner Agents include—

U.S.A.: POLKS MODEL HOBBIES, 314 Fifth Avenue, New York, 1, N.Y.

AUSTRALIA: PAUL GROSMANN 16a Tinsara Road, Ashfield N.S.W.

HONG KONG: RADAR CO: LTD., 2 Observatory Road Kowloon H.K.

CANADA: G. BOOK & CO., 45 Wingold Avenue, Toronto 19, Ont.

S. AFRICA: PHIL de BRUYN 85 Pritchard Street, Johannesburg.

N. ZEALAND: BURTON BRAILSFORD 261 Willis Street, Wellington, C.1.

MAP The Finest Range of Model Technical Books in the World!

8 FLYING SCALE MODELS

All types of scale flying models are described in turn-glider, free-flight and control line; Jetex, diesel, rubber or ducted-fan types. Much useful information is given on achieving highly realistic finished and detailed parts and there is a useful set of tables listing camouflage and insignia from 1914 up to date.

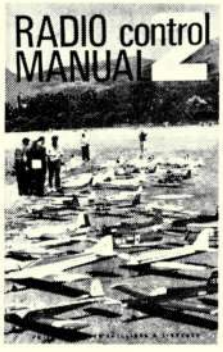
8½ x 5½ in. Hard bound. Over 300 diagrams, sketches, photo-illustrations. 40,000 words. Lists of Aircraft Manufacturers, useful Organisations and References. Includes several useful aircraft scale drawings. **62½p**

158 MODEL CAR RACING BY RADIO CONTROL

The first book entirely devoted to the subject by American expert George Siposs, suitably edited for British market and availability of parts in this country. Covers the construction and operation of one-eighth scale Grand Prix and G.T. cars in detail with chapters on engine, power train, suspension system, chassis-frame, bodies and their mounting, accessories and equipment. Chassis tuning, pre-race preparation, driving and trouble shooting covered. Installation of radio control equipment detailed, and brief particulars of R/C needs. Appendix gives suggested Racing Rules. Drawings and description for building a car, also particulars of a number of construction kits available.

8¼ x 5¾ in. (A5). 87 pages. Profusely illustrated in photo and line. Full colour card cover drawn on. **75p**

107 RADIO CONTROL MANUAL – 2



Ron Warring discusses control surface design, Peter Chinn on R/C engine developments. Don Careless provides expert advice on the art of multi-model racing. Don Baxter on the operation of R/C water planes. Peter Waters, passes on the secrets for successes in R/C Goodyear racing. 17 scale drawings of some of the world's leading model designs.

8½ x 5½ in. 128 pages. 83 photo-illustrations, 49 diagrams, 17 model plans. Bound in hard boards with full-colour cover photo. **67½p**

58 MULTI CHANNEL RADIO CONTROL

This book has been introduced to help the beginner over his problems. Here the beginner will find explained in simple terms the working of multi-channel equipment.

8½ x 5½ in. 96 pages. Full-colour photo cover, hard boards. Numerous line and photo illustrations on high-quality gloss paper. **52½p**

134 RADIO CONTROL MANUAL 3

Features include Single Channel Contests. How to run an R/C Rally, a review of instant Covering Materials; An Approach to the Multi Aerobatic Schedule by Doug Spreng; Scale R/C by Dennis Thumpston; and a pictorial report on the 1969 World R/C Championships and Scale Internationals. 38 scale drawings, all fully dimensioned, of the best of the World's R/C model designs of all categories.

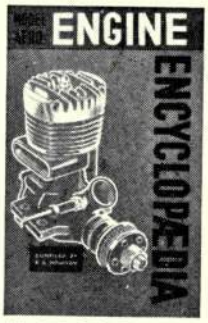
8½ x 5½ in., 120 pages. Hard-board cover with full-colour illustrations. **75p**

59 SINGLE CHANNEL R/C

General definitions, simple receivers and transmitters and then go on to cover actuators, escapements and servos. Suitable aircraft types and their power plants plus consideration of possible manoeuvres. Control systems for single channel – mainly rudder, but also engine control. Then boat and vehicle systems. Installation of equipment operation, testing, fault-finding and trouble shooting are covered. Finally, valuable tables deal with available equipment, receivers, transmitters, servos, actuators, and escapements

7¼ x 4¾ in., 80 pages with 50 diagrams, plus 12 art pages of photo-pictures. Numerous tables. Drawn on card photo cover in two colours. **30p**

4 MODEL AERO ENGINE ENCYCLOPAEDIA



All the better known world's engines are detailed in tabular summary with principal dimensions and advised propellers. Three extensive chapters deal with initial operation of a first engine, whether it be coil ignition, diesel or glowplug. Advanced data on fuels, horsepower, speed controls, silencers and tuning of racing engines.

8½ x 5½ in. 208 pages. Full bound in plastic cloth with three-colour dust jacket, over 300 sketches, photos, data tables. **75p**

MAP

HOW TO ORDER. Ring round the reference number of the titles you have chosen. Carry out totals to cash column and then total up at the bottom. POSTAGE free on orders over £1 UP to 60p., 5p; 60p to £1, 7½p.

107 . 58
8 . 158
134 . 59
4

Name.....

Address .....

.....

£

MODEL & ALLIED PUBLICATIONS LIMITED 13-35 Bridge Street, Hemel Hempstead

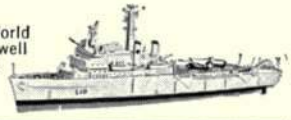
Get every detail right with Airfix

It's the little things – like the opening hatches and elevating machine gun on this Centurion tank – that really make the model! And that's why Airfix Construction Kits are so fantastically popular. Every model is accurate to the smallest detail – a perfect replica of the real thing! There are nineteen series each made to a constant scale. Over 300 kits to choose from at prices from 17p. From all good hobby shops and F. W. Woolworth. Ask for the catalogue.

Bottom left : World War I tank Bottom centre : Lee/Grant tank Top left : 88mm Gun Right : Centurion

PLANES! Over 150 to choose from, including aircraft from both World Wars, modern jets and airliners.

SHIPS! Warships from World Wars I and II, as well as modern liners and historical ships.

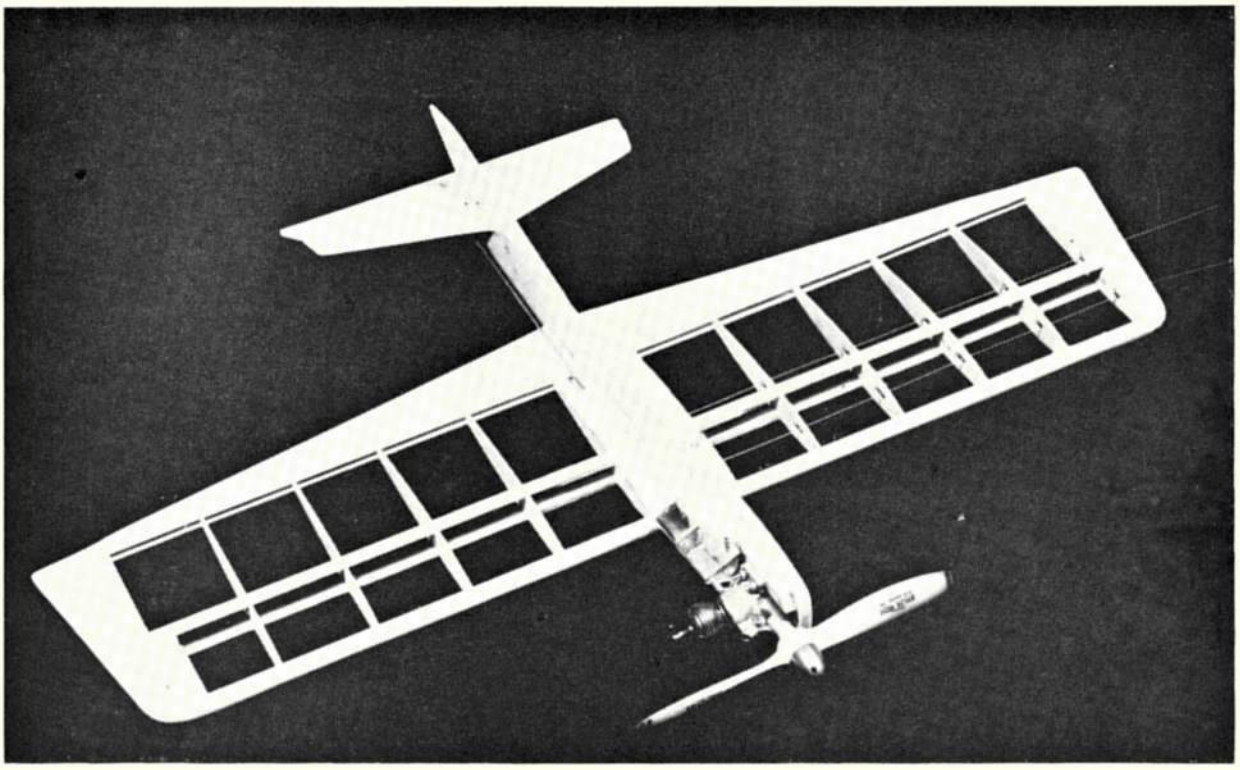


STOP PRESS One of the most advanced British motor cars, the five-door Austin Maxi has five forward gears. The fascinating Airfix model features authentically detailed engine and interior trim. 34p.

AIRFIX

The world's biggest range of construction kits

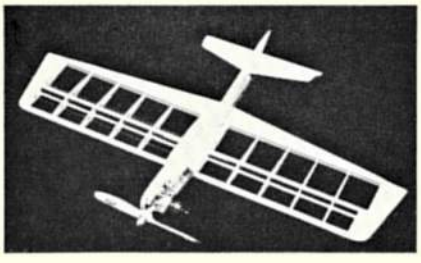
News, articles, conversions for modelling enthusiasts every month in AIRFIX MAGAZINE. 15p from your model shop or newsagent.



We built our first control line model in the early days of the war when all we knew was that something called U-control had appeared in the States – plus a little bit of information gleaned from an early article in 'Air Trails'. That explained, briefly, the two line-bellcrank-pushrod-elevator horn hook-up. Some of our wartime supplies of Balsa got diverted to investigating this new angle on aeromodelling – but we made one basic mistake. Our aerodynamics expert insisted that the pivot point should come on the CG. And that's how we tried it – flight after flight, with a period for repairs in between each one! We never completed more than half a circuit with the lines taut – even with a drag plate on the outer tip.

Eventually the (old English) penny dropped, of course, and we found that we could design and fly control line models as well as other aeromodellers – well, almost. Perhaps that is why we stick to being balsa specialists. We like to find out what balsa will do – but other aeromodellers are so much better at 'advertising' how well balsa models fly! But we do have a point here. Our experience with balsa dates back to the days when it was first used for aeromodelling in this country – long before control line. That's why the name Solarbo *means* something – true *aeromodelling quality* balsa, in fact.

Incidentally, there is something not quite right about the top photo. The photo should appear this way round for 'opposite hand' circuit flying. (The clue is the name on the prop.)



Solarbo BALSA

ALWAYS ASK FOR IT BY NAME

SOLARBO LTD.,
COMMERCE WAY, LANCING, SUSSEX

MODELLERS!

PART 2 OF THE

® Revell JET-AWAY contest

IS NOW IN FULL SWING

This is your last chance to win a free 7 day action packed holiday in California

As soon as you board the BOAC VC 10 at London Airport the excitement begins. When you arrive in America there's more fun waiting – like visiting Disneyland, Catalina Island, Marineland, Knotts Berry Wild West Farm and a Hollywood Movie Studio.

This fabulous prize could be yours. There are also a further 100 £2 Revell Kit Vouchers as runner-up prizes.

A fabulous newcomer!

The H432 Tacoma.
A beautifully detailed model of the US Navy's jet-powered gun boat with 15" hull, radar antennas, moving gun turrets and colourful flagsheet. RRP 99p. 4 Jet-Away Stars with this kit.

All you have to do is collect 4 Jet.Away Stars, being given with Revell Model Kits, (in certain stores they will be attached to the side of the box). Stick them on your Entry Form, make sure you have completed all parts of the Questionnaire – then Hey Presto – you could be a lucky winner.

Send your completed Entry Form to: Revell (G.B.) Ltd., Dept. C., Business Action Ltd., 192-198 Vauxhall Bridge Rd., London, SW1V 1EG

FLY BOAC VC10 with ® Revell

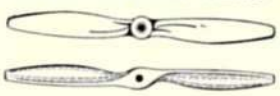
RipMax

'RIPMAX' iron beech CONTEST PROPS

9 x 6	27p	11 x 7½	30p
9 x 7	27p	11 x 8	30p
9 x 8	27p	12 x 4	33p
10 x 5	28p	12 x 5	33p
10 x 6	28p	12 x 6	33p
10 x 7	28p	13 x 4	36p
10 x 8	28p	13 x 5	36p
11 x 4	30p	13 x 6	36p
11 x 5	30p	14 x 4	40p
11 x 6	30p	14 x 5	40p
11 x 6½	30p	15 x 4	44p
11 x 7	30p	24 x 8	£2.95

A range of sizes to suit all popular needs – plus a NEW GIANT SIZE 24" dia. x 8" pitch DISPLAY PROP. Looks wonderful in your den, or over a mantlepiece! Price **£2.95**

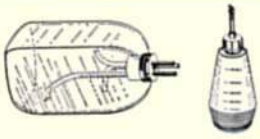
RIPMAX-KAVAN ITEMS



NYLON PROPELLERS

6 x 4	16p	7 x 4	24p	8 x 4	32p
8 x 6	32p	9 x 4	39p	9 x 6	39p
10 x 4	45p	10 x 6	45p	11 x 6	49p
11 x 6	49p	11 x 7¾	49p		

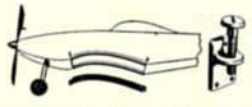
FIBREGLASS PROP 11 x 7¾ 54p



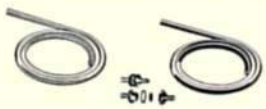
SEALITE SQ. CLUNK TANKS

4 ounce	72p	6 ounce	76p
8 ounce	80p	10 ounce	85p
Large 14 ounce	90p		

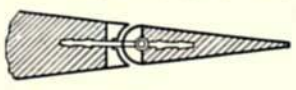
Squeeze Bottle with twist cap 49p



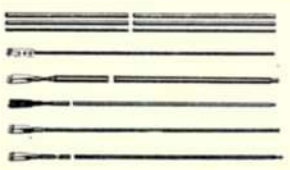
Screw-Adjusting Aileron Horns	33p
Differential Aileron Horns (2)	49p
Flat Nylon Hinges (pkt. 10)	40p
Short Nylon Horn (pair)	15p
Medium Nylon Horn (pair)	16p
Long Nylon Horn (pair)	17p
Nylon Wing Fixing Bolts (2)	30p
Rubber Wing Seatings (pair)	39p



Take-apart Fuel Filter	30p
Rubber Fuel Tubing (40")	16p
Silicone Fuel Tubing (20")	39p
Hot Glow Plug (red)	49p
Warm Glow Plug (yellow)	56p
Cold Glow Plug (blue)	65p
Super Glow Plug (green)	74p
Speed Glow Plug (black)	82p
Painted Pilot 1¼"	54p
Rubber 'Chicken Finger'	39p



¼" Control Surface Fairing (32" long, pair) 24p
5/16" ditto (32" long, pair) 33p
⅜" ditto (32" long, pair) 40p



Black Kwiklink with 5" rod	10p
Silver Kwiklink with 5" rod	16p
Silver Kwiklink with 10" rod	20p
Nylon Kwiklink with 10" rod	8p
Black Kwiklink only (pkt. 2)	16p
Silver Kwiklink only (pkt. 2)	24p
Nylon Kwiklink only (pkt. 2)	12p
L'wt. Snake & nylon K/link	24p
L'wt. Snake & silver K/link	40p
H'wt. Snake & silver K/link	49p
K/link with Large Connector (2)	33p
K/link with Small Connector (2)	33p
Small Snake Tube only (white)	8p
Small Snake Tube only (gold)	10p
Large Snake Tube only (white)	12p
Small pushrod end cap (pkt. 2)	15p
Medium pushrod end cap (pkt. 2)	16p
Large pushrod end cap (pkt. 2)	17p

STANDARD AIRSPAN WHEELS

1¾" dia. pr.	68p	2" dia. pr.	76p
2¼" dia. pr.	85p	2½" dia. pr.	95p
2¾" dia. pr.	£1.05	3" dia. pr.	£1.18

WHITEWALL AIRSPAN WHEELS

1¾" dia. pr.	78p	2" dia. pr.	86p
2¼" dia. pr.	95p	2½" dia. pr.	£1.05
2¾" dia. pr.	£1.15	3" dia. pr.	£1.28

STEERABLE NOSEGEAR

Short £1.63
Long £1.80

STEERABLE GEAR

with brake £2.25

The above are particularly recommended as well designed, durable units.

SILVERED NYLON SPINNERS
(¼" UNF or 7mm thread)

1¾" dia.	54p	2" dia.	62p
2¼" dia.	70p	2½" dia.	79p

NEW LOW-BOUNCE WHEELS

1¾" ... pr.	55p	2½" ... pr.	87p
2" ... pr.	62p	2¾" ... pr.	£1.05
2¼" ... pr.	67p	3" ... pr.	£1.23
2⅜" ... pr.	75p	3¼" ... pr.	£1.40

GRAUPNER RECORD WHEELS

1⅛" (30mm)	34p	2⅜" (60mm)	59p
1½" (40mm)	39p	2⅝" (70mm)	78p
2" (50mm)	47p	3½" (90mm)	£1.34

Ripmax 'PB' Aeroscale Airwheels

2½" ... pr.	97p	3½" ... pr.	£1.50
2¾" ... pr.	£1.10	4" ... pr.	£1.80
3" ... pr.	£1.25	4½" ... pr.	£2.30
3¼" ... pr.	£1.46	5" ... pr.	£2.90

Ripmax 'KBK' Tru-Spin Airwheels

¾" ... pr.	16p	1½" ... pr.	39p
1" ... pr.	22p	1¾" ... pr.	44p
1⅛" ... pr.	28p	2" ... pr.	49p
1⅜" ... pr.	34p		

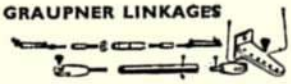
Nylon Hub Tru-Spin Airwheels

1½" ... pr.	47p	2" ... pr.	63p
1¾" ... pr.	54p	2⅜" ... pr.	79p

RIPMAX NYLON

TENSILE NYLON in white, yellow, orange, red, blue and khaki. White **35p** per yd. or **99p** per 3 x 1 yd.: Colours **42p** per yd. or **£1.20** per 3 x 1 yd.
SUPALIGHT (white only) **35p** per yd.; or **99p** per 3 x 1 yd.
ECONOMY NYLON (white only) **29p** per yard; or **82p** per 3 x 1 yd.

GRAUPNER LINKAGES



Metal linkage set	37p
Moulded linkage set	27p
Extension tubes 20" x 5 mm.	17p
For above 20" x 7mm.	17p
Quick-Clip linkage (pair)	27p

BONDAGLASS ITEMS

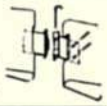
All 'BONDAGLASS' products available plus their NEW ALUMINIUM MESH, 10" x 8" sheet **12½p**. Ideal for scale rads, etc.

CONTROL HORNS, etc.

Graupner 90° Nylon Crank (2)	24p
Graupner 120° Nylon Crank (2)	24p
Bowden Cable with Links	38p
Adjustable Throttle Linkage	27p
Horn with Snap-on Link	37p
Snap-on Aileron Links (set)	42p
Klip-on Keeper	4p
Metal Bellcranks, Small **18p** Large	24p

RAND HINGES

Four types – easy to fit (pkt. 4) 16p
SWING-IN KEEPERS ... 16p

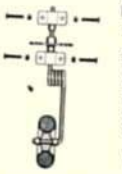


RIPMAX REDLINE TUBING

The NEW age-resistant extra heavy wall (anti-kink) crystal clear fuel tubing, easily identified by the red line and the black and yellow reel dispensers in your model shop! Prices per ft. 1/16" **1½p**; 3/32" **2p**; ⅛" **2½p**; 3/16" **3p**; ¼" **4½p**; 5/16" **6p**.

'RMA' TUF-TANKS ROUND CLUNK

½ oz.	33p
1 oz.	33p
2 oz.	33p
4 oz.	35p
6 oz.	37p
8 oz.	39p
10 oz.	43p
12 oz.	48p



GRAUPNER ITEMS

NOSELEGS

B'lkhead mounted ...	£1.98
Belly mounted (Both single leg steerable units).	£2.34

L/W STEERABLE NOSEGEAR

Short or long	£1.19
Noseleg bracket (2)	32p
Nylon Steering arm (2) ...	34p

SPINNERS

1¼" 3-bl.	22p
1½" 3-bl.	26p
1¾" 2 bl.	24p
1½" 2-bl.	15p
1¾" 2-bl.	16p
2½" 2-bl.	£1.15
1½" metal	62p

GRAUPNER Round Clunk Tanks

Suitable for R/C or C/L models.

100cc	3½oz	55p
200cc	7oz	90p
300cc	10½oz	99p
100 cc Square Clunk tank		69p
250 cc Square Clunk tank		76p
500 cc Square Clunk tank		94p
20 cc Metal (for Consul)		80p
60 cc Metal (for Amateur)		99p
Graupner in-line Fuel Filter		30p
200 cc Squeeze Bottle		29p
500 cc Squeeze Bottle		43p

'RMA' BLIND NUTS

4 each nuts, bolts, plain and spring washers, 4BA 12½p, 5BA 12½p, 8BA 12½p.

RIPMAX Wing Bolts (set) ... 30p
'Lubrisil' Paper 4p
Botto Masking Tape (59ft.)
½" 7p, ¾" 10p, 1" 14p

SEE THEM ALL AT YOUR LOCAL MODEL SHOP!

HALES QUICKBUILD ALL Balsa

Rubber Powered SCALE FLYING AIRCRAFT

"QUICKBUILDS"

Positively the world's finest range of all-balsa flying scale models. Kits include die-cut COLOUR PRINTED balsa sheets, plastic prop, wheels, nose bearing, shaped wire undercarriage, rubber motor, etc., plus diagrammatic step-by-step building and flying plan. Every QUICKBUILD is easy to assemble, realistic in appearance and a wonderful flyer. Wingspans 15" to 19".

MONOPLANES **55p**

BIPLANES **60p**

Pick your favourites from these terrific models!

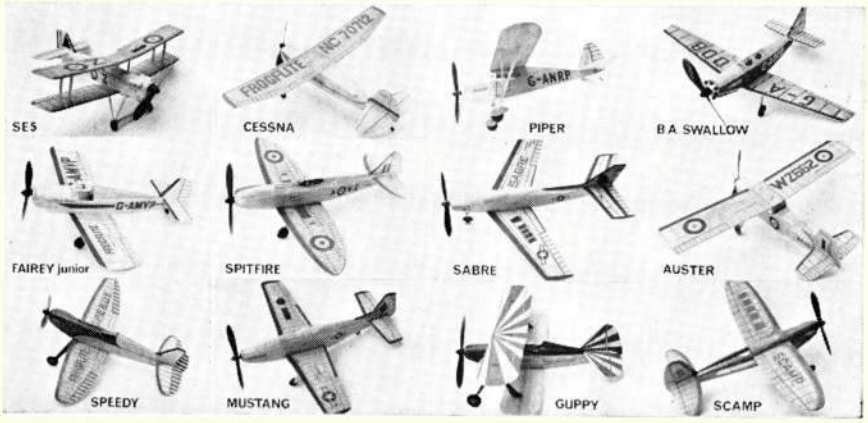
GREAT designs . . . TOP CLASS ideas on kit prefabrication . . . and every model really easy to build. That's FROGFLITE . . . really SUPER MODELS with first-class flying performance.

By test-the BEST! 24 Balsa flyers at pocket money prices

FROGFLITE 'MINIS'

Here's a GRAND RANGE of twelve scale and semi-scale rubber powered models with all-sheet balsa construction, all parts DIE CUT AND PRE-DECORATED. Kits include PLASTIC PROPELLER and WHEELS, nosebutton, shaped prop shaft, RUBBER MOTOR, etc—everything you need to complete the model (except for balsa cement). Plans include picture of finished model and full assembly and flying instructions.

Price **40p** each



all waiting for YOU at your nearest model shop

A.A. HALES LTD.

● STAND BY! For details to be released next month on the new FROG VENOM engine

P.O. BOX 33, Hinckley, Leicestershire

From MacGregor Radio Control, manufacturers of the world's finest single channel radio systems, now comes perfection in digital proportional control . . .

The MacGregor Digimac III

Individual prices

MR800 Digimac III Transmitter including built in rechargeable power pack
MR80 Digimac III Receiver plus Crystals
APO4 Rechargeable Power Pack with switch and harness
APO8 Tx/Rx Charging harness
Combo price £34-75

MR10 Digimac Servo £10-50
(Also available for positive logic systems)
APO5 MacGregor dual purpose charger £3-75
APO6 MacGregor 'buddy box' harness £1
Go 3 Channel Proportional for less than £67!
or 2 Channel for less than £56!
You can always add the other servo later.

Available from all Ripmax stockists throughout the U.K.

MacGregor Radio Control
Canal Estate, Langley, Bucks.

Send S.A.E. for further information.

Heard at the HANGAR DOORS

THIRTY-SIX, *not* 32 Nations (as we announced last month) took part in the biggest ever World Championships in Sweden from June 30th to July 4th. John O'Donnell was there in person to report for us, and his illustrated account will appear in the September issue. Unfortunately we were obliged to go to press with this issue just 3 days before the contest concluded, but we have been able to provide some stop press results.

GLASSFORD's, the modelling mecca in Glasgow, went up in flames last month. As a big stockist of model kits Jimmy Glassford had built up his business over the past twenty years to an inventory valued at many thousands of pounds. The fire destroyed everything and was so intense it caused evacuation of local homes and one fireman was overcome while fighting the blaze. We all hope that Jimmy will rebound from this tremendous setback.

RHODESIAN Championships results read like an European International! Visitor Horst Wagner (Austria) appears to have won all five of the free flight events he entered and this included Rhodesia's introduction to Coupe d'Hiver.

FREE FLIGHT internationalists who want to take part in a popular F.A.I. Rubber/Power/Glider contest with a long record of high class flying should contact Jean Magniette, 16 Rue des Puits, 92 Suresnes, France for details of the *Pierre Trebod* Criterium. This takes place at the aerodrome of Marigny-le-grand near Sezanne in Northern France on August 28/29th. Entries must be made ($4 each) by August 15th and F.A.I. licences are essential for all competitors.

STANDARD FUEL would by now, we should have thought, be thoroughly understood. Not so apparently in San Diego where Richard Diaz of the 'Orbiteers' has written at length in the excellent newsletter *EL Torbellino* on the subject. Richard queries whether the F.A.I. meant the 75/25 mixture should be made up by weight or by volume! He proves that by weight the mixture has a greater percentage of methyl alcohol and asks *Can we, as free Americans, ask for weight to weight? Or do we have to take what they give us?* Untwist those knickers Richard, you're all mixed up over nothing. The key word is *standard* – in other words everyone at the event has the same, and the formula is by volume, on account of the fact that's the way everyone goes about mixing up a fuel.

JAGUAR nose wheel door on the first French production aircraft has a new shape and the rear fuselage bulge is even more prominent than that shown in our drawings (January issue).

OBITUARIES this month include two pioneer modellers from the Continent. Andre Watteyne, the renowned model helicopter designer, from Brussels, and Rene Chapart who was for years a regular visitor to the Bowden Contests, Eaton Bray and Fairlop from Paris. They were both aged 74 and had each in their time played great parts in aeromodelling. So too had Jack Cooke of Congleton, a stalwart of that club in its heyday and model shop proprietor who always had a kindly word for the novice. Jack's death on June 9th, aged 46, takes another good friend from our midst.

NATS GRAND DRAW winner of R/C model plus Gem Digi-4 was L. Byram of Kings Lynn. Other major prizes went to P. G. Dunmore (Abingdon), A. D. Holland (Cirencester) and J. Grimes (Wotton under Edge). Prizes were donated by Mainstream, Veron, KeilKraft, Merco, Micro-D.B. and Humbrol, in aid of F.A.I. Team Travel funds.

SHORT SC1 VTOL AIRCRAFT XG900 designed by Short Brothers and Harland Ltd., is the subject of a special exhibition recently opened at the Science Museum. It is accompanied by a display of models illustrating the history of VTOL flight from de Vinci onwards and a tape recording made by a test-pilot giving his impressions of the aircraft's flight. The exhibition will be open to the public for about three months.

First major Pylon race of the year was held at North Weald during the R.A.F.A. Air Tattoo on May 31st. The newly imported 'Little Toni' was a convincing winner despite its age. U.S. registration is still carried on the fin over the 'Cosmic Wind' name and British G-AYRJ. Rollason Beta 03 appeared with another undercarriage variation and extended cowling blisters to add detail to last month's feature on 01 and 02. Black tape patches seal all the cowl, pant and canopy gaps.

Contrasting conditions over the two-day S.M.A.E. Jamboree at R.A.F. HULLAVINGTON

BRITISH NATS '71

Souvenirs which some may have missed are the S.M.A.E's colourful pennants (above), a few of which are still available at 30p from the S.M.A.E. Treasurer; and below, the specially marked Punctilio prop. We understand the manufacturers still have a few left.

UNQUENCHABLE ENTHUSIASM for the annual British National Championships shone through all the problems and setbacks that clouded prospects for the big jamboree this year.

Faced with a very real need on many counts, to move the location away from hospitable Hullavington, the Society of Model Aeronautical Engineers found every alternate approached either unsuitable, unavailable or completely unwilling. Though loathe to go back to a generous Station that had more than had its fill of model invasions, the S.M.A.E. made its last appeal, and so the "NATS" returned, for a fifth time, to this setting in the Cotswolds. It was very much a late decision, leading to late issue of entry forms, no traditional programme, and elimination of some of the frills of previous occasions. Nevertheless any pretence of it being an "economy" Nats will soon be dispelled when the profit and loss account is made public by the treasurer. We shall be very surprised if there is a credit balance, and this in spite of generous support from some sections of the model trade helping to offset cost of equipment.

Yet without hired tents, crowd barriers and ancillary services, the spectacle of the radio contests would have been reduced to soaked chaos in the rain of Sunday. For though diminished in numbers, the spectating public swarmed through those exhibition tents, grateful both for the shelter and the chance to examine at close quarters, the 1971 scale models and pylon racers.

Divided geographically, and at times in altercation, were the three main groups of free flight, control-line and radio control. Without any doubt, this was the year of free flight with its proliferation of events spread around a wide arc of the perimeter and attracting the bulk of the Nats participants, if not the spectators. Control-line was more localised, and the skills displayed in team race and combat were inspiring. Radio was the best controlled and most heavily manned event of all. It set the seal on Pylon racing as the most thrilling, but hazardous contest yet devised, and it produced a fine new crop of models as our companion magazine *Radio Control Models & Electronics* reports in full.

Above all, the Nats was as ever a mini-Internats with many visiting firemen from overseas. It's never a surprise to see Pete Alnutt, over on his European contest rounds from Canada, or the occasional U.S. Serviceman or American technician who has arranged his tour of consultation with a U.K. company to coincide with the Nats. But this time it seemed that every country in the Commonwealth and several European nations were represented, if not in the contests, certainly among the keenest spectators. When we asked one group what they thought of our glorious muddle the retort was *"Never even dreamed that anything like this ever happened; so many models in the air at once, so many different classes and types and so many friends to make"*, and that just about sums up the big difference between our two-day fiesta and the controlled style specialised *Championships* held elsewhere. No doubt in our mind which does the best for aeromodelling . . . and causes the greatest turnover in volunteer administrators.

CONTROL LINE SCALE

	Name	Model	Club	Best Flight	Scale Workmanship Complexity	Total
1	H. G. Venables	*Fokker DVIII*	Wolves	224	442½	666½
2	D. Goddard	*Pfalz DXII*	C.M.	208	426½	634½
3	W. Brown	*Ansaldo SVA-4*	Esbank	205	326	531
4	M. Poncelet	*Grumman Tigercat*	Esher M.F.C.	249	280½	529½
5	W. B. Cordwell	*Gloster Gladiator*	Three Kings	247	136½	383½
6	H. J. Carter	*Spinks Akromaster*	Tamworth	169	203	372
7	J. P. Skinner	*Bristol Bulldog*	Heswall M.A.C.	118	193½	311½
8	B. Sexton	*Gee Bee RI*	Three Kings	122	189	311

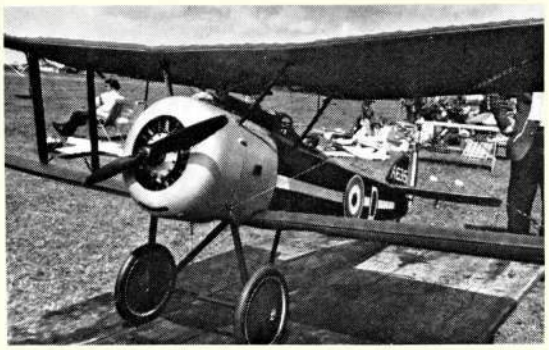
FREE FLIGHT SCALE (Superscale Trophy)

	Name	Model	Club	Best Flight	Fidelity	Craft	Complex	Total
1	T. Manley	*A.W.FK8*	Blackburn A/C	253	107	105	57	522
2	E. Coates	*B.E.12e*	Lee Bees	256	121	93	44	514
3	A. F. Clements	*Fokker E1*	Maidenhead	199	140	126	46	511
4	J. Palmer	*Sopwith Baby*	—	184	156	127	40	509
5	J. G. Watkins	*T. Morse Scout*	Wolves	153	72	69	34	328

RADIO CONTROL SCALE (Radio Modeller Trophy)

	Name	Model	Club	Flt. 1	Flt. 2	Fidelity	Craft	Complex	Total
1	A. Lunt	*Chilton DW1*	Bromley	603	708	177	150	42	1077
2	N. Butcher	*Fokker DVIII*	Buckaneers	582	586	216	191	65	1058
3	T. Melleney	*DH 94*	Hillingdon	—	527	236	217	64	1044
4	T. Sheldon	*Sopwith Pup*	T/F	663	549	135	128	67	993
5	P. Neate	*Hanriot HD1*	N. London	427	585	172	167	67	991
6	J. Morton	*DH 82*	Winchester	725	580	97	1'2	31	955
7	D. Bryant	*Condor*	Bromley	446	307	238	209	57	950
8	D. Foskett	*Fairchild PT19*	T/F	334	682	112	90	37	921
9	R. Norris	*Fairey Battle*	T/F	527	726	71	60	28	887
10	M. Thompson	*Turbulent*	T/F	352	516	175	149	39	877

Jack Carter with his beautifully finished 1/6th scale Spinks Akromaster. Full cockpit detail visible through the hinged canopy. Unfortunately it could not emulate the full-size's aerobatic performance!



Impressive Sopwith Pup by Jack Sheldon of Luton DMAS which placed fourth in R/C scale.

Roy Norris took time off from VC 10 aircrew work to fly his Fairey Battle (proto) which made top flight score in R/C Scale.

SCALE

In keeping with the general revival in free flight, the **Superscale Trophy** event rejoined the Nats circuit this year, and though supported by a mere handful of the better known protagonists, free flight scale provided a close enough result to justify a regular fixture in the programme. In the end, it was the new 'complexity' factor which determined the winner, this being introduced to sort out the more difficult subjects and the manner in which their intricacies were reproduced in the models. Terry Manley's *Armstrong Whitworth FK8* and Eric Coate's *B.E.12e* were practically identical in their flights which began with very realistic take-offs. Others chose the alternate hand-launch at sacrifice of points but still thrilled with stable flight patterns in every case. For detail, both John Palmer's *Sonwith* seaplane and Tony Clement's *Eindekker* impressed most. Cockpits equipped with ancient instruments and specially reproduced surface finishes are by no means the prerogative of the far heavier R/C models. Each of the five finishers, with J. Watkins' *Tommy-Morse* tailing in as a very practical but less detailed flyer, should be commended for their operation of well-tried models in a very efficient manner. Eric Coates had to be specially slick as he could only qualify during a brief break from R/C judging duties; yet he had time to throw in a few extra flights *'just for fun'*. That's the true spirit of free flight scale, long may it prosper!

The tussle for the **Radio Modeller Trophy** in R/C scale was a most fascinating exercise of points balancing. Scoring for the flight manoeuvres can be much higher than for scale fidelity as is always proven by the unshakeable Jack Morton, who this time had his *fifth* version of a *Tiger Moth* way out in the lead on flight scores at the end of the first round. Subsequently Roy Norris's *Fairey Battle* overtook Jack by a mere point, yet as the results column shows, they were both down the list in the totals due to scale points. For a long time it looked as though Norman Butcher would be collecting his own Trophy as his *Fokker D.VIII* built up a fine all-round score, especially as Terry Melleney with a magnificent, though still not fully completed, *Moth Minor*, Denis Bryant with an equally impressive *Condor* and Pete Neate with a new *Hanriot* each failed to overtake Norman's flight score sufficiently in their second rounds. Then along came Tony Lunt and his fine *Chilton D.W.1*, which performed just like the real thing, right down to a feather-touch landing 'on the spot' to clinch a 19 point lead. The results are as close as could be, and they reflect two things. One, is that the newly added complexity factor has little influence in R/C. Two, is that this class of scale is not excluding itself out of business and still remains a very open challenge for the perfectionist. (Especially when Mick Charles and Roy Yates forsake their entries to judge.) And here we must mention two models which were *not* flown. Arthur Bailey's reproduction of the late Charles Boddington's *Tiger Moth* is quite *the* definitive Tiger Moth replica, even to smoke tank, field repair patches and buckled ply, and though currently in the 'too hot for owner to operate' stage will eventually make its mark. Then David Vaughan's second (!) *Miles Master* is simply staggering for realism and cockpit detail; but ouch – just a few ounces overweight when fuelled for flight. A few chips off the nose ballast will make this model a beauty to watch at future events. Apologies to all those others who *did* fly for not mentioning their greatly appreciated efforts, despite the squalls. It was a great show, with much improved efficiency all round.

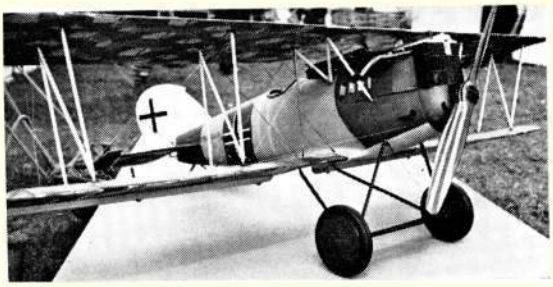
Control-line scale had a far greater contrast in standards. The proportion of 'first time out' models with rearward centres of gravity putting paid to any chance of a respectable flight score was higher than usual. The result was an almost runaway success for the two leaders with H. G. Venables' excellent *Fokker D.VIII* ahead of Derek Goddard's well known *Pfalz D.XII* in both static and flying points. The accent in control-line points scoring is centred on the fidelity and craftsmanship, and as might be expected, this results in extra cockpit detail, complicated markings, etc. Those experts in the gimmick-type all-working model, Bob Ivans and Albert Briggs did not compete, so the field was open to the one with better scale and workmanship. Maybe it is significant that the two leaders had complex hexagonal camouflage fabric and close to life reproductions of their internal fuselage structure. They also possessed an atmosphere of realism that is not always easy to attain. In third place came W. Brown's *Ansaldo*, always an attraction if the huge heraldic lion is emblazoned on the veneered fuselage sides, and this one did not disappoint. It flew well, but not quite as impressively as the *Tigercat* by Maurice Poncelet of Esher, and Wally Cordwell's *Gladiator*. We specially liked Wally's cracked fabric effect. Intentional or not; just look at a real surviving Gladiator and you'll see what we mean. Tailing mainly because they were to a large extent untried were H. J. Carter's *Akromaster*, J. P. Skinner's *Bulldog*, and B. Sexton's *Gee Bee*: three very bright and colourful selections which rounded off the eight who made qualifying flights.

CONTROL LINE

ALTHOUGH attracting a marginally larger entry than the previous year, fewer than 50 per cent of the competitors actually flew in the **½A team-race event.** Despite this, semi-finals were demanded by the competitors – rather ridiculous when considering that two rounds had to be held to select nine out of the 13 fliers to qualify for these semis!

Having previously achieved a double hat-trick at this event, the absence of Mick Hughes and Brian Turner must have encouraged quite a few competitors, but the times were well short of those that this team could manage. In fact, the heat times were in general very poor, only the Heaton/Ross team recording a sub-four-minute (3:54) time with their latest model powered by Malcolm's home-built motor, utilising an Oliver liner, but otherwise original.

Nearest team to this fast time was Harknett/Smith, at 4:04, but despite making the second fastest time they only just made the final, due to an 'overcooked' engine being reluctant to restart during the semi-final. Campbell/



Derek Goddard's Pfalz DXII with its hand-painted camouflage patterns and fuselage carved from a block of pine never seems to age or fail to impress – it placed 2nd in control line scale.

Perkins, of Hinchley, are another team who frequently do well in this event, and although their model was one of the quickest, they lost a lot of time on the ground during the second round, and lost their settings on the universally used Oliver Cub. No doubt the damp weather was the cause of much of the trouble, but many engines were being sent away off-tune.

In the final, the contenders were Heaton/Ross, Harknett/Smith and Devenish/Davey – the latter with a very fast, but slightly inconsistent motor. At the starting whistle it was Heaton first into the air, with Davey a close second, and finally Smith, with a very slow, over compressed, run. The new Ross motor was clearly faster than the Devenish/Davey Oliver and sounded very sharp – in direct contrast to Tony Harknett's motor, which coughed its way round for a full tank. At the first stop it was Derek Heaton first to come in for a perfect one-flick restart, followed closely by Les Davey – although it took Joe Devenish some five flicks for a somewhat slower stop. When Steve Smith eventually landed, pitman Tony Harknett soon had the motor on song and it was compatible on speed, although some way behind. Heaton/Ross continued with clockwork precision, while Devenish/Davey had restarting difficulties. The final result was a very quick 7:53.4 for the Leigh pair of Heaton/Ross, with Harknett/Smith nearly 1¾ minutes behind – when was the last occasion that an Oliver Cub *failed* to win this event?

Incredibly, the **Goodyear** class attracted 80 entries, and this is the first time that this event has been included in the Nationals programme. Admittedly, 30 of these entries scratched before actually competing . . . nonetheless, it was second only to combat in popularity of support.

Despite the obvious expertise of the top fliers, it was good to see so many 'new' (and young) faces at the circle, although many seemed rather ignorant of the rules – some not realising that a 'le Mans' start is obligatory, nor too aware of warm-up procedures!

Having watched the glow engines in practice one would have thought that the diesel was on the way out, but this proved not to be the case – two diesels reaching the final. The competitors here were Harknett/Smith (*Ginny* plus Super Tigre G15RV diesel without a fuel cut out), Heaton/Ross, using the same combination but with an ETA 15, and Skitt/Pittaway, with a *Falcon Special* powered by a Super Tigre G15 RV glow, also without a fuel shut-off.

All got off to a good start, being fairly evenly matched for speed, but with the glow perhaps a little faster. Derek Heaton was first to land, for a very quick pit stop, but the motor then unexpectedly cut after just one lap. At this point the other two models came in to land, and as Derek whipped his *Ginny* round for a restart, he fell over Steve Smith, who was kneeling down while his motor was being restarted. Fortunately, the model did not run in, and Malcolm Ross restarted the motor quickly, although losing time running round the circle to reach the model. Meanwhile, Tony Harknett and Skitt were having trouble restarting, eventually getting away again, having lost several valuable seconds. At the next stop Heaton again had a quick getaway, with the other two considerably longer. None of the models had cut-offs fitted, which must have worried Heaton/Ross severely – their motor cutting again just three laps before the end of the race – very finely judged! Even more worried were Skitt/Pittaway, whose motor over-ran, thus disqualifying them as they only made two of the three compulsory stops. Winners were therefore Heaton/Ross, at 8:38, 26 seconds in front of Harknett/Smith.

Contrary to the printed programme, **Mouse** race was held on the Sunday evening, and this year was organised on the runways rather than in front of the hangars, due to noise complaints over the previous years.

With time naturally running short, due to darkness, and no doubt an ever-growing thirst for the light brown liquid which is so much a part of every 'Nats', entrants were restricted to just one heat time each.

Class I (expensive motors, i.e. Tee Dee 049s) saw the usual incredible speeds with spidery, minimal aircraft, several using such sophisticated aids to modern living as fuel cut-outs. Most interesting was Dave Handley's machine, with 12 thou aluminium sheet wings, Tatone speed pan faired into a balsa/ply fuselage powered by the inevitable Tee Dee. Unfortunately, tail-heaviness and running-in on take-off slowed it down, leaving the Jolley/Counsell team to take the honours with the frayed remains of their model in a final time of 6:55.4.

Run concurrently, *Class II* saw first five competitors from the 16 entries. Last year's winners, Harvey/Coote, using the same motor/model, were right out of luck after recording the fastest heat, when they retired in the final. Fellow finalist Halmslow likewise retired, leaving Mike Gagg to win in a very slow time of 10:02.5.

Extended now to a two-day event, **Handicap Speed** had its best entry for many years – 33, with 17 recording official flights. This may seem to be a high 'dropout' percentage, but bearing in mind the difficulties to be encountered in this sport, it is far from being so. It is a popular misconception that 'money buys success' in this field – but this is not true – expertise (and luck) are still main requisites. This is borne out to a large degree by the three TWA 15s used in the contest. Although by far the most expensive 2.5 c.c. speed engine available (the cost may be as high as £84 in this country) and potentially the most powerful, they need a great deal of skill and experience to extract this performance. Gordon Isles and Ron Irvine have much speed flying experience between them, but could not achieve more than 124.3 and 123.0 m.p.h. respectively on FAI fuel. Bill Firbank, another established speedster, fared little better at 128.0 in the open category using the same engine, yet each of these engines must be capable of more – eventually! In contrast, the best performing FAI model was John Dixon's Rossi 15 ship – (the motor plus pipe costing in the region of £24) and he recorded a very good 133.9 m.p.h. flight to put the cat among the pigeons, or rather the Feltham club amongst the North Sheffield! Another flyer out of luck was German visitor Claus Maikis, who achieved just 122.4 m.p.h. from his highly tuned Super Tigre G1 F.A.I. model.

Alan Woodrow completed his recent run of success with his minute Cox Tee Dee 0.09-powered balsa/ply model to record 111.9 m.p.h. (98 per cent of the record).

Top British speed man at present is undisputably Brian Jackson, who on the damp Sunday evening established a new British 5 c.c. speed record with his familiar K&B 29 model at 164.4 m.p.h., comfortably beating the record set at last year's Nats by John Penton, which stood at 156.4m.p.h. Brian's motor has had the liner raised 0.016 in. to increase the exhaust period, shimmed rotor to decrease drag and a tapered piston. K&B 60% nitro fuel, K&B plug and a 7 x 10½ in. Topflite prop were used to achieve a static r.p.m. of 18,900.

Combat, as always, a two-day event, suffered from the occasional rain more than most events due to soggy streamers refusing to stay in one piece, and this caused delays in the first round. Models were naturally almost universally 'conventional' wings, although thoughts differ on maximum rib depth and aspect ratio. As usual, everyone is after yet faster models with tighter turning capability, with the expected 'staleness' of design which development always brings. Many of the pilots seemed very new to the sport and had obviously not practised such minor details as pit crew 'work sharing'! Common were the heavy prangs with the pilot shouting many and varied instructions to his team, only to confuse the issue even more. This should not be necessary in a well organised combat club; but is understandable for the 'lone wolf' fliers who perhaps only compete at the Nationals.

The first semi-final brought last year's victor, Vernon Hunt, against Richard Evans, and a brilliant bout followed, which was greatly appreciated by the large crowd. The result was very close, but Vernon had the rare misfortune to lose, in fact, the first semi-final he has ever lost!

The final brought Richard and Steve Jones together to provide what many people proclaimed the 'best yet' final. Agility and reflexes of these two 'aces' was remarkable even for those used to watching combat. Steve eventually emerged as the winner – but both received a warm round of applause for their performance! He used his new 'wing plus tail' model, which is shortly to be included in the *Aeromodeller* plans range.

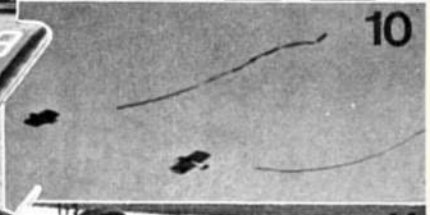
Normally an event most affected by weather, the **Gold Trophy** did not fare too badly, despite the relatively poor conditions of the Sunday. Although the wind was quite stormy, it at least was fairly consistent and did not prove to be too much trouble for the twenty-four competitors who actually flew, although it was noticeable that most scored better in the second round held in the calmer afternoon.

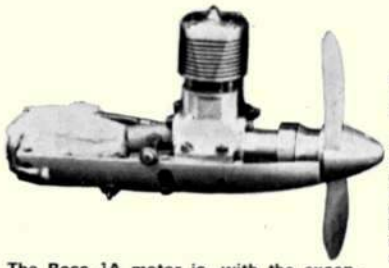
Organised by the *Three Kings* club once again, the event proceeded smoothly enough, although a few delays and the high entry made it a long drawn out contest. Most of the models were well known in the competition sphere with few 'new' ones to be seen, and in general there was a lack of development evident. Indeed, many of the models were well beyond their original 'freshness' and there were no (with certain exceptions) outstanding paint schemes – many rather on the rough side for this event which usually

Continuation of caption opposite

Harknett/Smith triumphed in the Goodyear event. 6. Derek Bird starts up his Carrier-winning Grumman Guardian, assisted by second place man Andrew Keeler. 7. Gold Trophy winner was Dave Day, who also performed well in R/C pylon racing. 8. Junior John Heanen had a most successful weekend, winning the Junior stunt event and placing well in the Gold Trophy. 9. Steve Jones flew his Orcrist to victory in Combat, his tailplane-equipped wing (10) outperforming Evan's conventional 'wing'. Winners at last of the ½A event were Heaton/Ross (11). German fliers Bader/Schwarz (12) triumphed in F.A.I. team race with superb pit work by Schwarz (right).

1. Class 1 mouse race winners Handley/Jolley with battered remains! 2. Brian Jackson with his K&B 29 record-breaking speed model. 3. Class B Team race winners were Davey/Howarth with an old F.A.I. racer powered by an overbored ETA 15 diesel. 4. Control line scale winner G. Venables and his Fokker DVIII. 5. Diesel powered 'Ginny' of





The Ross ¾A motor is, with the exception of the liner, entirely home-built. Updraught carb used to save fuel wastage. Tufnol rotor. Fuel tank insulated in silicon rubber.

has many 'concours' type finishes.

Top scorer in the first round was perhaps not unexpectedly Steve Blake with his all orange *Starmaker* design, Fox powered, with a score of 976½, in front of Dave Day (Wolves) flying his six-year-old *Thunderbird*, using a Merco 35. This engine is installed canted over at an angle so that the silencer is enclosed within the cowl – the only model to feature such a design point, and one which certainly aids its appearance. Frank Warburton Jnr. made a good flight, although by no means as good as he was capable of, with his brand new stunter based on the Japanese *Tony* fighter. This model, finished just two days prior to the contest was not quite the same as his renowned original, having a higher aspect ratio and generally 'stretched' dimensions. His motor was an O.S. 40 R/C with a plain venturi, and this flight was his first official contest flight for some six years – quite remarkable after such a big lay off.

Last year's winner Jim Mannal was out of luck in this round, his motor being set far too lean, thus losing all power, and he had to forfeit his entire score. This, although not disastrous in an event where the best of two scores counts, hardly helps ones nerves! Mick Harvey, another flier expected to do well, was not on form flying his Fox 35 powered *Aries*, losing points badly on his square loops – perhaps the 43 oz. model was rather light for the conditions.

A lone junior, John Heanen flew a good pattern, in this his first Nationals entry, with an immaculately finished *Nobler* and although he received only 664½ points, he obviously has the potential to do better – this being borne out by his second round 833 score giving him 13th overall position, as well as winning the Junior event.

In the second round the positions changed rather dramatically, Steve Blake, although increasing his score, did not fare as well as the other top men, and his final total of 1027½ was only good enough for fourth place. Dave Day then went on to achieve the best score of the day at 1077½, closely pursued by Frank Warburton at 1063½.

Jim Mannal, making no mistake this time with his engine setting, and overcoming his psychological disadvantage did well to climb into third spot with an inspired 1060½, although it was surprising to have the top two places filled by experienced, though relatively unpractised fliers. These four were the only ones to score over the 1000 point barrier, and below them the standard dropped off rapidly.

Arguably, the 'premier' control line event, **F.A.I. team race,** held on the Monday under good conditions, was perhaps rather a disappointment this year with regard to times, despite much International competition from German and Dutch teams, and 30 fliers recording heat times (from a total of 54 entries). Possibly, the absence of teams such as Place/Howarth (although Don paired up with Peterson) and Turner/Hughes reflected a missing something from the event, and many teams capable of doing well failed to live up to expectations – indeed, in the first round not one team recorded a sub-five-minute time. Of course, perhaps the strict adherence to the rules insisted upon by Brian Turner, who marshalled the event, slowed the times . . . although in our view this improved the event considerably. Why didn't the continental fliers (with the exception of Schwarz/Kaul) fare better? Mainly because they entered purely for fun and used old models, preserving their 'good' motors in several instances for forthcoming Championships.

The second round saw better heat times, Harknett/Smith being fastest at 4:42 with the model built for the last World Champs, using their faithful S.T. G.15 RV. Second best were Schwarz/Kaul, flying together for a change (Schwarz normally pits for clubmate Ilg, while Kaul is better known as pilot for fellow German, Bader), at 4:42, using Schwarz's pod and boom type racer powered by an HP15. Using the same Austrian engine in their well finished racer, were Devenish/Davy, and their motor is now going well, although a tank check showed an excess capacity and, as a result, they were disqualified. Now that this motor has the 'bugs' sorted out, it could do well later in the season. Second fastest visitors were Rob Metkemeyer, who usually partners his brother, and Hank Visser, who is almost a fixture at any International meeting. Their model was quite old – in fact, it flew at the Swinderby Champs in '66, and showed this in times of 5:13 and 5:18.

Semi-finals produced yet slower times, the fastest being Schwarz/Kaul at 5:05.6, who met Harknett/Smith and Muncaster/Langworth in the finals.

At the starting whistle, all were in the air together, with the Germans fractionally in the lead. Although evenly matched for speed, the Germans were slowed considerably by Steve Smith's flying style – where he flew in a typical Russian fashion – that is, with handle to chest and lines parallel to his body, passing near his left shoulder. While not actually illegal, perhaps there are grounds for objecting on an 'obstruction' basis, as it forces the fastest pilot to run around him in a larger circle, visibly slowing the model, and, in fact, causing him to fly an effectively larger radius.

Bernie Langworth was first to land, for a slowish stop, followed by Kaul, using his fuel cut-out to good effect for a first-class pit stop. Smith then landed to have a three flick restart by Tony Harknett. After the next tankful it was again Langworth first down for a second slow restart, while Schwarz achieved another perfect two flick getaway, Tony doing the honours in four. The race continued in a similar fashion, with Jack Muncaster's Oliver being reluctant to restart quickly, their Solarfilmed model gradually falling behind, while the Feltham pair were unable to match the efficiency of the German teamwork.

Schwarz's pit stops were incredible to watch – he never even knelt on the ground, merely stooped to catch the model neatly delivered into his hands, inserted the pressure refuelling line gave one or at the most, two flicks and away went the model! They comfortably won – and the Davis 'A' Trophy leaves British ownership for the first time.

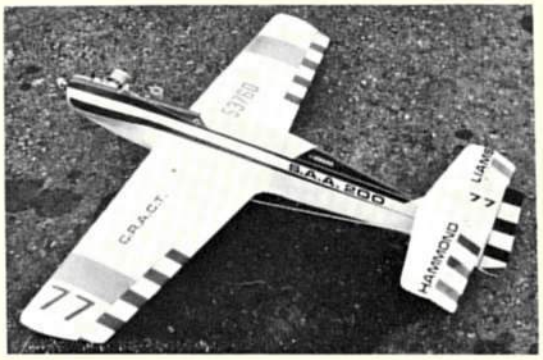
Not unexpectedly, the **Carrier Deck Landing** event attracted only four fliers, although event director John Perry must have been somewhat disappointed as it was thanks to himself and fellow *Three Kings* members that the contest was at all possible. The major bugbear

Andrew Keeler's second placed Carrier model is Douglas Skyraider. Flat bottomed airfoil used, but no wing flaps to aid low speed. 80 m.p.h. top speed.

Long time Class B enthusiast, Chas. Taylor, readies his 10-year-old model. ETA 29 used in the best tradition! Gordon Yeldham pilots, as always.

FREE FLIGHT

by John O'Donnell



Very attractive and unusual Goodyear racer, an SAA 200, by Hammond / Williams. Uses Oliver 2.5+ Cox carburettor, but slowed by its two-wheel undercarriage. Brightly finished in white/red/blue polyurethane paint.

'SPOILT FOR CHOICE' could well describe many a free-flight modeller confronted with the extensive list of events scheduled for the 1971 Nationals. With this year's inclusion of Coupe d'Hiver and A/1 glider, the only notable F/F contest class not represented is chuck glider. Not surprisingly there are protagonists campaigning to have it added to the list!

Several of the events called for a lot of flights. The three F.A.I. categories were flown in seven rounds, whilst the two smaller specification events demanded five flights to a two minute max. A serious attempt at one of the F.A.I. events involved virtually a full day's flying which is fine for the specialist, but does not appeal to everyone. All in all, the programme is certainly comprehensive, but I consider it overcrowded for a two day weekend. At least the timetable was better than previous years in that the open and F.A.I. events were now better spread out over the weekend.

The running of F/F events at the Nationals depends on volunteer clubs or individuals. Their duties usually involve the distribution and collection of flight cards, compilation of scores, and the maintaining of a scoreboard. Competitors are left to find their own timekeepers in the same way as (almost) any other contest. The real organisation comes at flyoff time when lots of timekeepers are needed simultaneously. Even the *fliers* have to be found on some occasions!

This year the S.M.A.E. F/F sub-committee had attempted to tighten the operation of the F.A.I. events by requiring the use of a 'launching area' defined by four corner markers. Times of rounds were laid down in a circular distributed by post to those who pre-entered. Contained in the same 'handout' was a requirement that flight cards 'be returned to the contest Director before five minutes have elapsed from the end of the round'. This was to prove a serious *bone of contention* and lead to many arguments. The situation was not helped by the sub-committee *claiming* the right to form or appoint a jury (to decide protests), and yet having

of this event has always been the difficulty (and high cost) of transporting the Deck itself, but by building a trailer which can be towed behind even a light car, they have overcome these troubles.

Eventual winner was Derek Bird of *Three Kings* with a Bill Netzeband designed *Grumman Guardian*, powered by a K&B 40. Well finished in its dark blue colour scheme this was the only model to gain the 100 bonus points for scale appearance – a deciding factor as it happened, as A. C. Keeler (Bristol Bulldogs) exactly equalled his flying points but failed (just) to receive these extra. Why, when it looked just as scale-like as the winner? Well, the rules are quite specific that part of the qualifications for scale points are that the engine cowl must be within $\frac{1}{4}$ in. of the motor, and his Super Tigre 40 had rather more air around it than this, so no points were given. Now re-read those rules chaps! His model, a *Douglas Skyraider* was built from *American Aircraft Modeler* plans, and did not have operable flaps. Alan Woodrow flew his elderly (and showing it!) *Aerobonita* with K&B 40 power, but although the fastest, could not get a very good 'slow speed' setting on his own-designed throttle.

Resurrected after several years lapse, the **Class B** event more than justified its inclusion in the Nationals calendar, even though only 50 per cent of the entry actually flew.

Several competitors used the 'tortoise and hare' approach, of using over-bored diesels in their F.A.I. class models (which are, of course, bigger than the Class B specification). The slower speed but greater economy of diesel makes an interesting sight compared with the 'real' racers powered by 'full' 5 c.c. glows!

As it was, Howarth/Davey won the event with an F.A.I. model which had twice previously taken the Davies A trophy, powered by a 2.81 c.c. ETA. This Howarth has modified to a three-bearing crankshaft to cope with the extra power. They achieved the fastest heat time (3:15) but only just won the final after the engine cut early for an extra pit stop. In second place were Horton/Kirton with a very fast ETA 29 model, probably the fastest there, which was also a most reliable restarter. Also using a 'proper' Class B motor Yeldham/Taylor failed to finish the final, despite a very fast heat time with their 10-year-old model – and motor!

The most pleasant surprise of the weekend was the good response to the first ever **Junior Stunt** contest, in which sixteen youngsters flew. This event was a completely 'unknown quantity' to the organisers as being the first of its type, in this country, no experience of the fairness of the handicapping system, nor indeed the other rules were available. As the results prove, the handicap seemed very satisfactory (10 per cent of the score was deducted for each year over the age of eleven) but a maximum engine capacity could have been preferable.

The general standard of flying (and indeed building) was quite frankly much higher than we had anticipated – a most encouraging aspect. Eventual winner John Heanen (16) was a good example of this. His *Nobler* was extremely well finished (complete with wheel spats and cockpit detail) putting to shame many of the entries in the Gold Trophy – a fact which he rubbed home by placing a very creditable 13th.

Most popular design of the contest was a 1.5 c.c. stunter named *Reaction* designed by a chemistry master, Mr. R. S. Walker, and flown by members of his Allerton Grange School club, who turned out in force with some eight entrants, all flying the same design, and all built to a uniformly high standard! Best placed of these was Andrew Gibson who in common with his school mates, used a PAW 1.49 for power. Plans of this very snappy stunter will appear shortly in *Aeromodeller*.

Left, swept wing combat model by 'Stoo' Holland has Copeman Oliver recessed into leading edge to provide rearward C.G. At right, winner of F.A.I. Glider, George Sharp of Croydon, GF rear boom on design influenced by Steve Bowles' models.

most of their members absent from the Nationals.

By its very nature free flight is affected more by the weather than other classes and this year's Nationals was no exception. A wet Saturday afternoon restricted pre-contest testing till well into the evening, and provided a foretaste of Sunday's weather. The morning had breezy, overcast, but dry, conditions when the contests should have started at 10 o'clock. There was little sign of the control points for the various events being set up until the very last minute – and some were difficult to locate. The only people really anxious to start were a handful of open rubber fliers apprehensive of the wind freshening, and A/2 entrants tied to round times

Retrieving gave a considerable amount of trouble. Until the latter part of the afternoon there was sufficient wind to take max flights off the airfield. As the downwind countryside was extensively cropped, with the largest fields and most luxuriant growth being immediately outside the aerodrome perimeter, trouble was inevitable. The farmer most afflicted complained not only of 'crop-wading', but also that his first knowledge of the contest was the sight of numbers of modellers in his fields. Those who spoke to him considered that he was a reasonable man, understandably annoyed! The whole problem was predictable, and could have been alleviated by an official approach in advance. Exhortations to the fliers (to request permission before attempting retrieval) are little more than a 'washing of hands'. If the officials set competitors the task of producing long flights in an airfield/weather/crop situation bound to give 'farmer trouble' who is to blame? In the circumstances prevailing a lot of models were lost – with those flying furthest being the most likely to be returned!

As the day progressed the solitary bright period was followed by intermittent rain or drizzle. This was accompanied by a decrease in the wind, together with a change of direction. The latter cancelled out, for a time, the benefits of moving the control points in an attempt to avoid the worst of the crops.

Although the **A/2** event commenced with plenty of activity it trailed off quite noticeably towards the end of the afternoon. This is common enough in contests run in rounds, as participants retire through loss, damage, or the disheartening effects of poor flights. The wet afternoon was obviously no encouragement. Use of the launching area did not preclude either lengthy tows upwind, or tactical flying with its attendant mass launches. Neither approach was altogether reliable. In particular there were several occasions when a number of models were launched simultaneously into very poor air, presumably this is through their owners following another model blindly without a critical enough evaluation of what it is really doing. Rain and round restrictions clearly forced some people into flying when they would have preferred otherwise.

In the conditions it was hardly surprising that the winning score fell short of a perfect seven maxs. Nevertheless George Sharp's top score of just over 19 minutes was more than respectable. His model was a straightforward. glass-fibre rod design having a pod shape that was styled on Elton Drew's layout, although the fin was mounted forward of the tailplane. The 3 spar wing was fairly high aspect ratio, with 5¾in. chord, and a Steve Bowles airfoil section. Runner up was Jim Baguley who used at least two models because of 'crop troubles'. His designs have appeared in print before, but he is now trying out glass-fibre rods on the same low pylon style layout. His clubmate C. T. James was but a few seconds behind.

I saw little of the **Coupe d'Hiver** event – except for enquiries as to the location of control. Some contestants were not pleased to discover that it had apparently 'gone for lunch'! Eventual winner was Bruce Rowe with a half-minute lead over Andy Crisp. Bruce's model was jointly designed with Dave Tipper, and is a simple looking box fuselage layout. Size is a little on the small side. Plans have appeared in the St. Albans newsletter *Thermal*.

The **Frog Junior** trophy for the under-16 year olds was won at the very last minute by A. Davis, of Bath. His second and third flights (both maxes) appeared on the scoreboard so late that runner-up Andrew Clifton had already been congratulated as having won! Andrew is a regular power flier and his Nationals model was an O.S. 15-powered 'Dixilander' – as plan except for a 2in. taller fin, and autorudder.

Another late and winning set of flights was made by George Simpson, who managed a clear win in the **Lady Shelley** tailless event. His *Wigsley Wonderer* glider was almost a true 'flying wing' with but a rudimentary profile fuselage to add noseweight, towhook, and the unused parachute D/T. From the extensive information sent to me, the designer owes much to Marcel Hinterman's *Sparrow* and Derrick Parker's *Woodford Sparrow*. Vital statistics of George's model are a wing area of 366 sq. in. and an a.u.w. of 12½ oz. The curved washout is achieved through building the wing in a specially constructed jig. Conspicuous by their absence in this year's event were the usual rubber powered models from Northern Area tailless exponents.

The flyoffs necessary to decide the open rubber and power events were not scheduled to be held until after 8 o'clock. This has been the standard arrangement now for some years, but the hopes of a calm 'dead air' flyoff won on sheer performance have yet to be fulfilled. At least the system does allow adequate preparation time before the flyoff for those who make their final timed o.o.s. at just over eight minutes.

The first of the two flyoffs was for **Power.** All the six qualifiers used glow motors in conventional layout pylon models. First to launch was George Fuller with his ETA 29 powered *E type Dixielander*. He had started the contest with an O.S. 29 version, but insufficient tail bands led to a spectacular mid-air wing break. George's misfortunes continued to the 'flyoff' as his V.I.T. mechanism jammed and the tail remained in the power position. The model still cleared four minutes, so the air was obviously good. It also *looked* good, so Russel Peers followed with little delay. He had changed from his ETA 29 *Woodpecker* to an O.S. 40 RR version with a thinner wing and *lighter* structure. This has a very straight climb that looped off the top of the climb despite V.I.T. and A/R. It looked to be in sink at first, but worked its way into lift eventually. It finally came down behind the hangars at a little under five minutes Other exponents of the large glow motors were Trevor Payne (whose ETA 29 taper tip model had a spiral climb, but stally glide) and Nigel Clarke with an off peak Fox 36X in a flat bottom winged model. A very different approach was used by the remaining two contenders. John West produced a very new looking open model for the flyoff – with an ex-FAI Wamper tuned G15 *and* pipe. He had the disconcerting experience of having his engine timer 'fall to pieces' a few minutes before the flyoff. This meant fitting replacement 'works' and explains his rather conservative 8 sec. run. The model was extremely fast, if rather flat under power, and did long enough to place between Peers and Fuller. Last to go, perhaps through having to carry a heavy car-type 'acc' to the flyoff area, was J. A. Steel with a ½*A train*. In bright sunlight against dark clouds he certainly had the visibility – but not good enough air.

Rubber had half the *fliers* reach the flyoff. This sounds more impressive than one-sixth of the *entry*! Nevertheless, the finding and marshalling of the necessary 30-odd timekeepers was quite an undertaking.

Winner, with an eye-straining, and eyebrow-raising 7:17 score, was John Boon. His diamond, low pylon polyhedral model was conventional enough except for very light, almost flimsy, construction and an 18 strand 5½ oz. motor. Vital statistics include a 52 in. x 5 in. chord wing of Wiseman section and a 24 in. x 30 in. prop. He flew without D/T, did 13½ minutes in the air, and came back with the model that night! He also brought back John Carter's *bigger* model that had gone a field further. Runner-up was Barry Hyde with a model unusual in combining a slab-sided fuselage and 'Midland' style pylon. This looks 'bitty' but is very rigid. He got a minute more in sight than the group of fliers who filled the next two places. Best of this bunch and third overall was Reg Lennox with a taper tip 275 sq. in. design. His initial power stall and indifferent climb proved to be no handicap.

It is impractical to mention all the other participants. Several flew models without D/T and some got them back. On the other hand, Mike Fantham, with a correctly estimated 7½-minute fuse left his model downwind. Disaster also struck Ted Prince when a damaged longeron failed completely under full turns, to ruin both a fuselage and his hopes.

Whilst Monday brought a complete change in the weather. There was not a lot of wind, and bright sun all day. This combination, on damp ground, made for strong and plentiful thermals. Long flights were commonplace, as indeed were lost models – the time taken to descend on D/T took many a model off the drome and into the crops.

The Wakefield and F.A.I. Power events were run by the East Grinstead club and helpers, under Mike Coomes.

The second round brought considerable difficulty through Mike's insistence that he must work to the rule demanding that cards be handed in within five minutes of the end of the round. Enforcement meant that a number of fliers had flights disallowed. This caused quite a rumpus as they claimed, correctly, that it was not *their* responsibility to look after flight cards, and to be penalised for someone else's laxness is unfair. At least one official protest was made – and referred to the S.M.A.E. F/F sub-committee members present. As they had devised the rule their decision is unlikely to be *considered* impartial. Deciding 'not to change the laid-down rules' did not really resolve the situation, which will no doubt be referred to the S.M.A.E. Council. The organiser's attitude seemed to be that of deliberately demonstrating that 'the law is an ass'.

1. Top vintage trio, all S. Bristol, Messrs. Burton, Silcocks and Mayes. 2. Winner this time in F.A.I. Power, Dick Jackson (St. Albans). 3. Free flight scale winner Terry Manley with FK8. 4. ½A winner Philip Ireland at moment of truth! Cox Tee Dee .051 power. 5. Kevin Managhan from Market Harborough placed 2nd in Junior Kit glider with Cirrosonic. 6. A/1 glider winner Martin Dilley. 7. Margaret Leicester with Dave Hipperson's F.A.I. Rubber winner. 8. Open Glider went to Albert Fathers with a terrific 15-minute flight.

George Simpson with his winning tailless glider – approximately the size and weight of an A/2. Did not use the 'chute D/T fitted.

Perhaps the commotion that resulted will ensure that the rule has a short life. It is relevant to mention that the results were affected, especially in Wakefield. The actual winners circumnavigated these and other hazards successfully. **F.A.I. Power** was won by Dick Johnson with a perfect score of seven maxes, this must have made up for last year's disappointment when the same model D/T'd at the end of the engine run when well set for second place. Like most F.A.I. motors, the power-plant is far from standard. The much-modified G15 had a Cox head tapped and plugged. The crankshaft is ground out and the crankcase compression boosted by packing the rear of the crankshaft with *balsa* secured with a dural ring and Araldite. The bottom of the cylinder liner is radiused for easier transfer. Prop used is a 7½ x 3¾ Bartell. The model has a thinned version of the section on Pimenoff's 'No. 18' and was featured on the cover of the August '70 **Aeromodeller.**

Left, Mike Coomes managed to find time to both run F.A.I. and place in the glider fly-off, was 13th. Right, Joe Barnes (Liverpool) has his model under shelter from Sunday's rain in Open Rubber, placed 4th.

John West secured another second place – using a 1965 model to the usual elliptical tipped, rear fin, formula. Power came from an old G15 modified by Kevin Lindsey, and mounted on T section alloy mounts. Andrew Brewster was third with the Rossi 15-powered, glass-fibre rod design shown in last month's *F/F Comments*. Fourth was Danny Jarman, flying his first F.A.I. power model. This has a standard G15, glass-fibre rod fuselage, and shows considerable John West influence!

Wakefield was flown tactically by many entrants, with the second round proving difficult. Fliers waited right to the end before launching, and this undoubtedly led to the troubles with returning flight cards, that have already been mentioned. Dave Greaves 'lost' a near-max that put him out of second place, and there were several other sufferers. Initial scores seemed high, but the pace soon flagged. Only Dave Hipperson maintained his string of maxes – but at the price of losing two models, one in crops and the other over the airfield buildings. His last flight was made after some rapid trimming and with the D/T timer set for only two minutes to ensure keeping the model, so he could 'make some more like it'.

The F.A.I. control and launching box was moved in the middle of the fifth power round to avoid the crops. A simultaneous change in wind direction promptly took models over the hangars. This proved to be my undoing, as I lost my only real Wakefield behind the buildings. I had my hastily ballasted open model wound but not the prop fitted when the contest close was signalled! Second and third in Wakefield were P. Coghlan and Mike Dixon – subject to the comments already made.

The 'Ladies' event for the **Woman's Cup** only attracted four entrants, but all flew. Last year's winner, Wendy Wood, made the mistake of flying too early. Jennifer Edwards used two models to win the event. The first was a duplicate of her 1970 model – but had the wings break twice, one through leaving a screwdriver in the rear peg and later through husband Bruce carrying it on a bicycle. She then used a 295 sq. in. 'flyoff model' – on half turns, as she knew the score she had to beat. This was the model exhibited in the *M.E. Exhibition* in January. Runner-up was Sue Miller, with one poor and two good flights from her usual power design.

Rubber winner John Boon with his model, despite a D/T-less flight!

In comparison, **Vintage Duration** attracted an entry of over 30, but only 10 recorded scores. Reasons are subject to speculation as there were certainly plenty of potential participants in evidence. Some, admittedly, were more suited for 'precision' events. Both first and second places were taken by the A.P.S. *Bazooka* design, in the hands of John Barton and Brian Silcocks. Third place also went to a South Bristol member, Vintage enthusiast John Mayes. He flew a *Powerhouse 33* powered by an OK Cub 0.049 glow motor. Pete

Russell Peers prior to the Open Power fly-off, which he subsequently topped.

Russell deserted his usual events to fly an A.P.S. *Hi-Ball* into fourth position. Also competing were replicas of the Halifax *Rapier* (with Frog 180 diesel), *Korda Wakefield*, A.P.S. *Straitplank*, *Tops IV*, *Supa Dupa* and *Pinocchio*.

The abundant lift meant that all the other events needed flyoffs. That for ½A was only a two-way affair, even though the contest had nearly as many participants as the previous day's open event. The winner proved to be Philip Ireland with a straight climb and slightly helpful air. His model had a TD051 and KSB timer, plus evidence of repairs necessary after 'contact' with a radio model some weeks earlier! Second place went to Bob Bailey with a respectable enough flight considering he had to refit his engine bearer assembly (with 'five minute' epoxy) following collision with a hangar. Last year's winner, Bryan Spooner, had his model stolen by a young boy who picked it up in front of some modellers near the hangar with the remark, 'that's my father's'.

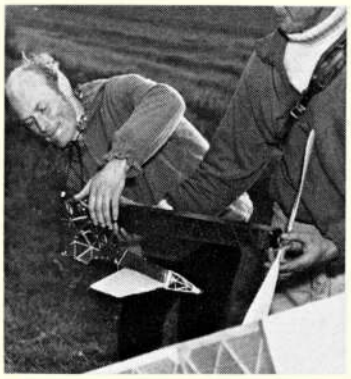
Bob Bailey's troubles continued to the **A/1** event. A 'spot check' on towline lengths saw his lightweight line break under the pull test, but not before it had gone overlength. He flew off using his A/2 line, but had his 3½-minute score disallowed. Logically, his five maxes should have been cancelled as well. Martin Dilly likewise found his light line too long, but fortunately had not used it for his officials. He used a 'bubble machine' to decide when to fly, caught good lift, and D/T'd in sight for over eight minutes. Martin's A/1 was three or four years old and had a Jedelsky style wing, but using a Benedek Section. Philip Ireland (in the same two flyoffs as Bob Bailey) and Tony Cordes, found little assistance but still cleared the two minutes used as the contest max.

The final flyoff was to prove a fitting finale to the F/F side of the Nationals. This was for **Open Glider** and had 16 qualifiers. Strangely enough, there were very few 'near misses' – a good demonstration of extreme ups and downs.

First to launch was young Anthony Fantham with a standard *Caprice*. This found weak lift, and inspired Ted Prince to follow with his large lightweight, covered all over in black tissue for thermal flyoffs. This was very new and stalled down. A few minutes later Martin Dilly and Albert Fathers flew. They looked to be in possibly helpful air but not such an obvious thermal as to precipitate wholesale following. Albert's model held towline height until halfway across the drome and then started to go up! It was timed for over 15 minutes by the naked eye (and over 22 using binoculars), thanks to being against a contrasting background. The model was high aspect ratio, far from new, and flown without D/T.

The rest of the fliers waited until there was only a minute or two of the 15-minute flyoff period left before deciding to tow. Those that waited longest launched into a strong thermal, with three models climbing rapidly together and another tagging behind. Not surprisingly, these fliers recorded good times and took second and subsequent top places. John Cooper was second with over 12½ minutes in his sights. He had an extender disc on his D/T timer that operated around 13 or 14 minutes and retrieved the model from just short of the M4 roadworks.

Colin Morris also managed 12 minutes plus, and caused yet *another* rules controversy. He used a third model for the flyoff and had it disallowed in consequence. As I was present at the critical moment when the number of models came to light, I know there was no attempt made to hide the fact. It was probably a case of having flown too many A/2 events. Presumably, Colin must have reported the matter, as results were not amended until two or three weeks afterwards. This gave third place to Dave Glue, whose A/2 D/T'd in sight and was seen all the way to the ground for 11½ minutes. Chrome tape reflectors flashed all through his flight. In comparison, Trevor Payne was timed o.o.s. at just over eight minutes.



A damaged longeron proved disastrous to Ted Prince, his fuselage collapsing under the strain of fly-off turns.

David Bloom, of Shrewsbury, was 3rd in Tailless with A.P.S. Xernes.

Finally, some acknowledgments are due. Readers of this report will no doubt appreciate that I cannot be in several places at once, and much information has been gleaned from both officials and contestants. I would particularly like to thank Tom Hargreaves, who loaned me his recovery bike (after mine 'blew' both tyre and tube) so I could continue competing and reporting. Mention is also due to those who responded to my appeals for information – Fred Chilton, Bruce Edwards, Gordon Hannah, John Mayes and George Simpson. Without them, and others, this report would have been much shorter.

JUNIOR KIT

This contest was one of the few events to suffer a lower entry than last year, with just 27 competitors, in contrast with the previous year's total of fifty. Perhaps the discouraging weather helped keep away some fliers – it was certainly wet enough to damp even the strongest enthusiasm!

Interestingly, the gliders achieved considerably better times than the rubber jobs under the wet and windy conditions, whereas the reverse had been true in '70 when the rubber models excelled in the more ideal weather. Many models suffered the inevitable breakage on the field which prompted some to give up. However, organiser Ray Favre was not so easily dispirited, giving the young entrants advice on repair, and almost 'ordering' some to take the models away and 'fix' them! This approach most certainly worked, many were the lads to come back again with a hastily repaired model, ready to fly again!

The rules called for the top five fliers in each category to 'fly off' with a further two flights each, and this proved unlucky for Anthony Fantham (quite a regular contest flier these days and indeed he reached the Open Glider fly-off) as he was more than two minutes better than his nearest rival in these qualifying flights, but dropped rather in the 'deciders', scoring just 104 seconds compared to winner T. Rigden's 250, although he still placed a good third. Most popular glider in this event was the Mercury *Swan*, which eleven out of sixteen entrants used.

In rubber, it was obvious that R. Green was out to improve on his previous year's performance, as he had entered twice, with two different models, and indeed achieved third and fourth places – a very creditable performance which illustrates his consistency. Fourth place previously, N. Watson this year made an improvement to take second place just 24 seconds behind the winner A. Cameron. In this event, the most popular machines were the Keil Kraft *Senator* with six to be seen, and the Mercury *Mentor* with 5.

Winner of the youngest entrant prize was a very wet Paul Sargeant (aged 7 years 3 months) who was persuaded to carry on trying, despite the rain, by his father and a helpful timekeeper – just as well he did! Winner of the C. Hamley cup for the highest scoring S.M.A.E. member was T. Rigden, who was, of course, winner of the glider section.

Terry Rigden, aged 16 years 8 months, with his Mercury 'Swan', winner of Junior Glider and best S.M.A.E. member (Salop MS).

RESULTS

Open Rubber (Model Aircraft Trophy)
Fly-off times

1.	J. Boon	(Falcons)	+	7:17
2.	B. Hyde	(Torbay)	+	6:55
3.	R. Lennox	(Birmingham)	+	5:57
4.	J. E. Barnes	(Liverpool)	+	5:55
5.	R. Monks	(Birmingham)	+	5:48
6.	J. E. Carter	(Spitfires)	+	5:28
7.	M. Fantham	(Richmond)	+	5:22
8.	B. R. Peers	(Falcons)	+	5:19
9.	B. V. Rowe	(St. Albans)	+	4:20
10.	A. G. Jack	(Tynemouth)	+	3:50
11.	C. J. Chapman	(Torbay)	+	3:49
	A. R. Wells	(Norwich)	+	3:49
13.	F. E. Elton	(Leeds)	+	3:36
14.	U. Wannop	(C.M.)	+	3:04
15.	K. Horry	(Bristol & West)	+	2:49
16.	E. Prince	(Falcons)	+	00

Open Glider (Thurston Cup)
Fly-off times

1.	A. V. Fathers	(C.M.)	+	15:06
2.	J. Cooper	(C.M.)	+	12:39
3.	D. Glue	(Brighton)	+	11:32
4.	T. F. Payne	(North'pton)	+	8:11
5.	M. Dilly	(Croydon)	+	7:15
6.	G. Pink	(Sth. Bristol)	+	7:00
7.	A. Fantham	(Richmond)	+	3:33
8.	L. A. Rogers	(Swindon)	+	3:30
9.	E. Prince	(Falcons)	+	2:49
10.	J. O'Donnell	(Whitefield)	+	2:16
11.	C. P. Williams	(Richmond)	+	2:07
	D. Yates	(Whitefield)	+	2:07
13.	M. J. Coomes	(East Grinstead)	+	1:07
14.	L. G. Barr	(Hayes)	+	0:55
15.	H. E. James	(Maidenhead)	+	0:27

Tailless (Lady Shelley Cup)

1.	G. Simpson	(Nuneaton)	6:22
2.	G. Mills	(Nth. Surrey)	4:54
3.	D. A. Bloom	(C.M.)	4:34
4.	J. Marshall	(Hayes)	4:30
5.	B. F. Bow	(Sth. Bristol)	3:57
6.	A. T. Slater	(Leatherhead)	3:45

Frog Junior Trophy

1.	A. Davis	(Bath)	7:08
2.	A. G. Chilton	(Crookham)	6:49
3.	B. Yearley	(St. Albans)	4:57
4.	A. Fantham	(Richmond)	4:07
5.	P. Coleman	(Cheltenham)	3:44
6.	R. J. Jones	(East Grinstead)	3:33

Open Power (Sir John Shelley Cup)
Fly-off times

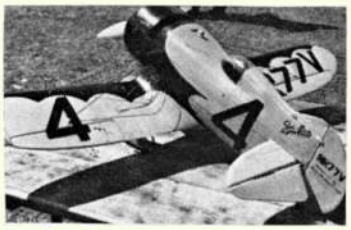
1.	B. R. Peers	(Falcons)	+	4:50
2.	J. West	(Brighton)	+	4:28
3.	G. Fuller	(St. Albans)	+	4:07
4.	J. A. Steel	(Luton)	+	3:54
5.	N. P. J. Clark	(Richmond)	+	3:01
6.	T. F. Payne	(North'ton)	+	2:08

Vintage

1.	J. W. Barton	(Sth. Bristol)	8:12
2.	B. D. Silcocks	(Sth. Bristol)	6:13
3.	J. B. Mayes	(Sth. Bristol)	5:51
4.	P. Russell	(Worksop)	5:47
5.	B. V. Rowe	(St. Albans)	4:03
6.	Cpl. Redhead	(RAFMAA)	3:59

½A Power

1.	P. Ireland	(South'ton)		9:00
			+	4:05
2.	R. L. Bailey	(St. Albans)		9:00
			+	2:28
3.	B. R. Peers	(Falcons)		8:11
4.	R. Cummins	(Bristol & West)		7:44
5.	R. Woodruffe	(Swindon)		7:36
6.	M. P. Keevill	(Nth Surrey)		7:13



Gee Bee RI flown in C/L scale by B. Sexton of Three Kings Club.

A/1 Gliders

1.	M. Dilly	(Croydon)		10:00
			+	8:14
2.	P. Ireland	(South'ton)		10:00
			+	2:21
3.	A. Cordes	(Tynemouth)		10:00
			+	2:03
4.	R. L. Bailey	(St. Albans)		*10:00
5.	K. Taylor	(East Grinstead)		9:31
6.	A. Turner	(South'ton)		9:28

* Disqualified at fly off because check on line at that time proved to be overlength.

Women's Cup

1.	Mrs. J. Edwards	(Richmond	8:48
2.	Mrs S. Miller	(Cambridge)	7:20
3.	Miss. S. Wood	(Halifax)	6:41
4.	Mrs. J. Duncan	(Wigan)	3:11

Eric Coates' BE 12e in flight, placed 2nd in F/F scale.

F.A.I. Rubber
Fly-off times

1.	D. Hipperson	(Croydon)	+	11:23
2.	P. Coghlan	(Havering)	+	9:04
3.	M. A. Dixon	(Birmingham)	+	7:41
4.	D. Culpin	(Rolls-Royce)	+	6:39
5.	D. Greaves	(Birmingham)	+	6:04
6.	A. J. Crisp	(FACCT)	+	4:27
7.	R. Lennox	(Birmingham)	+	4:26
8.	P. S. Masterman	(C. M/ Havering)	+	4:02
9.	F. E. Elton	(Leeds)	+	3:14
10.	J. O'Donnell	(Whitefield)	+	3:12
11.	D. J. Wain	(Sth. Bristol)	+	3:07
12.	D. G. Digby	(Nth. Surrey)	+	2:47
13.	A. C. Grantham	(East Grinstead)	+	2:39
14.	A. G. Jack	(Tynemouth)	+	2:34
15.	D. Smalley	(Norwich)	+	2:20
16.	P. Ball	(Rolls-Royce)	+	1:26

F.A.I. Glider
Fly-off times

1.	F. G. Sharp	(Croydon)	+	10:46
2.	J. Baguley	(Hayes)	+	9:33
3.	C. T. James	(Hayes)	+	9:29
4.	C. F. Peters	(Leicester)	+	9:13
5.	D. Glue	(Brighton)	+	9:12
6.	D. T. Hambley	(York)	+	8:03
7.	T. J. Punter	(Hayes)	+	7:46
8.	A. Cordes	(Tynemouth)	+	6:33
9.	R. L. Bailey	(St. Albans)	+	6:24
10.	M. Woodhouse	(Norwich)	+	6:21
11.	G. Ferer	(Leicester)	+	6:03
12.	S. R. Bowles	(Norwich)	+	5:44
13.	G. Read	(Anglia)	+	5:40
14.	D. Roche	(Anglia)	+	4:48
15.	W. Houghton	(Richmond)	+	4:47
16.	R. Cummins	(Bristol & West)	+	4:44
17.	A. V. Fathers	(C.M.)	+	4:24
18.	J. Cooper	(C.M.)	+	4:21
19.	G. Simpson	(Nuneaton)	+	4:18
20.	G. Pink	(Sth. Bristol)	+	4:05
21.	R. A. Twomey	(Croydon)	+	4:01
22.	C. H. Morris	(St. Albans)	+	3:11
23.	P. D. Freebrey	(Northwood)	+	3:06
24.	A. Davis	(Bath)	+	2:36
25.	M. Dilly	(Croydon)	+	2:28
26.	M. Shepherd	(St. Albans)	+	1:30
27.	C. P. Williams	(Richmond)	+	1:28
28.	D. Greaves	(Birmingham)	+	1:13

F.A.I. Power
Fly-off times

1.	R. Johnson	(St. Albans)	+	14:00
2.	J. West	(Brighton)	+	12:49
3.	A. J. Brewster	(Leeds)	+	11:03
4.	D. Jarman	(Brighton)	+	9:09
5.	F. E. Elton	(Leeds)	+	9:00
	F. G. Chilton	(Crookham)	+	9:00
7.	K. J. Glynn	(Surbiton)	+	8:03
8.	R. Collins	(Anglia)	+	7:54
9.	M. Hargreaves	(Leeds)	+	7:40
10.	R. Baggott	(Birmingham)	+	7:39
11.	P. Bond	(Anglia)	+	6:28
12.	I. W. Hargreaves	(Leeds)	+	4:32
13.	T. Child	(Brighton)	+	3:14
14.	M. H. Green	(C.M.)	+	3:06
15.	R. J. Melville	(St. Albans)	+	2:25

Robert Calvert (Blackburn) came second in Junior Stunt with his well-used (and how!) Dolphin, from American Aircraft Modeles plans, powered by a Merco 35. Far left, Bob Bailey with 2nd place ½A Power model.

1. Mike Birch won the multi-aerobatic R/C class with his 'Capricorn'. 2. Dave Handley, winner of R/C Pylon. 3. Tony Lunt's Chilton DWI in pale blue and silver, winner of R/C Scale; and 4. Anxious pit man releases Frank Van den Bergh's 'Phaeton' in R/C Pylon, one of the fastest models in the field – C/L speed included!

Coupe d'Hiver

1.	B. V. Rowe	(St. Albans)	8:38
2.	A. J. Crisp	(FACCT)	8:07
3.	P. Coghlan	(Havering)	7:55
4.	M. Lambert	(Nth. Surrey)	7:49
5.	G. Ferer	(Leicester)	7:37
6.	D. Hewitt	(Portsmouth)	7:33

Junior Stunt:

1. J. Heanen (Rolls Royce)	199.1 pts
2. N. Pointen (Long Eaton)	192.8 pts
3. R. Calvert (Blackburn)	179.6 pts
4. D. Dowdeswell (Glevum)	143.5 pts
5. A. Gibson (Allerton Grange School)	142.1 pts
6. I. Freestone (Northampton)	112.8 pts

Mouse Race – Class I:

1. Jolley/Counsell (R.O.I.)	6:55.4
2. Harvey/Coote (Bristol)	7:30.8
3. Warburton/Astall	Ret'd

Mouse Race – Class II:

1. M. Gagg	10:02.5
2. Halmshaw	Ret'd
3. Harvey/Coote (Bristol)	Ret'd

Class B Team Race (Davies B Trophy)

1. Howarth/Davey (Wharfedale)	7:11.5
2. Horton/Kirton (Wharfedale)	7:12.8
3. Yeldham/Taylor (Southend)	118 laps

F.A.I. Team Race (Davies A Trophy)

1. Schwarz/Kaul (Stuttgart)	10:04
2. Harknett/Smith (Feltham)	10:42.2
3. Muncaster/Langworth (Novo)	11:27

½A Team Race (RAFMAA Trophy)

1. Heaton/Ross (Leigh)	7:53.4
2. Harknett/Smith (Feltham)	9:36.2
3. Devenish/Davy (Wharfedale)	9:45.3

Goodyear Team Race

1. Harknett/Smith (Feltham)	8:38
2. Heaton/Ross (Leigh)	9:02
3. Skitt/Pittaway	Disq.

Aerobatics (Gold Trophy)

1. D. Day (Wolves)	1077½ pts
2. F. Warburton (Maidenhead)	1063½ pts
3. J. Mannal (Buckaneers)	1060½ pts
4. S. Blake (Buckaneers)	1027½ pts

Combat:

1. S. Jones (ACE)
2. R. Evans (South Bristol)
3. V. Hunt (ACE)
3. S. Holland (Phoenix A.C., Eire).

Carrier:

1. D. Bird (Three Kings)	279 pts
2. A. Keeler (Bristol Bulldogs)	179 pts
3. A. Woodrow (Yeovil)	125.5 pts
4. R. Clarke (Sharston)	–

Handicap Speed

1. B. Jackson (N. Sheffield)	105%
2. A. Woodrow (Westland and Yeovil)	98%
3. M. Billinton (N. Sheffield)	95.65%

Left, Frank Warburton placed second in Stunt with a new 'Tony'. At right, Paul Sargeant won the prize for the youngest entrant in the Junior Kit contest.

Junior Kit Contest:

Rubber

1. A. Cameron	161 + 131
2. N. Watson	136 + 107
3. R. Green	177 + 86
4. R. Green	144 + 80
5. A. Newman	102 + 0

Glider

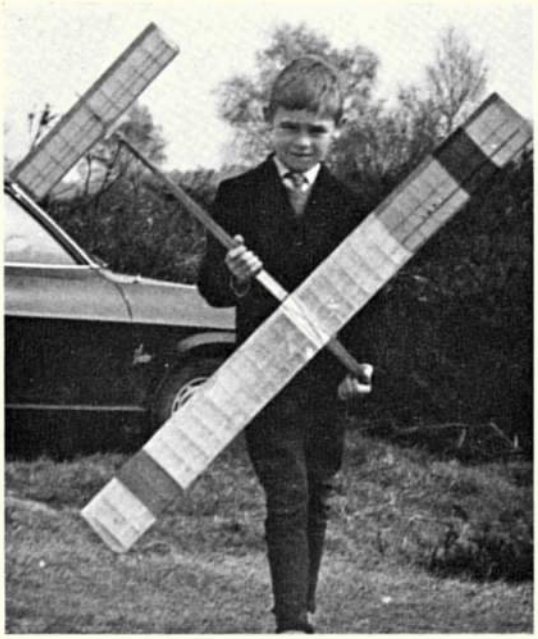
1. T. Rigden	221 + 250
2. K. Monagham	205 + 183
3. A. Fantham	346 + 104
4. M. Lowe	272 + 44
5. R. Luxton	204 + 0

Youngest entrant: P. Sargeant.
Best S.M.A.E. Member: T. Rigden.

TRI-STAR *Your FREE PLA*

TRI-STAR is a true beginner's sailplane, yet it is designed to meet the International A/1 Glider specification, and is both straightforward to build and satisfying to fly. The plan was drawn up over the Christmas '70 period for the designer's three young sons, ages varying from 8-11 years, each of whom managed to produce a reasonable replica (with just a little assistance) in time for the *Crookham Contest Modellers* meeting during March – the first event of the year.

The notorious postal strike of that period (of all things!) made its presence felt at this contest as three clockwork D/T timers which had been ordered failed to materialise, and young Christopher Twomey (eight years old) lost his *Tri-Star* in his first ever contest flight. He was 'unlucky' enough to catch a big 'Chobham bump', and the model disappeared at quite an altitude after being watched for some 15 minutes!



Construction has deliberately been kept as simple as possible, and the only tricky bits are the dethermaliser (D/T) and auto-rudder (A/R) fittings, with which some parental help may be appreciated. A P.V.A. glue is recommended for all balsa joints, while an epoxy adhesive was used for all balsa/ply joints, and also for securing all metal tubes, etc.

First, cut out the two fuselage sides from 3/32 in. sheet followed by formers F1-4. Pin the formers to the plan view of the fuselage, and glue them to the sheet sides. When dry, join at the tail end with a piece of $\frac{1}{8}$ in. sheet, and add the nose block. The top 1/16 in. sheeting may now be added (cross-grained), with the exception of the wing position, but leave the bottom until after the fin and rudder plus the A/R and D/T lines are in place.

Note the small piece of curved aluminium tube which takes the D/T line behind the tailplane, and the brass tube (left side of fuselage just inside the sheet side) which will hold the timer release pin which is attached to the towline. Note also the horizontally-placed (across the fuselage) aluminium tube which serves to pivot the timer operating arm (marked 'P' on the plan), which with the timer itself, is mounted on the left-hand side of the fuselage (add these items after tissue covering the fuselage). It is important to ensure that the nylon D/T line emerges from the fuselage at the correct distance from the timer D/T hook-up, as this distance determines the tip-up angle of the tailplane.

The fin is simply cut from 3/32 in. sheet, and has the rudder hinged to it by means of cloth tape, glued in place with balsa cement. Slot the fuselage top sheeting to accept the fin, and glue in position. The ply-

Heading photograph of the author's three sons clearly explains the name of the design! Construction is very basic, yet the 'mechanics' of the model are identical to that used on more sophisticated gliders. At left, eight-year-old Christopher with the model he subsequently lost due to lack of a timer.

wood rudder horns are now epoxied in place, followed by the wing and tailplane mounts.

The D/T and A/R lines may now be installed within the fuselage. Bend and cement the tow-hook to a piece of 1/16 in. sheet (again with the grain to go across the fuselage width), then add the remainder of the bottom sheeting, followed by the sub-fin and ¼ in. square nose skid.

The complete centre section of the wing is flat, and the port and starboard halves are initially built in one piece. Pin the leading and trailing edges to the plan, as well as the lower spar. Glue the six W1 ribs in position, then insert a drinking straw (wrapped around with tissue for easier gluing) to house the single 10 s.w.g. wire joiner, but do not put the wire in at this stage. Finally, add the top 3/16 in. square spar. Build the two tip panels in a similar fashion, angling the root ribs with the template shown, then add to the centre section at the correct dihedral angle, using the ply dihedral braces at the leading and trailing edges. Finally shape the leading edge, add the centre section

Dick Twomey's A/1 Glider for the novice modeller

sheeting and sand all over – but do not separate the two halves yet.

The tailplane is extremely simple, the only noteworthy point being the ply D/T horn which is set between the centre ribs.

Cover the whole model, including all sheeted parts, with lightweight Modelspan tissue – and the more colourful the scheme the better. Use clear dope as a tissue-adhesive. When the tissue is firmly fixed, water-shrink it carefully. When it is dry again and free from wrinkles, add two coats of a 50/50 mixture of clear dope and dope thinners, and pin down wings and tailplane to a flat board. If possible leave them pinned down for a week, to ensure that no warps appear.

With the model thus finished, the auto-rudder is completed, noting that a small tension spring is used between the wire and the left-hand rudder horn. Rudder control is sensitive, and is made to turn the model right on glide by means of a rubber band attached to the right-hand horn. The autorudder line is attached to the bottom of the ply operating pivot 'P', and then taken on to a ring (such as a nylon curtain-runner ring) through which the towline release pin will go.

The dethermaliser line is a stretchy nylon line, the rear end looped so that it can be passed over the front of the ply D/T horn on top of the tailplane. (The rubber bands are then passed over the rear of the same horn and attached to the tailplane L.E. mount, an arrangement which will prevent the D/T loop from falling off.) At the front end, the D/T line is attached to a nylon curtain-runner ring and connected to the KSB timer. The timer on/off switch must be loosened off to move easily, and is biased into the 'on' position by a spring. The on/off switch is wired (control-line wire again) to the **top** end of the ply operating pivot 'P'. The timer itself is pushed into a cut-out in the left-hand side of the fuselage and screwed into place.

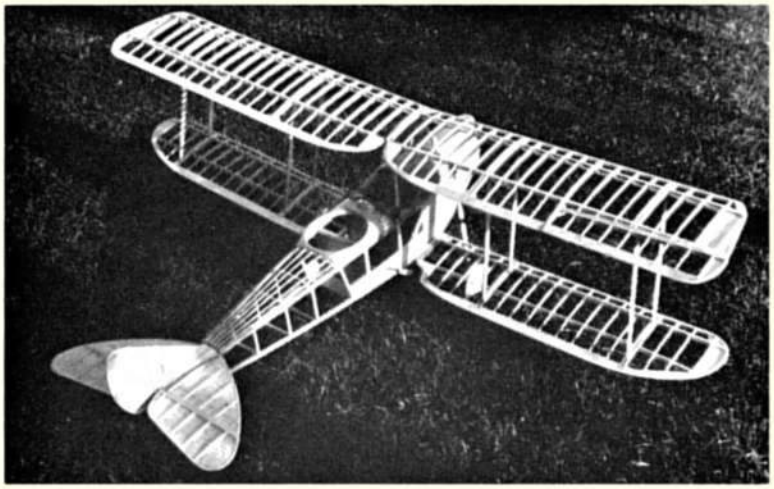
Trimming

Add lead to the nose-weight box until *Tri-Star* balances on the lower wing spar. Hand launch until glide is satisfactory, adding packing (1/32 in. at a

time) under the tailplane trailing edge until best glide is achieved. Do this in conjunction with a small amount of right rudder (⅛ in. offset may be enough). Before towing, check the operation of the autorudder, which should pull straight when in the towing position. Check operation of the tip-up tail D/T also, and set the timer. Now try towing, making small rudder-stop adjustments between each flight until a straight tow and wide circling glide is achieved. Check that the release pin comes out easily, and spend plenty of time making small adjustments to rudder and tailplane until you are satisfied. Although this sailplane is a simple one to build, its 'systems' are the same as for any advanced competition model, and therefore demand the same care.

Above, nine-year-old Michael Twomey is all set to follow in his father's footsteps with his nicely-built version of the Tri-Star. Model is very simple with no tapering wing tips to trap the unwary.

Below, from left to right, the 'Twomey Tribe' of Christopher, Michael and John, all set to give J. O'D some worries at the fly-off!



Uncovered view of the author's Rumpler CV displays the use of twin balsa spars let into the upper and lower surfaces of the rib. Although light and strong, his preference is now to use a centrally disposed spar, as shown in figure 2.

Part VI:

Wing and Tailplane Construction

FLYING SCALE MODELS

by Eric Coates

WE WILL look in detail at the structure of scale model tail surfaces prior to the wing structure. This is because I usually construct my wing tips in a similar manner to my tailplanes, and as this construction is somewhat unconventional I intend to devote a large part of this month's article to it.

Generally tail surfaces are the least well-made structure on the average scale model. Typical instructions given with most kits and magazine articles blandly state '*The tailplane and fin should be constructed in a similar manner to the wings*', sometimes with a rider to the effect that '*care should be taken to avoid warps*'. I used to build my tail surfaces similar to my wings twenty years ago, but stopped doing so after the Avro 504K in 1951. Although I took care to avoid warps it did not prevent me having to hold the thing in front of the electric fire every week and twist the tail surfaces flat again!

If a free flight scale model is to have a long and successful life it is essential that the tail structure is built true and remains warp-free for its entire life. When one considers that the edges of the typical fabric covered tailplane were usually metal tube of about 1 in. to 1½ in. diameter this means that our edges must be made from 3/32 in. to ¼ in. sq. balsa (anything else would be too heavy) if working to approximately 1/12th scale. As the maximum tailplane thickness is about 3/16 in., and the span can be up to 15 in., an open framework similar to a wing structure, cannot help but warp. If we stick to the open framework structure the only alternative is to 'beef up' the thickness and use oversized spars and edges. The result is most un-scale like in appearance.

Take a look at the photograph of the tail structure of my Rumpler C.V. built back in 1956. This is a sandwich form of construction which is built symmetrically over a centre core of 1/32 in. sheet. Each part, i.e. tailplane, elevators, fin and rudder is built separately as follows:

(1) Select a suitable piece of straight-grained medium hard 1/32 in. sheet and place under the plan with a piece of carbon paper interposed.
(2) Draw over all the spar positions, leading and trailing edges and rib positions to transfer them, via the carbon paper, to the 1/32 in. sheet.
(3) Cut out the sheet to outline shape.
(4) Draw a mirror image of the structure on the reverse side of the sheet. This is easily done by poking a pin through the sheet at each rib position where it joins the leading and trailing edges, and then join all the holes up.
(5) Glue the structure to the one side of the sheet preferably using a P.V.A. adhesive to prevent warping. Pins are used to hold the strips in place until dry. The scantlings will depend on the model but for the Rumpler, which is a fairly typical 1914-18, 1/12th scale two seater spanning 45 ins., the main spars were ¼ in. sq., the leading edges 3/32 in. sq. and the trailing edges 1/16 in. sq. The ribs were 1/16 in. x ¼ in. The spars should be medium-hard but all the rest of the structure fairly soft. If the edges are curved, as on the Rumpler, then the balsa strip should be notched on the inside, with the thumbnail, at about ¼ in. to 1/16 in. pitch – dependent on the radius – to pre-curve it prior to glueing to the sheet. You will be surprised how easily this is achieved. Practice first on a piece of scrap strip, holding it between the forefinger and thumbnail, then press. As you feed the strip through, it forms a natural curve. The more notches per inch, the tighter the radius.
(6) When the structure is dry the sheet is turned over

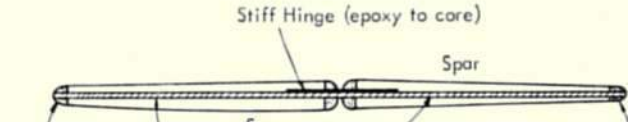


FIG.1. CROSS SECTION THROUGH TAILPLANE

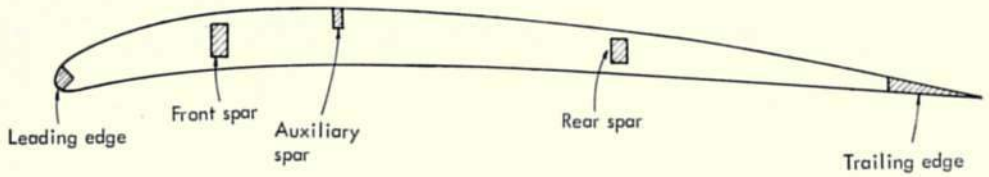


FIG.2. TYPICAL WING SECTION 1914 - 18 AEROPLANE

and the procedure repeated.

(7) Any 'hard points' to hold bracing wires or where the tailplane is attached to the fuselage, etc., are now added.

(8) Using a sandpaper block, the whole structure is now sanded to the required airfoil shape, just like a chuck glider wing, although with considerably less effort and dust! A considerable amount of wood can be removed from the leading and trailing edges to get them nice and thin, as on the prototype. Care should be taken, however, not to overdo the sanding of ribs otherwise an unsightly scalloped effect is produced.

Even before covering, a tailplane made in this fashion is very stiff torsionally. When covered and doped a very strong and almost unwarpable unit is produced. Tail structures made in this fashion are remarkably strong also in resisting 'edgeways-on' loads; such as frequently happens with fast downwind landings when the whole thing cartwheels.

When covered and doped a very realistic tail-end is produced. The sheet sandwich forms an opaque centre to the structure preventing daylight shining through the thin surfaces when viewed in flight from below. The extremely thin leading and trailing edges are very apparent in these photographs.

I first saw such a sheet sandwich structure used on one of Jim Bridgewood's scale models, I think it must have been his Vigilant, at the 1952 Eddie Riding memorial competition held, as usual, at Woodford. I was competing with my then new DH.9a fitted with a conventional open structured tailplane which had warped, of course! I don't know if Jim was the actual inventor of such a structure but I immediately 'cribbed' it and built a new tailplane for the 9a in this manner and was an immediate convert. I have used such structures ever since on all my scale models which includes the odd control-liner as well as on radio models latterly. I am amazed that such structures have not become more widely popular. Apart from my own immediate acquaintance in the Blackburn Aircraft, Doncaster and Lee Bees clubs I don't know of any other modellers who have adopted this form of construction.

The elevators and rudder are attached to the tailplane and fin respectively by means of aluminium or tin fishplate type stiff hinges pushed into the centre of the spars adjacent to a wing rib (see Fig. 1).

The 'hinges' should be stiff enough not to allow the inertia of the control surface to alter its setting during a heavy landing otherwise it will be virtually impossible to progressively trim the model. When the aeroplane is trimmed it is desirable that the control surface is tack glued, using blobs of cement in the hinge line crack. If the setting has to be altered at a later date these can be cut through.

Wing Structure

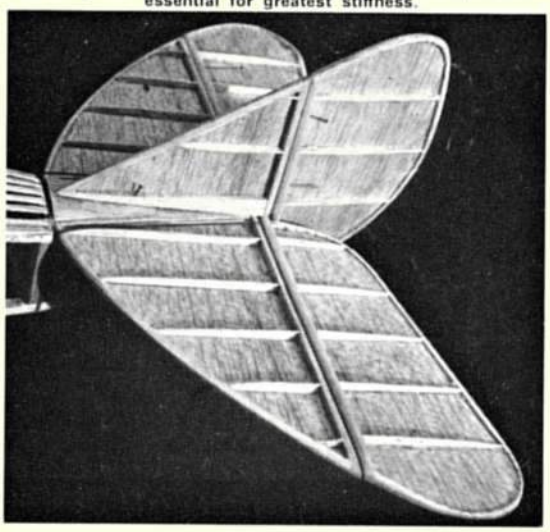
As mentioned last month there are two basic types of wing structure: braced and cantilever. Invariably all braced structures are fabric covered and on most aeroplanes prior to about 1925, very thin in section. These wings are by far the most difficult to reproduce so that we have a strong, light, flexible structure that looks realistic.

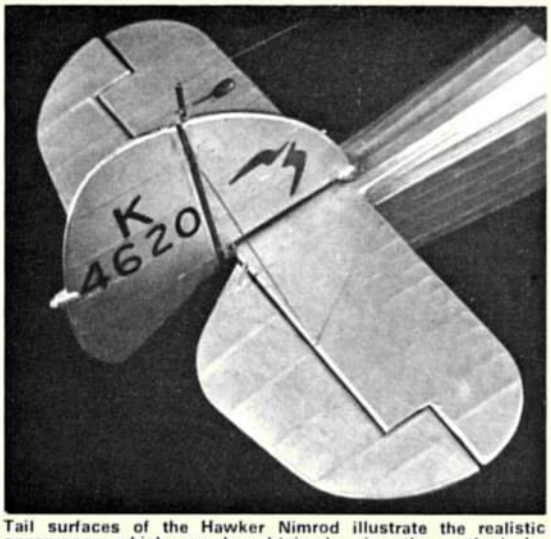
Fig. 2 shows a typical undercambered wing section of a 1914-18 biplane. All sections of that period were very similar; some had more and some had less camber but invariably a considerable amount of undercamber is present. I personally always use the exact scale section for models of this period, making the wires do most of the work, but as mentioned in Part III, a 20 per cent thickening of the section does not intrude very much and it allows deeper spars to be used.

When designing the wing, the first job is to work out the scantlings for the spars, which are invariably dictated by the section itself. Virtually all biplanes have two spars and we have to adhere to their scale position to enable the interplane struts and wires to pick-up on them. I used to use twin balsa spars notched into the upper and lower surfaces of the ribs which undoubtedly is the strongest and lightest method of sparing a wing: allowing the spars to work farthest from the neutral axis. However, it is not very scale-like in appearance as the spars can clearly be seen when the wing is covered. In recent years I have used centrally disposed spars, as shown in fig. 2. This is, of course, how spars are run in full size practice so that they do not foul the covering. Although the covered wing looks much better, it is nothing like as an efficient structure and is also prone to eliptical dihedral warping. Because of the inefficiency of centrally disposed spars it is necessary to use spruce on all but the smallest models. At least 1/16 in., and if possible a little more, of wing rib should traverse over and under the spars. Anything less and the ribs are too weak.

There is also a danger of the covering adhering to

Detail shot of the Rumpler tail surfaces shows Figure I put into practice. Unit is very light, strong, warp resistant, yet looks 'right'. Note also grain direction used in fin/rudder – essential for greatest stiffness.





Tail surfaces of the Hawker Nimrod illustrate the realistic appearance which can be obtained using the method described, and as illustrated in Figure 1. Sheet centre core cannot be seen, yet prevents tail from being 'transparent' in flight.

the spar where it sags between ribs. The best scantling one can then usually achieve is ¼ in. x ¼ in. for the front spar and 3/16 in. x ¼ in. for the rear spar. These are quite adequate for a well braced wing.

Eliptical dihedral warping is a problem to which I must confess I don't know the full answer. It is caused, I think, due to the asymmetric distribution of the spars (including the leading and trailing edges) in relation to tension in the covering. In other words because of the camber of the section all the spars are too low down: it certainly doesn't occur if the spars are on the wing surface as on the Rumpler. It is, of course, at its most marked if the spars are only on the lower surface, as builders of a certain well known designer's sports models well know! Terry Manley thought he had the answer when he fitted a third auxiliary spar, of ⅛ in. x 1/16 in. spruce, just below the surface at the point of maximum camber, as seen in Fig. 2, on the wings of his R.E.8. I followed his example on my B.E.12b. Neither of these models have been troubled with eliptical dihedral. However, on Terry's next model, the F.K.8, he now reports the old trouble is occurring again despite this auxiliary spar.

I almost always use a light section leading edge, usually ¼ in. x ¼ in. balsa (set diamond wise). This is quite adequate with the close set rib spacing prevailing.

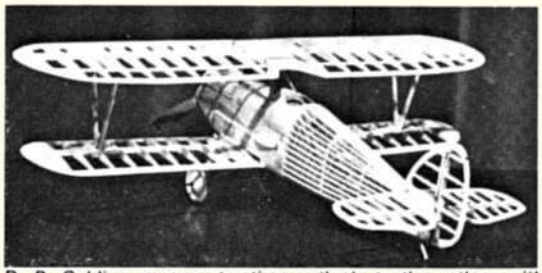
I have not found a satisfactory answer to the trailing edge problem. Of course the originals were of a very light section but invariably internal wire bracing stiffened the structure. I have tried light sections, such as 3/16 in. x 3/32 in. spruce, but they have tended to warp badly locally. On large radio controlled models, with chords in the region of 12 in., it is possible to insert a thin sheet into the rear of the ribs and just cap the end although with the thin trailing edges, in the scales we are working, this is not very practical. All in all I find no alternative to the fairly large chord T.E. of ¼ in. x ¼ in. or even ¼ in. x ¼ in. balsa, dependent on the section. When the wing is painted and rib tapes are used, carrying the rib line to the extreme trailing edge, then the large section is hardly noticed. Do ensure that the trailing edge is accurately shaped to smoothly follow the contour of the ribs as any undulation in the wing section here is very noticeable.

Now to the manufacture of the ribs themselves. These should be cut from medium straight-grained 1/16 in. or 3/32 in. balsa. End ribs and the rear half ribs, at the aileron split, should be thicker (⅛ in. or 3/16 in.) so that they do not 'pull in' when the wing is covered and doped, the latter being used if the section is very thin. Two templates are first cut from 16 or 14 s.w.g. dural plate complete with all notches and cut outs for spars. In order to make the rectangular holes for the two spars, a ¼ in. diameter hole is first drilled and the rectangle opened out with a 3/32 in. square file.

Two random 1/32 in. holes are made in the templates for pins, between the front spar and leading edge and the rear spar and trailing edge. Rectangles of sheet, slightly larger than the templates, are then cut and sandwiched between the templates. The whole bundle is then pinned together and the ribs carved and sanded to the contours of the template. Each wing set is made individually. This means we have a bundle of about 20 ribs at each go, i.e. 1¼ in. thick if 1/16 in. sheet is used. Before the bundle of ribs are separated the spar holes are cut; again using the ¼ in. drill, which is run in from each side, and the 3/32 in. square file. Check that a section of spar will pass through the bundle of ribs before separating. The spar should be a fairly loose fit in its tunnel of holes.

I always make my ailerons separately, but at the same time as its respective wing panel. This means that the outboard ribs require cutting and a piece removing to allow for the aileron spar. To achieve this I usually cut one of the templates to the correct length to cater for the aileron spar and use this as a pattern for shortening the required number of ribs. Similarly if riblets are required (and they usually are in their hundreds!) the front portion of one of the templates is cut to the length of a riblet and used as a pattern. I am afraid that riblets are too small, usually, to block together so that they have to be individually cut out with a balsa knife – to me the most hateful job in all aeromodelling! Of course one can choose one's prototype without riblets – the Rumpler C.V. is one and the White Falcon another. This latter offers a double bonus in that it doesn't have ailerons either; having wing warping instead.

Eric's Leopard Moth seen before the leading edge sheeting was applied. He also used a full depth rear spar on these wings, as this was the simplest answer to a problem created by the large span ailerons and inboard flaps – very little fixed surface extends beyond this spar.



D. P. Golding uses contrasting methods to the author, with his Fairey Fox Mk. I. Wing spars are let into lower surface of the ribs only, which could cause weakness and warps. Beautifully built model spans 38 in. and is destined for Mills 1.3 power.

Having cut and shaped all our spars and ribs, we are now ready to commence assembly. The trailing edge is first pinned down on the plan taking care to pack up the front by the correct amount to cater for the undercamber. With undercambered wings I always find it an advantage to notch the front of the trailing edge spar about 1/16 in. to receive the ribs. I know this is bad practice structurally, but it does make assembly very much easier. It is unnecessary with a flat bottomed section as the trailing edge of the rib is resting hard against the building board. All the ribs are now slotted on to the two spars and their trailing edges glued into their respective notches in the trailing edge spar. Each rib is pinned to the plan at its nose and the leading edge glued in place. The aileron is built packing the aileron spar up the correct amount so that the split ribs line up correctly.

The wing tips now follow. Their construction of course varies according to the shape. Square tips are relatively simple and can follow normal methods as on the White Falcon wing. If a rounded form is to be built, however, these are best built along the lines of the tailplane. The spars can be slotted outboard of the last rib, or even the penultimate rib if a stronger job would result, and 1/32 in. sheet let in. This should be pre-curved to the necessary camber of the tip. This is a point often overlooked. Flat tips on a highly cambered wing look hideous. The top half of the tip section, usually 3/32 in. sq., is then pre-curved, by the usual technique, and glued in place. When the structure is set the wing is unpinned and removed from the plan, and the lower half of the tip section is then added. 1/16 in. x ¼ in. (or thicker if required) strips are then added above and below the rear spar adjacent to the aileron spar. The various hard points are then added as well as the ply end facing rib. The whole wing structure is then thoroughly sanded, particular care being given to the wing tips. As with the tail end, this form of structure will take plenty of end-on punishment and wing tips get plenty of that! The photograph of my B.E.12b wingtip undergoing repair is an interesting case. The 1/32 in. sheet should have been carried back to the penultimate rib but I am afraid I was rather lazy and only sheeted outboard of the last rib. The resultant structure is obviously weak in the vicinity of the front spar. During a heavy cartwheeling landing the whole tip section, between the spars, was stove in. As can be seen a compromise modification was made by inserting a prop, midway between the spars, between the two most outboard ribs.

To return to our typical wing construction, all that now remains to do is to fit the various interplane strut and wire attachments to the structure (these points were covered extensively last month.) Finally the innermost pair of ribs are drilled to take either the brass tubes or the dowels and these items glued to the ribs and spars. A check should be made that each wing panel accurately lines up on the fuselage, or centre section, at the correct incidence angle before the epoxy glue sets.

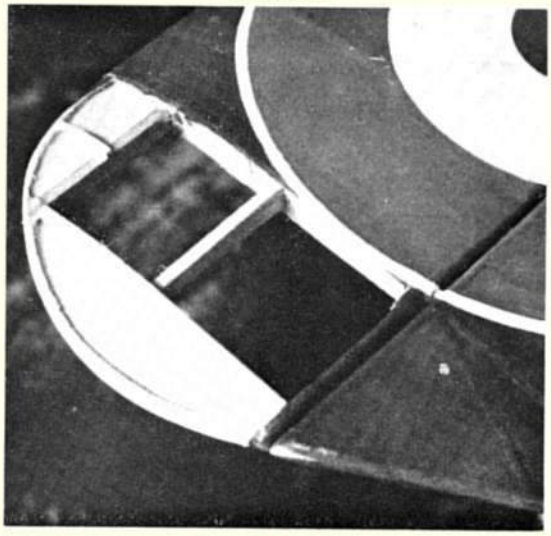
Wings on post war (1914-18 that is) biplanes and monoplanes are generally easier to construct, due to their thicker section. Very often they were sheeted with ply between the leading edge and the front spar, to form a box spar. The front spar is usually nearer to the leading edge than was the practice during the war years, to facilitate this. On smallish models, around 36 in. span, I generally reproduce this box spar out of solid medium balsa. I have done this on the Hawker Nimrod and also the Bucker Jungmann. The scantling of the latter being 5/16 in. deep x ½ in. wide. With a hefty spar like this at the front one can cut back a little on the scantlings of the remainder. However, one still needs a rear spar to carry the rear interplane strut and wires. On the Jungmann this was on the lower surface of the wing. The heavy leading edge allowing one to get away with this to a large extent. On the Nimrod, however, I put it in the middle and I think this is the best place for it. On the Jungmann I used a small section spruce trailing edge which, as I stated earlier, I do not now recommend.

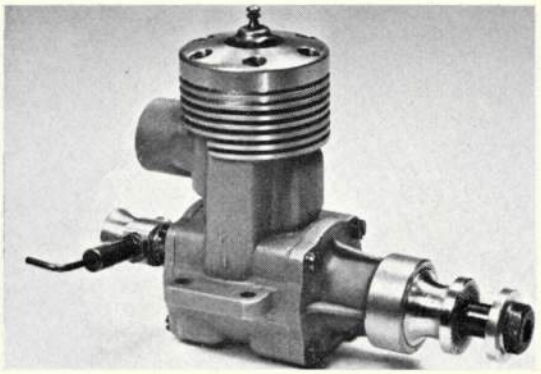
For larger models, with box leading edges, one has to use a built-up section which follows traditional lines: i.e. small section leading edge, upper and lower front spars and 1/16 in. leading edge sheeting.

That concludes the treatise on wing structure with the exception of the reproduction of the all ply covered and stressed skin wings. Aeroplanes with wing structure of this form are generally not very suitable prototypes for free flight models. Much has been written on this type of construction, usually using foam wing cores, in the specialist radio model publications in recent years and, therefore, I shall not repeat it all again here.

Next month we shall go on to look at covering and finishing techniques.

The B.E. 12's wingtip undergoing repairs as detailed in text. Laziness was the reason for the damage – if the sheeting had been continued to the next rib, the model may have escaped unscathed.





LATEST ENGINE NEWS

by Peter Chinn

Well-produced version of Hungary's latest 2.5 c.c. speed engine, the Moki S-6T. Motor now incorporates Schnuerle porting and rear facing exhaust in keeping with latest Western approaches.

Moki S-6T

Thirteen years ago a brand new 2.5 c.c. engine burst abruptly upon the European speed scene with a 1-2 placing in the 1958 *Criterium d'Europe*. This was the Hungarian Moki which, flown by Imre Toth and Rudi Beck, handsomely outpaced the Czech MVVS and Italian Super-Tigres that had been fancied to win. In 1962, a Moki won the World Championship in the hands of designer Krizsma and in 1964, Krizsma was second only to Bill Wisniewski. Since that time, of course, no one has so far managed to beat Wisniewski's T.W.A. engine in a World Championships but successive developments of the Moki have continued to power Hungarian challengers and there is no doubt that they have been among the very best engines made in Eastern Europe.

The Moki speed engines began with the S-1 (disc valve) and first progressed through the S-2 (shaft valve) and S-3 (disc valve) models. The S-4 was a 5 c.c. unit. All these were of fairly orthodox design and borrowed certain Super-Tigre and K&B features. A change, however, came with the S-6 series and, as can be seen from the photos, this now follows the current formula of Schnuerle loop scavenging with rear exhaust and a tuned pipe. The engine illustrated is a Moki S-6T owned by Pilot Officer John Dixon who, because these engines are pretty scarce outside Hungary, was kind enough to send it along to the Editor so that it might be dealt with in this column.

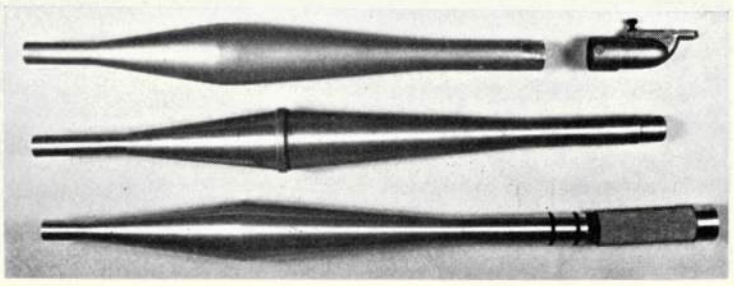
Moki engines are built in the workshops of the Hungarian state model design and development centre. The Moki speed engines are of very much higher quality than the motors produced in East European countries for the ordinary modeller and are comparable in most respects with the best Western equivalents. The S-6T has a nicely turned out main casting comprising crankcase and full length cylinder casing. This incorporates a rear exhaust stub and the usual three transfer channels. The drop-in, finely finished hardened steel cylinder liner, which has a 1.5 mm. wall thickness, uses a fairly large area exhaust port and the transfer ports are carefully shaped and angled to direct gas flow away from it. Port timings, as measured on the example examined, give an exhaust period of 157 degrees of crank angle, a main transfer period of 126 deg. and of 136 deg. boost port period.

The flat crown cast-iron piston has the skirt cut away at the front to register with a similar cutaway in the lower part of the cylinder-liner. It is coupled to a machined aluminium alloy con-rod by a 4 mm. gudgeon-pin that is retained by wire circlips and the complete piston and rod assembly weighs 8.3 grammes. The cylinder-head is plain with a shallow hemispherical combustion chamber (no squish band) and no gasket and it is probably the head that offers most scope for development.

The crankshaft, which runs, in the usual way, in dual ball journal bearings in a separate cast front housing, is of the enclosed counterbalance type, the balancing peripheral slots on the crank-disc being covered by an alloy rim. The rotary-valve is of a Tufnol-type material and runs on a steel pin pressed into the back-plate. The valve timing is 42 deg. ABDC to 50 deg. ATDC. The carburettor has a 6.5 mm. throat and, after allowing for the jet and needle, has an effective choke area of approximately 24 sq. mm.

The Moki tuned pipe has the orthodox dual cone shape and plugs straight into the engine's exhaust outlet, this latter being fitted with an O-ring for the purpose. The pipe has an inlet i.d. of 11 mm. and a tailplane i.d. of 6.5 mm. The pipe length (from the cylinder exhaust port) is approximately 11¼ in.

The Moki S-6T has the usual 15 x 14 mm. bore and stroke (2.474 c.c.) and weighs 160.5 grammes (5.66 oz.) or 188 grammes (6.63 oz.) with pipe. In-



The Moki S-6T pipe (centre) compared with the Kosmic K15 pipe and adaptor (beneath) and the Super Tigre G15 pipe with elbow.

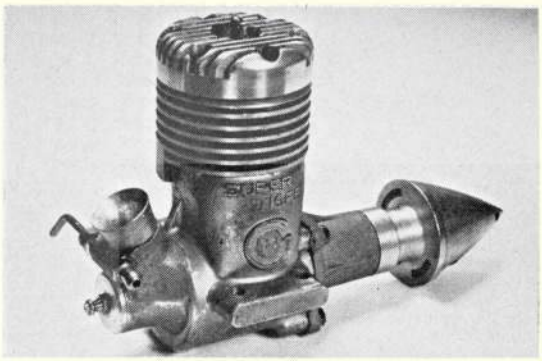
cidentally, we understand that this particular example is 'surplus to requirements' and that the owner might be just tempted to part with it. . . .

Martin Shelley Special

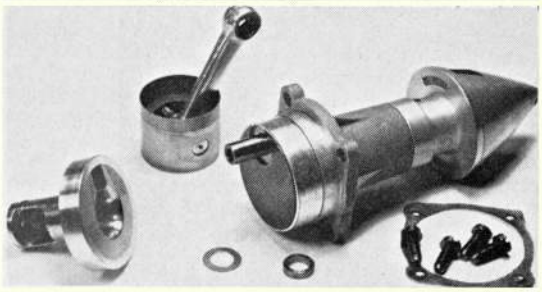
This engine was built by Martin Shelley of Edinburgh using parts of a damaged Super-Tigre G.40RR and a K&B Torpedo 29R front end. We are not told how well it goes but it is certainly a novel piece of work. The crankcase and cylinder casing is basically G.40 but reversed back to front, with the exhaust duct removed, fin o.d. reduced and housing turned down and shortened to serve to accommodate a rear drum type rotary-valve. The latter was machined from a G.40 12 mm. crankshaft, crank cutaways filled with Devcon aluminium-filled epoxy and fitted with an aluminium outer rim. Aluminium filled epoxy was also used to graft the carburettor onto the crankcase. This is offset in the direction of rotation and uses a K&B peripheral-jet, 11/32 in. bore venturi with Eta needle-valve assembly. The rotary-valve is ported to open at 30 deg. ABDC and to close quite late at 60 deg. ATDC although, in fact, since the 2 mm. oil hole of the original G.40 shaft has not been blanked off, the crank chamber is not fully sealed until approximately 110 degree past top dead centre.

The cylinder and piston assembly are standard G.40RR with deflectorless lapped cast-iron piston and symmetrical port timing. The G.40RR head with its very wide squish-band has been lowered slightly to maintain compression ratio with the reduced stroke. The crankshaft, bearings, front housing, prop driver and

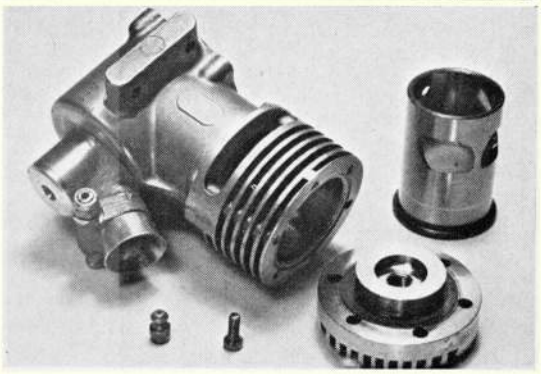
Martin Shelley's 6 c.c. hybrid built from a damaged Super-Tigre G.40RR and a K&B 29R with help from Devcon aluminium filled epoxy resin.



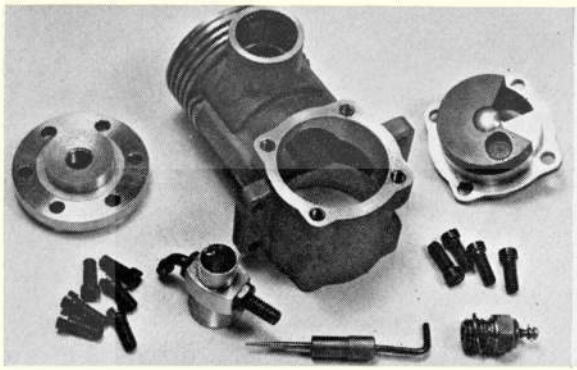
Parts of the Shelley Special reveals G.40RR piston plus standard K&B 29R shaft and housing. Valve rotor is made from the G40 crankshaft. Note spacer and shim for the crank pin to locate con-rod.

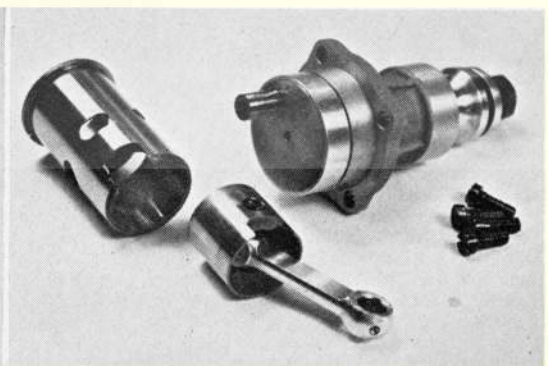


Shelley's 'back-to-front' G.40 casting with epoxied-on K&B intake, G.40RR liner and modified head. Also shown is rotor retaining screw and pressure fitting.



Below left: Moki crankcase/cylinder casting, cylinder head and induction unit parts display excellent machining and finely produced castings. Below: the S-6T's cylinder liner, piston and front end assemblies. No gaskets are used in the assembly of this high performance unit.





A Holland Hornet .049, one of the hottest engines of its capacity in its heyday before being ousted by the appearance of the Cox Tee Dee range, converted to compression ignition by Harry Lea.

spinner assembly are stock K&B, simply with the addition of a distance-piece and shim on the crankpin to locate the conrod, plus realignment of the housing flange screw holes. The crankcase barrel is slightly enlarged to accommodate this. The revised stroke results in the exhaust and transfer port timing being increased to just over 70 deg. each side of BDC.

With the G.40's 21.5 millimetre bore and the K&B 29R's 0.675 inch stroke, Martin Shelley's special checks out at 0.378 cu. in. or 6.2 c.c. The engine weighs 332 grammes or 11.7 oz. – much the same as the original G.40.

Two Dieselized Glow Engines

In the current issue of *Radio Control Models & Electronics*, there are some notes on two interesting large engines (a 20 c.c. twin and a 13.7 c.c. single) built by Harry Lea of Rainford, Lancs. In addition to making engines of his own design, Mr. Lea also indulges in conversions of existing motors and shown here are compression-ignition conversions of two glow engines, one of them an American Holland Hornet 049 (0.8 c.c.) which was first manufactured in the late nineteen-fifties and the other an O.S. Max-III 35 (5.8 c.c.) made in the early 'sixties.

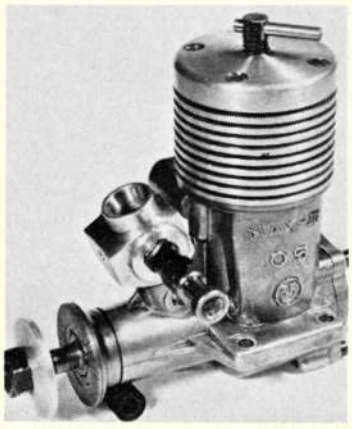
The Holland Hornet was one of the best 'Half-A' class engines of its day. Bob Holland's Holland Engineering Company later offered selected 'factory special' competition versions of this engine which were very powerful, delivering their peak output in the region of 20,000 r.p.m. Harry Lea's conversion is an essentially simple one. The engine uses its original piston and he has merely put a dural contra-piston into a new dural head. He says that the engine is 'a good runner' but that a chicken-stick is essential with small props. We hope that Mr. Lea doesn't risk using too small a prop. We remember getting carried away by the Hornet's phenomenal ability to rev and eventually succumbed to the temptation of under-propping it to the tune (and what a 'tune') of 25,000 r.p.m., whereupon the conrod broke just below the ball-joint. Actually this was not uncommon with the aluminium rod used by the Hornet and we had been warned by Bob Holland that it might happen.

The Lea-O.S. diesel was a rather bigger conversion job, involving a new piston and cylinder assembly with conical crown piston and matching contra-piston. It was also equipped with a steel prop driver more appropriate to a diesel's kick than the existing aluminium one. The engine is, it will be noted, equipped with a Merco throttle type carburettor.

Big diesels are usually harsh-running, often with spiteful handling characteristics but Harry Lea assures us that this one is a very pleasant and easy-to-start engine, with a slow idle and clean pick-up to maximum revs.

In Brief . . .

K&B are planning to re-enter the 2.5 c.c. market with a new high-performance Torpedo 15. We understand that the engine will be a Schnuerle scavenged type but with side exhaust and is intended mainly for R/C racing in the 'Quarter-Midget' class that is beginning to catch on in the U.S.A.



Another Harry Lea diesel conversion, this time on an old O.S. Max-III 35. Said to work well turning a 15x4 prop!

Jim Clary, who used to make the castings for Clarence Lee's original hand-built Lee 45's and whose foundry now produces alloy wheels for sports cars, is the manufacturer behind the new Wisniewski racing engines, the first preproduction models of which are now beginning to appear. Three motors will be made in the regular C/L speed sizes (at prices alleged to be between $125 (£52) for the 2.5 model to $200 (£83) for the 10 c.c. job) and in a 40 size for R/C pylon racing.

From Italy, the current production version of the 2.5 c.c. Kosmic K-15 racing engine. Details to follow in this column shortly.

topical twists

by 'Pylonius'

illustrated by 'Sherry'

'Personally, I still think there's something fishy about our new member'

Super Het-Up

The latest malaise to afflict modern man is a condition known as Radio Anxiety. This is similar to the more widespread Car Anxiety, where the haggard look of the sufferer is not due to the unnerving road conditions or the frustrations of the traffic jam, but to that sinister noise in the crankcase or that perhaps expensive rattle in the gearbox. When someone staggers into the office, white faced and distracted, you know immediately that he is suffering from acute big end trouble or a severe loss of brake fluid.

Or such was the case until recently. Now that drawn look and trembling hand may well be due, not to car sickness, but to the radio fault syndrome. Following a severe traumatic experience such as complete loss of signal in mid-flight, he will be haunted by the suspicion of a disastrous trouble spot lurking amidst the servos and transistors. Dare he fly the model this weekend or will it mean another disaster? The anxiety is bad enough when all is in order, but as old George says, it might be worrying, but at least it takes your mind off the car.

Bang-Bang Radio

With the environment up to its daisy roots in putrefying pollution, mostly the bird life we see about is of the hot pants variety; the feathery kind is only to be found in the cock robin posture, having succumbed to the latest insecticide, which seems to fatten the caterpillars and flatten the birds.

What then is the jolly old sportsman to do, with not a bird in sight and all the rabbits down with myx . . . whatever it is, when a fat, tantalising target of a radio plane comes into his sights? We put this question to that well-known twelve-bore specialist, 'Pigeon' English:

'All this talk abaht pot. Nuffink much to pot these days. Not a pigeon in sight. And who can blame the little perishers when there's all that free grub in Trafalgar Square. 'Course a model plane ain't the same as a pigeon or a rabbit, but it's better 'n nuffink. Make it more fun though if they were to come crashing dahn in flames. You being in the business, like, perhaps you could 'ave a word with the lads to get somfink fitted.'

Anti-kid Device

Whenever I fly a model on our local open space I always get engaged in a race to the model with a gang of yelling kids. Too often, though, they beat me to it, and the model falls into the clutches of grubby, destructive hands. Does anyone know of a suitable child repellent? The authorities frown on the use of twelve-bore shot guns, and, anyway, they could damage the model.

Non-Permissive Society

We hear all this talk about a permissive society, but when it comes down to cases, we find we are all kept rigorously to the straight and narrow path. Just try to put a venturesome, permissive foot off the beaten track and you are met by hoardings, barbed wire, screaming *keep out* notices and snarling dogs. Any gaps which the forces of containment have not been able to close are so hedged round by restrictions that people mostly prefer to stay in their cars, daring only to open a window to throw out the litter.

In this land of Magna Carta, there is no surer way of enraging the forces that strive to keep us to our little hutches and prescribed runs than of doing something as space consuming as flying a model plane. One letter of complaint from a retired colonel – or two from a retired captain – about the noise of model planes upsetting the guard dogs, and the Town Clerk is hauled out of bed to frame a jackboot size byelaw.

These thoughts are prompted by the brave action of a defiant spirit who, from the council chamber gallery, questioned the legality of the anti-model byelaw the council members were joyfully passing. This, in turn, recalls an equally celebrated occasion when the Little Twittering M.A.C. held their Magna Carta Flying Rally in the Council Chamber as a protest against being banned from Bodger's Common. Wakened by the noise, the councillors were quick to react. Some, who had never seen a model plane before, blamed the whole thing on to the use of pesticides, whilst others thought it was a visitation from the dreaded Banshees of Bodgers.

Actually, the club was exercising a very ancient right. The council chamber was, in fact, the old Death Watch Barn, given to the good citizens of Little Twittering by that early exponent of unisex, King Ethelfred. He decreed that the old barn be used for publick revels on Griving Thursday or when Bodger's Common was in blight.

After an impassioned speech from Miss Little Twittering 1970, who claimed that it wasn't much good living in a permissive society if there was nowhere to be permissive, the council decided that, retired colonels or no retired colonels, the model planes were less nuisance on the common than in the council chamber. So now, on any summer evening the air of Little Twittering resounds to the happy buzz of model engines and the answering yelps of the guard dogs.

Are you between 10 and 16 years of age? Then don't delay, join today

ANOTHER JUNIOR KIT CONTEST!

THE JUNIOR Kit Contest held at the past two National Championships have been most successful in providing a contest suitable for the younger enthusiast. Its one drawback is perhaps that it is a 'once a year only' event, which does little to sustain the competition interest of Junior fliers. To help remedy this, and perhaps to pave the way for other organisers, the South Midland Area has agreed to run an identical contest at their annual rally, to be held at Cranfield, in Bedfordshire, on September 19th. Once again Ray Favre has 'volunteered' to organise this contest, so now all that is needed are the necessary under-16 year olds! Further details will be announced later, but the rules remain the same as for the Nationals contest.

Junior stunt control line fliers have not been forgotten, and are reminded that the London Area Championships cater for their needs. The next, and last, round of this series is on October 3rd, at Fairmile Common, Esher – where it should be noted that silencers are essential. Rules are also as per Nationals, and would-be competitors are advised that they do *not* have to live within the London Area to compete – the events are open to all, but Area members gain points towards their own Championship table.

Dear John,

In the April issue, two plans were presented for indoor models. I was very interested in these – particularly 'Little Willie', as it seemed a lot easier to build. In the article on how to make this model it says that the materials necessary are available in this country – but where? I have tried all the shops around here, and no one has the 'special' balsa or rubber motor. Many had never even heard of some of the things! Where can I get these items from?

Coventry, Warwicks. *S. Peters*

Indoor model materials are easily available in this country, but only from one source! This is via the post from Laurie Barr, of 4 Hastings Close, Bray, Berkshire – Laurie can supply all the hard-to-find articles that are needed, and his catalogue provides fascinating reading – available on receipt of 3p stamp.

Dear John,

Recently I purchased a secondhand A.M. 15 described as 'test run only as new' and whilst I am very pleased with its performance when it is running, it is extremely difficult to start. I have tried all the usual cures with little success. However, there is no gasket between the liner and the crankcase so I tried making gaskets from all sorts of things (paper, rubber gloves, leather, polythene) all with marginal improvements but they disintigrated after a few minutes continuous running. If you think this may be the cause, could you please tell me where I can get a spare one since the local model shops do not stock this particular spare.

Also, in a friend's handbook it says that running the engine on an over large prop. can damage the engine. I ran my A.M. in on a 9in. x 6in. prop, the recommended prop for F/F is 8in. x 4in. If you think this may have damaged the engine please tell me in what way and what cure, if any, is appropriate. *David Deaville*

Teversham, Cambridge.

A gasket is best made from brown paper or from special gasket paper obtainable from most garages. To make the gasket, simply press the material over the joint which it is intended to seal, thus leaving an impression on the paper of the required shape. Cut this out with a pair of sharp scissors or a modelling knife blade – taking care not to nick or tear the finished article.

The 9in. x 6in. propeller will certainly not have harmed your engine, which would run happily on a 10in. x 4in. for such purposes as a lightly loaded free-flight scale model. Turning a very large prop is unlikely to cause damage unless done for long periods – but as the power output at the much lower r.p.m. would be so little, it is most unlikely that any model aircraft would fly.

Dear John,

I have just had an OS Pet R/C stolen from my workshop. This engine was the only engine I had over 1 c.c. Therefore I now have an A.P.S. *Swanee*, a partly built A.P.S. *Tyro*, and not to mention countless pipe dreams of C/L models doing loops, etc. There is no chance of it being recovered, because even if I did locate it, I would not be able to prove it to be mine.

I am wondering if you could help me with an idea, which was aroused by this theft. Do you think that you could urge manufacturers to give every engine a serial number? This would help locate any engine be it lost or stolen. I know that this is done on the more expensive engines, e.g. HP61, Enya, and I believe that Frog do this to all their engines. Why do they only do this to expensive engines? I am sure that a small D.C. Dart is just as expensive to a young boy as an HP61 is to a working man. I am sure that many other modellers would share my point of view. Do you think you could do something about serial numbers?

Martin Doran

Camberley, Surrey.

Numbers were originally stamped on engines so that manufacturers could easily identify when the motor was produced, thus making servicing the engine or supplying spares much easier. Often the manufacturers' records could reveal who purchased the engine.

Today, however, with the volume of production enormously increased, and changes between 'batches' of engines rarely made, the practise has largely been dropped.

Although, as you say, it would help identification of a stolen engine, it also means one more manufacturing process, which must inevitably push up the cost of the final product a little more.

Dear John,

I recently acquired my first engine, a .75 c.c. D.C. Merlin. With it I bought Keil Kraft Diesel Fuel, but I was reading an article in the May edition of **Aeromodeller**, which said that you could use Castrol GTX. Could you please tell me if I could use this instead of K.K. Diesel Fuel?

Michael Duncan

East Kilbride, Glasgow.

In Eric Coate's article on Flying Scale Models he stated that he used a fuel containing a mineral oil, such as GTX in preference to a castor-oil based fuel.

Diesel fuel consists of three major constituents, namely paraffin to provide power, oil to lubricate the engine and ether to enable the engine to start. Castrol GTX is, of course, purely a lubricant, and must be blended with the other materials to produce a fuel suitable for your engine.

Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 25p (5/-) to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

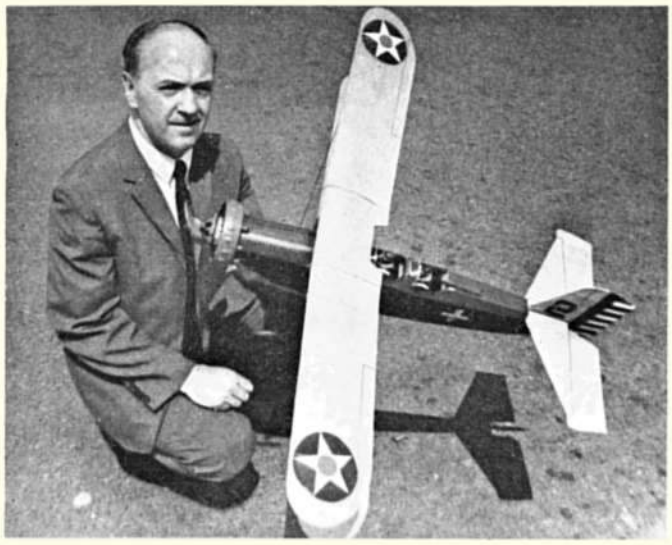
ADDRESS .....

.....

YEAR OF BIRTH.....**SCHOOL**.....

NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any) .....

SEND TO: **GOLDEN WINGS CLUB, AEROMODELLER, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.**



An 'old fashioned' interest rekindled by . . .

KEN McDONOUGH

with his 40" span, one-twelfth scale, rubber powered

DOUGLAS 0-38

A RARE SIGHT INDEED in these 'instant, easy modelling' days, is that of a rubber powered scale model flitting across the skies, the only noise being that of a large propeller turning slowly, and the skein of rubber vibrating inside the hollow fuselage.

The challenge in building such models comes not only from building a reasonable replica of a full-size machine, but also in the model's flight performance. Too much weight kills the flying ability, so this unwanted factor must be pared to a minimum – while of course retaining sufficient strength to withstand the occasional 'bump'!

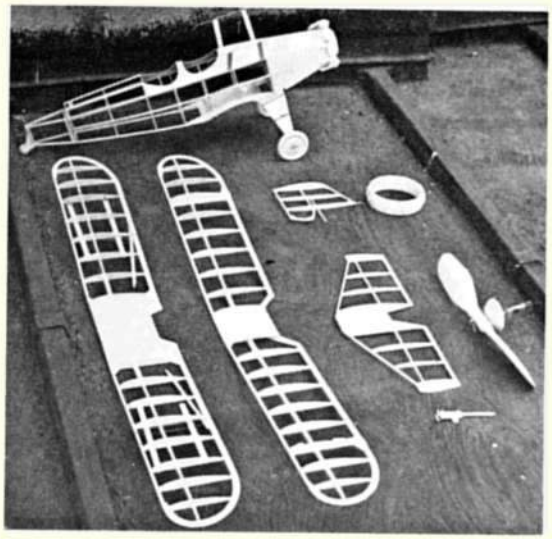
Allied to this fascination is of course one other great advantage – the models are cheap to build! No expensive engines with their attendant messy fuels, no fuel proofer, much less balsa, and even less paint is required – just a few feet of rubber and preferably an old hand drill and you have all the 'accessories' you need.

The designers choice of model was the ever popular biplane, in this case the Douglas 0-38, an aircraft which was widely used in the mid-thirties by the U.S. Army Air Corps as an observation machine. There were several versions of the basic design powered by the 450 h.p. Pratt and Whitney Wasp and 525 h.p. Hornet engines. The 02MC, externally similar to the 0-38 was built for the Chinese Nationalist Government.

The near-scale model flew straight from the proverbial drawing board and has proved a reliable performer through three flying seasons. Apart from a motor breakage, necessitating a splice in one of the longerons, no damage has been sustained and the airframe *should* last indefinitely. Rubber-powered scale models are fascinating to fly. With a slow, stable machine such as the 0-38, the flight pattern is delightfully consistent and each landing is a gentle three-pointer.

Provided that the all-up weight is kept to 13 oz., flights of 60 seconds duration can be expected with 500 hand wound turns on 12 yards of ¼ in. x 1/24 in. tensioned rubber, and about 90 seconds from 750 stretched turns applied with a winder. As the structure of the model is conventional and the plans practically self explanatory, the notes will be confined to those points which demand special attention.

First, a word about adhesives. Use balsa cement for the fuselage box frame and for any joints which will not be subject to warping. For the wings and



Heading picture shows the designer with his beautifully-built replica, which gives a good impression of the size of the model – larger than most people would imagine possible for this form of motive power. At right, the bare components of the Douglas reveals its basically simple construction, although it is by no means a beginner's model.

Top photograph shows the whole fascination of this type of model – its slow, stable flight pattern is very realistic, with no messy fuel to rot the airframe or spoil the finish! Below, two posed views of the Douglas displaying its colourful 'trainer' paint scheme, making it a most attractive subject. However, intending builders should take pains to achieve a light weight finish – for which a spray gun is a most worthwhile asset.

tail surfaces, P.V.A. glue should be employed due to its non shrinking properties. If desired, each joint can be varnished with clear lacquer as a protection against moisture, though this is not really necessary.

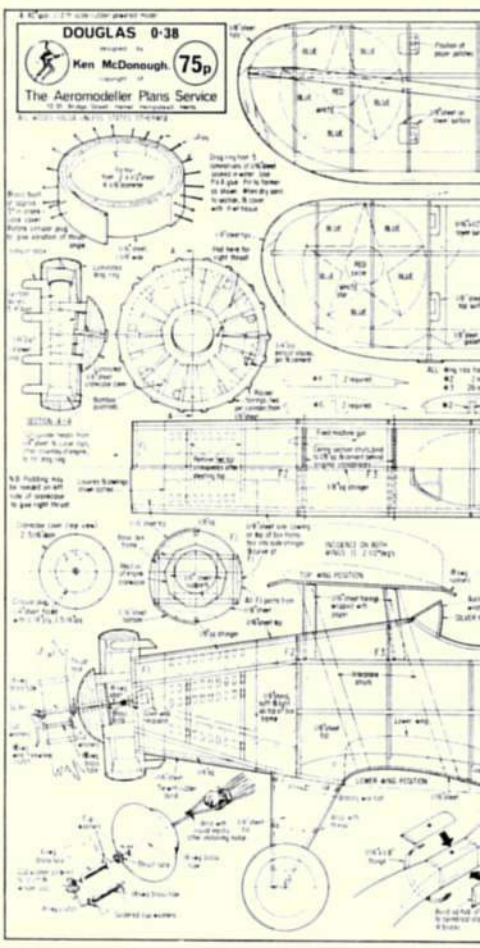
After the basic fuselage frame has been completed, form and solder the centre section strut and undercarriage assemblies, and then bind and cement them to the appropriate cross-pieces. Formers, stringers, cowling and turtle deck are then added, using the lightest possible balsa for all sheeting.

When making the wings, splice the main-spars, add dihedral keepers and then assemble in the usual way. To avoid warps it is essential that spars, leading and trailing edges are quite straight and that the building board is perfectly flat. Keep warps out of the structure before covering! All notches should be an easy sliding fit on to the spars and each rib should be pushed right home. There should be no stress anywhere in the assembly as this is an open invitation to warps, etc.

Tail surfaces demand special care, but provided that PVA glue is used and the diagonal members are incorporated in the tailplane, no distortion should result. However, it is important that the diagonals are fitted while the tailplane is still on the building board.

The airscrew is carved from a block of medium-light, balsa 14½ in. x 2 in. x 1¼ in. The block should be tapered in side elevation as shown to allow for a decrease in blade angle towards the tips. Carve the rear faces of blades first, applying undercamber by means of sandpaper wrapped around an empty dope jar – the blades should be kept as thin as possible towards the tips, consistent with strength. The finished airscrew should be balanced and covered with lightweight Modelspan tissue. For lazier modellers, 18 in. diameter balsa airscrews can be bought and no doubt would be suitable cut down to 14½ in. but the pitch would be coarser after trimming. The angled bush in the nose plug is essential – slight variation in the thrust angle can be obtained for trimming simply by rotating the plug.

The fuselage is covered with dark blue heavyweight Modelspan tissue and all flying surfaces with lightweight yellow. Steam, or water shrink the tissue lightly with a fixative spray, then apply two coats of clear dope (diluted with 30 per cent thinners) preferably with a spray gun for lightness. The dope should be further thinned to 50 per cent for the tail surfaces. An extra coat of clear dope is applied to



FULL SIZE COPIES OF THE 1/6th SCALE REPRODUCTION ARE AVAILABLE AS PLAN No. FSR 1123, PRICE 75p (15/-) POST FREE FROM AEROMODELLER PLANS SERVICE, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

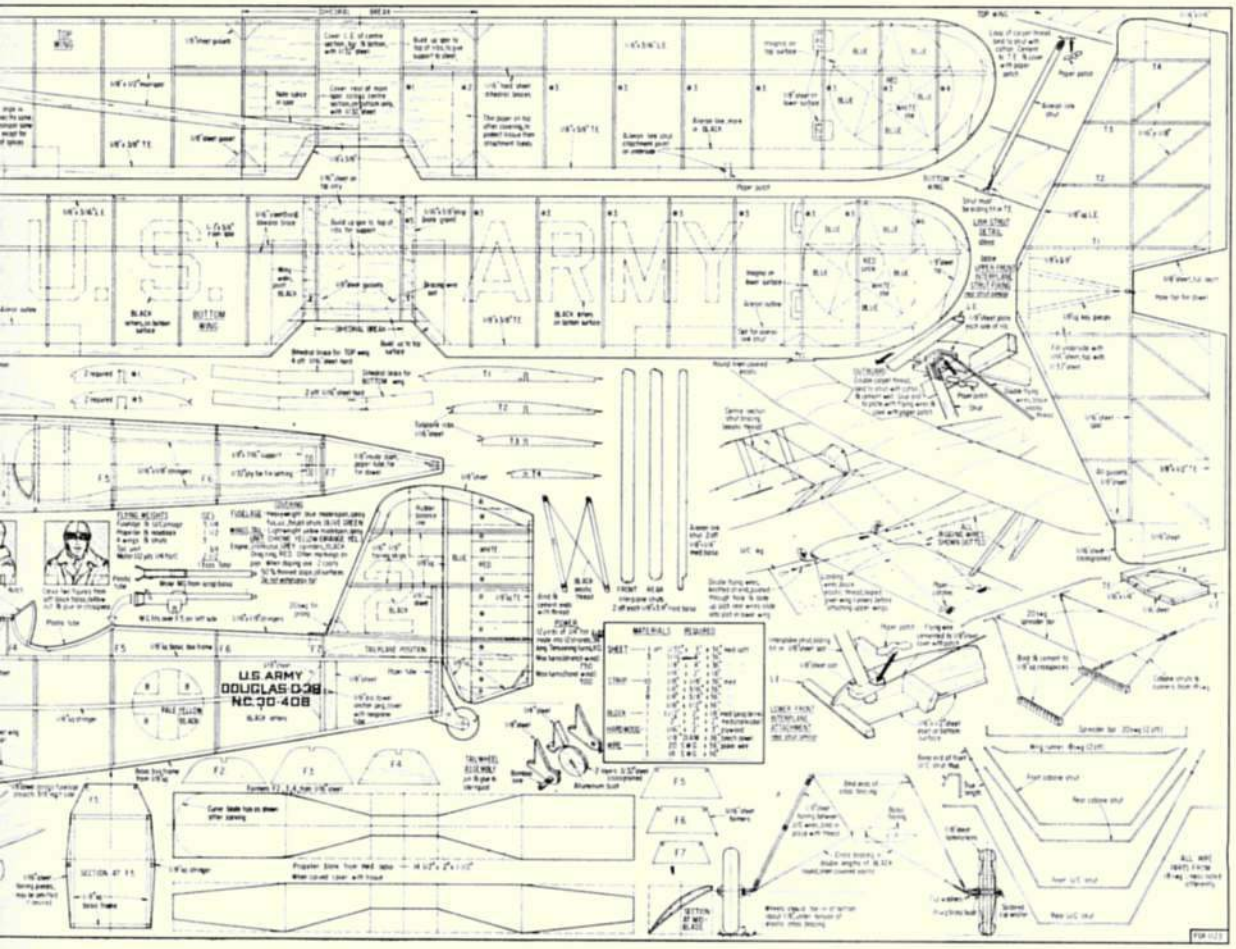
the fuselage only, for added strength. Pin both wings and tail surfaces down after applying a second coat of dope to prevent warps from creeping in – then leave in this condition for several hours.

Titanine colour dope is recommended for finishing and was used on the original, again applied with a spray gun. The correct shades are readily mixed from orange, red, yellow, blue and black and are Olive Drab for the fuselage, undercarriage and all struts, with Chrome Yellow for wings and tail surfaces. The cowling ring and nose plug are Red. With the use of coloured tissue, very little dope mixed to the colour indicated on the plans need be applied. Aim to achieve an even, semi-transparent finish on wings and tail surfaces. National markings are cut from pieces of red and blue tissue doped on, and hand painted on top.

The 12 yard motor is made up into six strands 72 in. long. Approximately 100-120 turns are then applied, the two ends of the six strand skein being brought together to form a single plaited 12 strand skein the same length as the distance between the shaft hook and the anchor peg. Work up to maximum turns in stages starting with 20 per cent turns. Safe turns are 500 hand-wound, and 750 stretched-applied with a winder

Provided that the centre of gravity is correctly located, no difficulty should be encountered with trimming. The tailplane will take a small amount of positive incidence but no more than 1/16 in. packing should be added under the leading edge. The model should turn right and the correct trim can be achieved by offsetting the fin and by rotating the nose plug to obtain the best thrust angle. Should the model tend to stall under power then further down-thrust can be incorporated by packing behind the nose plug.

Beautiful workmanship evident on the author's original, particularly in respect of the engine detail and wheels. Propeller may be carved from block as detailed on the plan, or alternatively a commercial balsa item may be modified to suit.



Sun shining but nothing to fly? If the shops haven't closed, you can still go aviating with an

INSTANT BOOMERANG

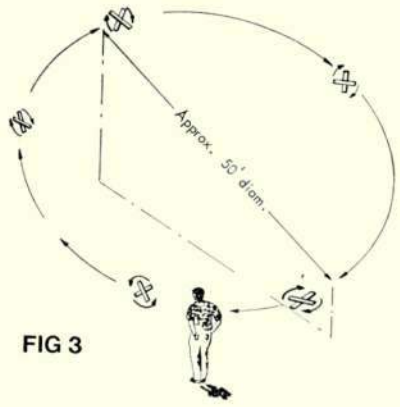


FIG 3

. . . and as described by P. Malone (B.Eng., AMIMechE, AFRAeS), it costs just 8p!

NOT ONLY IS THIS the easiest ever boomerang to build, it is also probably the easiest flying model of any sort that has ever been built! It is so simple that there aren't even any plans to work to – and it's portable, indestructible, cheap, suitable for small fields, bad weather, etc. . . . !

But you don't believe that it will fly? Try it, then send us your apologies! As to why it works so well – if you can find that out you will have collected a lot of useful gen on gyrocopters and gyroscopes, as well as Aborigines, and can join in long arguments with learned men who have been quarrelling about these matters for some time.

So here's what to do. Buy two wooden one foot rulers, from the 'Red and Gold' store – they cost around 4p each. Fasten them firmly and flatly together at their mid points, with a thick rubber band, as shown in *Fig. 1*. That's it! This assembly will now be referred to as the 'Boomerang'. It is not important that they shall be fastened at their exact centres with respect to each other – the only important thing is that they are fastened flat side to cambered side, as shown, not with a flat side to a flat side. Next step is to take your creation to a field, or try it in your garden if it is large enough.

Fig I

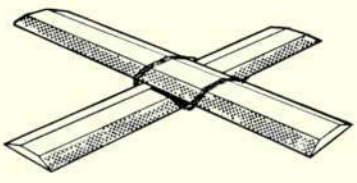
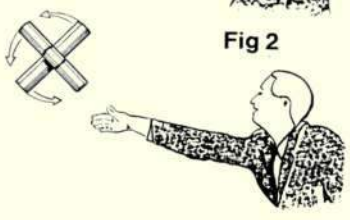


Fig 2



Launch the boomerang as shown in *Fig. 2* – that is, use an overarm throw as in a tennis service, or like bowling a cricket ball, although launch slightly upwards, and with the boomerang in a vertical or near-vertical plane. It is probably a good idea to give it a bit of extra rotation, by 'stopping' the wrist suddenly as the boomerang departs – that is by **not** 'following through'.

The boomerang will now whizz off, but will not go straight ahead. In fact, it will follow the curved path shown in *Fig. 3*, and arrive back some five or six seconds later, from a different direction. By the time it arrives it will have taken off all the vertical bank it started with and will be rotating in a horizontal plane, descending vertically, but still with the same rotational speed as when it set out. Be warned, therefore, to dodge out of the way in case it all really works. The centre of this circular flight path will, of course, be towards the cambered side of the rule when the 'weapon' set off.

If you want to make it work better still, you can try planing a bit off the edges of the rules, in order to make them into better looking aerofoil sections, but be warned – you'll probably make them worse before you eventually make them more efficient. Balance of the arms seems completely unimportant, and a bit of variety can be introduced by fastening the rulers not by their middles, as we've done so far, but at their ends, in an 'L' shape, more like the conventional idea of a boomerang. This makes for slower rotation and a correspondingly longer flight, but the projectile is less stable in this form.

The actual throwing involves no great skill, but the flight path is quite sensitive to variations in the direction of the initial plane of the throw – about 30° off the vertical, cambered side uppermost, is probably the most interesting. Initial spin, on the other hand, seems to matter little; so long as it is over a certain minimum – the rotational velocity is supplied, and kept constant by aerodynamic forces.

Finally, if the whole project has had no other benefit, you are only 8p poorer, and the exercise will certainly have improved the muscles of your throwing arm, for serious chuck glider work!

Readers' Letters

Dear Sir,

The first two *Readers Letters* in the May issue deserve an answer. First of all, I believe that these two writers misinterpreted my slang usage of the 'tongue-in-cheek' term 'Weird Beasties'. F.A.I. Team Race models are designed to meet probably the most restrictive rules of any model event anywhere. I would be the first to admit that my own latest T/R design is truly a 'Weird Beastie', which treads closely to the edge of legality in looking like a real airplane. Competition is so keen that one must exploit all possibilities in search of an edge on the competition. I enjoy flying the event, so one must do like the Romans when in Rome.

I will take issue with the writers on one point, the Team Race event is for models which must go fast economically while resembling real airplanes and carrying a scale pilot. The F.A.I. Speed event is for fast model airplanes with few other restrictions. If that is the writer's goal, maybe they are in the wrong event.

Ron James pointed out in his article in a recent *Aeromodeller* how he found that most Americans fly many events, rather than concentrate on just one as seems to be more the case in Europe. He and I became acquainted through the Team Race event. He was almost appalled to find more Free Flight models in my workshop than control-line models of all types. I enjoy building and flying model airplanes of all types except R/C – wish I had more time to spend on this type of activity.

Probably the greatest weakness of our hobby lies in one type of enthusiastic failing, or being unwilling, to look in the other fellow's 'bag'. One need not have to enjoy and participate in the event favoured by another, but should at least be willing to allow him his separate interest. Control-line events differ widely. I've tried my hand at all of them, though often not too well. There is an advantage to be gained from this. Ideas, gadgets, and gimmicks can be learned and borrowed from the other events for use in one's own favourite to good advantage.

The Navy Carrier flyers have benefited greatly by borrowing engine tricks from the Rat Race enthusiast. Conversely, the R/C Formula 1 Pylon flyers refuse to associate with lowly C/L flyers (the R/C'ers in this country already hate me so I can afford to insult them) and have not yet reached the performance level of the Carrier and Rat flyers' engines and throttles. A cheap, high performance throttle existed for the .40 size engine in Bill M. Johnsons' Fuel Control and exhaust slide system. The R/C'ers turned their backs on it and bent rules, corrupted the event and now only require a shut-off rather than use something developed by a C/L fancier. I will borrow from anywhere, if it will help my performance.

Another point to consider. Performance in an event gradually increases until it outstrips its governing rules. Rules must then be changed to add new restrictions and challenges, or the events die. Free Flight development brought shorter and shorter engine runs and the 'Max' flight. Speeds increased until a low powered fuel was required for safety in the FAI Speed event. The Rat Race event in the U.S.A. is near extinction now unless a change is made to restrict performance. My factory prototype HP40 R powered Rat now clocks 140-145 m.p.h. and full potential has yet to be reached. My team-mate pilot Bruce Van Hoozan found himself almost physically overwhelmed by trying to stay up with, and hang on to the model, in traffic at a recent contest.

FAI competitors rules have now been frozen for a long period to come. Several performance restricting rules for the Team Race event were considered, then dropped, before the rules were frozen. Performance will continue to improve during this period and will probably reach a bordering-dangerous point before these rules expire. Now is the time to be considering what we will do then. Rather than go to smaller engines, longer lines, smaller tanks, etc., a better route might be the scale airplane as a performance restrictor.

The full size Formula 1 rules are ready made and ideally suit this approach. The rules are restrictive enough to fit our needs while the 100 plus different designs give a wide range of subjects to choose from – enough to find one to suit anyone's tastes. The R/C Formula 1 Pylon event has already demonstrated this. (See, I'll even borrow from R/Cers). The $1\frac{1}{2}$ in. equals 1 ft. scale of the Goodyear C/L rules provide an example which we can follow. Little other change would be required to accomplish the new restrictive rules which will be needed. The Scale Racing, or Goodyear event allows us to examine this approach and refine the thinking so that the new rules will be ready when we need them.

Florida, U.S.A. *James A Kloth*

Dear Sir,

Many people commented during the Goodyear event at the Nationals on the brutal piloting seen, particularly towards the end of the second round and in the semi-finals. In fact two of the Germans over for the FAI Team Race were heard to exclaim during one of the semi-finals that they hoped that such flying would not be allowed in the team racing. It is significant that the majority of those reaching the semi-finals came from the last few heats in the second round when whipping was allowed. None of this is intended as a criticism of the Goodyear officials since they were only following the Goodyear rules as they now stand.

Apart from this brutal piloting (one pilot was seen to kick another in one race) a few obviously non-scale and poorly finished models were allowed to compete without the organiser apparently being able, according to the rules, to do anything about this.

To help restore Goodyear to the standard many of us expected when it was first introduced, i.e. attractive scale-like models flown in a sporting fashion, I have drafted a new set of rules for this event and have forwarded this draft to Derek Heaton, the chairman of the S.M.A.E. C/L sub-committee for consideration. For those interested in helping with the formulation of better rules for Goodyear, I have given below a brief summary of the main points of my draft in the hope that the C/L sub-committee may receive criticisms, suggested improvements, etc.

1. Models, Engines and Lines – as per current draft S.M.A.E. rules.
2. Flying, Pitting and Race conduct – essentially as per current FAI team race rules.
3. Processing for Finalists – new checks for wing area, fuselage depth, model finishing and eyeball scale judging.
4. Penalties following Processing – Extra 10 laps penalty for each of above 4 checks if failure to meet requirements.
5. Responsibility for Proof – Onus is upon entrant to prove conformity with rules is requested.

I hope that you can find space to publish this letter thereby contributing to the rule improvement process that must occur if Goodyear is not to become 'Ginny-spinning' Rat-year.

Cheadle Hulme, Cheshire. *D. Clarkson*
(NWA Delegate to S.M.A.E. Council)

Dear Sir,

In the February, 1971, edition I noted Mr. Russell was hot in Iran, but it was a pity he did not come to the land of the Maharajas. Here it is decidedly warm and my inbuilt thermometer tells me that the temperature on the runway in summer is a cool 120 (yes, one hundred and twenty). As the field is within a couple of hundred yards from the sea, we have the benefit of the cool ocean breezes. Pity the poor lad in the wild of the interior with his airborne temperature of 130°F plus. Anyone for fried transistor and melting DEACS?

You moan about Chobham, lads, but I'd rather have Chobham in the wet than Bombay in the summer. By the way, it rains here too (in buckets when it does). Up to nine inches a day; so anyone for seaplanes in the rain?

Seriously, the problems here are considerably more than those in the U.K.

Bombay, India. *N. L. Druce*

BEAULIEU AERODROME

Dear Sir,

As a result of new regulations by the Forestry Commission it is an offence to fly model aeroplanes of any type within the New Forest. In order to represent model flyers in the area a committee was formed to negotiate with the Forestry Commission for permission to fly models at Beaulieu Aerodrome. This committee is known as the *Beaulieu Model Flying Committee* and is the representative of all clubs in the area. The Committee have successfully negotiated for use of the aerodrome subject to certain conditions, one of which is that the Committee shall be responsible for issuing permits to fly at the aerodrome. Permits are available at 50p and are valid until 31 December, 1971. They will be issued subject to the applicants acceptance of the rules laid down by the Beaulieu Committee. These are common-sense rules designed to ensure that flying will take place in as safe a manner as possible.

Anyone wishing to obtain a permit should send 50p, (cheque or P.O.), a stamped addressed envelope, plus proof of insurance (M.A.P. or S.M.A.E.) to:

The Treasurer,
Beaulieu Model Flying Committee,
44 Ennerdale Road,
Maybush.
Southampton.

Publication of this information will assist us to avoid any upsets resulting from people wishing to fly without possession of a permit.

Tony Mills,
(Secretary,
Beaulieu Model Flying Committee)

Left, self-explanatory club insignia depicts a glider (slope soarer?) with potential C.G. problems! Right, rather more stark design represents the South Essex Model Aircraft Society.

Club News

IT'S EASY ENOUGH TO SAY, *'Just go and build a model'*, but when you come to think of it, the production of anything but the simplest kit model demands a great deal of planning, personal effort and domestic reorganisation. This is specially true today when model planes, generally, are structurally and mechanically more complex than they were in the days when the modeller could make do with a corner of the kitchen table. This situation gives more maturity to the hobby, but means that the number of actual flyers are fewer, though perhaps more enthusiastic, than was once the case. However, many more people would fly if given a definite project upon which to make a start.

Very much aware of this problem of initial encouragement is the **B.A.C.M.A.C** of Preston. Club membership is a healthy 40 plus, but the excellent flying ground at Warton Aerodrome and useful slope soaring country nearby, have not been used to the extent they deserve. In order to get a healthier showing of wings in the district, Jeff Newton, the Comp. Sec., put forward the idea of a Winter Building Competition. Models to be divided into five classes, covering the spectrum from chuck glider to radio. Put into execution the response was remarkable; no less than 25 models were lined up for the day judging. Scrutineers were well known glider expert Bob Gosling, and two Warton test pilots. They were obviously pleased with what they saw – so too were the 300 visitors who were treated to a display of r.t.p. flying. D. Womersley's *D.H Chipmunk* was the overall winner, but the real victory was in the prospect of those twenty five models helping to fill the too empty model skies.

Whatever the calibre of new recruits may be, we can be sure of the vintage quality of the proven old timers; so, when a recent social evening brought a few ex-members back to the fold of the **Leeds & D.M.A.C.**, the club was highly pleased. And it was quite a generation gap to be bridged by Tom Fudge and H. Vauvelle, for they are both of pure, prewar stock. Mr. Vauvelle was, in fact, a 1934 founder member, and we are told he has graciously accepted the position of President. Less historic, but still very much vintage, are the other new/old boys, F/F exponents Ernie and Bill Farrance. The contemporary limelight though, is focussed on Frank Elton. He was top British entrant in that somewhat inglorious (for us) International Coup D'Hiver event. He also won Rubber at the N.W. meeting, and took the Gamage Cup as an encore. A word of praise here also for Jack Kay in coming a close second in the dear old Damage. Further honours for Frank in winning Coupe at the N.A. Vintage meeting, but it was left to maestro H. Tubbs, a vintage flyer himself, to win the main Vintage event with his G.H.20 Wakefield. All evidence of a lively and go ahead club. Interested? Then phone J. Moseley, Garforth 2772.

Mention again of the N.W. Easter event. This time in the Area newsletter, *The Message*. Quite a healthy entry by present day standards: 32 in Glider, 20 in Power and 17 in Rubber. Weather must have been quite fabulous, judging by the numbers of fly off qualifiers: no less than 12 in Rubber alone. A good turn out, too, for the April F/F meeting. A hint in the pages of another large S.M.A.E. insurance claim in the offing, arising out of an incident at Padiham Donkey Derby!

If ever Free Flight needs a 'Liberation Movement', Maurice Doyle is the chap to lead it. Here we find him again in the Model Aeronautics Council of Ireland's *Newssheet*, championing the cause of free flight with a few telling points against any suggestion that control-less flying is going the way of that other unlikely flier, the Dodo. He notes, for instance, that the team being sent to Sweden this year is the strongest since 1963. He also suggests that F/F enthusiasm is vitiated by staging contests for classes with no great measure of popularity, such as Coupe D'Hiver, ½A and A/1, and things we should concentrate more on the F.A.I categories. Equally forceful in his views on what is wrong in the Northern Irish part of the movement, is the newssheet Editor, Dr. M. D. O'Hara. He has some scathing things to say on the apathy to be met with, and his prescription for renewed health is a dose of that old fashioned enthusiasm. The newssheet, incidentally, comes in the form of a pukka printed, rather than stereod booklet.

Writing in the *Scimitar*, the newsletter of the **Buckaneers Model Club**, the Chairman, Bob Rutty, says he is putting the finishing touches to a President! Nothing to do with paving the way for promotion, but just that he thinks this to be a safer flying proposition than the usual low wing aerobatic machine. You see, Mr. Rutty, had a spot of radio bother last year which had dire consequences for his model. And now its all a question of regaining confidence in his radio gear. But if he is not sure of being in control, 'wee McGregor' has no such misgivings. The little chap is to be seen quite a lot about the club since a visit by a member of the radio firm of the same name resulted in the generous distribution of 'wee McGregor' transfers. A note here about the Buckaneers Open Stunt Contest for the Scimitar Trophy to be held on Sunday, August 22nd. It is hoped that radio flyers will co-operate by not using Finmere on that day. And Jim Mannal, too, if the other competitors are to have a chance! Not really, though.

Coming events do not always cast their shadows before. Quite the contrary. When looking forward to a particular meeting we envisage a kindly sun floating in balmy air. The shadows, in the form of dark, wind blown clouds, come on the actual day, and the much hoped for event becomes a non-event. This is just what happened to the **Watford Wayfarers M.A.C.'s** spot landing comp. Ron Hughes now wisely suggests that such events to be held impromptu, and intends to carry the necessary impedimenta for same in his car at all times.

Mostly the **Three Kings Aeromodellers** newsletter is taken up with the series of Stunt events held round and about the start of the season. Organised jointly by the **Esher** club, the London Area Championships had all the mod cons laid on, including a P.A. system and a hard floored circuit. Jim Mannal, flying his blue and white Nimrod 3, was the victorious man of the occasion, as he was, too, at the Elliott Stunt Meeting, where he again beat Mick Harvey of Three Kings. But good going from Mick who, after coming third to Steve Blake's second at the London Area Event, pipped him to take second place at Elliott. Very sportive occasions. But not, apparently to Radio London. A letter from the club to the producer outlined the sporting nature of model flying and drew attention to some of the meetings to be held this year. Sorry, was the reply, but it ain't a sport it's a hobby, and advised that the letter be forwarded to the hobbies programme. Slightly disappointing, too, was the turn out for the club C/L Scale contest – only five people entered, although many more were expected. Even so all got airborne to provide plenty of thrills and spills in the stiff wind.

Keeping it in the family, was the dictum very thoroughly observed by the **Western Area** at the Devon Rally at Woodbury; the Area fliers gaining four firsts and two seconds. Open Rubber, Open Glider and Chuck all went to South Bristol members, while Rex Woodruffe of Seindon took Open Power with his ½A job. Outside honours went to C. Morris of St. Albans, who won the main All-In F.A.I. Event. He was closely followed by Elton Drew and Geoff

Pink, both of S. Bristol. Quite amazing how the Western F/F fliers have come on over the past few years. It is encouraging to see such a bourgeoning of skill and enthusiasm. L. Rogers, the P.R.O., who sends us this news, reached the Open Glider fly off at the Nats, together with Gerry Pike. He tells us that Elton Drew has now got his all-sheet wing glider ready for the World Champs. Very promising still air times: around the 2.50 mark. Also getting his new glider into trim is Elton's compatriot, Dick Cummins. Still air times only slightly less at 2.40, all of which augered well for Sweden. Western Area members have great hopes.

Just to further confound my remarks about the apparent dearth of model clubs in Suffolk, I have a letter from Peter Miller drawing our attention to the existence, very much so, of the **Sudbury M.F.C.** While this, as yet, undeveloped part of the country appears to abound in open space, the club is strictly control line. Types of model in order of preference are, Stunt, Scale, A Rat and Combat. Small though the club is, it ranges widely, taking in the Nats and Old Warden, running displays at half a dozen fetes and carnivals, and putting on a big window display in Sudbury's main street. Flying takes place each Sunday on Friers Meadows Playing Fields. A river runs along one side of the site, and in order not to waste all that inviting liquid someone has fitted floats to a Stunter (Aquabatics?). More spectacle is provided by the spate of twins that have appeared in the club. No mention of a fertility drug used. No clubnights, but new members welcome at Friers Meadows on Sunday mornings, or should write to P. Miller, Red Cot, New Street, Chelmsford.

Bill Manuel, whose recently published *Chobham Hawk* will no doubt cause quite a few conversions to Radio Glider flying, hopes himself to net a few for his newly formed **Chobham Soaring Society**. Mr. Manuel has been piloting the full size soarers for some twenty years, and from this plus the fact that he has recently built one himself, entailing 2,600 hours of building time, we see that he is not short of experience in this field. With regard to the model side of things, Mr. Manuel finds the model soarer a fascinating challenge. We could point out here that it also is relatively safe and quiet; two factors that should win it a lot of friends. Mr Manuel encloses a newspaper cutting with his letter, and this tells us that the club meets in the Viking Sea Scout Hut in Felix Road, Walton. His own address is 60 Thames Mead, Terrace Road, Walton-on-Thames. Incidentally, Mr. Manuel is endeavouring to open up that famed kite flying domain, China, to model glider flying by sending over a plan of his *Chobham Hawk*, together with a plan of his *Supa Kit* design.

Another small but active club, this time devoted to radio flying, is the **Chester le Street Radio M.C.** Facilities, we are told, are excellent; a good hall for meetings, socials, films, etc., and a rented flying field, far from such maddening things as trees, buildings, radio masts, and, we suppose, reactionary homo saps. Flying has gone on there all through the winter, even in the snow. A goodly number of spectators seem to foregather, but more flying members are required to make up the deficiency of absent shift workers. Variety in code colours preferred. All on red might suit Mao . . . Mostly members are a fly for fun crowd, but there is a sprinkling of Nats standard talent. Current club rage is biplanes – no less than 13 on the strength. Personally, I find the sight of a stately moving biplane a refreshing change from the usual fast and frantic radio job. I am still unable to decipher the name of the gentleman who sent us this report, but having recently moved up from the Midlands to Durham, he seems to think that any model flyer who survives in the high winds must come of a very hardy species.

Tony Andrews, the club sec., of the newly formed **Sittingbourne & D.M.A.C.**, asks, with plenty of reason for contradiction, who said that the modelling movement is declining? Meetings are held fortnightly at the Golden Ball, Murston. Just 100 yards down the road is the club's two acre control line field. The main flying field, though, is some 300 acres of squelchy marshland on the Isle of Sheppey. What then would be an appropriate club emblem, members ask? Could be a rampant duck in thigh boots is one suggestion, and another is that of a large member of the radio fraternity, model held aloft, sinking slowly in the West. Club membership is 20 plus, and covers all aspects of model flying. Mr. Andrews' address is 106 Tong Road, Sittingbourne, Kent.

The **Handsworth M.A.C.**, asks once again, where have all the erstwhile C/L fliers of Birmingham gone? A mystery here, for model shops say that kits and engines are still being sold, but neither the products or the owners seem to get as far as the flying field. A small contingent gave the Nats a call, but were somewhat dispirited by their sole F.A.I. T/R entry losing a certain place in the semi's through a sagging engine at the second pit stop. Members, generally, were impressed by the closer observance of rules than in previous years, and also by the amount of foreign participation. They time-kept for the winning German team, and thought its professional approach an interesting contrast to the home teams, themselves included.

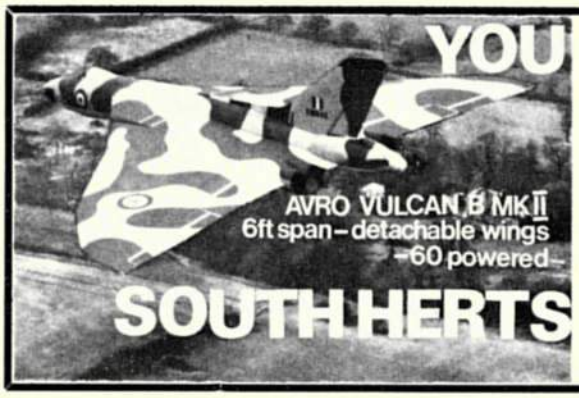
The man of the *Eastbourne Two Day Soaring Event* was not so much the 'Long Man', as Chris Foss of the **Sussex Radio Club**. He was in devastating form to take six first place trophies out of seven! Whether it was S/C Spot, Single or Multi Pylon Racing or Multi Aerobatics, he was the master of the situation. We gleaned this from the **Eastbourne M.F.C.** newsletter. I am not sure what is expected in the way of entries for this type of event, but the commiitee was disappointed at the small amount of support and the financial loss involved. The club flies at Deanland, but on a somewhat restricted basis for Power flying.

According to Anthony Goddard, Hon. Sec., of the **Guisborough & D.M.C.**, (Yorkshire), Radio flying is losing some of its dominance. This is particularly so in his own club where something of a reversal has occurred over the past year, with the non radio flyers holding the numerical edge. He suggests that this might be due to expense and the difficulty of obtaining suitable flying sites. Club interest at present seems to be focussed on control line, and the club is now on the lookout for experienced combat, team race and demonstration flyers. They, too, would like to see a broadening of the free flight sector, and the club contest plans are to include events for this type of flying as well as winter r.t.p., Chuck, Combat and Rat Race. The club is hoping to extend its activities, and any Northern clubs interested in inter club contests are asked to contact Mr. Goddard at 35 Stump Cross, Guisborough, Yorkshire. The same for prospective members.

The **Flying Druids** newsletter deplores the publicity given to that now famous battered model Lancaster, thinking it about time the national press gave us some better publicity. Still, 'twas a glorious crash. And, speaking of scrap, the club, for the purpose of its events, has scrapped the builder of the model rule. They think it to be nonsense in these days of foam and fibreglass assemblies.

Marsh Gas, the bulletin of the **South Essex M.A.S.**, has gone all nostalgic after coming across some 1941 copies of the *Aeromodeller* during a preparatory work on the club *Ajax* contest (see contest calendar). Happy hobbying days, to be sure, but, I for one, think the modern scene has very much more to offer.

CLUBMAN



YOU GOTTA BELIEVE IT!

YOU GOTTA BELIEVE IT! This IS a model! In fact it's the one you saw at the Nats. South Herts bring it to you at a price you can afford in their unique KIT-IT-YOURSELF KIT. The Kit contains all the special hardware necessary including 13 assorted vacuum formed parts, spun aluminium jet pipes, slim line fuel tank and even a LH fibre glass prop plus assembly drawings and comprehensive instructions and more besides. You supply the wood and save purchase tax – we supply revolutionary STICK DOWN drawings which take the fag out of marking out – printed on super-stable self-adhesive polyester film; you just press them down and cut around them. £22.50 from your model shop or direct (cash with order please) from

SOUTH HERTS MODELS · STAR HOUSE
POTTERS BAR · HERTS

---

look! low prices

DIESEL and GLOPLU G AERO ENGINES

DC Bantam .8cc	...	£2.40
DC Merlin .76cc	...	£3.18
DC Spitfire 1cc	...	£3.78
DC Sabre 1.5cc	...	£4.00
PAW 1.49cc	...	£4.51
PAW 2.49cc	...	£5.51
PAW 19D 32cc	...	£5.30
Taipan 2.5 R/C Glo		£7.39
Taipan 2.5cc	...	£5.81
Taipan 1.5cc Glo	...	£3.48
Merco 61 Mk IV R/C		£17.70
ED Fury R/C	...	£4.80
Cox Medallion 049	...	£4.74
Webra Winner 2.46cc		£5.64
Webra 61 R/C 10cc		£27.50

Many more Aero and Marine
New Zealand orders welcome
Send 1/6 P.O. for Lists
Duty Free - Export only

THE MODEL SHOP (Guernsey)
No. 1, Commercial Arcade, Guernsey, C.I.

EVERYTHING FOR THE AEROMODELLER

MACGREGOR RADIO CONTROL
Single Channel Handbook 8p post paid
Digital Handbook 13p post paid

NEW 1971 KEILKRAFT HANDBOOK 23p post paid

K.K. Gyron R/C	£5.95	K.K. Conquest Glider	85p
K.K. Mini Super R/C	£8.95	K.K. Competitor Rubber	99p
K.K. Radian C/L	£1.90	K K. Talon C/L	£2.75

Veron BIG EAGLE Slope Soarer Kit £12.80
Kits by Veron – K.K. – Mercury
Motors by E.D. – O.S. – FROG – D.C. – COX – PAW
All accessories, fuels, paints, transfers, Balsa, Obeche, ply
Please add postage for prompt return

JONES BROS. OF CHISWICK
56-62 TURNHAM GREEN TERRACE, CHISWICK, W.4
(Phone 01-994 0858)
(1 min. from Turnham Green Station) Established 1911
Hours: Mon., Tues., Wed. and Sat., 9 a.m.-6 p.m.
Fri. 9 a.m.-7 p.m. Closed all day Thursday

MC MODEL HOBBY CONSORTIUM

ENGLAND'S LARGEST MODEL SHOP
Overseas Orders please deduct 17p in £ British Purchase Tax

363 Lewisham High Street, London, S.E.13 ☎ 01-690 5885 **PAYBONDS BARCLAYCARD**

Mail order – instant turn round P.&P. UP TO £3, 15p; OVER £3, FREE EXCEPT OVERSEAS

Due to increased postal charges, it is regretted that no letters can be answered unless accompanied by a S.A.E.

RADIO

SKYLEADER CLUBMAN

2 Tx and Rx	...	£39.60
3 Tx and Rx	...	£48.65
FB3 SERVO	...	£11.95
LOG MM3	...	£15.00

MACGREGOR SINGLE

MR 360 Codamatic Tx-Rx S/H RELAY	...	£22.95
MR 350 Codamatic Tx-Rx S/H R/LESS	...	£21.60
MR 340 Codamatic Tx-Rx S/R Relay	...	£18.50
MR 330 Codamatic Tx-Rx S/R R/LESS	...	£16.95
MR 260 Powermac Tx-Rx S/H RELAY	...	£17.95
MR 250 Powermac Tx-Rx S/H R/LESS	...	£16.00
MR 240 Powermac Tx-Rx S/R RELAY	...	£13.50
MR 230 Powermac Tx-Rx S/R R/LESS	...	£11.95

FUTABA

Digimax 4 + 4 Servos		£109.50

ENGINES

E.D.

SUPER FURY 1.5 c.c.

A/C	...	£5.61
R/C	...	£6.12

SILENCER	...	£2.19

STANDARD RACER 2.5 c.c.

R/C	...	£7.52
A/C	...	£6.76
SINGLE SILENCER		£2.56
DOUBLE SILENCER		£3.74

SUPER RACER 2.5 c.c.

A/C	...	£7.40
R/C	...	£8.16
SINGLE SILENCER		£2.56
DOUBLE SILENCER		£3.74

D-C

MERLIN .75 c.c.	...	£4.01
SUPER MERLIN .75 c.c.		£4.39
SPITFIRE 1.0 c.c.	...	£4.77
SABRE 1.5 c.c.	...	£5.06

ACCESSORIES

DEVCON 5 min. EPOXY	44p
NYLON HINGE STRIP	15p
ARALDITE	30p
NYLON, White, Blue, Red, Yellow, Dark Blue, 1 yd. sq. ...	40p
GLOW PLUG CLIP ...	34p
K/K SPINNERS 1⅛"-1½"	17p
1⅝"-2"	21p
STRONG 'G' CLAMPS ½", 1", 1½" openings set of 3 only ...	40p
SPRAYIT Canister spray with bottle	£1.18

Bondaglass, Bonda Paste, Bonda Primer, Ply Sheet, Odd lengths Balsa Block, Nuts & Bolts 14-4BA Tissue, Spray Paint, Props Tanks, etc.

KEILKRAFT KITS

SUPER SCALE SERIES

CESSNA 140	... ...	£2.70
PIPER S.C.	... ...	£2.70
LUSCOMBE SIL.	...	£2.70

RADIO CONTROL

MINI SUPER	... ...	£8.95
SUPER 60	... ...	£10.95
GYRON	... ...	£5.95
FLEETWING	... ...	£10.95
STUDENT	... ...	£12.60
OUTLAW	... ...	£5.95

JETEX POWERED

SKYJET 50	... ...	70p
HI-JET	... ...	£1.25

RUBBER POWERED

PIXIE	... ...	70p
GIPSY	... ...	£1.50
SENATOR	... ...	85p
COMPETITOR	...	99p
ROBIN	... ...	99p
ACE	... ...	75p
PLAYBOY	... ...	45p
EAGLET	... ...	70p
ACHILLES	... ...	70p
AJAX	... ...	85p
ELF	... ...	45p
GEMINI	... ...	85p

KITS

VERON

TOMTIT	... ...	£22.00
C180 CHEROKEE	...	£17.95
ROBOT	... ...	£7.25
MINI-CONCORDE	...	£6.80

ENGINES by MERCO, FROG, DAVIS CHARLTON, ENYA, FUJI, TESTORS, SUPER TIGRE, O.S., E.D., etc.

KITS by KEILKRAFT, MERCURY, GRAUPNER, etc.

HUMBROL ENAMEL, DOPES
Full range stocked

BONDAGLASS, BONDA PASTE, BONDO PRIMER.

CRUNCH ON THE FIELD? →
Fix it for good with
DEVCON 5 MIN EPOXY 44p

LINING TAPES
Gold, Silver, Red, Green, Blue, Black, Dayglow Orange, etc. 1/64": ⅛". Two strands, 18" long. Please state colour and size. We will send nearest,
10p each or 12 for £1.
Plus s.a.e.. Large for 12 or more

Jetex 50C	... ...	50p
Universal Fuel Needle	...	32½p
Glowglip, Plug, Lead	...	34½p
Handy Spanner	... ...	15p

C/L HANDLES

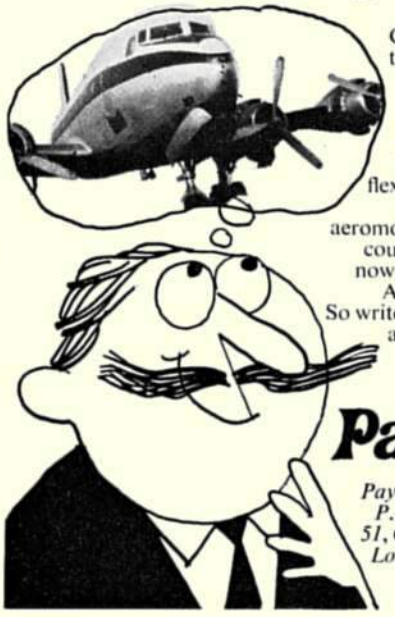
Junior	... ...	11p
Contoured	... ...	21p
Adjustable	... ...	55½p

A battery operated hobby drill "geared" to deliver the power needed for drilling metals and plastics used in modelling.
X-ACTO No. 376 CORDLESS POWER DRILL SET. Includes drill bit, grinder, 2·80 centre punch and two extra collets complete in carrying case (less batteries).
At all good modelling shops.

x-acto

World's largest maker of hobby tools.
DISTRIBUTED BY
E. KEIL & CO. LTD., Wickford, Essex.

Have you got what it takes to be a High Flyer?



Go on. Make something that will really do justice to your talents. If it's only the cost that's worrying you then you should know about Paybonds. It's the new, flexible credit scheme that's specially geared for the aeromodelling enthusiast. You could have £25-£300 to use now on the things you need. And up to 2 years to pay. So write for full details without any obligation. Go on—Spread your wings!

Paybonds

Paybonds Ltd., P.O. Box 430 51, Cannon St., London E.C.4

Paybonds welcome

Michaels Models of Finchley

Selected Items

RADIO

Skyleader Clubman

3 Tx & Rx	£48.65
4 Tx & Rx	£59.20
6 Tx & Rx	£71.70
FB3 Servo	£11.95

MacGregor

MR 360 Codamatic Tx & Rx Superhet relay	£22.95

ENGINES

D.C.

Merlin	£4.01
Super Merlin	£4.39
Spitfire	£4.77
Sabre	£5.06

ACCESSORIES

MFA Glow fuel	
½ Gallon	75p
1 Gallon	£1.20

Callers only please.
Micro Mold, Solarfilm, Devcon, Stabilit, Kavan, PB Low Bounce wheels, Balsa block, sheet, strip, ply, tissue, paints, etc.

KITS

Veron

Tomtit R/C	£22.00
Cherokee R/C	£17.95
Robot R/C	£7.25

KeilKraft

Rubber Powered

Playboy	45p
Eaglet	70p
Ajax	85p
Gipsy	£1.50

Gliders

Dolphin	70p
Caprice	£1.80
Chief	

Super Scale Series

Cessna 140	£2.70
Piper	£2.70
Luscombe	£2.70

Radio Control

Mini Super	£8.95
Super 60	£10.95
Gyron	£5.95
Fleetwing	£10.95
Student	£12.60
Outlaw	£5.95

Also available: Flight Link, Futaba, K&B, Veco Fox, Cox Merco, P.A.W., O.S., Enya, Mercury, Contest Kits, RipMax, Graupner, Top Flite, and many others.

Send S.A.E. for our list, state whether kits and accessories list or secondhand engine list. Paybonds accepted. P. & P. up to £3, 15p over £3 free except overseas.

MICHAELS MODELS
646-648 High Road, N. Finchley, London N12 0NL.
Tel. 01-445 6531.

Closed all day Monday. Easy Parking

CLASSIFIED ADVERTISEMENTS

PRESS DATE for September issue, 1971, 23rd July 1971.
Private rate 2p per word (minimum 20 words)
Trade rate 3p per word (minimum 20 words). Display box rate £2.50 per single column inch.
Box Numbers 15p extra.
Box replies to be sent care of Advertising Department, 13-35 Bridge Street, Hemel Hempstead, Herts., England. Copy received after first post on 23rd July will be held over until the next issue, unless cancelled in writing before 15th of the following month. There are no reimbursements for cancellations.

FOR SALE

O.S. Max 29X Factory prototype, very scarce. Excellent condition, ½ hour's running only. Very powerful. Sensible offers. Box No. 884, Aeromodeller (Lancs), 13/35 Bridge Street, Hemel Hempstead, Herts. H.

For Sale: Model Shop, large south coast town, 20 years lease, living accommodation. Box No. 885. Aeromodeller, 13/35 Bridge St., Hemel Hempstead, Herts. H.I.

For sale Aeromodellers 1954 to 1957, various, 15p each. Aeromodeller Annual 1955/56, £1.50. S.A.E. all requests. Northcott, 11 Thornberry Terrace, Penzance, Cornwall. H.

Engine collection (20 engines), mainly US Petrol's. Offers. List on request: A Callerfelt, Skogsmilsgat.3 S-421 37 Vastra Frolunda, Sweden. H.

Mint unflown Fleet superhet outfit with Ghost servo, Deacs and charger. £35. William Stafford, Harehope, Eglingham, Alnwick, Northumberland. H.

Dooling, De Long, Panther, Majesco, Micron plus various others, all as new or N.I.B. S.A.E. Ross Beale, 51 Burley Wood Crescent, Leeds 4.

Kraft K.P.6. Transmitter, receiver, four servos, Deacs, Charger, two models and Merco 61 thrown in. £120 the lot. Old Vicarage, Newborough, Burton on Trent, Staffs. H.I.

Eta 5 c.c. miniature compression ignition engine, S/N 54840. Bench tested only. Offers. B. Tyler, 1 Wayman Road, Corfe Mullen, Dorset. H.

DC Merlin Diesel, guaranteed, Frog 100 diesel, good condition, £3 each, Marshall, 19 Castle Road, Wakefield, Yorkshire. Phone 56526. H.

AM 15, not run in, £3. Conquest Actuator Outfit, £1. Both boxed. Bennetts, 22 The Friars, Chigwell, Essex. H.

Engines for sale, Various types and sizes, S.A.E. for list, please. Moorland Cottage, Harbourneford, South Brent, Devon, TQ10 9DT. H.

O.S. Pixie Tx and Rx with servo and provision for extra control. Only £12 complete. Contact Paul, 49 Doncaster Road, Selby, Yorks, or ring Selby 3433 H.

33ft. span, Wt. 273lb. H17 glider, immaculate flame and white. Basic instruments, canopy, easy two man rigging, new closed trailer. £195, or part-exchange model engines, building materials or w.h.y. Phone Banks, Bedford 50062. H.

Merco 61 Mk. II, as new £14. Merco 49, just run in, £10, or exchange good 15 or 19's. Bedford 50062. H.

Collectors' items. Hallam Baby 0.23 petrol engine, unfortunately minus carb and contact-breaker, but with original propeller. Also early Atwood Wasp. Exchange only. Requirements include Needle and tank assembly for Ohlsson 23, V2 spark plug, various Arden parts and Forster 29. Offers: Box No. 887 (Nottingham), Aeromodeller, 13/35 Bridge Street, Hemel Hempstead, Herts. H.

WANT TO FLY?

Come to the KENT GLIDING CLUB. Come on a Gliding Holiday. Holiday courses, professional instruction. April-November. Winch and aero tow launches.

Apply to: **KENT GLIDING CLUB, Challock, Nr. Ashford, Kent.** Tel. Challock 274 or 307.

WANTED

Wanted – by American Distributor – Model Products, especially Diesel Engines and related items. Need D-C Tornado Twins. Box No. 888, Aeromodeller Magazine, Bridge Street, Hemel Hempstead, Herts H.I.

Wanted in South of England, Model Railway Shop or Model Shop, to buy or partnership. Box No. 883, Aeromodeller Offices, 13/35 Bridge Street, Hemel Hempstead, Herts. H.

Wanted. Hospital Patient would gladly welcome offers of Aeromodeller back numbers. Box No. 886 (Worcester), Aeromodeller Offices, 13/35 Bridge Street, Hemel Hempstead, Herts. H.

Wanted. Plan of E.D. Radio Queen; wanted to purchase, or borrow for tracing. Also wanted to purchase early diesel and spark engines, Amco, Mills, Eta, etc. Please write to Duance, c/o 6 Monk Road, Bristol BS7 8LE. H.

SPITFIRE II PILOTS NOTES A.P. 1565D

Published 1941. Facsimile copy of this official document. Copyright of Her Majesty's Government from whom permission is granted to copy. Contains 26 pages and 4 diagrams. Available at 75p each plus 5p (U.K. only) postage. Others to follow. Remittance to:

BOOK SHELF, Dept. J,
Back West Crescent,
St. Annes-on-Sea, Lancashire.

TOP ALLOWANCE ON FISHING TACKLE AND PHOTOGRAPHIC EQUIPMENT TOWARDS ANY MODELLING GOODS MODEL ENGINES BOUGHT FOR CASH

ROLAND SCOTT LTD.

85 BOLTON ROAD, WALKDEN NEAR MANCHESTER

KITES

Build and fly the scientifically designed SUPA KITE. Send now for fully detailed 40in. x 22in. plan, 50p post free. W. L. Manuel, 60 Thames Mead, Terrace Road, Walton-on-Thames, Surrey. G.H.

The Advertisement Manager reserves the right to refuse or suspend advertisements without giving any reason. Every care is taken to avoid mistakes, but the publishers cannot be held liable in any way for clerical and printing errors or omissions. Receipt of 'copy' for publication implies acceptance of these conditions by the advertiser. Whilst every care is taken to exclude advertisements from doubtful sources, no responsibility can be accepted by the publishers for the bona fide of advertisers.

PLACES OF INTEREST

The Shuttleworth Collections Military Air Pageant at Old Warden Aerodrome, off the A.1 near Biggleswade, Beds, on Sunday, 25th July, will include demonstrations by famous fighting aeroplanes of the 1914-18 and 1939-45 wars and by types in R.A.F. Service today. Admission: adult 50p, child 15p, car park 50p. Gates open 11 a.m., flying 2 p.m. H.

WEST WALES GLIDING CLUB HOLIDAY GLIDING COURSES

Withybush Airfield is centrally situated for over 70 miles of National Park coastline and unspoilt beaches for your family holidays.

Residential and non-residential courses for beginners and advanced pupils from May to October.

Auto-towing and Aero-towing.

Camping and caravan facilities available.

Brochure & fuller information from Gliding Secretary:

136 HAVEN RD., HAVERFORDWEST
Tel. Haverfordwest 3156

TRADE

Printed Circuit Kit. Enables you to build your own R/C gear professionally. All inclusive plus two electrical circuits for experimenting. Requires NO electrical knowledge. Send £1.10 (p. & p. included) to: SPECIALIST ELECTRONICS, P.O. Box 34 2 Woodland Avenue, Brentwood, Essex. H.

Top prices paid for good condition vintage engines. Must be before 1950. Wolverhampton Models & Hobbies, 3 Bell Street, Manders Centre, Wolverhampton. T/C.

Advertising Pencils. Superb Ball-Pens, Combs, Brushes, etc. Raise funds quickly, easily. Details: Northern Novelties, Bradford 2. G-S.

BOOKS

AMERICAN MAGAZINES by annual subscription. 'Flying Models' £2.70; 'Model Airplane News' £2.90; 'American Aircraft Modeller' £4.00. Send stamp for complete list. Willen (Dept. 1), 61a Broadway, London E15 4BQ. T/C.

Aeromodeller back issue mart, vast stocks of back issues held in stock, Beaumont, 11 Bath Street, London. E.C.1. H. ALT/TC.

DIESELS WANTED

We need new or used diesel engines as well as older petrol engines. We will pay top cash allowance or trade for engines. R/C equipment and kits from the 'Colonies'. Post your list off to us along with 10p (2/–) in stamps for instant 'Air Mail' reply.

STANTON HOBBY SHOP INC.
4734 N. Milwaukee Avenue
Chicago, Ill. 60630, U.S.A.

RADIO CONTROL

FUTABA 4 channel proportional	£109.50
MACGREGOR Superhet Relayless	£10.50
MACGREGOR Superregen Relayless	£11.95
MACGREGOR Superhet Relay	£17.95
ABC Superregen Relay	£14.25

SUITABLE KITS

KK Super 60	£10.95	Veron Cessna Skyplane	£9 28
KK Gyron	£5.95	Veron Mini Concord	£6.60½
KK Fleetwing	£10.95	Veron Mini Robot	£3.55
Mercury Matador	£2.70	Top Flite Schoolmaster	£4.97½

We stock a large range of all types of kits and a host of accessories

PAYBONDS WELCOME

Est. 1936 **John W. Bagnall Ltd., 18 Salter Street, Stafford** Tel. 3420

BINDERS

in handsome leather cloth with gold blocked name plate on spine to take 12 copies of your AEROMODELLER

Copies open flat and can be removed unmarked as required.

Price including postage 90p

AEROMODELLER
13-35 BRIDGE STREET,
HEMEL HEMPSTEAD, HERTS.

THE MIDLANDS LEADING MODEL SHOP – WORLD-WIDE MAIL ORDER SERVICE

S. H. GRAINGER & CO. CALDMORE MODELS

108 CALDMORE ROAD, WALSALL WS1 3RB, STAFFS.
(1 MILE FROM M6 MOTORWAY JUNCTION 9) TEL. WALSALL 23382

RADIO CONTROL

Simprop Propo	from	£82.00
Gem Propo	from	£34.00
Skyleader Propo	from	£75.00
Sprengbrook Propo	from	£75.00
Futaba Propo	from	£109.00
Remcon Kit Propo	from	£98.00
McGregor S/Channel	from	£11.95
Mainstream S/Channel	from	£12.00

All types servos, actuators, deacs, etc.

ENGINES	KITS	BOAT KITS	ACCESSORIES	MATERIALS
Merco	KeilKraft	Aerokits	Micro Mold	Solder
Super Tigre	Graupner	Billings	X-Acto	Balsa
O.S. P.A.W.	Topflite	Veron	M.F.A.	Humbrol
Enya	Sterling	Mondav	DEACS	Fibreglass
K&B E.D.	M.F.A.	Graupner	Electric Motors	Solarfilm
Rossi	Goldberg	E.D.	Chargers	Nylon
H.P. Veco	Aviette	Norstar	Boat Fittings	Fuel
Davis Charlton	RipMax	Mainstream	Tanks	Paints
Webra	Heigi	Simplas	Wheels	Buoyancy Foam

Fibre-glass Marine Models including the popular 1/12th scale Surfury and Cigarette. Mail order catalogue 10p. Discount details from £25. Paybonds accepted. Part exchanges.

MODEL SHOP DIRECTORY

ALDERSHOT Tel: 26825

CONCORDE MODELS

134 VICTORIA ROAD

R/C Models – All Accessories –Mainstream and Merco Area Agents

Also at **14 Jeffries Passage, Guildford** Tel: 4247

AMERSHAM Tel: 4030

R. E. HADDOCK

(R.E.H. Photography)

61 SYCAMORE ROAD, AMERSHAM, BUCKS.

R/C equipment, aircraft and boat kits and all modelling accessories. Cameras taken in part exchange.

AUSTRALIA Tel: 637424

RIVERSIDE HOBBY CENTRE

3 PRINCE WALK, MELBOURNE 3000

Radio Control Equipment Kits, Engines, Accessories, M.A.P. Plans, Books.

FAST MAIL ORDER SERVICE

AUSTRALIA

SEMAPHORE HOBBY CENTRE

12 HART STREET
SEMAPHORE SOUTH, S.A. 5019

M.A.P. Plans, Books, Kits, Engines, Accessories, etc.
Radio Control Equipment
Free Price Lists

AYLESBURY Tel: 85752

TAYLOR & McKENNA

46 FRIARS SQUARE

BARKINGSIDE Tel: 01–500 2007

PAGE'S OF BARKINGSIDE LTD.

M.E.T.A.
19 BROADWAY MARKET, BARKINGSIDE ILFORD, ESSEX
Why go to town?
We can supply all your needs at Ilford's largest Model Shop

BARNSLEY Tel: 6222

DON VALLEY SPORTS

28 DONCASTER ROAD, BARNSLEY

Model Aircraft, Boats, Cars, Railways
All makes of Engines
R/C Equipment

Postal Service

BATH Tel: 60444

CYRIL HOWE'S

CHEAP STREET, BATH, SOMERSET

The Model Shop of the West for all your modelling requirements. Aircraft, boats, engines, radio control. Expert advice available
M.A.P.

BIRMINGHAM Tel: B'ham Highbury 3237

KINGS HEATH MODELS

5 YORK ROAD
KINGS HEATH, BIRMINGHAM 14

KeilKraft, Veron, Airfix, Monogram, Frogflite, Cox, Aurora, Diesel and Glow engine, Accessories, etc. Also Boats, Railways, Slot Racing cars, etc.

BIRMINGHAM Tel: 021-772 4917

BOB'S MODELS

520-522 COVENTRY ROAD
SMALL HEATH, BIRMINGHAM 10

MODEL CENTRE OF THE MIDLANDS
RADIO CONTROL SPECIALISTS

Friendly help and Advice backed by over 20 years' experience

BIRMINGHAM Tel: 554 5565

THE MODEL MECCA

204 WITTON ROAD
BIRMINGHAM 6

Model Aircraft, Boats, Trains, Cars and R/C outfits

BIRMINGHAM Tel: 021-554 8760

ARTHUR BENN'S MODEL SHOP

18 COLLEGE ROAD, HANDSWORTH, BIRMINGHAM 20

KeilKraft, Veron, Ripmax, Aircraft and Boat Kits, Engines and R/C outfits, Balsa wood, etc.

BIRMINGHAM Tel: EAST 0872

POWELL'S MODEL CENTRE

769 ALUM ROCK ROAD, WARD END BIRMINGHAM 8

Personal attention of G. & F. Powell

BIRMINGHAM Tel: 021-458 4239

TURNERS MODELDROME

NEWSAGENTS
24 TEVIOT GROVE, KINGS NORTON

Radio Control equipment, KeilKraft, Veron, Airfix, Frog, Ripmax, Engines, etc.

BRADFORD Tel: 26186

MODELDROME

182 MANNINGHAM LANE
BRADFORD 8

Radio Control Equipment, Aircraft and Boat Kits and all Modelling Accessories
Mail Order by return

BRIGHTON Tel: Brighton 48225

HARRY BROOKS

15A VICTORIA ROAD
PORTSLADE, SUSSEX

The best stocked model shop in the South – You want it, we have it

BRISTOL Tel: 47505

MODEL HIGHWAYS

85 GLOUCESTER ROAD, BRISTOL 7

Keil, Veron, Top Flight
Fuel by the gal. Balsa, etc.
CLOSED WEDNESDAY

CARDIFF Tel: 29065

BUD MORGAN

The Model Aircraft Specialist

For KeilKraft, Mercury, Veron, Ripmax, Simprop R/C and Mainstream products.
PAYBONDS ACCEPTED
S.A.E. stamped please for assorted lists
22 & 22A CASTLE ARCADE, CARDIFF CF1 2BW

CHICHESTER Tel: 83592

PLANET MODELS AND HANDICRAFTS

108 THE HORNET, CHICHESTER, SUSSEX

Aircraft and Boat Kits. All Accessories. Balsa Wood, Engines, Fuels, Finishes, etc. Model Railways & Racing Cars.
Personal Service Mail Orders

DERBY Tel. ODE 2 62771

SUPER MODELS
3 CHAPEL SIDE, SPONDON, DERBY
(7 mins. off M1. Exit 25)

The leading shop for Ready-built Airframes. Quality RC gear. Delta Skyleader. Main Service Agent for Skyleader in Midlands and North. Fantastic selection of Solarbo Balsa Wood 2", 3", 4" & 6" wide 4' & 3' long

DEVON Tel. 2685

THE MODEL SHOP

56 FORE STREET,
BRIXHAM

We think we are
THE BEST IN THE WEST

DONCASTER Tel: 62524

B. CUTTRISS & SONS

MODELS AND HANDICRAFTS
40 DUKE STREET

Call and see our Shop

DUDLEY Tel: 57045

ACE MODELS

20 FOUNTAIN ARCADE, DUDLEY

For KeilKraft, Veron, Mercury Revell, Riko, Frog, etc.

CLOSED WEDNESDAY

FAREHAM Tel: 4136

G. M. H. BUNCE & CO. LTD.

206 WEST STREET, FAREHAM

Aircraft, boats, engines, radio control

Engineers/woodworkers tools and machinery

FARNWORTH Tel: Farnworth 74688

JOYCRAFT

29 HALL LANE, MOSES GATE
FARNWORTH, BOLTON

The shop for all your modelling needs. Balsa Wood specialists, materials, engines, aircraft and boat kits, R/C equipment. S.A.E. for reply. Postal service. We are here to serve 'YOU'

GLASGOW 041-632 8326

RIDDELL BROS.

61 MOUNT ANNAN DRIVE
(Facing Mount Florida School)
GLASGOW, S.4

VERON KEIL BILLINGS AIRFIX

Accessories, Balsa, etc.

HAVERFORDWEST Tel.: 3175

MODELCRAFT

15 CARTLETT, HAVERFORDWEST
PEMBS

At last a specialist model shop in West Wales. All popular makes always in stock. Mail Order? Certainly. S.A.E. for lists please. R/C accessories, Aircraft and Boat Kits, etc.

HEMEL HEMPSTEAD

Tel: 0442 58963

HEMEL MODEL CENTRE
61 WATERHOUSE STREET

Specialists in Radio Control. We supply equipment by most leading manufacturers, including Staveley, Flight Link, Simprop, Futaba, etc.

PART EXCHANGES WELCOMED
MAIL ORDER A SPECIALITY
EARLY CLOSING WEDNESDAY

HEMEL HEMPSTEAD

Tel: 53691

TAYLOR & McKENNA

203 MARLOWES

HONG KONG Manager: J. H. Symons

FAR EAST MODELS LTD.,

C-1 HAPPYVIEW HOUSE,
SHATIN HEIGHTS ROAD,
NEW TERRITORIES, HONG KONG

Japanese model equipment. Aircraft, boats and radio control equipment. Mailed to any part of the world. Mail order only. All currencies accepted.

HONG KONG Tel: K-680507

RADAR CO. LTD.

2 OBSERVATORY ROAD
TSIMSHATSUI, KOWLOON

The most complete stock in the Far East. Agents for Veron, Solarbo, Keil Kraft, M.K., Pilot. Sole Agents for Graupner, O.S. Prompt mail order service.

HORSHAM Tel. 65133

MODEL CORNER

30 NORTH STREET, HORSHAM, SUSSEX

Comprehensive range of Kits. Veron Keil, etc. P. & P. extra.

Overseas enquiries invited.

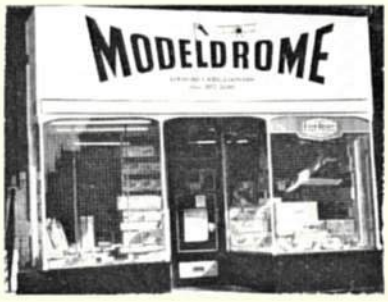
HULL Tel: 43701

REG. BEAUMONT

150 CHANTERLANDS AVENUE,
HULL, E. YORKS.

Mainstream, Veron, etc.

MAIL ORDER SERVICE



ILFORD Tel: 01-554 9142

AVIACOLOUR

MODEL SUPPLY SPECIALISTS
Specialists in Radio Control
466 EASTERN AVENUE, ILFORD, ESSEX
(1 min. from Gants Hill Central Line tube station)

KENT Tel: RAV 0818

AVICRAFT LTD.

6 CHATTERTON ROAD, BROMLEY

I sell as much modelling gear as I can afford to stock. Radio Control, Boats, Planes. Good selection of wood and accessories.

Whatever you want in the way of gear for Avicraft's sake, send your orders here

KENT

MODERN MODELS LTD.

49/51 LOWFIELD STREET
DARTFORD, KENT

For all that's best in Model Aircraft and Boats, including Radio Control American Kits and Accessories a speciality

LEEDS Tel: 27891

THE MODEL SHOP

38 MERRION STREET
(Nr. Tower Cinema)

Model aircraft—boats—cars—railways, all makes engines. Every accessory, R/C equipment. Same day postal service

LEICESTER Tel: Leicester 21935

RADIO CONTROL SUPPLIES

52 LONDON ROAD
Mail Order Specialists
Closed Monday
Open until 8.30 p.m. Friday
The Showroom of the Midlands with full R/C service facilities

LEYLAND

Think of MODELS

TERRA, AQUA & AIR also everything associated with them and you think of

"TERRAQUAIR"

64 CANBERRA ROAD, LEYLAND

Coming by M.6? from North or South. 2 min. to run Off/On. Turn left at 'Damps Canberra Service Station' and you're here. With 'Off the Road' parking areas provided.

LINCOLN Tel: 25907

MODEL CENTRE

24 NEWLAND

THE ENTHUSIAST'S SHOP

Big Stocks of Kits, Engines, Balsa, Accessories, R/C Gear, etc.

MAIL ORDER

LONDON 01-808 5668

TOTTENHAM MODELS AND RACEWAY LTD.

367 High Road, Tottenham, London, N.17
Come to THE Centre and try our track: **KING** 155 feet per lap – and all the latest merchandise in slot cars, model boats, static kits, radio cars, aircraft, military vehicles. We are the 'DREMEL' moto-tool agents. Open 6 days per week – Closed Mondays Open Sunday afternoon

LONDON Tel: 01-228 6319

E. F. RUSS

101 BATTERSEA RISE, LONDON, S.W.11

Plastic Kits, Model Boats, Aircraft and accessories. All leading makes in stock.

Friday open until 7 p.m.
Early closing Wednesday

LONDON Tel: 01-560 0473

RADIO CONTROL SUPPLIES

581 LONDON RD., ISLEWORTH, MIDDX.
Mail Order Specialists
Open each weekday and until 8.30 p.m. Fridays
Largest R/C stockists in the country
Own R/C service centre

LONDON Tel: 01-788-6497

J & D's HOBBIES

118A Upper Richmond Road
Nr. East Putney Tube Station

Closed Thursday
Open until 7 p.m. Friday

LONDON Tel. MIL 2877

H. A. BLUNT & SONS LTD.

MILL HILL CIRCUS, LONDON, N.W.

Complete range of model aircraft, engines and accessories, boats, cars and railways

LONDON Tel: 01-692 62[illegible]

D. BRYANT

MODEL SUPPLIES
328 BROCKLEY ROAD, S.E.4

For Futaba R/C equipment and all other leading makes, Keil, Veron, Frog, Airfix, etc. Expert advice on scale problems.

LONDON GRA 2471

A. G. HERMITE
(MODEL SUPPLIES)
633 BARKING ROAD, WEST HAM, E.1

Aircraft—Boat—Car—Plastic Kits & R/C
Saturdays 9 a.m. to 6 p.m.
Postal Service

LONDON Tel: 01-485 1818

AERO NAUTICAL MODELS
39 PARKWAY, CAMDEN TOWN, N.W.1
Main Agents for RIPMAX, GRAUPNER
Full range of Timbers stocked and cut
ALL KITS AND ACCESSORIES FOR AIRCRAFT AND BOATS
MAIL ORDER SERVICE
1 min. from Camden Town Tube Station, Northern Line.
LONDON'S LEADING MODEL SHOP

LONDON Tel: 01-852 263[illegible]

LEWISHAM MODEL CENTRE
45 LEE HIGH ROAD, LEWISHAM, S.E.13

A good selection of KeilKraft, Veron, Graupner, Top Flite Gillons, etc. always in stock. All types of Engines, Accessories and Spares; also single and multi R/C equipment.
Late night Friday. Mail Order a pleasure
Paybonds and Barclay Cards accepted

LONDON Tel: WELbeck 8835

W. & H. (MODELS) LTD.
14 NEW CAVENDISH STREET, W.1
(Five minutes from Oxford Circus)
LEADING WEST-END STOCKISTS OF ALL QUALITY MODEL AIRCRAFT KITS, BOATS, RAILWAYS, MAIL ORDER

LONDON Tel: 01-607 4272

HENRY J. NICHOLLS
& SON LTD.
308 HOLLOWAY ROAD, N.7

We stock only the best for AEROMODELLERS
Specialists in Radio Control

LONDON Tel: 01-703 456

MODEL AIRCRAFT SUPPLIES LTD.
207 CAMBERWELL ROAD, S.E.5
Business Hours:
Monday to Wednesday, 10 a.m. to 6 p.m.
Saturday 9 a.m. to 6 p.m.
Late night Fri. 7.30 p.m. Closed all day Thur.
Postal Service. Parking Facilities

LONDON Tel: 01-445 653[illegible]

MICHAEL'S MODELS
646-8 HIGH ROAD, N. FINCHLEY, N.12
Comprehensive stock of KeilKraft, Mercury & Veron kits. Good selection of engines and a full range of accessories and woods. Specialists in secondhand engines.
MAIL ORDER A PLEASURE
Closed all day Monday Easy parking

LONDON Tel: 850-4324

ELTHAM MODELS
Ian and Ray Stilling
54 Well Hall Road, Eltham, London S.E.9

The Model Shop with the friendly atmosphere

Full range of Aircraft & Boat Kits, Engines, Balsa, Dope, etc.

LUTON Tel: 23182

AEROMODELS (LUTON)
20 GORDON STREET
LUTON, BEDS.

Model Aircraft, Cars, Railways and Boats for the beginner and expert.

MAIDENHEAD Tel: 21769

E. WALTON
61 KING STREET

Wide range of Modelling Kits and Accessories
Engines and R/C Equipment
Railways, etc.
Established 1932

MAIDSTONE Tel: 51719

J. F. CARTER & SONS LTD.
(THE MODEL SHOP)
19-23 UPPER STONE STREET
MAIDSTONE, KENT

Complete range of modelling equipment and accessories, including R/C.
MAIL ORDER

MANCHESTER Tel: BLA 3972

THE MODEL SHOP
13 BOOTLE STREET
MANCHESTER 2

THE UP-TO-DATE SHOP WITH THE COMPREHENSIVE STOCK
Mail Orders by return

MIDDLESBROUGH

MODELDROME
265 LINTHORPE ROAD
MIDDLESBROUGH, TEESSIDE
Tel: Saltwells 3212

Radio Control Equipment, Aircraft and Boat Kits and all Modelling Accessories.
Mail Order by Return

NEWCASTLE Established 1924

THE MODEL SHOP
(NEWCASTLE UPON TYNE) LTD.
18 BLENHEIM STREET Tel: 22016
NEWCASTLE UPON TYNE, ENGLAND

Pioneers of modelling
Our Expert Staff are at your service
MAIL ORDER

NORTHAMPTON Tel: 31223

THE MODEL SHOP
(Super Model Aircraft Supplies)
230 WELLINGBOROUGH ROAD, NORTHAMPTON
Established 1937

Full range of model supplies in new enlarged shop, Ripmax, MacGregor and Futaba Digital.

NOTTINGHAM Tel: 50273

GEE DEE LIMITED
40 GOOSE GATE
NOTTINGHAM

Everything for the aeromodeller at Nottingham's leading shop.

OLDHAM Telephone: MAin (Oldham) 8812

A.B.C. ELECTRONICS (OLDHAM) LIMITED
83 LEES ROAD, OLDHAM, LANCS.

* Radio Control Manufacturer *
All leading makes of R/C, engines, kits and accessories in stock

OLDHAM

THE HOBBY LOBBY
86 MARKET STREET, SHAW, LANCS.
(between Oldham and Rochdale)

Model Aircraft Kits, Accessories, Cars, Boats, Railway, Plastic Kits.
Postal service. Send for 'Bargain Bulletin'. Lots of interesting items.

PORTSMOUTH Tel: 23681

THE HOBBY SHOP
(Robin Thwaites)
28 ARUNDEL STREET

Aero – Car – Boat Kits, R/C Equipment.
Used Engines bought and exchanged.
Paybonds, Provident, Barclaycard accepted.

POTTERS BAR HERTS.
Tel: 59355

HENRY J. NICHOLLS & SON LTD.

8 SOUTHGATE ROAD, POTTERS BAR, HERTS.

Try the Hertfordshire Department of the well-known hobby shop for all your modelling needs.

READING
Reading 51558

READING MODEL SUPPLIES

5 CHATHAM STREET, CAR PARK OXFORD ROAD, READING, BERKS.

BERKSHIRE'S SPECIALIST MODEL SHOP FOR KITS, ACCESSORIES, ENGINES, RADIO EQUIPMENT.

H.P. Terms available.

You can drive right to us.

READING
Tel: 50074

G. SLEEP, LTD.

22/24 KINGS ROAD, READING

For over 30 years we have had one of the largest Model Stocks in the South of England

ROMFORD
Tel: ROM 44508

HOME & HOBBY STORES

144 NORTH STREET, ROMFORD, ESSEX

We stock all that's best in modelling. Kits, engines, radio. Part exchange. Mail order by return. Paybonds agents. Open 7 p.m. Fridays. No parking problems.

SHEFFIELD
Tel: 581197

MODELS & HOBBIES

117 LONDON ROAD, SHEFFIELD

Main Agents for R/C equipment. Staveley, Sprengbrook, Skyleader, Kraft, etc. Main Agents for True-Line styro wings. Aircraft and Marine accessories. We do any repairs to any make of radio. Mail order. H.P. available. Easy parking.

SINGAPORE

SHING FATT RADIO

1340 UPPER CHANGI ROAD, SINGAPORE

Latest in Japanese R/C equipment and kits. Fresh stocks of M.K. Custom kits, Servos, Accessories, Digital R/C, H'node, Enya, O.S. Send for lists. Prompt service our speciality.

SOLIHULL
Tel: SHI 3374

SHIRLEY MODEL SUPPLIES

62 STRATFORD ROAD SHIRLEY

Triang, Scalextric, Airfix, Balsa Kits etc. Personal attention and advice to young modellers.

SOUTHAMPTON
Tel: 0703-25565

R.G.L. MODEL SHOP

R. G. LEWIS (SOTON) LTD.,

17 HANOVER BLDGS., SOUTHAMPTON

Specialist in
BOATS – CARS – AIRCRAFT
RADIO CONTROL EQUIPMENT

SOUTHAMPTON
Tel: 25919

HOBBY LOBBY LTD.

52 COMMERCIAL ROAD

CALL – WRITE – OR PHONE
Paybonds accepted.
Open 6 days a week.
8.30 a.m. – 6 p.m.

ST. ALBANS
Tel: 59234

BOLD & BURROWS LTD.

19-23 CHEQUERS STREET, ST. ALBANS, HERTS.

THE MODELLERS' DEN

STOCKPORT
Tel: STO 5478

THE MODEL SHOP

280 WELLINGTON ROAD SOUTH (BRAMHALL LANE CORNER)

Aircraft, Boats, R/C Equipment, Engines Railways, Car/Racing, Plastic Kits Postal Service.

SUTTON
Tel: 01-642 8291

E. L. S. MODEL SUPPLIES

9 EAGLE STAR HOUSE, HIGH STREET, SUTTON, SURREY

SURREY'S HOBBY CENTRE
BY RETURN POSTAL SERVICE

Complete stock of all Aeromodelling requirements.

WALKDEN
Tel: 061-790 6707

ROLAND SCOTT LTD.

85 BOLTON ROAD, WALKDEN

MOST ITEMS IN THIS MAGAZINE IN STOCK NOW.

SEND FOR SECONDHAND LISTS

WALSALL
Tel: 23382

S. H. GRAINGER & CO.

CALDMORE MODELS
108 CALDMORE ROAD

Everything for the Modeller
Aircraft – Railways - Boats - Electric Cars
Repairs - Overhauls - Spares - Radio Control - Part Exchanges - Paybonds accepted

WATFORD
Tel: Watford 43026

MODEL EXCHANGE

71 ST. ALBANS ROAD WATFORD, HERTFORDSHIRE

The shop with stock and expert advice. Free radio and engine testing service. S/H engines and radio bought and sold any time. 'Performance spoken here'.

WELWYN

H. A. BLUNT & SONS LTD.

38 FRETHERNE ROAD WELWYN GARDEN CITY, HERTS.

Complete range of model aircraft, engines and accessories, boats, cars and railways.

WESTON-SUPER-MARE
Tel.: 21031

BILL EVANS

WESTON MODEL AERO & ANGLING SUPPLIES
1 OXFORD STEET

The best in Radio Control for 25 years! All the main agencies. Open till 8 o'clock, 7 days per week for your convenience. 'By the Enthusiast for the Enthusiast'

WIGAN
Tel: 83208

TONY'S MODEL CENTRE

10 CHAPEL STREET, PEMBERTON, WIGAN

Radio Control equipment, Aircraft, Rail and Boat Kits and all your modelling requirements. Personal attention assured.
IT WILL PAY YOU TO VISIT US
Easy parking
MAIL ORDER SPECIALISTS

WOLVERHAMPTON
Tel: 26709

MODELS & HOBBIES

BELL STREET, MANDERS CENTRE WOLVERHAMPTON

EXPERTS COME TO US
VISIT US AS WELL

WE HAVE ALL THE BEST IN MODELLING

WORCESTER
Tel: 0905-26697

R.G.L. MODEL SHOP

(R. G. Lewis Ltd.)

6 FOREGATE STREET

Specialist in
BOATS – CARS – AIRCRAFT
RADIO CONTROL EQUIPMENT

WORCESTER PARK
Tel: 01-337 0983

THE TOY HAVEN & WORCESTER PARK MODEL CENTRE

16/18 CENTRAL ROAD, WORCESTER PARK, SURREY

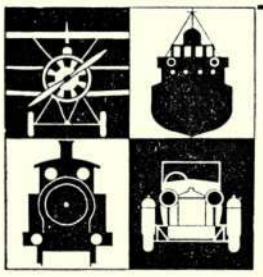
Mon. to Sat. 9 a.m. to 6 p.m. For the enthusiastic Modeller. Plastic Kits. The best toys. Mail Order Nearby Parking

WORKSOP
Tel: 2855

MODEL CENTRE

RYTON STREET

Main agencies for all Kits, Engines and Radio Control equipment.
Mail Order Service



41st Great Show!

MODEL ENGINEER EXHIBITION

SEYMOUR HALL, LONDON, W1

January 4th — January 15th 1972

ENTRIES
Entry forms are being prepared. You still have six months to get your entries to exhibition standards. May we hope that you will be supporting us with your very best! Classes for every kind of model . . .

Over twenty trophies, over £300 in prizes, plus the pleasure of displaying your efforts and seeing those of other people.

Details from the Exhibition Manager.

Another better than ever show at the Seymour Hall! Exciting new features for this **41st EXHIBITION** include – for the first time ever – indoor **MARINA** – a pool 98ft. long by 29ft. wide for demonstrations of radio controlled boats; competition racing in the evenings; and some fine steam powered boats in operation. **HUGE FLYING CIRCLE!** We are elevating our electric flying circle to give full width of the hall between balconies – enabling models to fly a diameter of over 40 feet! We believe electric-powered models can loop, wing-over, fly inverted – in fact, go through the book – come and watch us (and our enthusiastic club helpers) try out new techniques. **BIGGER & BETTER DEMONSTRATIONS!** Model Engineer Consultants and Silver Medallists will be assisting at the S.M.E.E. Workshop ready to show you how . . . Ever-popular **S.M.E.E. PASSENGER TRACK** in operation, plus enormous surprise item on show . . . The Bryanston Room will be devoted to club stands, demonstrations, and provide a visitors' Clubroom. This room will also house the **TRACTION ENGINES.** New! Lecture Hall will be **BATTLEGROUND** – where three **BATTLEGAMES** will be taking place with running commentaries, plus **MILITARIA** display. Upstairs regular **CINEMA SHOW.**

If you feel you can help in any of these projects, get in touch at once. Big contest classes will have improved stewarding; all small models and entries under glass. Write in for further particulars.

MODEL & ALLIED PUBLICATIONS LTD.
13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

three things made these models perfect

Skill, patience & Humbrol

You've got to work at the first two but you can buy the third at any good modelling shop. Your models deserve the best and you'll certainly get the best from Humbrol. Ask for these products by name—enamels (matt or gloss) for brushing or spraying; modelling adhesives of every kind; craft knives, dopes, thinners, brush cleaners, fuel proofers, authentic colours, metallics and poster colours. **Remember—Humbrol helps you make better models!**

HUMBROL

HUMBROL · HULL · YORKSHIRE