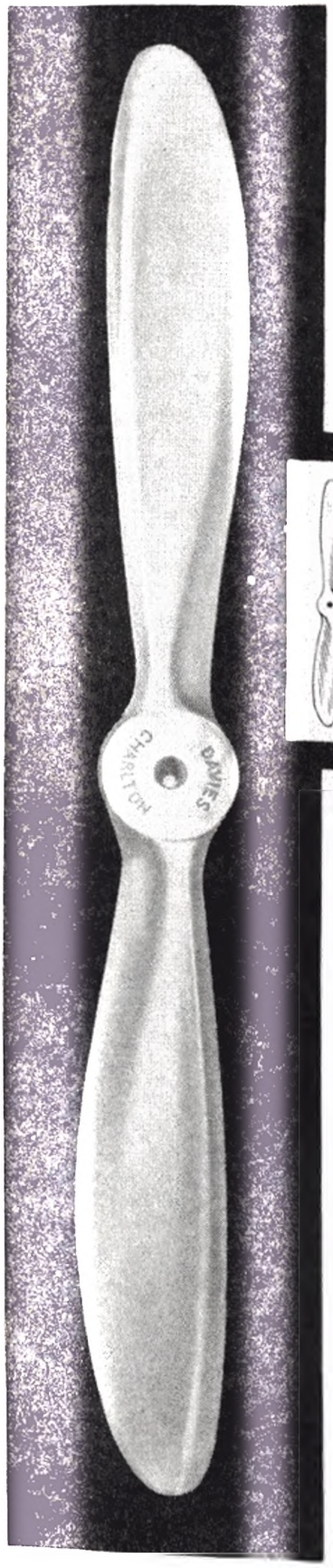
MARCH 1961

AERO MODELLER

Famous Biplane

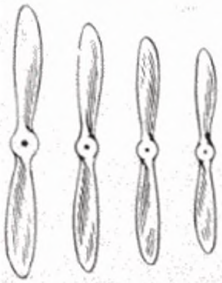
D.H. Tiger Moth

2/-



QUICKSTART

accessories get you airborne *faster—smoother*



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Superbly moulded in high tensile nylon, virtually indestructible, unaffected by temperature or fuel. Perfect balance, precise blade profile and the special thin section airfoil ensure maximum thrust.

Nylon

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Made by K.L.G. Now available only in the distinctive Quickstart pack. Precision engineered throughout and rigorously tested, these lightweight plugs give top performance throughout the longest flying life.

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For Top Performance

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5½" x 4"	1/6
6" x 3"	1/6
6" x 4"	1/6
7" x 4"	2/-
7" x 6"	2/6
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8" x 6"	2/11
9" x 4"	3/5
9" x 6"	3/5
9" x 7"	3/5

Moulded in our own Factory from best-quality Nylon.

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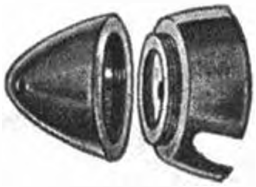
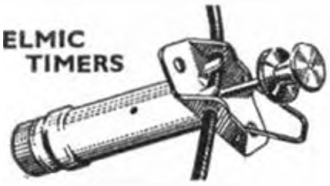


1¼" dia. standard (plastic)	2/7½
1½" " " "	2/11
1¾" " " "	2/11
2" " " "	3/4½
1¼" dia. supersonic (plastic)	2/11
1½" " " "	3/4½
1¾" " " "	3/4½
2" " " "	3/11
1¼" dia. (aluminium)	5/10
1½" " "	7/10½

ELMIC TIMERS



Mini-diesel (with cut-out) *(illustrated)*	8/9
Universal	14/6
Baby D.T. (dethermaliser)	6/5

K K FUEL CUT-OUT 4/10

Positive action

K K FUEL FILTER ... 2/6

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Fully pneumatic

2" dia. ... 14/- 2½" dia. ... 21/-
3" dia. ... 25/4 3½" dia. ... 28/-
4" dia. ... 29/2

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2" diameter 4/3

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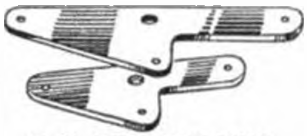

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"Stunt Queen" "	3½d.
Small plastic type	3½d.
Medium "	3½d.
Large "	3½d.

K K FUEL TANKS

½A stunt	2/11
Small stunt	3/6
Large stunt	6/5
7½ c.c. team race	3/2½
10 c.c. "	3/2½
15 c.c. "	3/2½
30 c.c. "	3/6
15 c.c. pressurised	3/6
30 c.c. "	3/6

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2 oz. "	1/3		
¼ pint "	4/3		
½ oz. colrd.	8d.	2 oz. colrd.	1/6
1 oz. "	10½d.	¼ pt. "	4/3
¼ pint Gold or Silver			4/6

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Per pack ... 1/-

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30 or 33 s.w.g. 150 ft. on card 2/6

Terylene Thread 100 ft. on card 7½d.

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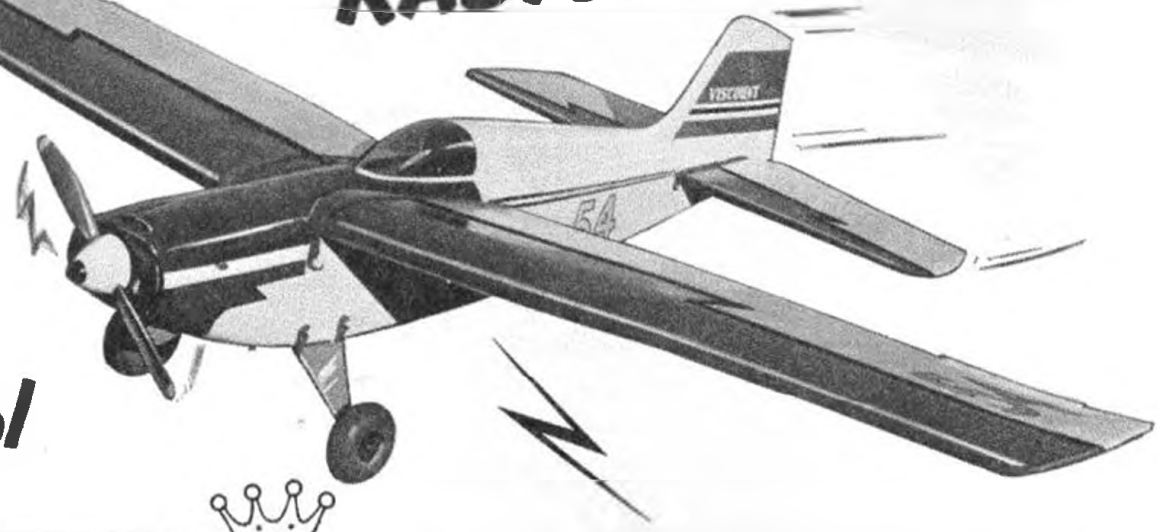

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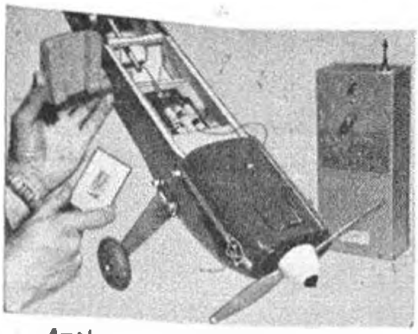
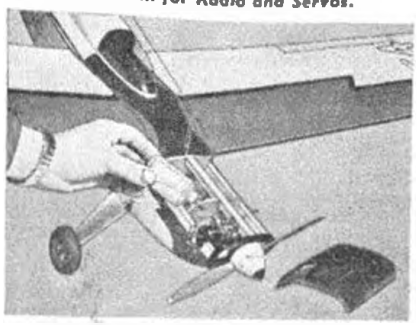
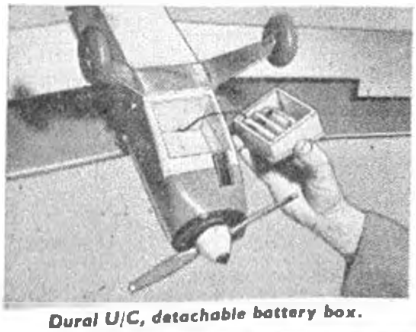


Ample room for Radio and Servos.



Complete accessibility to engine bay.



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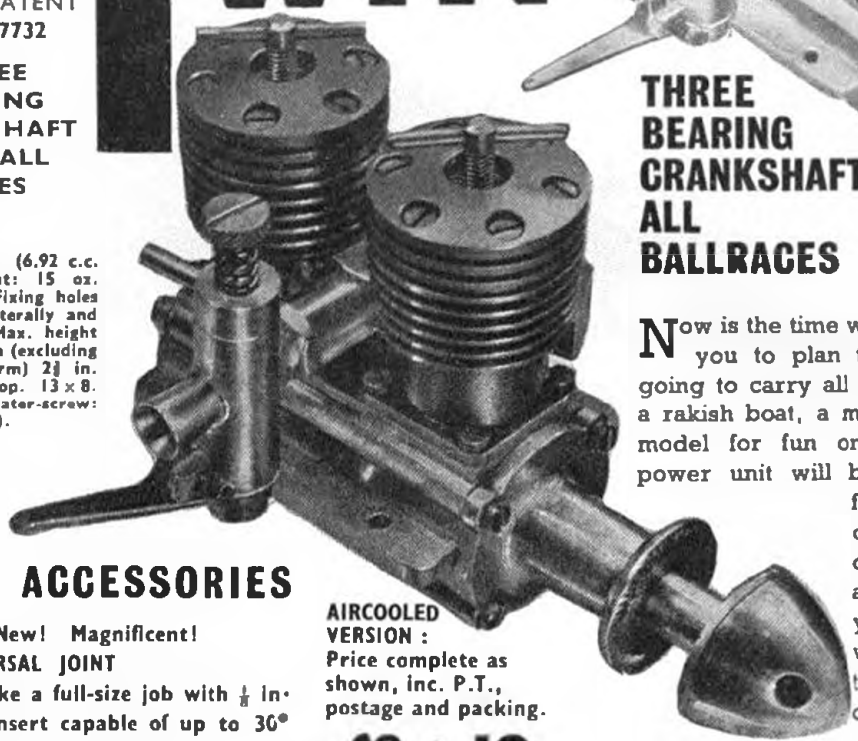
BRITISH PATENT
No. 747732

THREE BEARING CRANKSHAFT ALL BALL RACES

VITAL STATISTICS:
Capacity: 7 c.c. (6.92 c.c. actual). Weight: 15 oz. Engine bearers: Fixing holes 1¼ in. centres laterally and longitudinally. Max. height 3¼ in., max. width (excluding throttle toggle arm) 2¾ in. Recommended prop. 13 x 8. Recommended water-screw: 2¼ x 2¼ (2-blader).



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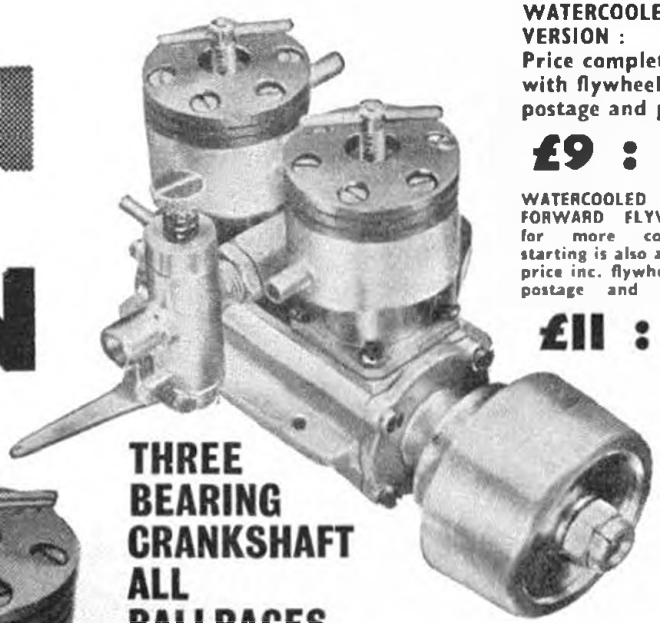

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Price complete with flywheel, P.T., postage and packing

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WATERCOOLED WITH FORWARD FLYWHEEL for more convenient starting is also available, price inc. flywheel, P.T., postage and packing.

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THREE BEARING CRANKSHAFT ALL BALLRACES

Now is the time with the long dark evenings before you to plan that next season's model that is going to carry all before it! Whether it is to be a rakish boat, a multi R/C plane, or just a sports model for fun on the local field or water, its power unit will be the deciding factor in your future pleasure with it. Be wise, decide on a TAPLIN TWIN, lots of other people have to their abiding joy; we are confident you will find it a particularly willing worker, with good looks, trouble-free operation and a host of other points to recommend it.

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Order safely by post since we guarantee satisfaction or money back. We will send yours anywhere in the world securely packed and insured, or just round the corner. You will find new enjoyment in your modelling with a TAPLIN TWIN—try one and see.

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Built exactly like a full-size job with ⅛ in. thick leather insert capable of up to 30° deflection; connectors threaded 4 B.A. to take prop shaft and ¼ B.S.F. to engine. Suitable all engines 1½ to 10 c.c. Heavily plated metal parts, dia. 1 in. Price 7/6.

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STAINLESS STEEL TAPLIN WATERSCREW Taplin Silencer: Taplin Tank: Taplin Universal Joint.

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GLOW-MOTOR POWERED . . READY-TO-FLY!

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Completely new—a spectacular MAN-SIZED ready-to-fly plane, perfectly scaled, with powerful 2.5 c.c. engine. BIG in any flying circle—the largest plastic ready-to-fly model ever produced. Price £16/8/5

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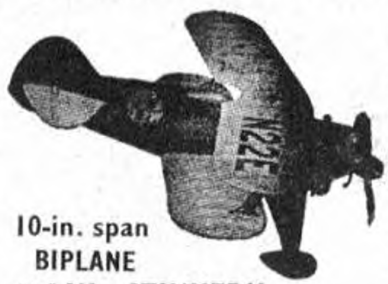
(not illustrated.) Superb, prefabricated kit.

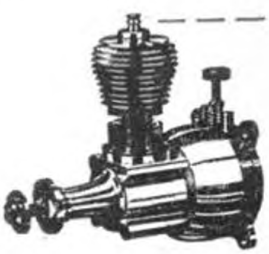
11-in. span F-100 SUPER SABRE

Sleek scale model of the first plane to break the sound barrier. Official U.S.A.F. markings. Price £4/7/0



10-in. span BIPLANE "LI'L STINKER"

World's smallest engine-powered biplane, but a tough stunt flyer. Price £5/6/2



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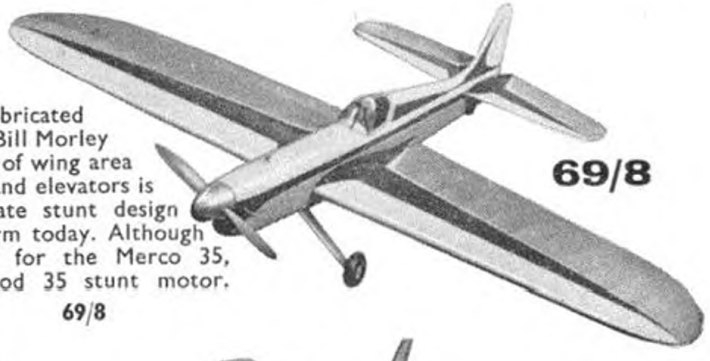

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69/8

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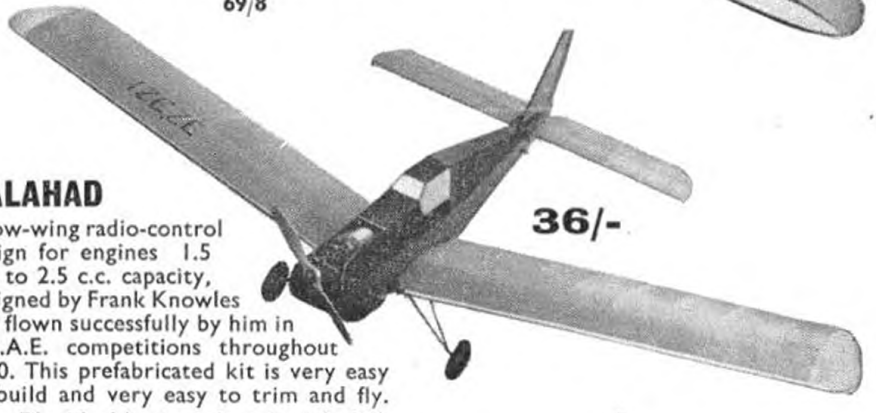

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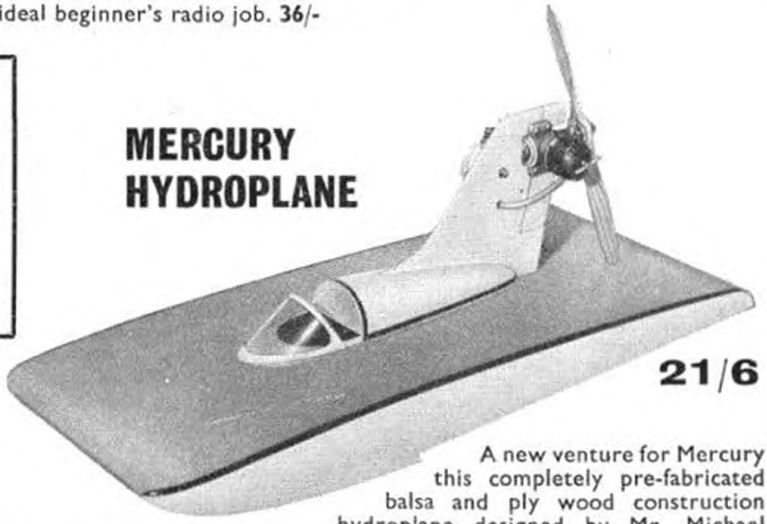
A low-wing radio-control design for engines 1.5 c.c. to 2.5 c.c. capacity, designed by Frank Knowles and flown successfully by him in S.M.A.E. competitions throughout 1960. This prefabricated kit is very easy to build and very easy to trim and fly. The ideal beginner's radio job. **36/-**

36/-

We are pleased to announce that the Super Tigre Jubilee 2.5 c.c. diesel and glow plug motors are now being imported by us and you should ask to see one at your local Mercury stockist. These motors are renowned for their high power output and ease of handling. **Price £5 . 18 . 1**

A.M. 10

This popular 1 c.c. diesel is one of the recommended engines for the Mercury Hydroplane. Already established as the best engine in its class it's ideal for beginner or expert and offers supremely good value at **56/8**



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21/6

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Pristine white, with dark blue letters make a good modelling scheme for Tiger Moth enthusiasts. Oxford Flying Club's G-AMEY at Kidlington airport

AERO MODELLER

Editorial Director D. J. Laidlaw-Dickson

Advertisement Director C. S. Rushbrooke

Editor
R. G. MOULTON

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TELEPHONE: WATFORD 32351 (Monday-Friday)

VOLUME XXVI
No. 302 MARCH 1961

CONTENTS

ON THE COVER

The London Transport (C.R.S.) Sports Association Tiger Moth poses for AEROMODELLER'S camera over Fairoaks. For photographic enthusiasts, we might mention that conditions were bad enough to call for 1/60th at f2.8 exposure on Western 400 rated film!

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the MODEL AERONAUTICAL PRESS LIMITED

Publishers of the monthly
MODEL MAKER
RADIO CONTROL MODELS AND ELECTRONICS

SUBSCRIPTION RATES (Inland) 28/6, (Overseas) 27/6 per annum prepaid including the special Christmas number.

Out of the postbag

IT HAS BEEN one of *those* months. Acrimonious correspondence on all sorts of subjects has not made it any easier. It makes one wonder if the Christmas pudding soured a few tempers when the daily postbag brought a fresh selection of bleats with each delivery. Not that we were the target in all cases. Everyone was having a go at everybody this January, and the go-between negotiations we were conducting merited an "Aunt Agatha" column,—if only we had room.

Aside from the vented feelings on the trade, the model movement, insurances, split-the-club groups, formula changers and non-co-operative town Councils, the letters which were particularly well received were those which help to keep your Editor and staff on their toes.

"You complain of bad die-cutting in kits" says Ian Bradley of Oakham, "but both my January and February copies contained pages still joined along one edge". We also managed to get a section bound in upside down for Ian's dubious benefit. He also pleads for use of most powerful fuels to obtain highest possible figures in our Engine Analyses. That is not our policy. We aim to use standard fuels, with such additives in some cases as would be employed by the *average* modeller, this way all tests are comparative and results in keeping with general useage. The expert can still extend most power outputs with exotic fuels; but we are not so much concerned with that aspect as with what *You* can expect to extract from the engine.

"What hapend (Sic) with the Aeromodellers?" says a pretty card from Mexico: but without an address who can do anything? "What will be the end of an Aeromodeller?" says a long letter from a Nigerian who wants to establish the hobby as an activity in schools. We'd like to put him in touch with experienced fliers in those parts if they would care to send letters for forwarding. "What are the maximum stresses in the connecting rod and crankshaft of a 2.5 c.c. diesel *e.g.* A.M.25 and what is the approximate maximum temperature in the combustion chamber in a diesel?" asks F. Cavins at St. Boswells, Roxburghshire. "Very high, very hot" was the answer one manufacturer volunteered. "Why not spell nitro-benzene correctly, with an "e" not an "i" says another 'con-line fiend' as he calls himself, from Sheffield. Fair enough—we *do* know how: but February issue displayed no less than three variations! Omission of the word "internal" in our January reference to the last B.E.A. Dakota flight brought corrections. B.E.A. have 22 "Daks" on strength, used for freight and Island services

just to put that record straight for the purists.

"Your scale drawings look rushed, lack detail" says a critic. We'd like him to meet our accuracy-devoted contributors who slave themselves for hundreds of hours to constantly improve the scale plans series. George Cox looked at neither photo nor drawing when he produced the wonderfully accurate D.H. Tiger Moth drawing in this issue. Instead, he took rule and pencil to Fairoaks, spent day after day measuring and sketching from life. The result speaks for itself, as "Tiger" fans will readily respect. Fortunately for our ego, the unsolicited testimonials for our scale and other plans outweigh those from critics. "Truly superb and unmatched" was the expression used by a much respected American aviation historian in a letter from the same day's post.

All of which may sound as though we dislike correspondence which criticises. On the contrary, keep it flowing; but please *oh* please would some letter writers stop to think before putting pen to paper. Is the complaint justified? Are you going to ask the impossible? Do you really think we have the time to seek your information and provide the lengthy answer? Can you expect *so* much for nothing—not even a reply paid envelope? Is the remedy not entirely in your own hands? We would be obliged if these considerations were given to the subject, especially if it deals with matters outside AEROMODELLER editorial content.

Contest Issue

As the next four pages, and the two Plans Service designs in this issue emphasise, this is a Contest Issue, aimed at stimulating interest for the coming season. The comments on what to do with the Rubber models by one of this country's leading exponents of the class will also play its part in stimulation: but possibly more in the direction of letter writing than in the way of construction!

What may come as a surprise to many devoted power modellers is Tom Smith's approach to wing sections, especially when it is known that he is Chief Design Aerodynamicist for English Electric at Warton, whence comes the fastest and most advanced fighter aircraft in service with the Royal Air Force. The suggestion that tail and wing tip ribs should be sanded from rectangles within the outline of the structure prompted us to ask Tom his views. "Its the *final* airfoil that matters *i.e.* the structure, covering, finish etc.," says Tom. "At the scale we work in, trips, turbulators and pin holes make as much difference as any subtleties in airfoil geometry." How true it is that so many make so much fuss about airfoil selection, then fail to make the wing adopt the chosen section! The prevalence of all-sheet covered wings at last year's World Power Championships is an indication that some leading fliers are taking up the matter of airfoil adherance seriously.

Calling indoor enthusiasts!

Arrangements have been negotiated for the further use of the huge airship shed at R.A.F. Cardington during the coming season, most important being the staging of the first World Championships for Indoor Models. This will take place during the August Bank Holiday period August 5th-7th., and more information will be published later regarding this special meeting.

Other dates booked are:—

April 15th-16th. June 10th-11th. July 15th-16th. September 9th-10th.

At *all* these meetings it will be necessary for would-be attenders to send in their names to the S.M.A.E. in order that a nominal roll can be placed with the police control at the Station. No name on the list—no admittance!

Pete Sotich is elected the new A.M.A. President. Pete was team manager for the U.S. team at Cranfield last year, and played a big part at the last triple World Champs. held at Finthen in 1955. He succeeds Dr. Walter Good, who has done much to stabilise rules for International events, and who will now take a well earned rest (we hope) from administration to enjoy more pioneering in radio control. Modellers everywhere will wish to congratulate the new President who is a devoted modeller of considerable experience and comes from Chicago

Lighter than air

An airship museum is to be established at R.A.F. Cardington in order to perpetuate the association of this Station with lighter-than-air craft since 1920. AEROMODELLER readers who can assist with the loan or presentation of models, photographs, items of equipment etc., are asked to contact Sqn. Ldr. J. Blake in the interests of completing this laudable project.

Federation Assistance

It is truly said that the average aeromodeller is very insular in his approach to the hobby, and has little idea of where the money comes from to further his interests both nationally and Internationally. Participation in the annual World Championship events for model aircraft often requires considerable finance to achieve, and the S.M.A.E. cannot send teams abroad on its finances.

Contributions are, therefore, always welcomed, and to the forefront in such assistance has always been the Federation of Model Aeronautical Manufacturers and Wholesalers. A special appeal went out last year to its members, and the following firms donated the sum of £262 10s. 6d. between them, quite a number of donations being from non-members and retailers, as below.

Airfix (Wholesalers) Ltd.
Apex Craft, Leicester
Celestor Manufacturing Co.
Contest Kits Ltd.
Davies-Charlton Ltd.
Walter Day
H. Fitzpatrick Ltd.
A. A. Hales Ltd.
Heset Model Supplies
Hobbies Model Supplies
Hobby Stores (Southend)
Humber Oil Co. Ltd.
International Model Aircraft
E. Keil and Co. Ltd.
Lakeland Handicraft Studio
Luton Model Supplies
Model Aerodrome Ltd.
Model Aeronautical Press
Model Aircraft (Bournemouth) Ltd.
Model Shop, Gorton
Bud Morgan
Henry J. Nicholls Ltd.
Nobles, Deptford
Percival Marshall Ltd.
Performance Kits
Plantation Wood (Lancing)
Ripmax Marine Accessories Ltd.
A. E. Rivers (Sales) Ltd.
Warriners, York
John Webber (Sports) Ltd.

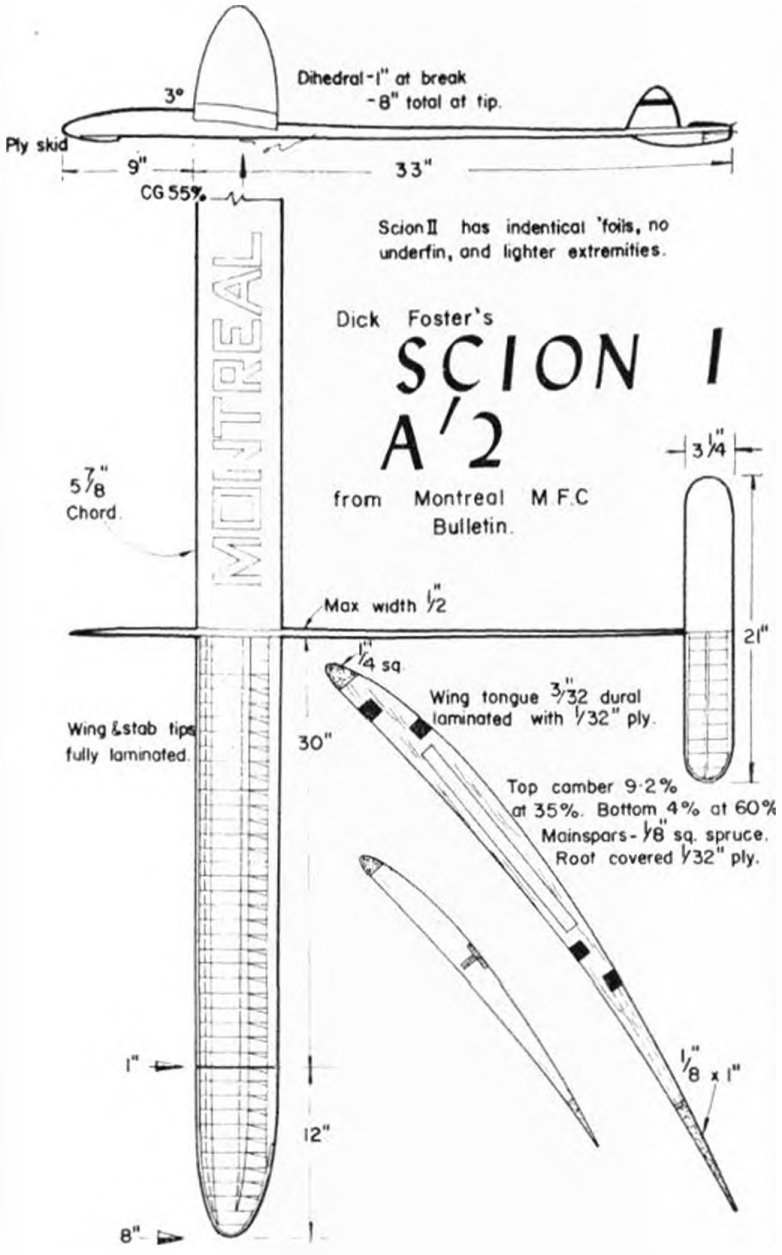
We remind clubs and rally organisers that the special posters prepared by the Federation for their use are still available from the Secretary at 156 Marine Parade, Leigh on Sea, Essex.

Contest designs

THE CONTEST SEASON for 1961 opened with two fine January rallies in the North West and will soon be in full swing as the S.M.A.E. programme starts. Dates have been released and are announced below. As a form of inspiration for those who have yet to get cracking with their building programme, this feature offers some of the top line designs of 1960 which have appeared in recent news bulletins issued by clubs and foreign magazines. We hope to continue the feature next month with more design details, including rubber models, of which there seems to be a dearth of fresh thought and information, (except of course J. O'Donnell's views on P.152).

Control-line stunt fans will find plenty to study on pages 148/9 of this issue by looking through that well known American Stunt Champion's camera lens at the star models seen at the 1960 U.S. Nationals.

This coming year will be a truly great one in the history of International competition flying. Location of the World Championships in Germany has yet to be announced but from preliminary reports we gather that a private airfield, complete with adjacent castle may be used, and this in the south, not far from Lake Constance. The Indoor Championships are settled for Cardington, by permission of the Commanding Officer of this Royal Air Force Station who is generously giving full co-operation. Then there will be the International R/C meeting in Sweden during August, Control-line in Belgium (thanks, as ever, to the dedicated promotion of this branch of the hobby by the F.P.A.B.). Free-flight events in Finland, Austria, Holland and Yugoslavia complete a full programme. Looking for inspiration in the shape of a new A/2?—and what better than Carlo Varetto's *Roplano* on P.150, or Dick Foster's *Scion* which we specially select from the *Montreal M.F.C. Bulletin* as number one in this round up of Contest Designs.



1961 SMAE Contest programme

March 5th — *Decentralised*
- Gamage Cup (U/R Rubber)
- Pilcher Cup (U/R Glider)
- White Cup (U/R Power)

March 19th — *Area*
- *KMAA Cup (F.A.I. Glider Eliminator)
- Gutteridge Trophy (F.A.I. Rubber Eliminator)

March 26th — *Centralised*
- C.L. Speed

April 9th — *Area*
- *Astral Trophy (F.A.I. Power Eliminator)
- S.M.A.E. Cup (F.A.I. Glider Eliminator)
- Women's Cup (U/R Rubber Glider)
- Jetex Trophy (Jetex)

April 22nd—23rd — *Centralised*
- R/C and C.L. Trials

April 30th — *Area*
- *Weston Cup (F.A.I. Rubber Eliminator)
- Halfax Trophy (F.A.I. Power Eliminator)

May 6th—7th — *R.A.F. Debden*
- R.A.F.M.A.A. Championships

May 21st—22nd

BRITISH NATIONAL CHAMPIONSHIPS — *R.A.F. Waterbeach*
- Thurston Cup (U/R Glider)
- S.M.A.E. Cup (Radio Control F.A.I. Multi)
- Lady Shelley Cup (Tailless)
- Knokke Trophy (Control Line Scale)
- Gold Trophy (Control Line Aerobatics)
- Davies A Trophy (Class A (F.A.I.) Team Racing)
- Combat (Preliminary Heats)
- Speed

May 22nd
- Sir John Shelley Cup (U/R Power)
- Model Aircraft Trophy (U/R Rubber)
- Short Cup PAA-Load 2.5 c.c.
- Super Scale Trophy (Free Flight Scale)
- S.M.A.E. Cup (Radio Control F.A.I. Multi)
- Team Racing (Class A)
- Davies B Trophy Class B Team Racing
- Combat (Final Rounds)
- Speed

June 18th — *Area*
- *Model Engineer Cup (U/R Team Glider)
- Flight Cup (U/R Rubber)

June 24th—25th — *Centralised*
- FREE FLIGHT TRIALS (F.A.I. Rubber/Glider/Power)

July 9th — *Centralised*
- C.L. Speed

July 15th—16th — *Centralised*
- FREE FLIGHT TRIALS F.A.I. Rubber/Glider/Power

To be fixed

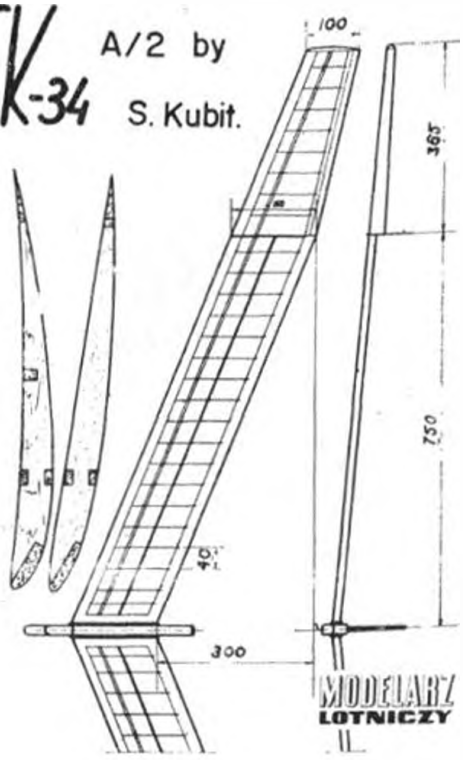
SCOTTISH GALA
- KLM Trophy (U/R Power)
- CMA Trophy (U/R Rubber)
- Glider U/R Glider
- Taplin Trophy (Radio Control Rudder)
- Team Racing (Classes A and B)

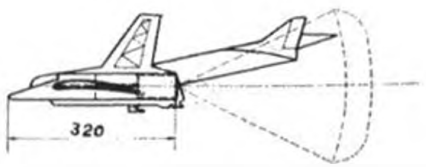
August 7th

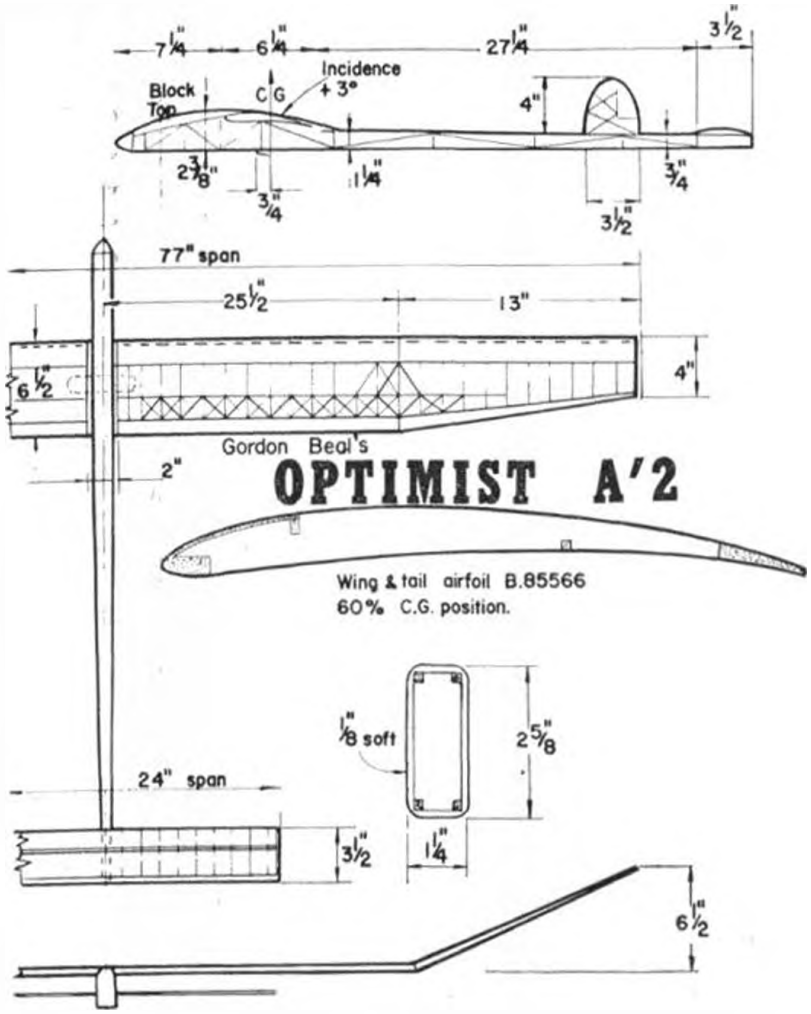
INDOOR WORLD CHAMPIONSHIPS — R.A.F. Cardington

August 14th
- Speed

SK-34 A/2 by S. Kubit.







Trying Tailless this season? Polish F.A.I. size model above has a good record and offers useful inspiration. For those who stick by traditional British lines, Gordon and Lou Beal's "Optimist" has an impressive record as a rough weather model, won the Woodford Rally and consistently high in Northern Area events. Adjustable towhook is advised. Wing bracing should be Warren girder, not criss-cross. Bert Spurr's "Ripthor" for F.A.I. and Open has topped the Northern Area many times and has become a popular design, with the creditable honour of winning the Astral Trophy in 1960 which as many will remember was a real bad weather contest. Both designs from the *Northern Area News* sheet

September 3rd
NORTHERN GALA
Glider (U/R Glider)
Hamley Trophy (U/R Power)
Caton Trophy (U/R Rubber)
Ripmax Trophy
(Radio Control Rudder)
Team Racing
Classes ½A, A and B)

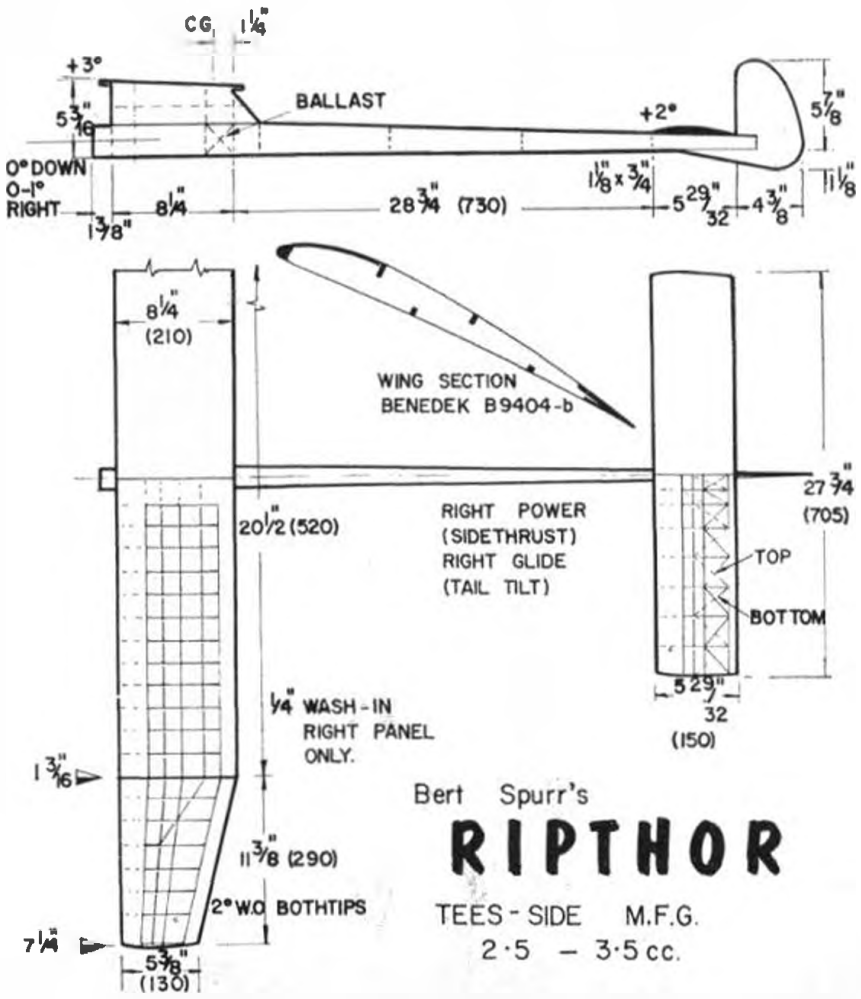
September 24th
*Keil Trophy (U/R Team Power)
Frog Junior Trophy (U/R Rubber Glider)
Speed
} *Area Centralised*

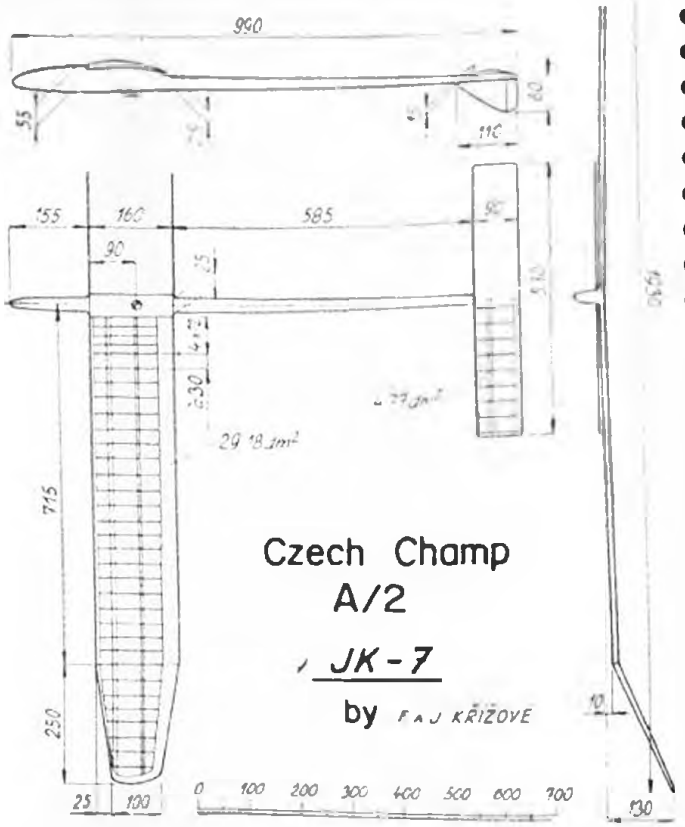
October 8th
½A Power
*Farrow Shield (U/R Team Rubber)
Team Racing
Classes ½A, A and B)
} *Area*

October 15th
Area Championships

October 22nd
Frog Senior Cup (U/R Power)
CMA Cup (U/R Glider)
} *Decentralised*

**Plugge Trophy events*





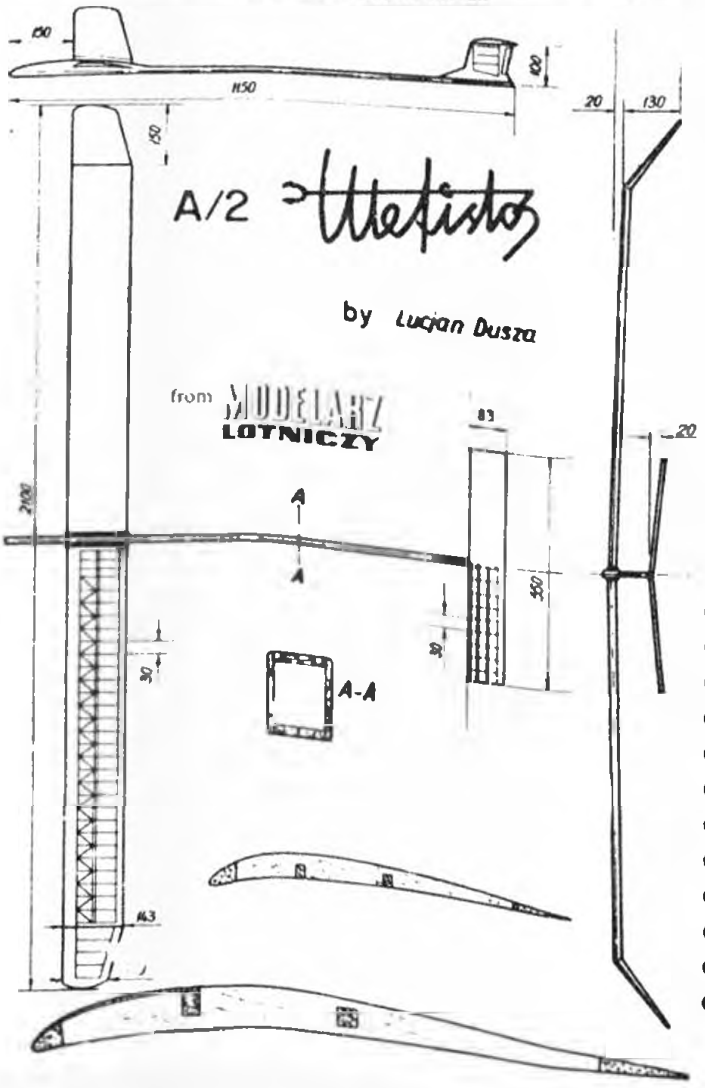
Czech Champ A/2

JK-7

by F.A.J. KŘIŽOVE

from LETECKÝ MODELÁŘ

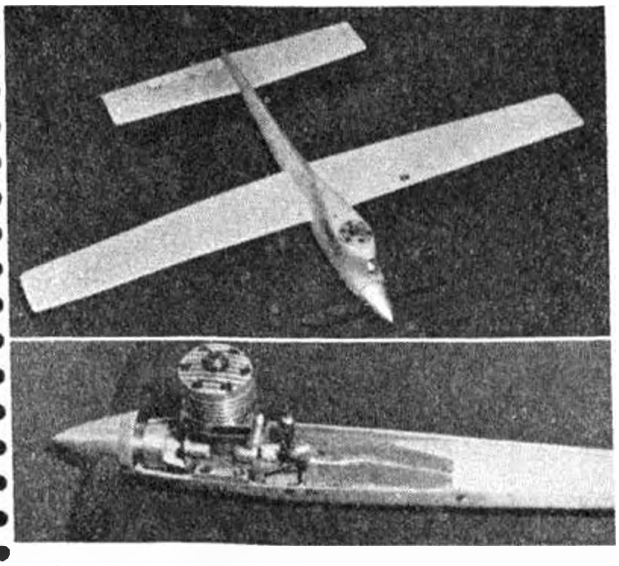
Two leading Continental A/2 designs of contrasting approach; providing a refreshing "new look" in tail layout. Complete sub-fin on the Czech Champ, seems vulnerable. The Polish "Mefistos" calls for strong fin structure to support the tail



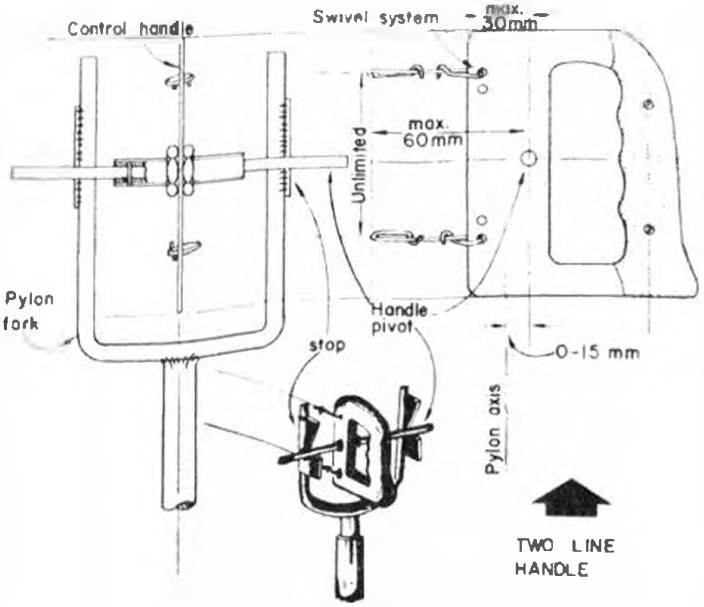
A/2 Mefistos

by Lucjan Dusza

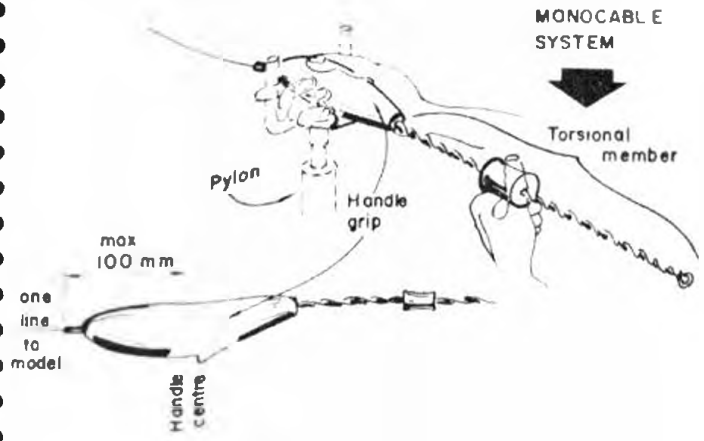
from MODELARZ LOTNICZY

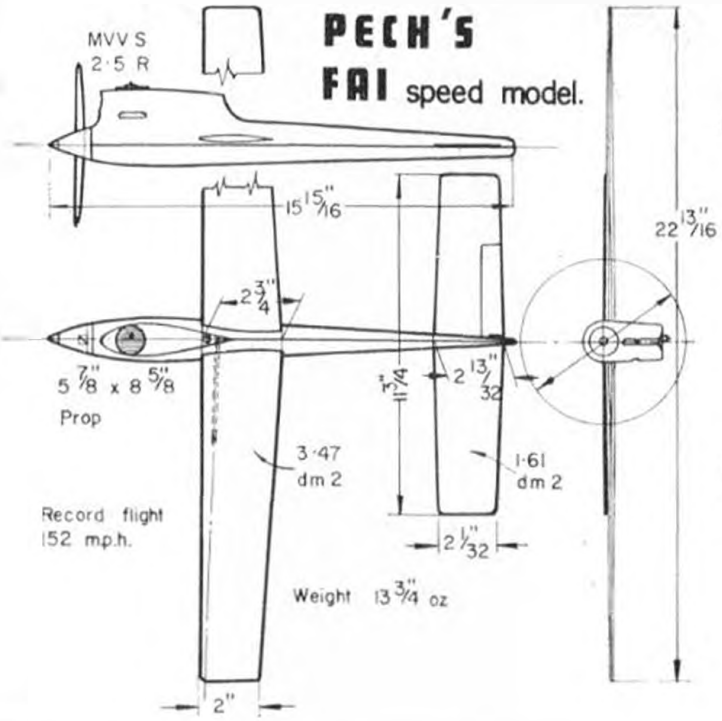


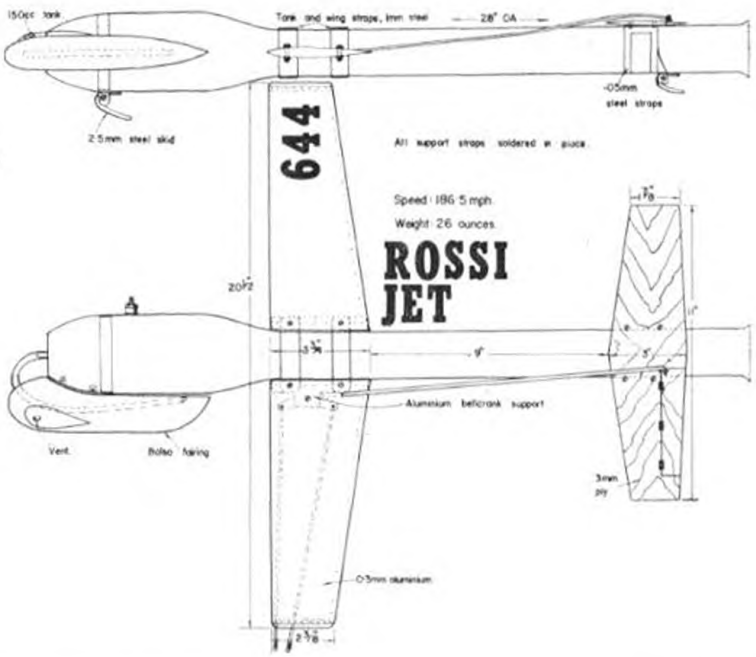
For Control-line enthusiasts, details of Pech's 2.5 F.A.I. record holder (152 m.p.h.) in drawing at right and photographs above. Tank is chicken-hopper feed, engine an M.V.V.S. 2.5R, and home constructed Monoline type control unit fitted with single 0.3 m.m. line connection internal at hole seen in left wing. At far right is the Rossi jet model which broke Ivannikov's World record but not by sufficient margin. Below are the official drawings of the F.A.I. control line handles for speed championships in 1962 and which may be tried at the September Criterium of Aces in Brussels. The Hungarian proposed handles have been successfully tested and have assured experienced fliers of their anti-whip capabilities

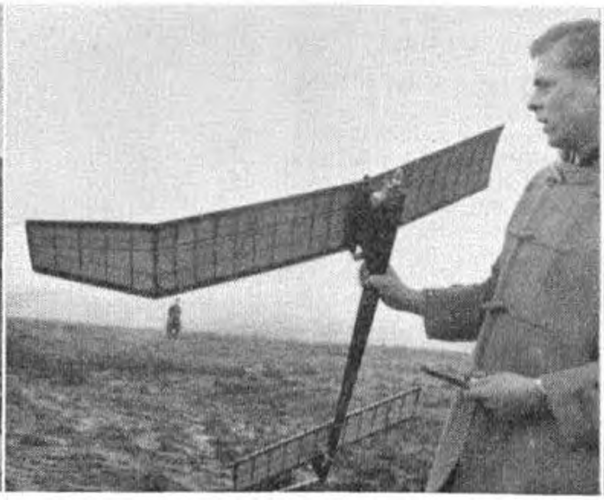


FOR RECORDS AND SPEED CONTESTS









FIRST MAJOR EVENT OF THE YEAR

EAST LANCS. M.A.C. WINTER RALLY

WALTON SPIRE, NEW NELSON, LANCS *Sunday, 15th January,* **1961**
Reported by Ron Firth

THIS RALLY, held on the moors near to Walton Spire, three miles south-east of Nelson, attracted some 150 - 200 modellers from all over the country and the weather conditions were near ideal. Almost all day there were clear blue skies and the wind strength made three-minute flights not too difficult a task over the moorland. The farthest travelled contestants did not return home empty-handed, for A. Wisher (Croydon) won Rubber with Jack North (Croydon) second; P. Manville (Bournemouth) won Power and Tony Young (St. Albans) won Chuck Glider. The local modellers had the Glider event all buttoned-up and J. O'Donnell made three nice flights to win with 8 : 41. The Radio Control competitors enjoyed themselves in an adjoining field and the combat men fought it out in a roped-off area on the hillside.

Rubber

1.	A. Wisher (Croydon) ...	3:00	3:00	3:00	= 9:00 +	3:10
2.	J. North (Croydon) ...	2:10	3:00	2:10	=	7:20
3.	J. O'Donnell (Whitefield) ...	1:56	2:11	3:00	=	7:17

Power

1.	P. Manville (Bournemouth)	3:00	3:00	3:00	= 9:00
2.	—. Garnett (East Lancs) ...	3:00	3:00	1:43	= 7:43
2.	J. Shaw (Oldham)	3:00	1:48	2:55	= 7:43
4.	J. D. Bailey (Whitefield) ...	3:00	1:51	1:46	= 6:37

Glider

1.	J. O'Donnell (Whitefield) ...	2:59	3:00	2:42	= 8:41
2.	J. Chadwich (Ashton) ...	2:09	3:00	3:00	= 8.09
3.	P. Verity (East Lancs) ...	3:00	3:00	1:06	= 7:06

Radio 1. Whittaker (Cheadle); 2. Donahue (Kersal)

Chuck Glider

1.	A. Young (St. Albans) ...	3:25
2.	D. Yates (Wigan	1:42·5

Above: left to right: A. Wisher, up from Croydon to win Rubber with a perfect score by his 300 sq.in. geared model. Peter Manville of Bournemouth, now at Leeds University flies with Baildon club. Made perfect score to win power with Oliver Tiger "Fallacy-2." John O'Donnell topped glider using his "Benzedrine" which has clockwork d/t and fluorescent wing tips

Below, Ramrod 600 with an ETA 19 weighs 20 ounces, and placed 4th in power for J. D. Bailey of Whitefield

AERO MODELLER

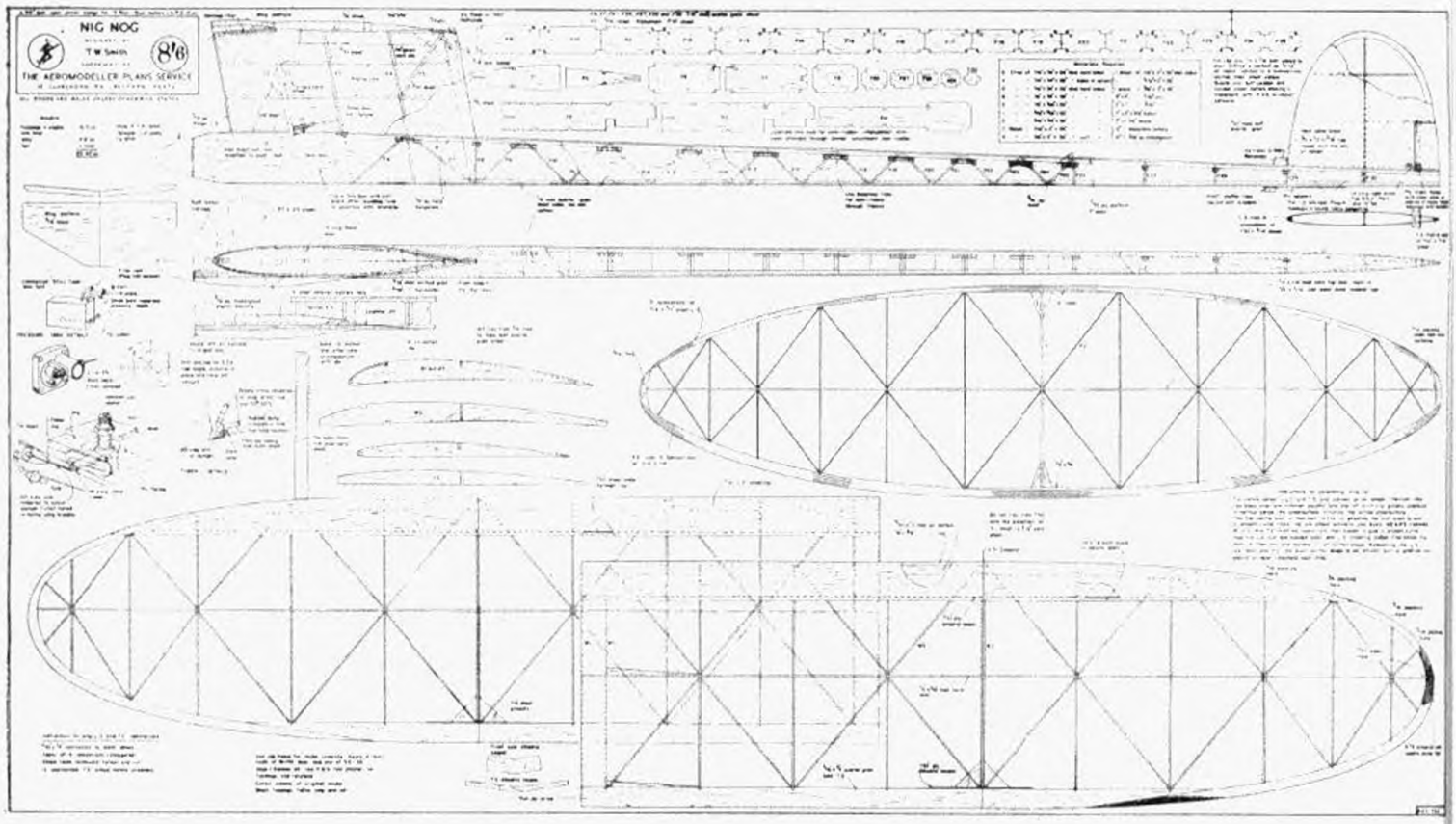
NIG NOG

Britain's fastest climbing open power model, the 1960 record holder and winner of Shelley, Hamley and Frog Senior Trophies, designed by

TOM SMITH

THE BASIC LAYOUT of this design was settled in early 1957 after a great deal of deliberation. Tom Smith's previous layouts typified by "*Fried Fritter*" (winner Hamley, 1953 and Shelley, 1954, A.P.S. Plan PET 563)

FULL SIZE COPIES OF THIS 1/8th SCALE REPRODUCTION ARE AVAILABLE AS PLAN PET 781, PRICE 8/6d. PLUS 6d. POST FROM PLANS SERVICE.



were designed to give a good climb with the power units then available, by getting the weight down to low values.

The normal follow-on to "F.F." was "*Oliver Twister*", designed to the current F.A.I. rules, using one of the first aircraft Oliver Tigers, and this won the Frog Senior in 1954 and the Shelley, 1956. It was in one of these models that Tom first used a 5 c.c. glow engine (Dooling 29) and came up against a fundamental snag. This took a deal of thinking and flying to resolve, but he believes the reason deduced explains why many models currently flying are unable to handle really high power. The reason is worth talking about at length some other time, but the measures taken in the present model appear to have been successful.

With this in mind, plus the need to obtain a good glide performance the "Nig Nog" layout was drawn. The wing and tail plan form combination were so designed to approximate the desirable lift distribution for minimum induced drag, that is, elliptical overall with the tail load included and not, as is commonly supposed, just the wing alone. The wing was kept out of the slipstream, the tail kept well in it and the main masses concentrated together giving a minimum of nose overhang. The rest just happened, and Tom makes no apologies for the conventional appearance (!)

The original N.N. was based on the old F.A.I. rules, 2·5 c.c. max. area and three were built with 485 sq. in. wings. After trying the first at the 1957 Nats., several models were incorporated to improve overall stiffness, mainly by reduction in wing span, and two Tiger powered (440 sq. in.) and one A.M.35 (390 sq. in.) evolved. This latter was so consistent that Tom decided to scale up to 550 sq. in. wing for a Dooling 29. The performance exceeded all expectations, but engine troubles dogged attempts in competition. These prevented its use in the 1958 Nats. and the Oliver models finished up 2nd, with one demolished in a good heaty prang, and the reserve having trouble in the fly-off. Tom eventually traced the probable cause to the vertical snuffer tube then used; the variance of fuse length causing trim changes! ! Far-fetched maybe, but horizontal snuffers (as shown) are now used.

The Dooling fuselage was "bent" at the 1958 Area Champs. (engine trouble again, so a new, stiffer, fuselage was built to accommodate the ETA 29. First try was at the 1959 Nats., where Tom just hadn't learnt how to handle the thing! ! Amends were made at the South Midland Gala that year with 7 : 44 fly-off for first place. All that remained was to improve the consistency of the power, and after some thought and testing, pressure system was incorporated. After trimming in preparation for the 1960 Nats., the model and engine needed little or no alteration through the season and flew as "on rails" *all* the time.

Building Notes

Since this model is strictly for the experienced, there is little point in detailed building instructions. Comments will therefore be confined to any unusual methods or features. There should, however, be a consideration for good wood selection. Use straight grain material throughout and when in doubt, use quarter grain stock. Accuracy in building is essential.

Wings. The method used on the original for building the tip was devised to avoid plotting tip ribs. Since Tom is not a great believer in the merits or otherwise of particular wing sections, the only thing in mind at the time was a decent tip structure faired into the main wing. Thus, Tom merely cut down the standard straight ribs at LE and TE (using the centre spar line as the datum) and placed them in the already assembled tip outline, packed up as on the drawing. The centre spar slots were then trimmed to allow the spar to bend in a smooth curve to the tip. The front spar was dealt with in a similar fashion after the cross ribs (also cut down from standard) had been cemented in place. The undersurface was then a natural continuation of the basic. The excess material could be trimmed off and sanded to allow the LE sheet to be attached and the whole tip assembly faired off with a large sanding block when dry. Care should obviously be taken to ensure that the two tips are as near the same as possible.

Tail. Here again, there is no necessity to cut out individual ribs. Strips of quarter grain stock cut to the max. rib depth are cut in sufficient quantity. Having assembled the outline, lengths are cut for the straight ribs and the spar slots cut. These ribs are then cemented in place and allowed to dry. Using some care, the slots are adjusted until the spar forms a natural curve from tip to tip. The cross pieces are then cut and cemented in place. When dry, the excess material is trimmed away, and the whole assembly sanded with a large block to a smooth shape using the spar, LE and TE as guides.

Covering. Wing and tail on the original were covered with Jap tissue. The structure was pre-doped using thick dope on the rib edges overall and the tissue attached using thinners brushed through. Double covering can be used with advantage on the inner panels. This is better done after the initial doping, using thinners again as the adhesive.

Two thin coats of dope on the wing, and one on the tail after water spray were followed by a thinned coat of 50/50 dope and banana oil with a little castor oil added. When dry, the wing centre section and the whole tailplane were fuel proofed, again thin to avoid excess weight.

It is better to deal with each wing panel separately in the later stages, pinning down to avoid warps.

Tom's own procedure, after the solvent smell has died away is to steam thoroughly, and allow to age, pinned to a board for two days at least, dealing with one panel at a time. This relieves the whole from any built-in strains and avoids warps creeping in.

Fuselage. The basis of the fuselage assembly is around the two sides complete with longerons and reinforcing front sheet. The bearers are bonded to the port side using *Aerolite* (hardener on to the bearers please note) and the formers then placed on this same side. The tank should then be bonded in place using *Araldite* and the whole tank bay filled with *soft* block since this part of the model gets the most handling. The starboard side can then be added, using the bottom sheet as a temporary guide. The neoprene tubes for the auto-rudder are cemented in place, and the wire run through (looped at each end temporarily). The top and bottom sheets are then attached and the whole pinned down conveniently to dry.

The timer box and auto-rudder mechanism should be installed after the pylon structure is built, but obviously before the sheeting. This is best done by butt joining $\frac{1}{16}$ in. quarter grain sheet to the right size, sanded smooth *before* assembly. To avoid poor joints and local warping, this sheet is attached using P.V.A. white glue.

After adding the fairing blocks, etc., shaping and addition of the cut-out valve (bonded with Araldite) the whole front portion of the model benefits by a liberal soaking of fuel proofer.

The original was covered with black Jap' tissue, doped and fuel-proofed, using two coats of the latter overall and four around the engine region.

Fin. This needs little explanation, save that the sheeting should be butt-joined and sanded prior to assembly, which is done using P.V.A. white glue, to avoid warping. After sanding to shape, the fin is cemented to the fuselage, of taking care to line up with the pylon. The auto-rudder

NIG-NOG *(continued)*

can be offered up as a whole, the top and bottom hinge ply plates fitting into the fin and fuselage respectively. Cover, dope and fuel proof.

Engine Pressurisation

The method used is to be recommended, because it requires no extra fiddling on the field. The only thing that can be forgotten is the vent plug. Even this can NOT be forgotten easily, since the engine just won't run after the intial prime without it.

Take off the engine back plate. Remove the disc (note left hand thread to attachment). Drill a small hole (about $\frac{1}{16}$ in.) on the line bisecting the inlet port, so that it emerges in the centre of the rear recess. This allows pressurised air from the crankcase to bear on the tank when the disc clears the hole. A convenient length and size of brass tube may be bonded with Araldite over this hole to form a nipple for a small bore neoprene connection to the tank.

This connection should enter at the top front of the tank to ensure that it enters the airspace. No restrictor has been found necessary. Since the ETA 29 will start quite easily on an exhaust port prime alone, no choking is necessary.

Trimming

Provided the C.G. and settings are as shown on the plan, all that should be necessary before glide testing is to set the auto-rudder glide position about 30 degrees to starboard and leave it. The glide should then roughly be assessed by hand launch, using small amounts of tail tilt and wing incidence packing to obtain a wide right hand circle. If any packing becomes excessive, check the C.G. and the settings.

Assuming the engine has been checked and found O.K., find a thick, grassy, soft field. If you can't find this, Tom recommends you take up gliders. Obtain a 4-5 sec. run consistently, otherwise go home. Adjust the auto-rudder to the central position for power, fit a very short (but not too short) fuse, start up, full bore, point upwards at about 75-80 degrees and launch for 4-sec. run.

This is nerve wracking, but it's the only way, low power is useless. With the settings as per plan, the departure from a straight line can only be slight, so that the engine will cut whilst still going up.

Having got the worst over, the aim is now to obtain a slow turn to the right, with the roll giving a spiral, in an almost vertical climb. The roll is of course, built-in,

ETA 29 screaming at peak revs, timer cocked, Tom Smith sets D/T before near vertical launch

so trimming is merely (Oh *so* casual!) a question of adjusting the turn using the auto-rudder power setting to prevent the roll getting out of phase (*i.e.*, the model appearing to go left). Gradually build up to a full length run.

If at any stage the model appears to be going over the top, *i.e.*, nosing down in the climb, to flatten out, etc., check the settings. If nothing is apparently wrong, then the C.G. should be moved forward $\frac{1}{8}$ in. at a time and the tail TE packed up to trim the glide again, until the tendency disappears.

The rest is a question of refinement, using small veneer packing for tailplane, wing, and use of auto-rudder settings to obtain the best climb and glide.

The auto-rudder does not make this easy, but it does make the procedure *easier*.—and now you know how it's done!

13th NEW ZEALAND NATIONALS *(continued from page 141)*

Aerobatics *(continued)*

Many good potential flyers were therefore eliminated.

1st	R. Goding ...	Christchurch ...	312 points
2nd	M. Kendrick ...	Auckland ...	309 ,,
3rd	B. Deakin ...	Palmerston North	267 ,,

CLASS B TEAM RACING on the last day of the Nationals was the final event for 1960-61. Quite a few good models were eliminated by having blown plugs, claimed by some as being due to the extremely hot weather that prevailed at the time. During the final a lap counter was found to be faulty and the whole event had to be re-run.

The results of this years Nationals were undoubtedly affected by the sudden change of weather at a time of year, a few days after the New Zealand Mid-Summer day, which is most unusual.

1st	B. Roberts ...	Tamaki ...	9:51·1
2nd	R. Johnson...	Palmerston North	10:37·0
3rd	P. Staples ...	Wanganui ...	10:55·0

OTHER RESULTS

Radio Control, Single Channel

1st	A. Street ...	New Plymouth ...	63 points
2nd	E. Hartley ...	Palmerston North	48 ,,
3rd	C. Boyd ...	Palmerston North	39 ,,

Radio Control, Multi

1st	E. Hartley ...	Palmerston North	105 points
2nd	B. McElwain ...	Wellington ...	21 ,,
3rd	W. Richardson ...	Palmerston North	15 ,,

Control Line Scale

1st	L. Akroyd (Hawera)	*Piper Commanche*	699 points
2nd	R. Milne (Hastings)	*Bell Airacobra*	665 ,,
3rd	M. Kendrick (Wanganui)	*Loving Love*	—

Free Flight Scale

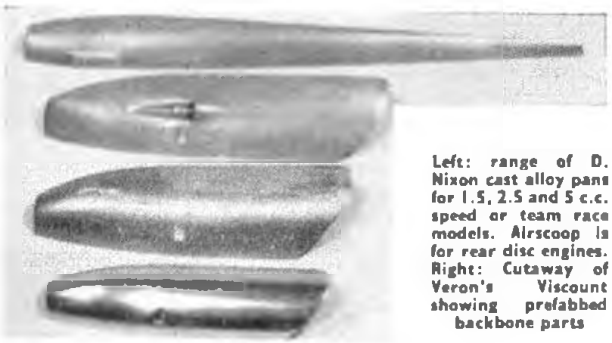
1st	R. Johnson (Palmerston North)	*Luton Minor*	675 points
2nd	L. Akroyd (Hawera)	*Bebe Jodel*	661 ,,
3rd	R. Fleet (Auckland)	*Cessna* 170	631 ,,

Control Line Champions
1st J. Winn (Auckland)
2nd H. Westland (Kaiapoi)

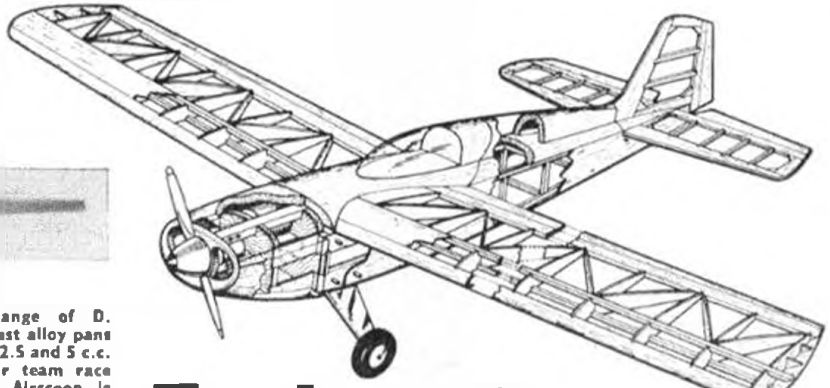
Champion of Champions
1st J. Winn (Auckland)
2nd B. Roberts (Tamaki)

Champion Clubs
1st Auckland (363 points)
2nd Upper Hutt (143 points)

Free Flight Champions
1st J. Malkin (Upper Hutt)
2nd W. Cook (Upper Hutt)



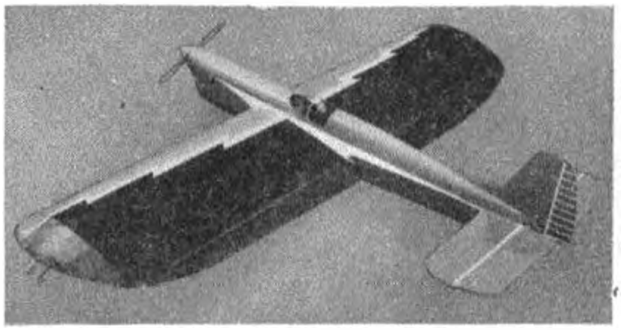
Left: range of D. Nixon cast alloy pans for 1.5, 2.5 and 5 c.c. speed or team race models. Airscoop is for rear disc engines. Right: Cutaway of Veron's Viscount showing prefabbed backbone parts



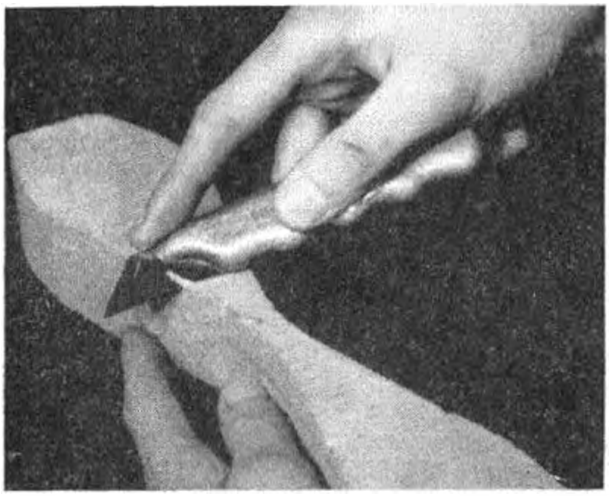
Trade notes

THE 34 tone range of **Humbrol** lead free *Plastic Enamels* which are so popular for plastic model decoration are to be increased to 9d per ½ ounce tin this month, with no increase for the larger sizes. It was interesting to find a superb colour chart for these enamels when we opened the latest Loco kit from **Rosebud** in their *Kitmaster* HO and OO range, the French 241*P Mountain* class. What detail, and how clever are the assemblies of these really outstanding plastic kits, no wonder we learn of a lot of aeromodellers taking them up as a "sideline" to their flying hobby. Another kit from **Veron** is due out any day, and having seen the prototype of Phil Smith's *Viscount*, we can rest assured that there's going to be a battle in the offices for the chance of making the review model. Designed for free flight at 48 in. span for 1·5 c.c. or 54 in. for 2·5 c.c. R/C, the Viscount has extensively pre-fabbed spindle moulded balsa parts. The drawing above shows how the fuselage top and cockpit fairing will be supplied ready shaped. Radio compartment is no less than 10 by 3½ by 3½ ins., airfoil is NACA 2412, area for R/C, 515 sq. ins. and the plan allows for multi development. For those who *have* to carve balsa the new **Multicraft** *Worknife* which retails at 3s. 11d. is a tough, heavy duty tool with a rigidly held and very sharp blade which we found most useful on a prop.

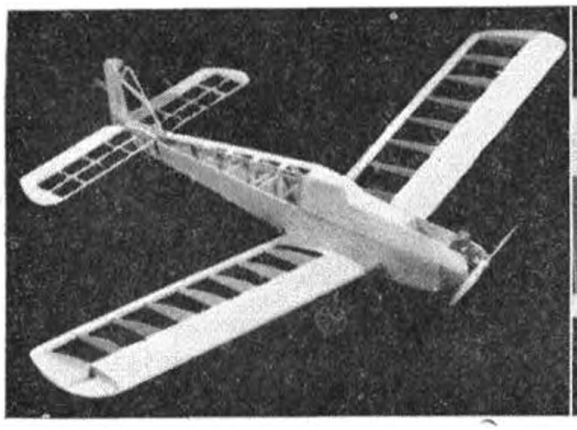
Mercury now have the *Galahad* and *Crusader* kits widely distributed and we fancy that they will each be a familiar shape on any club flying field for years to come. The Galahad undercarriage needs slight modification, perhaps our photo below will help builders. Make the bar which retains the wing bands more inboard than advised, or the bands slip off the fuselage dowels.

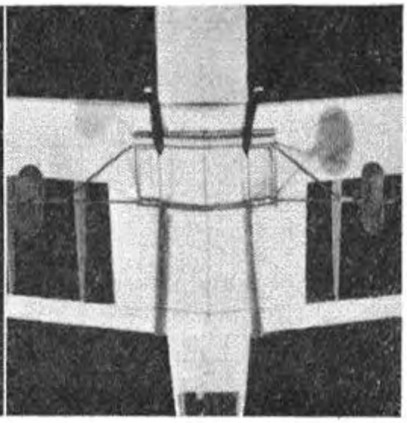


Performance Kits' (from 61 and not 1 Four pounds Ave, Coventry as in January advertisement) Pinnacle stunter now completed with revised cabin and red/white/Lt. blue/Dk. blue scheme weighs 46 ounces



Multicraft's Worknife in action on a prop blank at left, carves well. Below, the Mercury Galahad weighs 27 oz. in this state with Fox 15. Underneath view shows u/c mod. to retain wing bands on dowels. Right: the new 2 oz. Joyplane fluorescent paint just released, red or yellow at 4s.





ALTHOUGH the use of "calibrated" or "known" propellers is a very inaccurate method of power measurement, it is widely used for rough comparison or checks; and, indeed, is used as a standard method by some manufacturers and testers. In fact, we know that Appendix 6 of our *Model Aero Engine Encyclopaedia* is used for the majority of manufacturer B.H.P. claims.

Logically, the method seems correct. If engine A turns a particular propeller faster than engine B, then obviously engine A is more powerful than engine B. Equally, there is a theoretical relationship governing the torque absorption characteristics of a propeller, so on this basis it should be possible to calibrate a particular propeller — and thus a whole series of propellers — by reference to some suitable standard. The method falls down as an *accurate* means of power measurement on various counts, not all of which are fully appreciated.

• Real 'GEN' for the engine testers • – the result of hundreds of tests.

Propeller–torque charts

• Nylon ranges **by R. H. Warring •**

Basically, for a given air-drag load, torque absorbed is proportional to the square of the r.p.m. and the fifth power of the diameter of the propeller, fan or airbrake. For any given size of propeller the relationship can be expressed—

torque absorbed = Cq x (r.p.m.)²

where Cq is a torque coefficient for that particular propeller or air brake.

The use of torque absorbed instead of power absorbed is preferred because torque is the measured figure on test. The corresponding horse-power absorbed is found by—

$$\text{horse-power} = \frac{\text{torque (oz.-in.)} \times \text{r.p.m.}}{1{,}008{,}000}$$

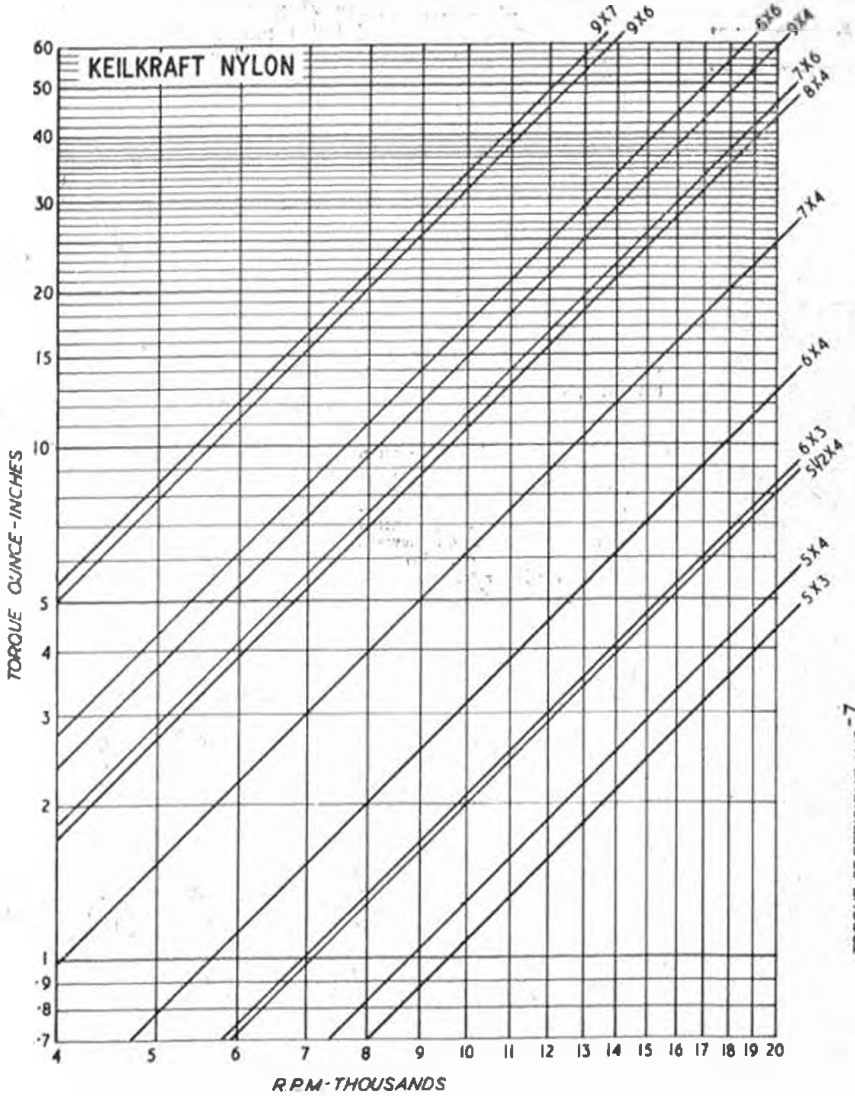
or with sufficient accuracy for most purposes—

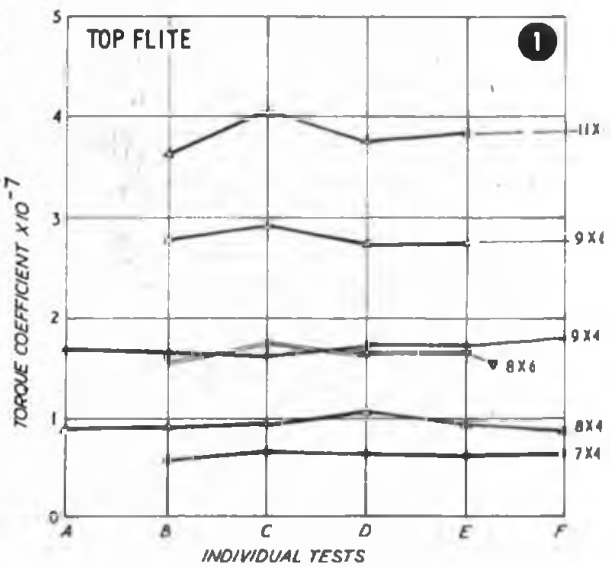
H.P. = torque (oz.-in.) x r.p.m. divided by 1,000,000.

Thus, thinking in terms of power, original errors are *multiplied* by r.p.m. and so exaggerated.

Unfortunately, in practical tests, the torque coefficient is not always constant, particularly for conventional propeller shapes. With some propellers, very good consistency is obtained; with others there are wide deviations for apparently inexplicable reasons. Also the torque coefficient is appreciably modified by the condition of the propeller-type air brake — a nick in the leading edge, a slight change in leading edge radius, or other small geometric differences can make all the difference to the value of the torque coefficient obtained at different speeds.

However, it could be anticipated that for any one given propeller, kept in good condition, the torque coefficient should be reasonably





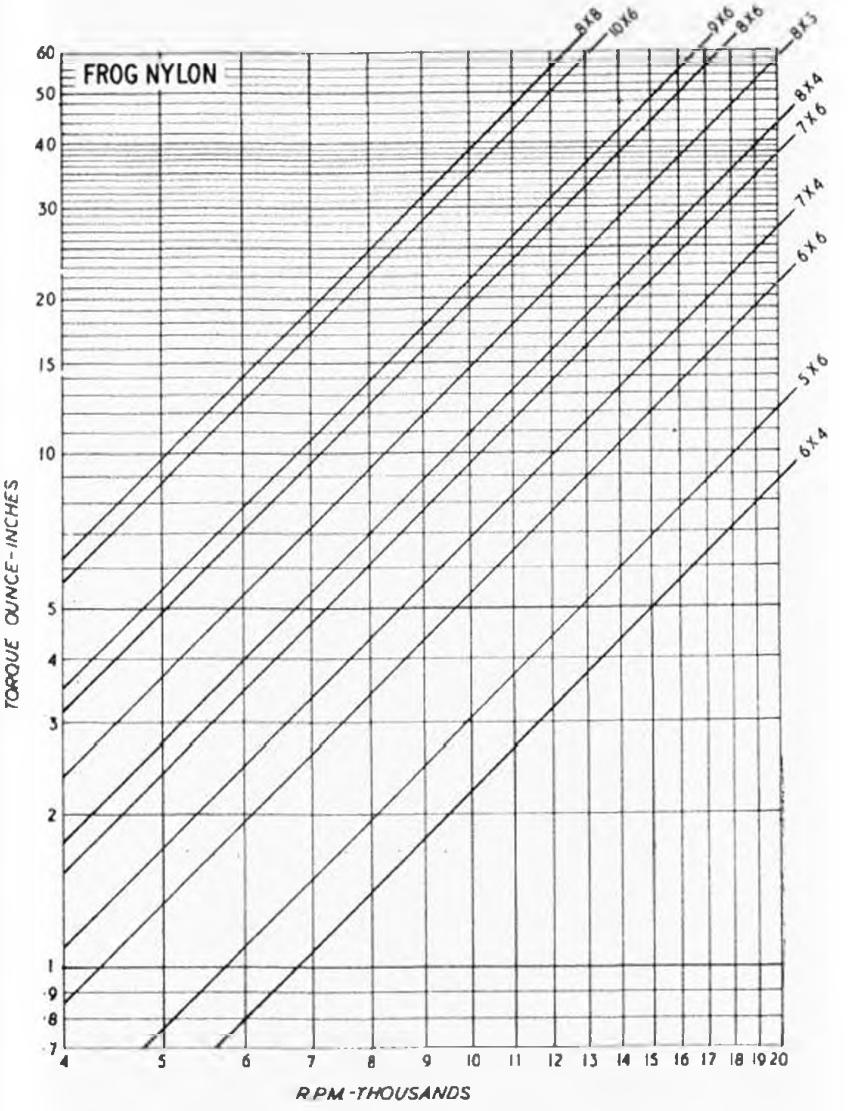
constant. In some cases this is found to be so, in others discrepancies emerge on test. Ignoring changes in air density (which, properly, should be accommodated in the basic formula), engines appear to "like" some propellers and "dislike" others. As a result, with a particular propeller size revs are down and running generally poor. Also considerable variation is possible with high pitch propellers which, under static running, have completely stalled blades.

Static running with propellers, in fact, does not give a true measure of the propeller's performance, because the blades are operating in a stalled or semi-stalled condition and their drag coefficient — which determines the torque coefficient — can be highly variable. But static running is the only feasible method of testing an engine and hence calibrated propeller-type loads, basically, are unsuited for power analysis. Even propeller r.p.m. figures can be similarly misleading. It is a well-known fact that engines speed up in the air as the load comes off the propeller and the blades assume a finer angle of attack. This effect is more noticeable with high pitch propellers than with low pitch propellers; and also there is usually a greater increase in flight r.p.m. with glow motors as compared with diesels. This can lead to quite anomalous results — a diesel with, say, a moderate power output perhaps showing static r.p.m. figures considerably superior to a racing glow motor of similar capacity — whereas in the air the glow motor shows up to be much the superior as regards performance. Static tests, in fact, are most unflattering to glow motors — which accounts for the fact that whilst diesels are generally considered to be appreciably more powerful than glow motors, size for size, this difference is usually far less (or even reversed) under flight conditions.

There are other numerous sources of discrepancies, such as differences in vibration levels, errors in r.p.m. measurement (the sliding reed type tachometer being inaccurate, for example, and capable of giving different readings when adjusted "up" as compared with "down"), the relationship between fuel and ambient atmospheric conditions, and so on. All this is aggravated by the high running speeds concerned, allied to the inherent limitations of every possible method of torque measurement.

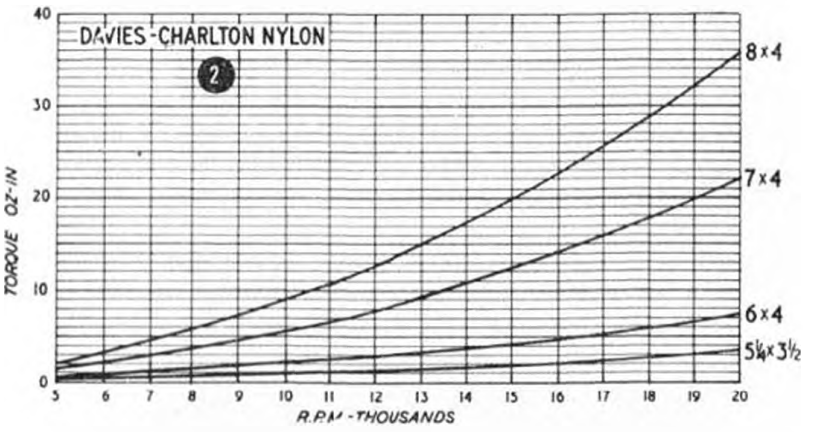
A driven dynamometer represents the most accurate method of torque measurement, but can induce unmeasured coupling losses. A swinging arm reaction rig suffers from vibration, mass balance and slipstream effects. Both, however, are *considerably more accurate* than using calibrated propellers or fan-type loads as a method of power measurement. The only satisfactory form of air brake which has been found to give reasonably consistent results is the torque bar of rectangular or, preferably, circular section which is largely free from scale effect and avoids "aerofoil" characteristics. These, too, have their limitations — one being an absence of cooling airflow over the engine cylinder due to lack of slipstream so that separate cooling air has to be supplied, prohibiting the use of a swinging arm rig.

However, propellers are still the most readily available method of "*checking*" the power; and propeller r.p.m. figures most widely favoured for comparison purposes. Even with the latter direct test there will be discrepancies, as we have mentioned, unless figures are "cooked". In fact, figures which did agree absolutely and consistently throughout would be suspect — if only on the score that practical experience shows that inconsistencies are inevitable!



Proprietary propellers are produced as "families" over a range of diameter and pitch size. It does not follow, however, that a similar geometric pattern is employed throughout the family. The same blade shape is followed in some: in others it varies appreciably from size to size. In view of this there is no point in attempting to analyse propeller performance on a "family" basis — especially as small geometric differences can make a large difference in torque absorption characteristics. Each individual propeller, therefore, must be taken in turn and measured separately to obtain a calibration figure.

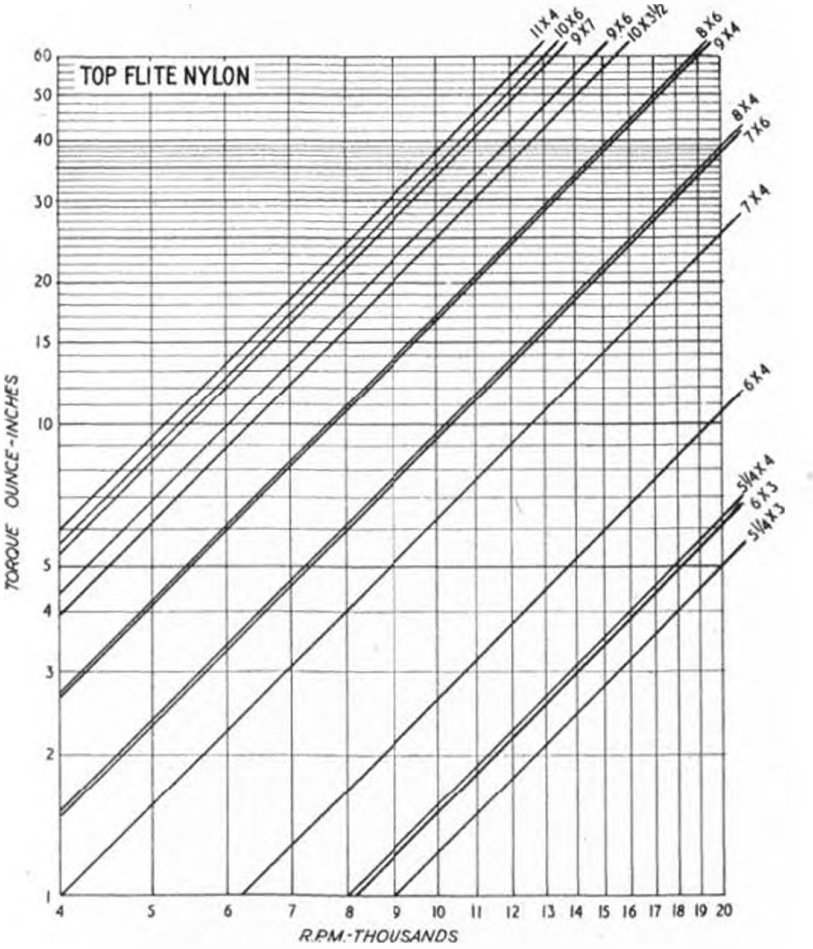
Fig. 1 shows torque coefficients calculated for a number of Top Flite nylon propellers which, although showing variation, are generally good — certainly sufficient to justify adopting a constant average value for the torque coefficient. Some individual propellers may show a much wider scatter, when it must be



accepted that there will probably be same variation in results. Extreme variations can be ignored and a mean calculated on the figures lying more closely to a constant value.

Manufacturers' sizes are usually nominal, both as regards pitch and diameter. With some series, actual pitch may agree closely with stated pitch; in others it may differ appreciably. In one series, for example, an 8 x 6 propeller was found to have *less* actual pitch than an 8 x 4 propeller in the same "family", but produced at a later date.

Diameter sizes are subject to less variation as a rule, but in the case of moulded plastic propellers it may be a variable factor from batch to batch. This is dependent on the temperature of the moulding when removed from the die, governing the final shrinkage. A measured difference of ⅛-in. is not unknown on an 8-in. diameter propeller — part due to undersize on the pattern and part due to shrinkage after moulding. Depending on the blade form, etc., changes in pitch angle can also occur through shrinkage.



The calibration charts given are based on literally hundreds of practical tests and are offered to meet a popular demand rather than present an accurate method of power determination. Torque absorbed against r.p.m. can be calculated directly from the torque coefficient and can be presented in three ways. Using linear scales as in *Fig.* 2, the resulting curves tend to crowd and flatten towards the lower r.p.m. range. Plotting torque on a log scale as in *Fig.* 3 gives an inverted form of curve which is easy to read, but calculation of such curves is tedious since torque absorbed has to be calculated at each 1,000 r.p.m. stage for each individual propeller, from the appropriate torque coefficient — *i.e.*, some sixteen calculations for *each* propeller analysed. It is probably, however, the best method of presenting the data.

The other method, adopted for the remaining charts, is to plot torque on a log-log scale and r.p.m. on a log scale, which renders the calibration curves as *straight* lines. Whilst less easy to read values of torque, such a family of curves more readily accommodates small discrepancies such as occur in practice. If preferred, the absorption curves for the remaining series can be re-plotted from direct calculation using the torque absorption coefficients given in either of the other two forms. The one particular advantage of the linear scale chart (*Fig.* 2) is that it can be directly related to conventional torque and h.p. curves, plotted against r.p.m., where linear scales are invariably employed.

Using the scales in the form of *Fig.* 4, a straightforward method of correction is open to accommodate a given "test" propeller which obviously differs in performance from the standard on which the chart torque coefficient was calculated, provided such difference is not due to difference in *engine* performance. Suppose, for example, test figures quote, say, 14,000 r.p.m. for a given size of propeller; and the same nominal propeller size (but a different propeller) gives a reading of 13,000 r.p.m. on the same engine. The difference *may* be due to engine performance; but could also be due

to slight difference in geometry of the propeller. In the latter case, the corrected torque coefficient can be calculated as:

corrected torque coefficient =

$$\text{standard Cq} \times \left(\frac{14{,}000}{13{,}000}\right)^2$$

or in the general case—

$$\text{correct Cq} = \text{original Cq} \times \frac{(\text{quoted r.p.m.})^2}{(\text{actual r.p.m.})^2}$$

A new curve can then be drawn, calculating for two different speeds—*e.g.*, 4,000 r.p.m. and 10,000 r.p.m., and joining with a straight line.

Torque coefficient Tables

DAVIES CHARLTON NYLON

Propeller dia. x pitch	*Torque Coeff. x 10⁻⁷*
5½ x 3½	·081
6 x 4	·186
7 x 4	·55
8 x 4	·90

TOP FLITE

Propeller dia. x pitch	*Torque Coeff. x 10⁻⁷*
5½ x 3	·123
5½ x 4	·155
6 x 3	·150
6 x 4	·262
7 x 4	·628
7 x 6	·940
8 x 4	·952
8 x 6	1·72
9 x 4	1·68
9 x 6	2·79
9 x 7	3·35
10 x 3½	2·51
10 x 6	3·51
11 x 4	3·80

K-K NYLON

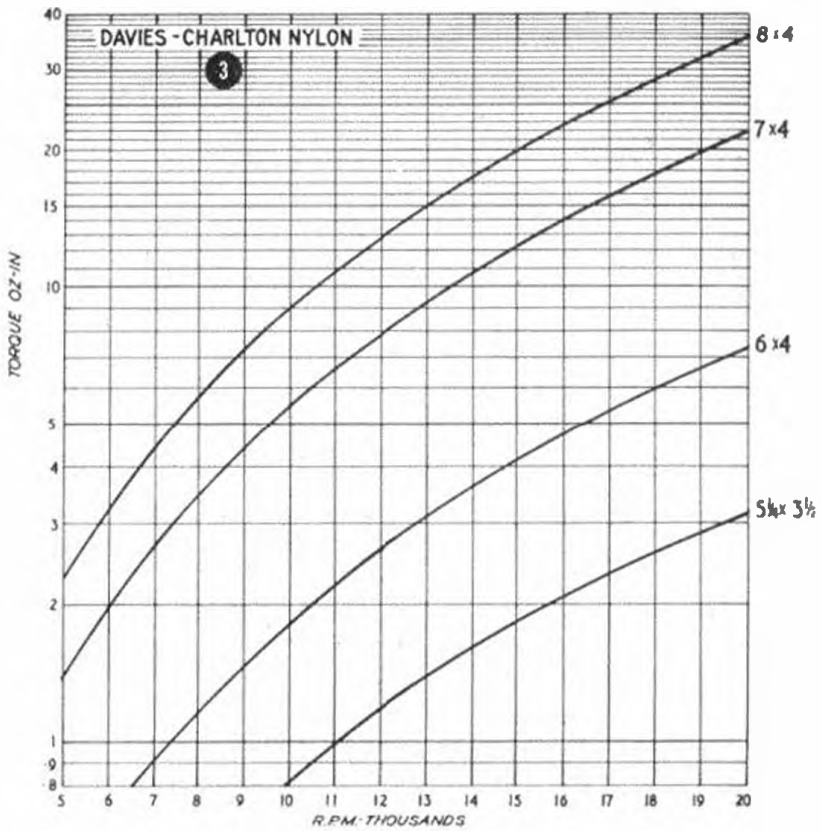
Propeller dia. x pitch	*Torque Coeff. x 10⁻⁷*
5 x 3	·107
5 x 4	·128
5½ x 4	·199
6 x 3	·206
6 x 4	·312
7 x 4	·610
7 x 6	1·14
8 x 4	1·08
8 x 6	1·72
9 x 4	1·49
9 x 6	3·14
9 x 7	3·36

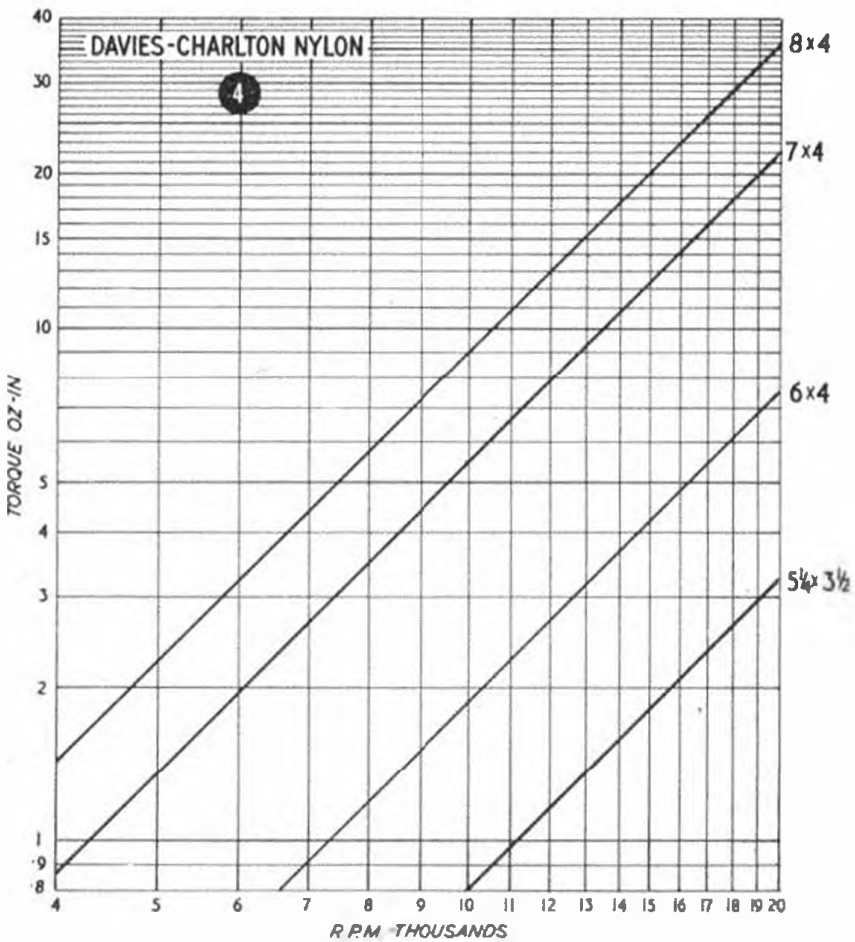
FROG NYLON

Propeller dia x pitch	*Torque Coeff. x 10⁻⁷*
5 x 6	·30
6 x 4	·22
6 x 6*	·53
7 x 4*	·68
7 x 6*	·95
8 x 5	1·46
8 x 4*	1·09
8 x 8	3·82
8 x 6	1·94
9 x 6	2·15
10 x 6	3·45

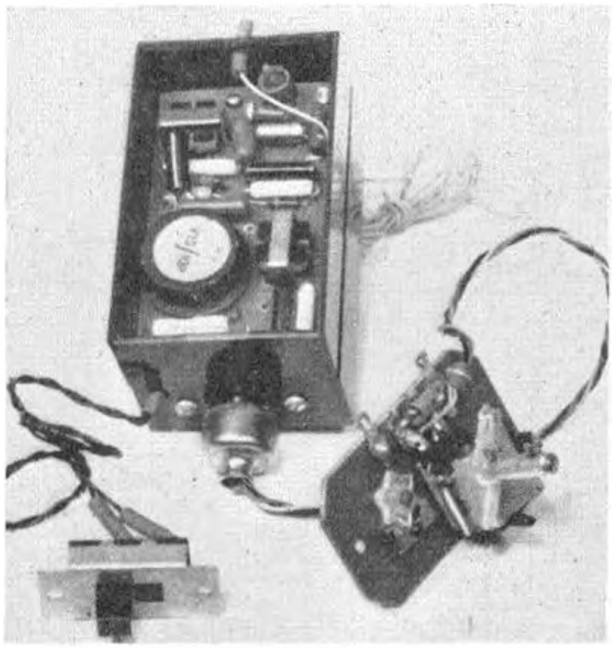
* NEW TYPE

Italic figures variable by test. There may also be marked differences between different propellers of the same nominal size.



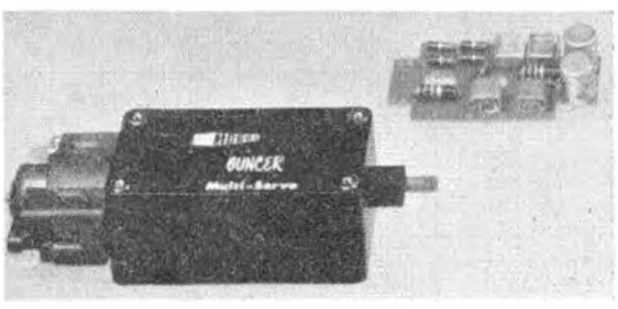


Over the Waves



FOLLOWING THE MENTION of the L.A.R.K. "Annual" contest in our January issue, we have more news of one of the outstanding models of the meeting. Keith Storey, well-known pioneer of team racing and speed models and for his associations with A.M.A., K. & B. and Disneyland, introduced *Gold Rush III*, a pylon racer featuring a retractable and extendable landing gear — the first time such had been used to win a contest. Quite different in conception and design (an earlier system was described in AEROMODELLER, September, 1959), this system worked every time. Keith used CAR (coupled ailerons and rudder), the ailerons being restricted in movement, resulting in smooth pylon turns. Landing gear is "the better mousetrap" type since it was escapement operated instead of using a servo to do the work. Mechanism, which had only one cycle per flight, might be described as a wire bender's nightmare though, except for this, is very simple. Model is a refreshing departure from the pencil missile-type of racer, having moulded fibreglass fuselage and as may be expected of a Storey model, the cockpit is pilot-equipped. Power is a McCoy 19 and speed, especially on the upwind leg, is expectedly fast.

News now of new American kits, several of which are to be introduced by **DeBolt Model Engineering Co.** First of these will be a semi-scale *Ercoupe*, intended for single channel flying. Wingspan is 36 in. for a wing area of 230 sq. in. Model takes engines 0·049 to 0·074 cu. in. and weighs 18 oz. Following this some months later will be one called the *Sonic Cruiser*, a shoulder wing type designed as a stepping stone from rudder only to the hot low-wing multi machines. Still later in the year it is hoped to kit the *Stits Playboy* which Harold DeBolt flew at the World R/C championships last year.



Already available from the same corner of the U.S.A. is the **VK Model Aircraft Co.** *Mach* 1, a sleek 68-in. swept-back 716 sq. in. shoulder winger for ·19 to ·29 cu. in. motors. Price is $19.95.

With the introduction of relayless servos, reed flyers will have to develop a new technique for tuning suggests Dick Branster (Bramco Inc.). During development of the new **Bramco** *Apollo* 10-channel relayless receiver, it was discovered that the usual method of tuning the tone pots. in the transmitter while watching for a servo to operate could lead to burnt out transistors in the servo amplifiers. Reason being that with a servo held full over one side, if you inadvertently hit the reed that drives it in the opposite direction (which can happen easily with normal tuning method, doing little except put a heavy load on the servo batteries when the relay type receiver is being used), the output transistors will be heavily overloaded and will probably burn out — so watch it!

Babcock will soon be releasing their new single-channel tone transmitter and receiver. Transmitter is the BCT-12 to be available with pot. trim for a range of tone frequencies. Price $39.95. Matching receiver is the BTR-12, a 9 v., 2½ oz., all transistor selectable tone set which will respond only to narrow band AF, has no reeds or elaborate tuning adjustments. Several tone frequencies will be made. Price $34.95. These two units will allow several models to fly at the same time without interference and are known as *Selectone*.

Tip for this month is that Ed Kasmirski is now using trike undercarriage. (So is Chris Olsen on his *Upheaval*). Ed considers the trike essential for new rules, the "sit and stick" no bounce landing being a major requirement.

In the "*Someone had to do it dept.*" we learn of an 8-channel variant of the popular "rudder-only" *Live Wire Trainer* with Fox 25 by Bob Draper of Peoria, U.S.A. Just shows how the lightweight gear packs into a small airframe.

Did someone say Nickel Cadium cells were expensive? The 6 v. 225 DEAC pack is no less than equivalent of 56/- when it crosses the Atlantic!

On this side, U.S. products are coming in at increasing rate. Harry Brooks of **Southern Radio Control**, Portslade, offers a K & B 45 re-servicing set (*see Motor Mart*) and a Duramite-Transmite conversion deal. The 6-transistor (four 2N306, two Philco 2N223, 260) Transmite amplifier fits neatly inside the Duramite box and switching can be arranged for neutralising or trim (used with engine or elevator). This **Bonner** servo has been carefully designed for extreme reliability even under the most adverse conditions. It eliminates the relay stage and does not require split insulated reeds. Price of the amplifier from SRC is £7/17/6 plus 10/- fitting charge. A repair service will be maintained and exchange amplifiers held in stock for immediate replacements.

Our American friends always give us something to think about, and from the Kansas City Radio Club, Newsheet *Contacts* we learn of an interesting experimental construction method being tried by the Wichita

Heading shows the Mini-Reptone complete with switch and extensively modified Rising Compound. Large "gold top" transistor is for rough handling tolerance. Photo gives clear indication of the neat layout of components in plastic cased receiver

***Left*: The new Cobb "Ouncer" weighs 1.4 oz., is the lightest transistor amplified servo yet. Size is 15/16 in. × 1 13/16 in. × 3 5/16 in., and push-pull action is 5/16 in. Motor brushes are replaceable. Price of transistorised version is $29.95. Type for use with relays $11.95**

R/C Club called the *Jayhawk*, it is a low winger about the size of an *Orion* and looks like a racing aeroplane.

Wichita clubsters are building the fuselage from fibreglass and the wing from Styrofoam expanded polystyrene, sheeted top and bottom with 1/16th balsa. A team of two can build a wing or fuselage, including the first coat of dope, in one evening. Materials for a fuselage cost about $5 and for a wing $1.

Ace Radio Control have announced their kits for the Kraft ten-channel relayless receiver and triple simultaneous ten-channel transmitter. Receiver is already available and the transmitter will be ready for customers by mid-February. There is a three-way arrangement between Phil Kraft (designer of the equipment), Ace R/C and the Eck brothers (**Ecktronics**) whereby Ecktronics market this popular equipment in ready-made form and Ace R/C only in kit form. Phil Kraft promises future offerings of super-selective and "interference-resistant" receivers both by superhet methods and by other, possibly less expensive, means.

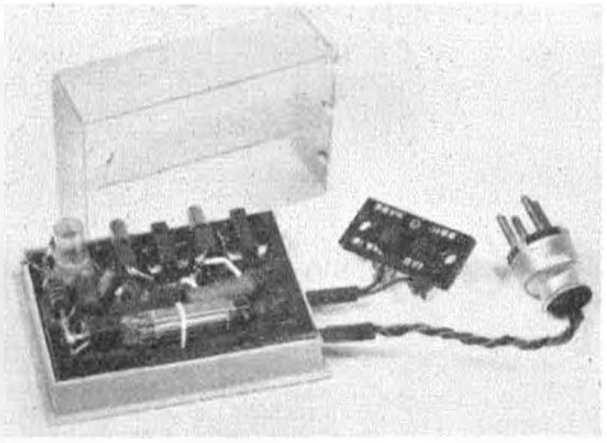
New British gear

Not to be overshadowed by development in U.S.A. British manufacturers have been far from idle, and the first British ten-channel radio set (23 oz. *with* 5 servos) by **Radio and Electronic Products** is being air tested. The set is highly advanced with gold-plated split reed bank. Built into the *Dekatone* receiver is a power converter supplying 30 volts from 4·8 volts for H.T. and 15 volts each way for the new R.E.P. transistor amplified servo (more of this in a moment) from the same pack. Power converter itself has two OC 76 transistors and two diodes, and actual power pack consists of four 225 DK DEAC cells, 2¼ oz. in a holder.

The new servo, designed especially for use with this new set is a printed circuit — 4 transistor amplified relayless type using a new German electric motor called the *Microperm* which weighs only ½ oz., with size comparable to that of a Micromax motor, and current drain of about 400 mA. Speed of this new motor is in the order of 10,000 r.p.m. on only 2 volts. Bearing races are self-oiling, and having seen it work we can say that it is very smooth in operation with no appreciable overrun. Power through the five gear stages is considerable — enough to shift the engine if the throttle sticks, we should think!

The absolute beginner will welcome another new set from the R.E.P. stable, the *Mini-Reptone*, which is all-transistorised from the aerial to revised Rising Compound Actuator supplied with the receiver and ready wired including slide switch. The Rising actuator, which plugs into the receiver via three-pin plug is specially modified to give "quick blip" engine control *without* the use of a relay and its back contact. Did anyone say it can't be done! Receiver size is 2¾ in. 1¾ x in. x 1¼ in. and the whole airborne installation, complete with three pen cell U12 cells, which is all the battery power required, weighs only 5¼ oz. — light by any standards. We still suggest using the mods described last month for torque rod conversion of the Rising Compound.

The ordinary *Reptone* (intended mainly for boats) will still be available but for the new *Mini* receiver the Reptone transmitter has been modified to give a higher (800 c.p.s.) tone frequency required. In future all Reptone transmitters will have a coloured escutcheon either in green, for high note, or red, for low note. If you have a low note transmitter, this can still be used with the Mini-Reptone, but it must be emphasised that in using this lower note unit, range will be somewhat reduced. Cost of the Mini-Reptone outfit complete with escapement is £16/16/0; for receiver only (without escapement) £9/6/0. Incidentally the escapement is Diode suppressed.

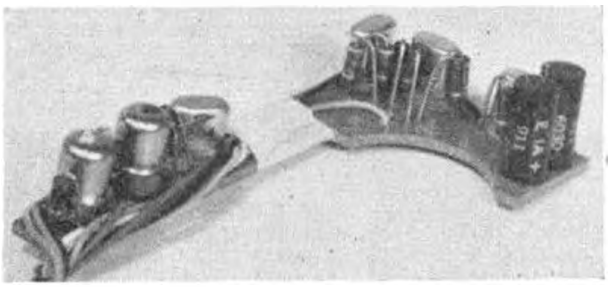


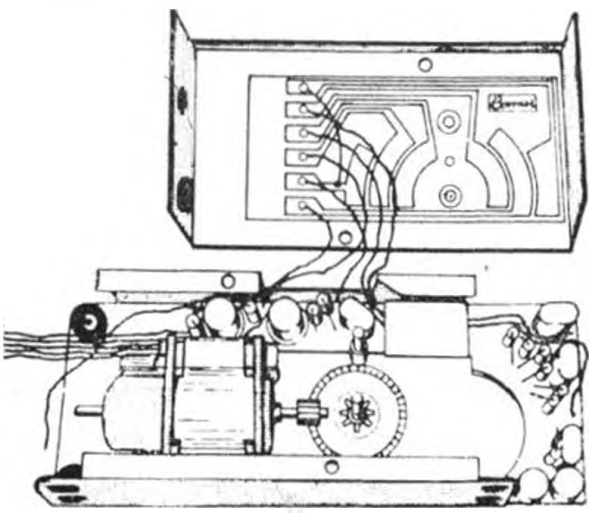
Above: Plastic case for "Goya" perfume bottle makes neat case for Quetone Rx, built from Rising kit. Gruner 957 relay is underneath the component base and size of unit overall is 2 in. x 1¾ in. x ¾ in. Weight 2 oz. So if the wife or girl friend uses this particular brand, then stake your claim. Alternatively, that present "for her" problem is now solved!

Well, development certainly is surging forward toward even greater reliability and lightness (with corresponding increase in cost). Just to prove that things really are on the up-and-up, we announce that Bob Dunham has achieved the amazing speed of 124 m.p.h. with McCoy 60. *Voltswagon/Regulus* 91 ounce combination on aileron only control with trim elevator.

To end this month's round-up, just one last passing thought:—

Lives there a modeller so dead,
Who never to himself hath said,
. . . . . let's modify it?





Right: Bonner six transistor servo amplifier which converts Bonner Duramite to Transmite standard. Fits into Duramite case as shown in sketch, by sliding under gears at base of case. For more details of transistorised servos, see our companion magazine *Radio Control Models and Electronics*, March edition

13th National Championships

Reported by
Ted Malkin

The 13th National New Zealand Championships were held at New Plymouth Bell Block Aerodrome from December 27th 1960 to January 1st, 1961, under the shadow of 8,260 feet, Mount Egmont, a very important land mark which can be seen for a hundred miles.

Accommodation provided was in the old Air Force quarters and under canvas. Bell Block aerodrome has a grass surfaced runway of one mile in length, with a 30 ft. rise in the centre. Dakota aircraft of the N.Z. N.A.C. present a most unusual sight on making their approach for a touch down, slowly sinking out of sight, only to reappear a few seconds later to complete the run in. On the night of the 27th the Met experts predicted calm weather for the next two days, however this did not materialise, as after a good start at 5 a.m. the next morning the weather deteriorated and by 6.30 a.m. winds of up to nine knots were in evidence and gradually increased to 20-30 knots during the day. On the morning of this day a start was made with the **A 2 NORDIC.**

The result of the first round was:— 1st J. Winn—Auckland, 2nd N. Hewitson—Auckland, 3rd J. Malkin—Upper Hutt.

In the second round which commenced at 6.30 a.m., it soon became evident that retrieving was going to be very difficult if a maximum was to be scored. It was during this round that the wind increased and quite a few competitors eliminated themselves by the simple expedient of having the wings of their models clap together during the tow. Thermals became more prevalent during this round, as also were the usual down draughts. Quite a few modellers were caught and one said when his model sank for a total of 70 seconds, "That's not a downdraught that's a vacuum". Leader in the second round was W. Cook of Upper Hutt.

By the time round three had commenced, the wind had increased still further and was gusting up to 30 knots and still more wings and tow lines came to grief. There were no alterations in Rounds 3 and 4 and the competition was still open to a good few fliers, who could make maximums in the last round. In round 5, W. Cook, Upper Hutt secured a maximum gaining 1st place.

1st	W. Cook	Upper Hutt	609·2 secs.
2nd	B. McGarvey	Auckland	625·6 „
3rd	J. Malkin	Upper Hutt	614·6 „

The **HAND LAUNCHED GLIDER** competitions were flown in the afternoon of the first day during a strong wind and while many models were capable of quite high times the elements were so rough that many finely made and finished models were dashed to the ground before proving their potential. A maximum flight of 90 secs. would take a model out of the aerodrome.

1st	T. Martin	Palmerston North	321·1 secs.
2nd	G. Maslin	Tamaki	274·1 „
3rd	F. Smith	Auckland	266·0 „

WAKEFIELD flying events commenced at 5 a.m. on December 28th, 1960. For the first round of flights windy conditions prevailed, the wind being in the vicinity of 10 knots. Only a few of the models had fast climbs the remainder being rather slow with long motor runs.

Had the flights taken place in still air they would certainly have put up a much better performance but in such conditions a fast climb pushed its way through the ground turbulence.

Positions did not change over the five rounds, the first and third placings were the same as in the eliminations held earlier in the year, the second placing was eliminated from the Wakefield Team as he had failed to put in his qualifying flights.

1st	J. Malkin	Upper Hutt	611·4 secs.
2nd	A. Lewis	Hamilton	612·1 „
3rd	W. Cook	Upper Hutt	516·3 „

The overseas Team are J. Malkin (Upper Hutt), W. Cook, (Upper Hutt) and W. Hewitson (Auckland).

Below are two of the outstanding models seen at the 13th New Zealand National Championships, held over the new year period

(1) T. Bannister's radio control delta has Torp .09 mounted a'top the fin, pushing. Model has elevons in lieu of rudder. (2) Beautiful control line Spad XIII has rib-for-rib, stringer-for-stringer construction by P. Carter.

(3) 2nd in control line scale, Tex Johnson's Bell Airacobra in racing colours, by R. Milne (Hastings). (4) Again control line scale, having "Love" took third place for M. Kendrick (Wanganui)

(5) Class B team [illegible] by B. Milne powered by Oliver Tiger. (6) Ian Henry's Class [illegible] speed model featuring alloy wing and tailplane. Engine is McCoy .60

Column Left Top to bottom. A 2 Champion W. Cook, Upper Hutt World R/C glider duration record holder I. Barber won A 1 glider with A P.3 Aiglet 2nd place in A 2 was taken by N. Hewitson of Auckland using [illegible] design.

CLASS A TEAM RACING, took place on the afternoon of the second day, and proved that it was not to be only the Free flight models that suffered from the conditions since many team racers could not complete the 160 laps. The final proved to be exciting as positions changed throughout the race, the third place team's model landing approximately 20 yards from the finishing line and required another pit stop to complete. One of the funny sights witnessed from the side line happened when one model landed and was refuelled by the owner, who flicked furiously before realising that he had lost both prop blades!

1st	J. Winn	Auckland	9 54·6 secs. (ETA 15)
2nd	W. Underwood	Auckland	10 11·4 „
3rd	L. Arbuthnot	Upper Hutt	10 34·8 „

F.A.I. POWER was flown at 5.0 a.m. on December 30th the weather conditions being atrocious with winds gusting up to 30 knots and modellers soon commenced to eliminate themselves from the start of the flying. It was very evident as the rounds progressed that the well known models and modellers would not necessarily be well pleased. The weather conditions deteriorated rapidly and by the last round rain was falling. The first round was 1½ hours and subsequent rounds were of one hour duration. Entries in this event were approximately 60, but the conditions were so bad that only 20 of the entrants flew, the rest were scratched for various reasons. If a model scored a maximum it could quite conceivably end up in the sea which was only about two miles westward, and at least one model did take to the briny.

Non flying modellers volunteered their services to go down wind to assist in retrieving models and all competitors greatly appreciated this help.

New Zealand's own co-holder of the F.A.I. power championship John Sheppard had the great misfortune to write one model off the night before whilst trimming and during the competition he launched his reserve model in a gust of wind and was unlucky enough to smear his last resort.

1st	B. Roberts	Christchurch	540·8 secs.
2nd	M. Kendrick	Wanganui	474·7 „
3rd	B. Dexter	Palmerston North	468·0 „

The morning of the **A/1 GLIDER** competition dawned with the weather completely changed, and more suited for the gliders and it was in this class that more reasonable times became attainable. Most popular type was the *Aiglet* with quite a good showing of original designs being flown but it would appear that the Aiglet model can compete with any type. Ian Barber's won with a total of 834 secs. This flew extremely consistently and most definitely deserved first place. Ian is at present the World R/C Glider duration holder and appears to go from one extreme to another.

1st	I. Barber	Wellington	834·2 secs.
2nd	B. Keegan	Auckland	648·8 „
3rd	R. Mason	Papakura	[illegible] „

SPEED CLASSES

On the first day of Speed Classes 3 and 4 were flown.

Entries in all speed events were up this year and again it was unfortunate that the weather was inclement, the wind so strong, gusting 30 knots sufficient to make the first two classes a fiasco.

Although many valiant attempts were made, only one time in each class was recorded.

Harvey Westland of Kaiapoi won Class 3 with 111.2 m.p.h., well below his record of 127 m.p.h. last year.

J. Winn of Auckland won the Class 4 with 113 m.p.h.

The following day Classes 1 and 5 were flown in more reasonable weather. Most of the interest was centred on Harvey Westland who had broken the record four times during 1960. He won the event quite easily with 111.2 m.p.h. another New Zealand record. He was using an engine he had designed and built himself, greatly to his credit. J. Winn was second, followed by A. Pearce. No speeds were recorded by Jets, there being quite a number of models but not one able to get off the ground without cutting out. After the event Ian Henry of Christchurch made a successful attempt on the Class 1 Speed record and raised it to 114.7 m.p.h. He used an OS 15 which had been tuned by Harvey Westland.

PAA-LOAD

Sunday January 1st proved a better morning for weather conditions, but unfortunately Payload never appeals to many and the entries were not so good as other Free flight events, although the standard was very good. Only one 2.5 c.c. model was in evidence the majority being powered mainly by American .049 glows.

1st	J. Sheppard	Papakura	760·3 secs.
2nd	J. Winn	Auckland	676·4 „
3rd	M. Hopley	Kinleith	654·6 „

AEROBATICS were held on two days this time against one day in other years. On the first afternoon only two modellers flew and gave a creditable display for juniors. The weather was very trying for them and their planes were blown to the ground before they could complete the schedule. 50 per cent. of the entries withheld from the competition owing to the weather conditions.

Continued on P. 132

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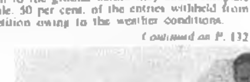

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Famous Biplane
D.H.Tiger Moth

March, 1961

Number 28 in the series

by G. A. G. COX

Red and Silver G-AIIZ, the "Flying Busmen's" Tiger Moth from the London Transport (C.R.S.) Sports Association Club at Fairoaks. This view clearly shows the size of the fin strakes, which are often modelled too small.

FOLLOWING THE UNPRECEDENTED success of their D.H.60 "Moth", the De Havilland company produced in 1931 a second basic trainer which they designated D.H.82, and which was destined to become the most popular and most famous training machine ever built in Britain or anywhere in the World. Longer lived even than the DC3, the Tiger Moth will celebrate the thirtieth anniversary of its first flight on October 26th this year, and still, in the opinion of many experts, it is the finest training machine available in this country.

Similar in many respects to the "Moth", the later machine nevertheless incorporates major changes in design. The inverted engine gives better forward visibility, and a stagger of twenty-two inches at the wing root makes easier quick egress from the front cockpit. The staggering of the wings necessitated sweepback in order to maintain the position of the centre of gravity, and this sweepback, measured at the interplane struts, is for some reason different on upper and lower wings, being eleven inches and nine and one eighth inches respectively. It is indicative of really good design that very few modifications have been made in all the years since the prototype first flew. The original D.H.82 had a 120 horsepower Gipsy II engine, and the rounded decking of the rear fuselage was formed by fabric covered stringers. The D.H.82A (R.A.F. Tiger Moth II) was fitted with the 130 horsepower Gipsy Major, and had plywood rear decking. The final large-scale modification was made in 1941 when the Tiger Moth's tendency to flat spins was corrected by fitting anti-spin strakes forward of the tailplane. Later, upper wing incidence was reduced as a cure.

The Tiger Moth soon proved to be immensely popular with flying clubs: although not quite so pleasant to fly as the Moth, it was much more robust and therefore suitable for primary training. Its one disadvantage compared with its predecessor was that it had non-folding wings and therefore occupied much more valuable hangar space. By the outbreak of war more than three hundred Tiger Moths were in use by flying clubs and reserve flying training schools, and well over one thousand had been delivered to the Royal Air Force. But production had only just begun. The total wartime production for the Royal Air Force and the Fleet Air Arm amounted to four thousand and five machines (the last serial was PG746), three quarters of these being built by Morris Motors. The Tiger Moth was also licence-built in Canada, Australia and New Zealand for the training of Commonwealth pilots, the Canadian machines having a cockpit canopy, brakes and a tail-wheel in addition to minor modifications. More than two thousand Tiger Moths were built in Commonwealth countries. In 1935 De Havilland produced a radio-controlled target version of the Tiger Moth, calling it the Queen Bee, and up to 1943 when production ended four hundred and twenty were built for the Royal Air Force and the Fleet Air Arm, some with twin floats. There were many differences between trainer and target, but the most obvious recognition feature of the Queen Bee was the fairing over the rear cockpit.

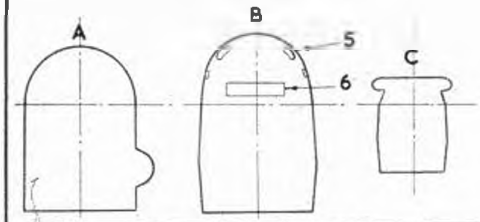
During the peaceful 'thirties the Tiger Moth was a familiar sight in many parts of the country, doped in the gay colours of the private flying clubs, but when war was declared these machines, with the many hundreds leaving the assembly lines, were given a camouflage colour scheme on the upper surfaces, including the fuselage as far down as the stringer, and trainer yellow on under surfaces, and pressed into service at the Elementary Flying Training Schools which were being established all over these islands. One such school was No. 18 E.F.T.S. at Fairoaks, near Chobham, in Surrey, which had 72 Tiger Moths on strength, distributed among the parent unit and two satellite airfields. During its period of operations at Fairoaks this school trained six thousand pilots and had only three fatal accidents—a tribute to the instructors and the aeroplane they used. Life at this school was not, however, without incident. There was always a zestful spirit of competition between flights which found expression in a variety of ways, some of them hazardous. An act of bravado popular for a time was to see who could bounce his wheels off one of the barrage balloons encircling the Vickers works at nearby Weybridge. The balloons were always flown above low cloud so that enemy pilots on their bombing run could not detect the presence of the tethering wires; the aerial trampoline act could therefore be attempted unseen from the ground. We may never know how many pilots succeeded in bouncing a balloon, indeed the practice would never have been discovered had not a machine landed at Fairoaks one day with the fabric on the fuselage underside and the lower part of the rudder burned away. The pilot had bounced the balloon, but with his propeller instead of his wheels. The envelope was torn open and the escaping hydrogen ignited by the exhaust. The flaming remains of the balloon settled on the fashionable St. George's Hill in

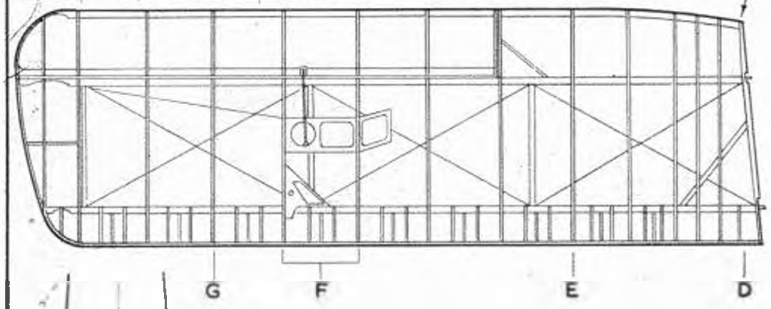
COLOUR DETAILS

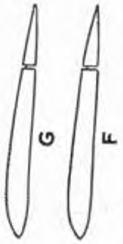
G-AOBX
All Silver except:—
Malachite Green — Struts, wires, wheels, registration letters.

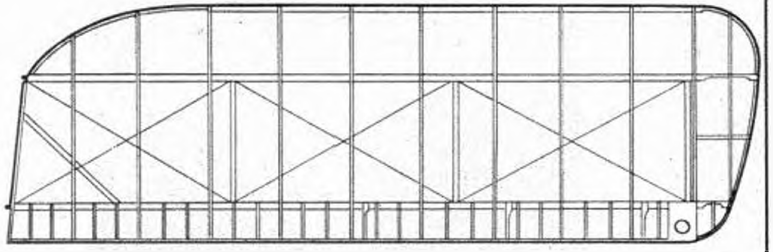
G-AIIZ
London Transport Red — Fuselage, Struts, Wires, Wing Registration Letters, Wheels.
Silver — Wings, Tail, Fuselage, Chevrons and Registration Letters.
Black — ½" outline to Chevrons and Fuselage Lettering.

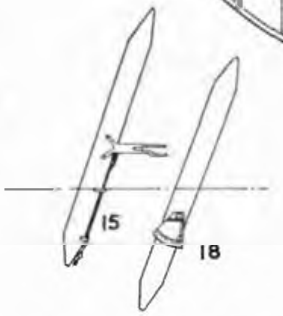
BOTH MACHINES:
Propeller — *Black* with 4" yellow tip.
Interior — *Dull green*.

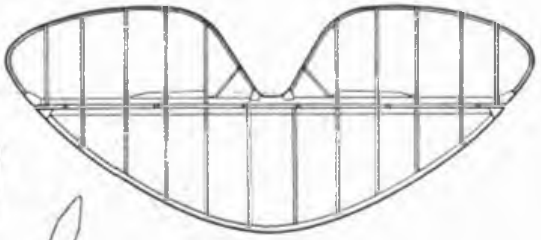


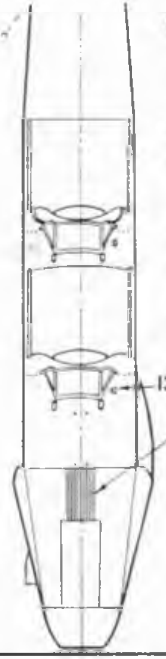


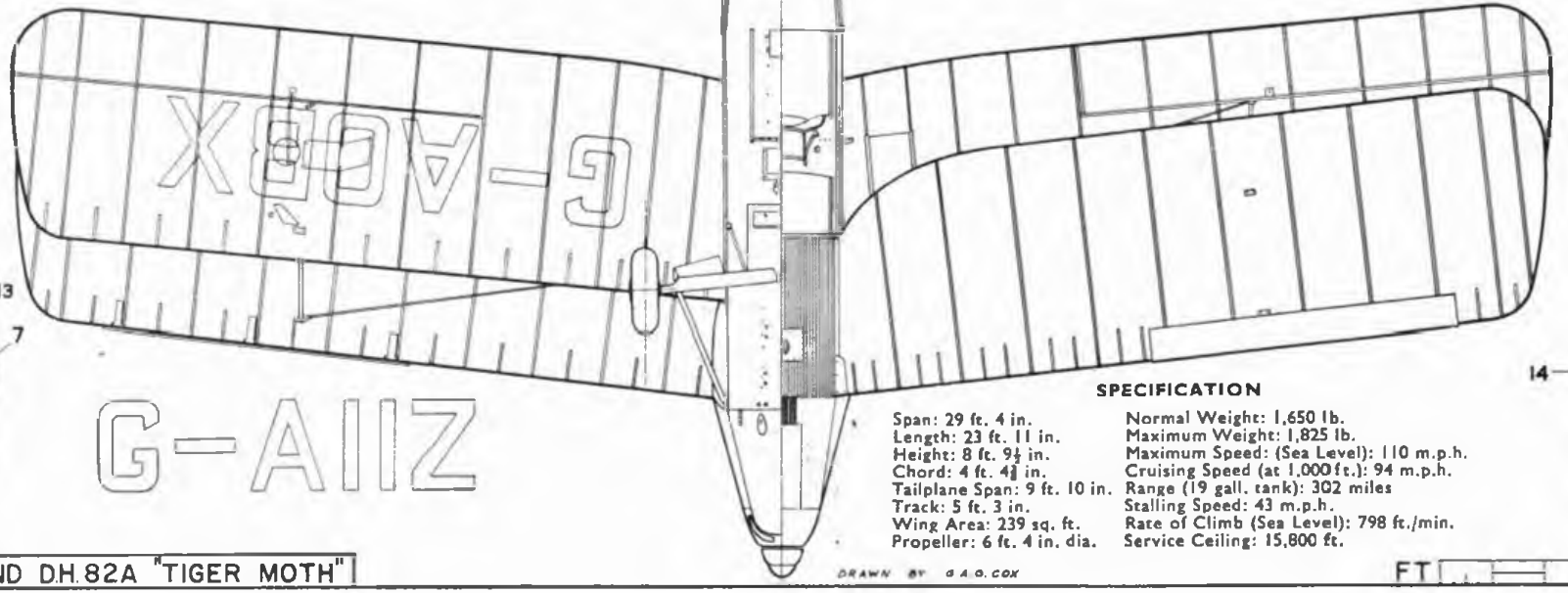


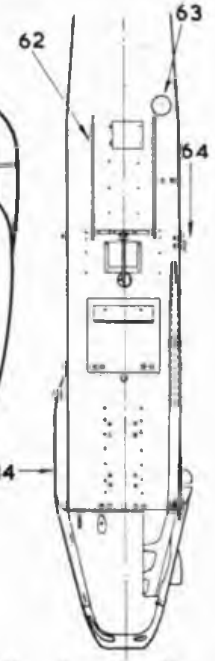












SPECIFICATION

Span: 29 ft. 4 in.	Normal Weight: 1,650 lb.
Length: 23 ft. 11 in.	Maximum Weight: 1,825 lb.
Height: 8 ft. 9½ in.	Maximum Speed: (Sea Level): 110 m.p.h.
Chord: 4 ft. 4½ in.	Cruising Speed (at 1,000 ft.): 94 m.p.h.
Tailplane Span: 9 ft. 10 in.	Range (19 gall. tank): 302 miles
Track: 5 ft. 3 in.	Stalling Speed: 43 m.p.h.
Wing Area: 239 sq. ft.	Rate of Climb (Sea Level): 798 ft./min.
Propeller: 6 ft. 4 in. dia.	Service Ceiling: 15,800 ft.

DE HAVILLAND D.H.82A "TIGER MOTH"

DRAWN BY G.A.O.COX

FT

Nose views above serve to compare the standard Tiger Moth at left, with author George Cox at rear cockpit, and the streamlined "Bishop" aerobatic variant produced by Rollasons at right. Note slim centre section (no tank); all wing roots are fabric-covered and Fairey-Reed propeller fitted to more powerful engine. Colours red and yellow. *Below*: Typical of many New Zealand crop spraying Tigers is Webbair's (N.Z.) silver and green ZK-AUT, which was VH-BEQ and T5555. Letters are red and yellow — quite a scheme!

Weybridge, and the pilot, fortunate to be still alive, managed to return to base. Just how serious was his misjudgement may be assessed from the fact that there was silver dope from the balloon fabric on the spinner of his machine.

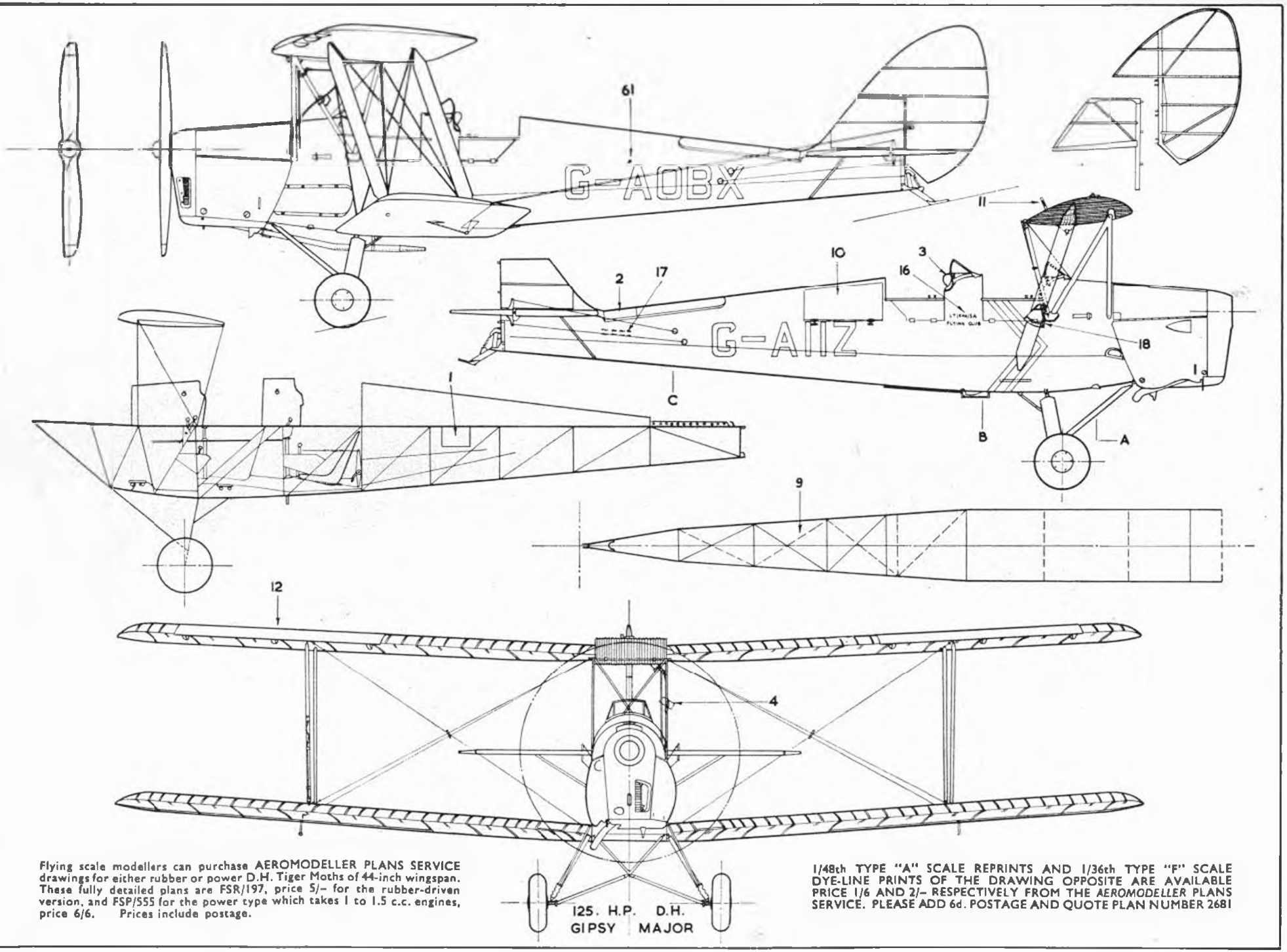
When the E.F.T.S. closed down after the war the flying clubs moved in, equipped mainly with war-surplus Tiger Moths, the cheapest trainer available. Fairoaks Flying Club, belonging to Universal Flying Services, have several all-silver machines, including -OBX, shown on the drawing. The London Transport (Central Road Services) Sports Association Flying Club, formerly at Broxbourne, moved to Surrey after the war with their immaculate machines. Their "Tiger Moth" -IIZ is maintained in superb condition—along with G-ANDV and Auster Alpha G-AJAC.

The Tiger Moth fuselage is of welded steel construction, the longerons being $\frac{7}{8}$ in. square tube and the spacers either $\frac{7}{8}$ in. square or $\frac{7}{8}$ in. diameter. The first production batch had wire bracing but this was soon replaced by diagonal tubes. The fuselage is in two halves, bolted together just aft of the rear cockpit where the plan view taper begins; this facilitates manufacture and repair. The rear fuselage decking is ply, as is the underside of the forward fuselage. One spruce stringer runs along each side of the fuselage, and the entire structure is fabric covered except for the metal cowling panels around the engine. The centre-section struts are of tubular steel, wire braced, and to this assembly is bolted a corrugated aluminium fuel tank of 19 gallons capacity or, for greater endurance, 24 gallons.

The wings are built around two I section spruce spars with steel tube compression ribs and wire bracing. The ribs, and edges are spruce, as are the nose ribs, two on the upper and one on the lower, between main ribs. The lower wing carries the ailerons which are hinged near the upper surface, and the trailing edge of the lower wing curves upwards from the aileron to the root, to a point three inches below the lower longeron. The lower wing is rigged with 4° 30′ dihedral and the upper with 2° 45′; incidence on both wings is 4 degrees. The lower rear spar is thickened by a packing piece between the ribs marked F, to give a surface parallel with the under surface of the upper wing, yet there is still a difference of $\frac{1}{4}$ in. in the lengths of the interplane struts, caused by the differential sweepback. These struts are of solid spruce with steel fittings, and because their attachment points do not exactly coincide with the compression ribs, there is a slight divergence in the front view. The tail assembly is of conventional construction with spruce ribs, a laminated tailplane leading edge and tubular profile members. The tailplane is rigidly mounted on two perforated alloy plates by means of a Z bracket. A degree of trimming may be obtained by packing under the spar.

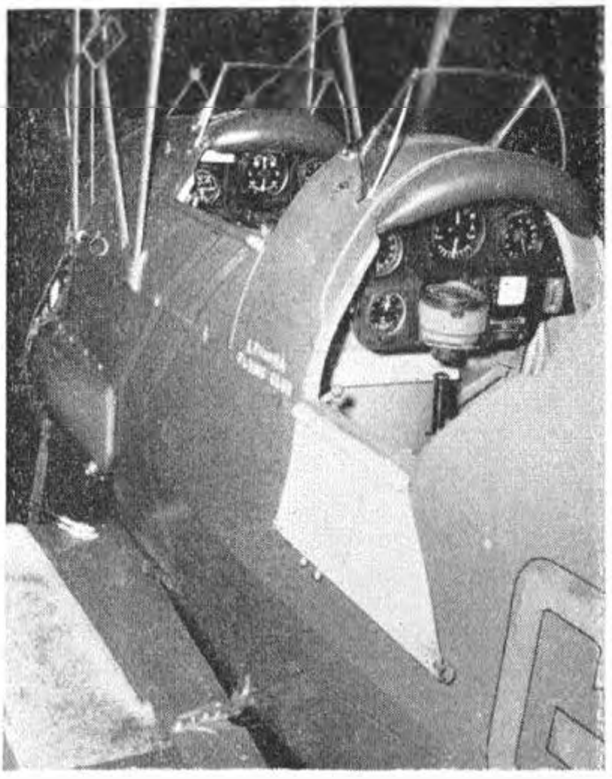
The cockpit is as simple and functional as the general design. The flying controls are housed in a control box attached to the floor of the cockpits, and to a platform on this box is bolted the rear seat: the front seat is set into a ply covered former attached a little forward of a diagonal member. The aileron lever projects through the cockpit floor, wires running from this into the wing root and direct to a chain and sprocket which operates the aileron by means of a circular cam and actuator rod. The linkage of rod to cam is such that the movement of the aileron is only $\frac{1}{4}$ in. down, but $3\frac{3}{4}$ in. in the up position. The aileron return wire is stabilised at its centre by a freely rotating arm just ahead of the lever. The rudder bars are of the parallel action type, adjustable for reach, the rear being connected to the front by a rod on the right hand side. The rudder cables run externally along the fuselage sides to the ends of the front bar which protrude through the fabric covering. A Z section aluminium strip covers the slot.

Torque is counteracted not by an offset fin, but by



Flying scale modellers can purchase AEROMODELLER PLANS SERVICE drawings for either rubber or power D.H. Tiger Moths of 44-inch wingspan. These fully detailed plans are FSR/197, price 5/– for the rubber-driven version, and FSP/555 for the power type which takes 1 to 1.5 c.c. engines, price 6/6. Prices include postage.

1/48th TYPE "A" SCALE REPRINTS AND 1/36th TYPE "F" SCALE DYE-LINE PRINTS OF THE DRAWING OPPOSITE ARE AVAILABLE PRICE 1/6 AND 2/– RESPECTIVELY FROM THE *AEROMODELLER* PLANS SERVICE. PLEASE ADD 6d. POSTAGE AND QUOTE PLAN NUMBER 2681



Cockpit view of well-kept G-AIIZ shows duplicated instruments for Instructor and Pupil, side flaps to cockpit, and lower wing spar attachment to fuselage, also the "driving mirror" on centre section strut.

spring bias on the rear rudder bar: modellers should note that when on the ground, Tiger Moths always have full left rudder. The engine controls are, of course, at the pilot's left hand, and beside him on his left is a lever which applies bias to the elevators, serving as an in-flight tail trimming device. On the right-hand side is another lever which locks the automatic slots before aerobatics. For the occupant of the front cockpit there are leather covered handgrips on the wires which run up the starboard rear centre-section strut and around pulleys to the wing roots. Not all the Tiger Moths at Fairoaks are fitted with the slots; a reduction of the stalling speed by a mere 3 m.p.h. is not considered worth the cost of maintaining an extra item of equipment. The rear cockpit may be equipped with a hood for blind flying, and when fitted, this hood is attached to the upper longerons one third of the way along the door. The 45° cutaway on the rear door is to provide clearance between the door and the stowed hood, and a rubber sealing strip is fitted at the forward edge of the cockpit. An intercom socket hangs from the upper longeron at the right hand side of the cockpits, the amplifier being stowed in the compartment aft of the rear seat. First-aid equipment is carried in a box in the rear fuselage, covered by a removable fabric patch; a loose loop is sewn to one corner of the patch to facilitate quick removal.

For twenty-nine years the Tiger Moth has given faithful service in many parts of the World, and it is still, in the opinion of many pilots, the finest trainer available in this country. How many more years of service can be extracted from the surviving machines depends on the availability of spares. None have been manufactured since 1941, and some are now difficult to obtain, although cannibalisation should enable operators to maintain some of the type for several years to come. Eventually this grand old aristocrat of the summer skies will become a rarity, a collector's item maintained by the sentimental enthusiast. While stocks last, however, the Tiger Moth will continue to be an economical machine for sport flying. One association which makes full use of the Tiger Moth's capabilities is the *Tiger Club*, founded by Mr. N. H. Jones. With ten machines on strength this club as well as providing sport flying for its members gives displays of aerobatic flying with specially modified aircraft. These aerobatic Tigers have their fuel tank repositioned in the front cockpit and are adapted for inverted flying. It was the Chief Flying Instructor of the club, Mr. C. N. Bishop, who was responsible for the acquisition G-ACDC, the oldest surviving Tiger Moth, formerly belonging to the De Havilland Flying School, and now restored in its original colours. The aims of the club as set out in the membership card are:—

(*a*) To provide a means of meeting for those who take an active interest in light aeroplane racing, displays and other forms of competition.

(*b*) To provide its members with good sporting flying at the lowest possible cost.

(*c*) To work for improvement in the standards of light aeroplane flying, aerobatics, and private flying generally.

It is hoped that these activities may inspire the foundation of many such clubs and that, in the words of the chairman, we may soon make as full use of the air as a medium of travel as we have already made of the other two elements, land and water.

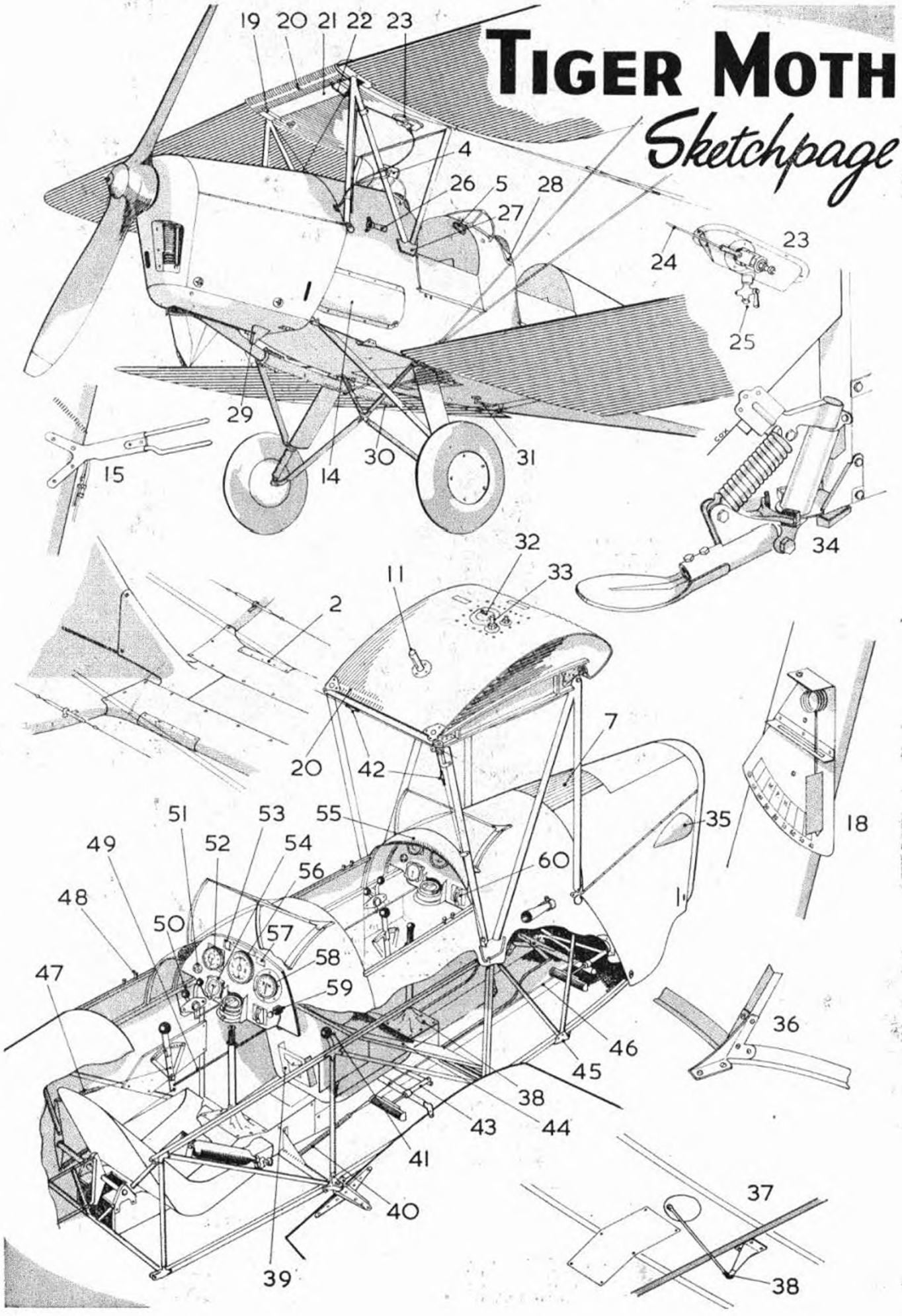
The writer acknowledges the generous assistance given by Mr. N. H. Jones, Chairman of the Tiger Club; Wing Commander Arthur, Chief Flying Instructor at Fairoaks; Mr. E. Baker, C.F.I. London Transport Flying Club; and Messrs. Nightscale and Chandler of the Technical Staff at Fairoaks who have kindly granted facilities for research. Drawings have been directly prepared from machines made available to the author at Fairoaks.

KEY TO DRAWINGS

1. First-aid stowage.
2. Chafing plates on anti-spin strakes.
3. Leather-covered crashpad.
4. Rear view mirror.
5. Handgrips in front cockpit only.
6. Slot for safety harness.
7. Corrugated step plate.
8. T.E. slopes up from aileron to root.
9. Bottom truss members shown dotted
10. Intercom. and baggage stowage.
11. Fuel gauge.
12. Slots not fitted to –OBX.
13. Magneto switches.
14. Oil tank mounted externally for cooling.
15. Pitot on front starboard strut.
16. ¾" white letters:
    L.T.(C.R.S.) S.A.
    FLYING CLUB.
17. ¼" black letters:
    MAX WT. 1825 lb.
    EMPTY WT. 1185 lb
18. Air pressure A.S.I. on front port interplane strut of –IIZ.
19. Metal retaining plates.
20. Corrugations flattened locally to give a smooth strip.
21. Flat cover plate over spar channel in tank.
22. Connector pipe across bridge of tank.
23. Fuel sump.
24. Fuel shut-off rod.
25. Drain cock.
26. Venturi on both sides, chromium-plated on –IIZ.
27. Pressed aluminium fairing.
28. Rubber seal strips for B.F. hood.
29. Oil overflow pipe fairing.
30. Short exhaust on –IIZ, long pipe perforated on lower half on –OBX.
31. Steadying arm for aileron return cable.
32. Filler cap.
33. Overflow valve.
34. Skid detail.
35. Carburettor air intake.
36. Chromium-plated windshield frames on –IIZ.
37. Aileron cam detail.
38. Leather cuff.
39. Map pocket.
40. Spring bias on rudder.
41. Slot locking lever.
42. Slot locking handgrips.
43. Parallel action rudder pedals
44. Front seat mounted in diagonal bulkhead.
45. Jacking pad.
46. Rudder linking rod.
47. Spring bias for tail trimming.
48. Door catches.
49. Tail trim connecting rod.
50. Throttle.
51. Watch holder.
52. Air speed indicator.
53. Deviation card holder.
54. Altimeter.
55. Crash pad.
56. Turn and bank indicator.
57. No smoking notice (white).
58. Engine speed indicator.
59. Cockpit light switch.
60. Oil pressure indicator (red).
61. Pull tab for first-aid access.
62. ¾" x ¼" wood strips.
63. Identification light here on R.A.F. machines.
64. Pitot tubes.

TIGER MOTH

Sketchpage



STARS FROM THE U.S.A.

Bob Gialdini and Mario Rondinell, 10th and 8th in Open Stunt at Nats with Olympics (2 fin Noblers) Bob dropped from 3rd through missing an outside loop

Nobler flier, Nats stunt Champ Jim Silhavy checks controls on Lew McFarlane's 35 Humbler, one of several "new-line" models.

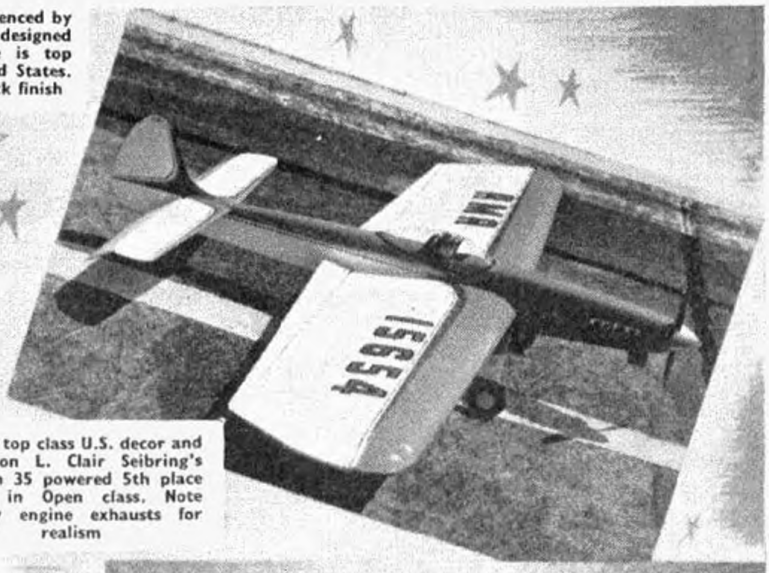
Gialdini's Olympic has Forster 35. Note zippy spat and fin lines—who said there was nothing new?

Earl Carpenter's magnificent 2nd place Navion in Nats open scale event, being prepared in hangar at Dallas

Sterling's Spitfire makes a fine model, this one held by Mrs. Williams was in too ten. Is similar in size to the A.P.S. Spitfire VIII

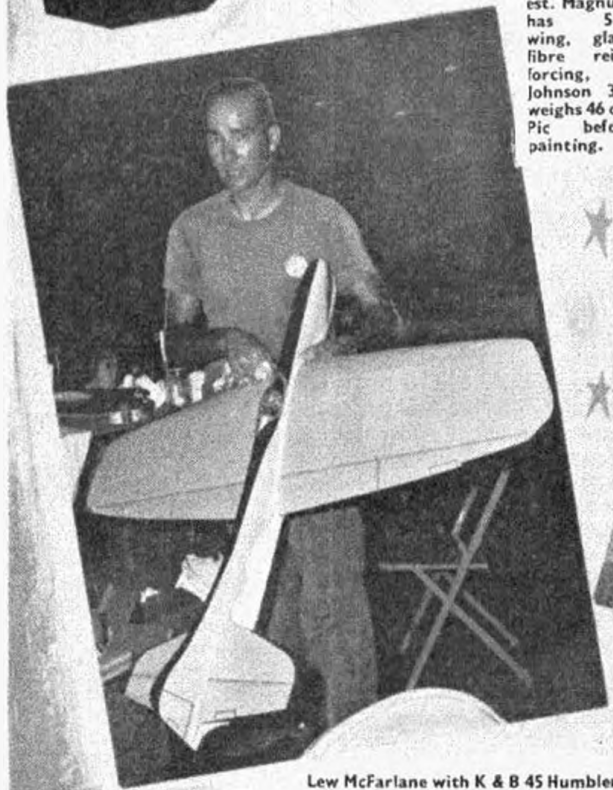
1959 Nats Stunt Champ Bill Werwage was fifth Senior by slim margin in '60 with his sleek Detroiter style design, uses Fox 35 engine

James Vornholt was influenced by D.H. Sea Vixen when he designed Fox 35 "Carousel". He is top Junior flier in the United States. Silk covered, glossy black finish



Typical top class U.S. decor and finish on L. Clair Seibring's Johnson 35 powered 5th place model in Open class. Note dummy engine exhausts for realism

Bob Tucker's "Tucker Special" carries Schneider racer lines, superb finish, at rest on its transport trailer. Another below was 3rd Senior for R. O'Toole, Fox 35



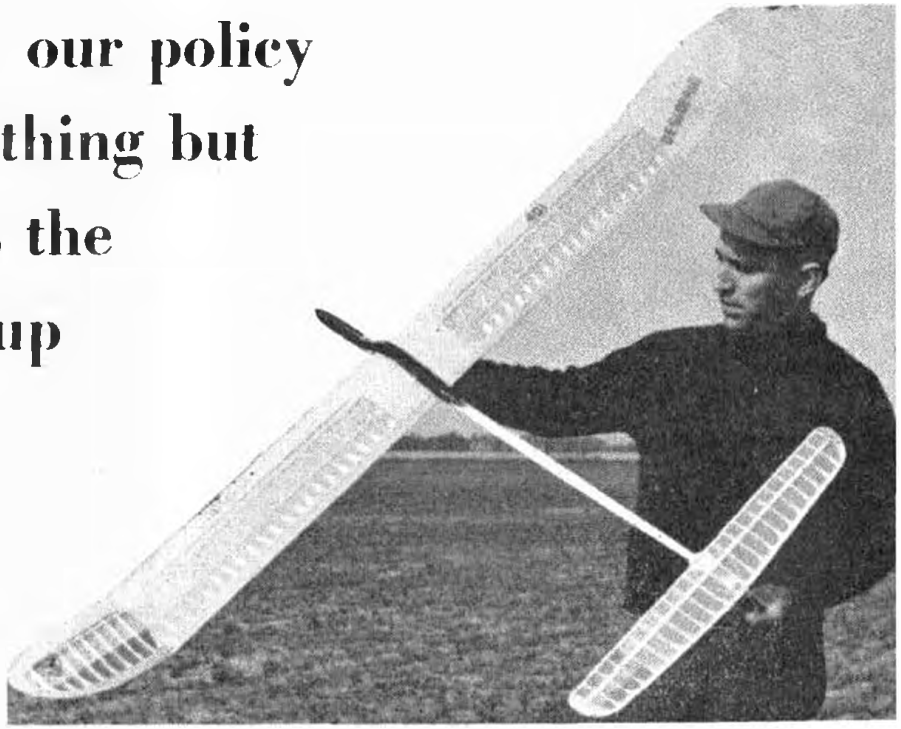
George Aldrich's latest. Magnum has S74 wing, glass fibre reinforcing, Johnson 35, weighs 46 oz. Pic before painting.

Winner of F.A.I. at Nats. was Howard Timlin with Saturn and Solar designs, Oliver Tiger powered and as beautiful a decoration job as we have ever seen

Lew McFarlane with K & B 45 Humbler, a fine flier but pulled bellcrank out on line test! How's this for a new look in stunt design?

PHOTOGRAPHED BY GEORGE ALDRICH

In keeping with our policy of providing nothing but the best—here is the 1960 Europa Cup winner by the top Italian A/2 flier



Carlo Paulo Varetto's Elegant 72 in. span A/2 ROPLANO

WINNER OF THE 1960 "Europa Cup" International in the Saar, a tough event held in trying conditions against the best in Europe, this glider is the ultimate of a series of models the first of which was built in 1954.

The 1955 version was taken to Wiesbaden for the World Championships, where it placed 12th — contributing to the Italian team victory.

For the 1956 World Championships, held at Florence the model missed a place in the Italian team by just a few seconds and so the designer proxy flew for Japan, taking 44th place with Hujikawa's model, being downdraughted three times and making one max and a 179!

At Mlada Boleslav in Czechoslovakia for the World Championships in 1957, 20th place was taken with a very unlucky 39 second flight caused by severe downdraught.

In 1959 Carlo could not go to Belgium because he placed fourth in the Italian team selection trials, and that year, teams were cut from four members to three!

The already-mentioned success in the 1960 "Europa Cup" was made with four maximums and a 146. This was for the second flight, which was made in cool evening air.

At present "*Roplano*" is adjusted for thermal "search", and cannot achieve more than 160 - 165 seconds steady average, but that's enough to satisfy most enthusiasts.

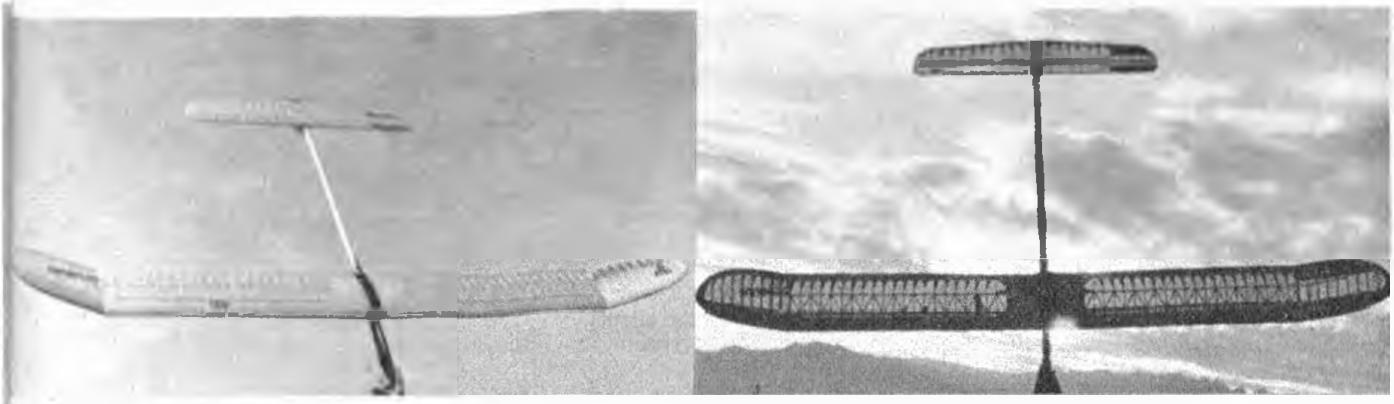
A "Roplano Called Desire" is the full name given to this model: "Roplano" being the name by which the designer's little boy calls all his models — the rest may be guessed.

The following notes on construction methods will help the builder when tackling the continental style of construction which, although usual practice in Carlo's own country, may at first seem complicated by normal British standards.

Wings: Originally the wing section was a Benedek, modified to incorporate to the the developments then taking place in Denmark. Subsequent models had section thicknesses progressively reduced to the present form. This may still seem a little thick when compared to some other designs, but tests have proved that the aerodynamic advantages of very thin airfoils do not warrant the more involved construction methods. The wing structure is straightforward, the only unusual feature being the spar built up with one $\frac{1}{4}$ x $\frac{1}{8}$ in. obeche strip, one $\frac{1}{16}$ x $\frac{1}{4}$ in. ply and one $\frac{1}{4}$ x $\frac{1}{8}$ in. balsa strip. The wing dowels are 10 s.w.g. wire, rooted into the fuselage, but are so fitted as to be removable. The aluminium wing tubes are thus inclined at their seating to give the correct dihedral angle. On the original the wings were covered with yellow Silkspan tightened by several coats of dope and finished with Duco Dulux R.C.47.

Tailplane: Construction has nothing unusual about it, but care should be taken to ensure that this component is not excessively heavy, and, of course, that the surface is not warped.

Fuselage: For many years the designer has been using this system of construction. This is a pod and boom type having the advantages of simple and swift construction and ease of repair. The pod consists of a central lamination of $\frac{3}{16}$ in. ply with two hard blocks cemented to it, one either side and sanded to the cross-section shown. Two $\frac{3}{32}$ in. ply ribs, through which the dowels are freely inserted, completes the structure. The boom is constructed separately. It has a triangular cross-section, with two sides in $\frac{1}{32}$ in. ply and the top is carved

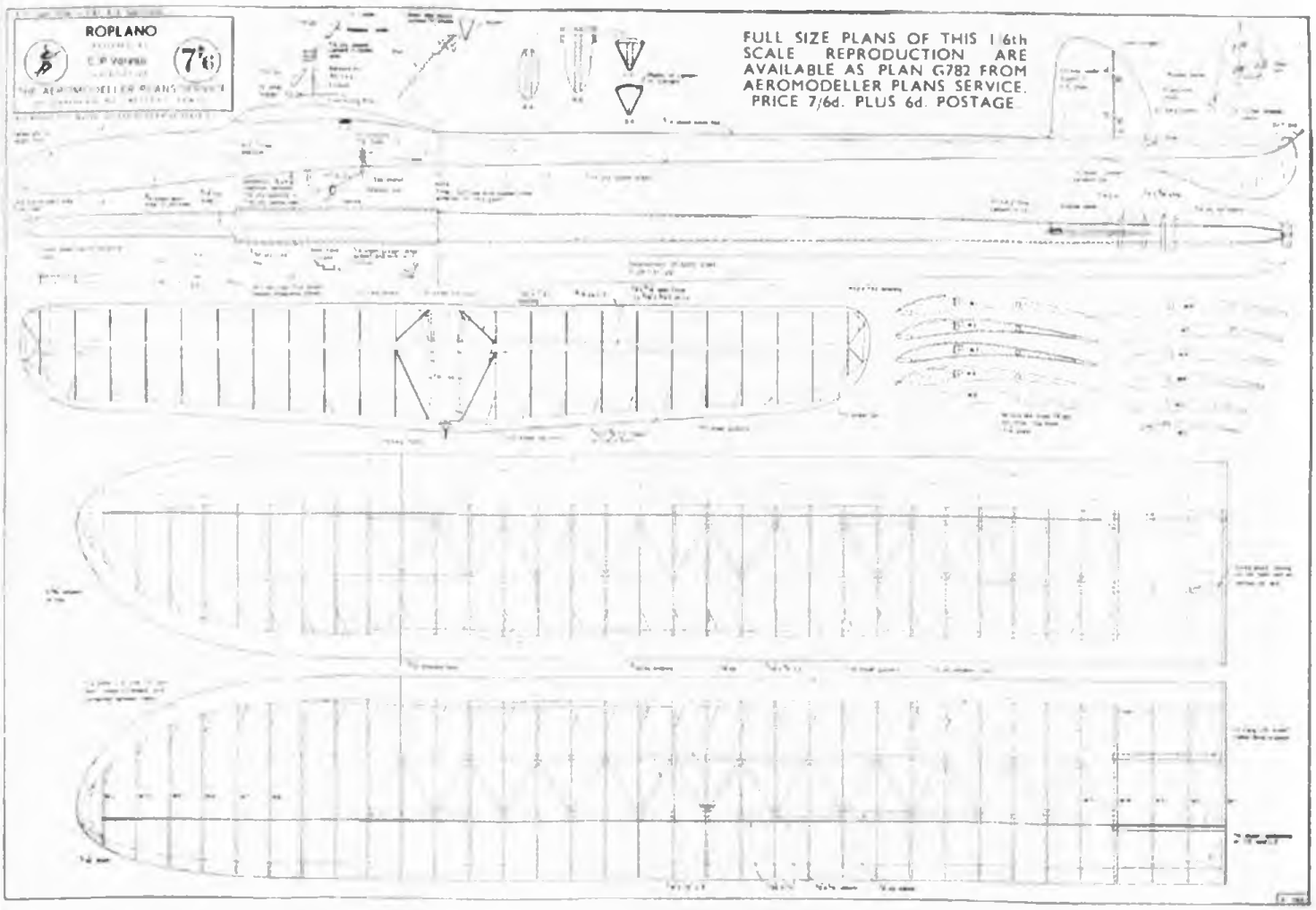


"Roplano" mixes the well proved features of several well-known designs with the elegance of Carlo Varetto's original ideas. Warp free wing structure, essential for Italian summers, towline tripped clockwork dethermaliser and tough pod and boom fuselage structure are practical features from this long experienced Italian expert glider flier

from $\frac{1}{16}$ in. balsa sheet. When the boom is finished, the rudder is inserted into it and then the whole is covered with tissue. The boom and rudder unit should weigh between ·7 and ·9 ounces.

The designer's model needed 2·8 oz. of lead on the C.G. to reach the required 14½ oz. all-up weight, and this improved stability.

Trimming: After several trimming arrangements had been tried it was decided to adopt the settings as shown on the plan, since these gave the best characteristics when holding the model on the line for long thermal hunting tows. The C.G. should be located in the position shown, and the final glide trim corrections made by packing the tailplane.



What to do with Rubber Models?

In recent years it has become apparent that the performance of the unrestricted outdoor rubber model has rather outgrown the size of flying field generally available and the range of timekeepers' eyesight, unless the weather is unusually calm. With the three- and four-minute maximums currently applied in competitions, the flyoffs necessary to give a winner are becoming almost universal and somewhat crowded when good weather is experienced.

John O'Donnell offers his views

Requirements

Some of the requirements of any scheme to restrict rubber model performance can be quoted as under:

(1) Resultant consistent performance to be just under the contest maximum — so as to give a contest where duration is more important than thermal-catching ability, but not the reliability event experienced with high performance combined with a low maximum.
(2) Ease of processing — so this will in fact be carried out — instead of the usual policy of trusting the competitor. The latter is unwise, even if there are more fliers who build inaccurately than who try to cheat.
(3) Independent of model size — so as to be applicable to all sizes and types of rubber model.
(4) Such as to encourage intelligent thought and care in both aerodynamic and structural design.
(5) To be such as to appeal to most modellers and not just to experts.
(6) Not to make all current models obsolete and unusable.
(7) Not to emphasise the importance of the rubber motor compared with the airframe.
(8) To be capable of modification in detail, but not in principle, as model development increases performance.

Attempts

Various schemes for restricted rubber rules have been put forward (and some have been tried in practice). Some of these are listed and discussed as under:

(*a*) *Specifications determining model surface areas, all-up and rubber weights, etc.*

The obvious examples of this are the 80 and 50 gm. Wakefield rules. This requires quite accurate processing and to give the required level of performance the structure is heavy compared with the motor. This does not encourage careful structural design, wood selection, etc. With weight to play with, there is some tendency to indulge in gadgetry which may appeal to the expert prepared to spend the time and money involved — but which certainly is not for the less experienced. (Zurad's much-publicised Wakefield prop assembly is a good example of what can be produced — but by how many?)

(*b*) *Rubber weight limited to a percentage of the all-up weight.*

An example of this was the "Rubber not more than 1/3rd A.U.W." contests staged by the N.W. Area about 1953 - 54. This is easier to check than a "tighter" specification as only a balance with different length arms is needed and applies to all sizes of model. However, it retains the other disadvantages already listed under (*a*).

(*c*) *High required total weight without rubber restrictions.*

The old 8-ozs. Wakefield rule was originally introduced to cut duration. This does not produce much performance reduction, as the extra weight can often be made up with more rubber.

(*d*) *Maximum weight and minimum size rules.*

These sound fine at first hearing as they are best met by very light structure models carrying as much rubber as permitted without going over the total allowed. If the numbers are correctly chosen the performance will come out at the desired level, and clever design and structure will certainly pay. However, a model's life will not be long — for as its structure weight increases with repairs, lubricant, dirt, etc., its motor must be reduced and, hence, its performance will soon decrease below initial expectations. The disadvantages of continually altering the motor are self apparent.

(*e*) *Restriction of rubber length to a fraction of Wing span.*

This was suggested to eliminate weighing and if defined as requiring the distance "between hooks" to be some fraction of wing span (and ensuring motors with little slack by barring tensioning, gears, etc.) then the model only need be checked. With current design proportions, duration could be reduced satisfactorily. However, there would be a trend to large cross-section motors turning very large propellers. These would possess rather too much performance in calm weather, even if they were unsuitable for flying in wind. The difficulties of defining the rule so as to eliminate "span extenders", etc., are obvious. Existing models would not in general be very suitable for this rule.

(*f*) *Restriction of propeller diameter.*

A maximum propeller diameter was once put forward as a method of cutting down performance — about 10-in. being suggested for a Wakefield by P. Royle in a letter in one of the model mags several years ago. The obvious answer to this rule is a large cross-section motor with a step-up gear box. This layout has in fact been used with success by Dick Baxter in the U.S.A.

Without going to extreme limits, this rule is hardly going to be effective enough. The propeller diameter will have to be related to some characteristic of the model for general application, and this may necessitate complex area measurement during processing. With these snags, plus the need for a new design approach, this suggestion is not favoured.

(*g*) *Specification payload.*

This was tried by P.A.A. some years ago but never "caught on". Possibly this was due to the somewhat small and certainly low performance models resulting from the rules. Checking the models was also rather involved Generalising the idea brings us to

(*h*) *Ballast in some form.*

This has often been suggested, but never favourably received. Most ideas have related ballast to model *size* and large amounts are generally considered necessary to reduce performance substantially. The resultant heavily-loaded ultra-lightweights are too fragile to be generally popular.

Author's Recommendation

However, as the aim should be to produce a rubber model with roughly half the performance of the best present-day models, the logical move is to *halve* the rubber weight without affecting anything else. In short, dis-

Readers' letters

C/L Free-flight

DEAR SIR,

Yesterday whilst flying my A.P.S. *Razor Blade* powered by a Frog 349 in the process of loop, I had the mishap to let go of the control handle. The plane immediately soared and after travelling 100-200 yards, the lines tangled round telephone wires of a local company and hit the roof. It then fell some 30 ft. onto concrete.

The only damage sustained was a broken nylon prop and several tissue rips.

My pals and I were so amazed as it flew in level flight that we just stood and stared. I would like to congratulate the designer of the *Razor Blade* for an almost crash proof design and also the makers of Frog engines for an almost indestructible engine, because not many models, or engines would stand up to that. The model was still flyable.

Halifax D. M. HIRST (aged 15)
Yorks

Metal props.

DEAR SIR,

With reference to the plan of the ¼A Pee Wit published in the February issue. The plan states that best results are obtained with a dural prop.

The S.M.A.E. General Contest Rules state, I quote: Section 1, Sub. 1.3. Para 1.3.11. Propellers: The use of metal propeller(s) is Prohibited.

Although there is no recognised class for these models as yet, no doubt they will be used by a few in open events.

D. G. BAUDET.
Exmouth, Devon.

At last we find someone who KNOWS *his rule book! Thank you, Mr. Baudet — and take heed you Pee Wit builders if entering S.M.A.E. events. The rule was, of course, established to outlaw a rash of cast* 10 x 6 *alloy props that were decidedly lethal on* 10 *c.c. Stunt models, etc.*—ED.

New contest class

DEAR SIR,

In recent articles in contempoarary magazines there were some interesting ideas on new forms of contest.

These contests, we feel, would be of greater interest to the average modeller, since they embody several aspects of mode design and flying.

At the present time the aspects of contest model flying, is such, that if a speed contest was organised on the moon, Messrs. Wisniewski, Rossi, and friends, would still head the field. It is not our intention to disparage their efforts, as a great deal of time, money and specialised facilities have contributed to their successes. These self same considerations are far beyond the reach of the average enthusiast and precludes him from entering this specialised field.

It is with hope of encouragement for "John Modeller" that we see developing in the U.S.A. a form of multi-event contest using one model and one engine*. We feel too that this form of contest could be taken up after discussion on the forming of a minimum number of acceptable rules, such as:

(*a*) Contest be divided into 4 parts.
I Stunt—max 100 points
II Speed—m.p.h. = points
III Rat Race—finishing position ± points
1st = 100, 2nd = 90, 3rd = 80 etc.
IV Concours—max 100 points.

The inclusion of rat-racing would introduce a simplified form of team-racing without the over elaborate rulings that exist today.

Further specifications we suggest could be:
(*b*) max engine capacity 5·70 c.c.
(*b*) max fuel capacity 2·5 ozs.
(*d*) fixed U/C
(*e*) line (handle to centre line plane) length 60 ft.
(*f*) only changeable item is the airscrew and fuel
(*g*) no whipping.

Since the minimum number of rulings is essential for the free running of such an event, we feel, that engine cowlings, fuselage cross section, wing area, will resolve themselves (by virtue of the concours and stunt points) into reasonable aeroplanes.

Duration as a points winner has been omitted as it makes the contest inordinately long to run off flights of 1½ hours duration Imagine 6 whale bellied planes going on for an hour plus with many more entrants awaiting their turn, for this contest alone!

In conclusion we would suggest that the whole question of the specialised event pure speed etc., would be left to those individuals with the aforementioned facilities, while the contest outlined above organised for the majority.

J. JONES.
Mackworth, Derby.

* *The U.S. contest, known as the Air Youth State Championship event, used to select sponsored modellers for free participation at the U.S. Nationals, is a great idea in our opinion. We hope to offer further details of the A.Y.S.C. "Quadrathon" contest at a later date.*

Glass fibre warning

DEAR SIR,

Further to Mr. W. A. Bennett's letter concerning glass fibre in issue of January 1961 I would be grateful if a correction could be made in his statement on release agents.

Never use silicone based polishes. The best results are obtained with the hard solid wax type such as Simonize. A tin will last for ages but one can always give the car a treat with the remainder.

Curing time can be speeded up even more if the laid up mould is placed in an elevated temperature say 90 deg. F. for a period of six hours. After it has cooled off it should be ready for service.

We should be grateful if this information could be published and thereby disappointment to glass libre model laminators avoided.

P. A. T. SMITH.
Man. Director. BONDAGLASS LTD.
Croydon, Surrey.

Smallest Airfix

DEAR SIR,

I noticed in "Trade Notes" in the January AEROMODELLER that you stated that the smallest model aircraft in the Airfix range was the Supermarine S.6.B with a 4¼ inch wingspan and the largest was the Short Sunderland with an 18¼ inch wingspan.

Whilst agreeing that the Sunderland *IS* the largest, I would like to point out that the smallest is, in fact, the Fokker D.R.1 Triplane with a wingspan of 3 13/16 inch. The next largest model is the Sopwith Camel with a wingspan of 4¼ inches. Upon checking the Supermarine S.6.B, I found that the wingspan was 5 inches, *not* 4¼ inches. I have no doubt that other readers will write to you pointing this mistake.

S. V. TUCKER.
Ashtead, Surrey.

Sorry! This'll teach us not to accept manufacturer's hand-outs as factual!—ED.

continued from previous page.

posable ballast carried should be related to *rubber weight* and as a first suggestion should be equal to it.

Discussion of Recommendation

Whilst any rule change tends to give rise to new layouts, most of the currently-employed techniques could be retained. Existing models are not rendered useless as they could be fairly easily converted. Replacing half of a model's rubber by lead should not substantially alter either the flying characteristics or strength.

It may be argued that performance would be increased by reducing the motor to, say, 60-70 per cent. of its original weight and carrying extra ballast to suit. If this is true, then the existing model has not enough rubber in it. The moral should be obvious.

If such a rule is adopted, then processing should be simple as the contest organisers merely require a balance with equal (or otherwise if the ratio is different) arms for comparing rubber and ballast weights. From the flier's point of view, slight variations in motor weight can be compensated by altering the ballast in preference to cutting odd inches out of the motors. As motors will have to be short, little or no tensioning will be needed after checking and so this and the refitting of the ballast could and should be witnessed by the timekeepers.

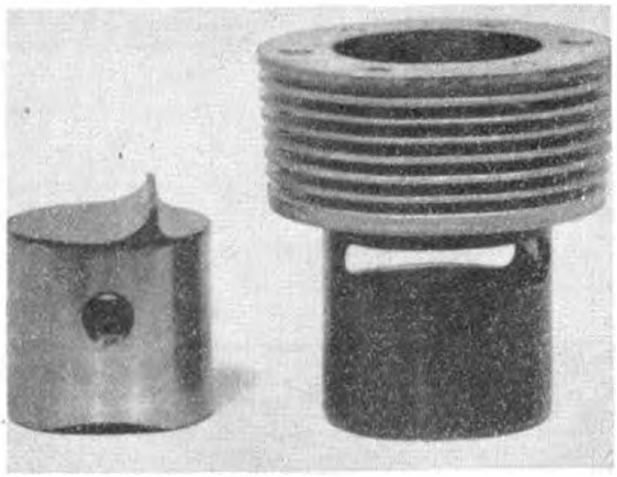
It is further suggested that the F.A.I.'s notions on the carrying of ballast be dispensed with, and that external ballast be legalised. This is considerably more practical than internal stowage as the ballast can be designed so that in a crash it comes off the model without having first to go through intervening structure. The internal stowage idea sounds a carry-over from full size practice and hardly seems a logical requirement for models.

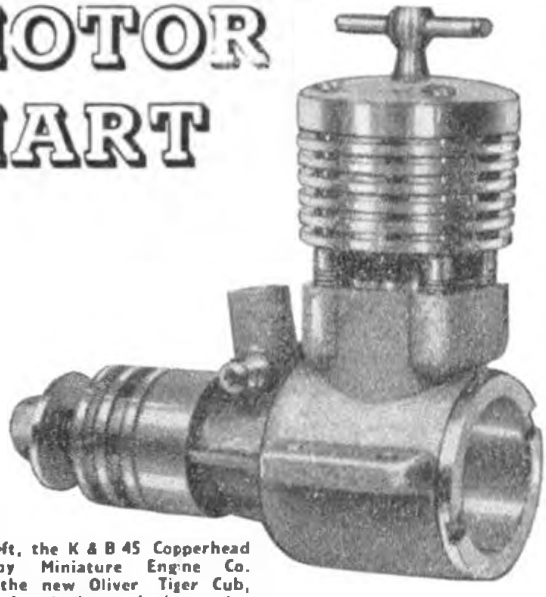
Conclusions

As the present 50 gm. Wakefield rules are not to everyone's liking, some change in them is bound to be made eventually. As I am opposed to strict specifications generally, and the present trend to higher flying weights and lower power in particular, I would like to see some attempt made to evolve a more general (and more popular) set of rules.

I feel that the ballast/rubber weight scheme has considerable merit and is well worth discussing by practising rubber fliers; and, if considered acceptable, tried out by holding contests to this rule. Having found any hidden snags that may exist it should be possible to make some real contribution towards a practical, stable and popular set of rules for "restricted" rubber models — at both National and International levels.

MOTOR MART





Above left, the K & B 45 Copperhead mods by Miniature Engine Co. Above: the new Oliver Tiger Cub, just ripe for the increasingly popular ½A T/R models

ENGINE CONVERSION SETS are coming into vogue, perhaps following the fashion of the car people with their prodigious market of "Hotting-up" kits. From America, the **Miniature Engine Co.** of California markets a series of *Copperhead* versions of the K & B 35 and 45's. The combat version of the 35 can be supplied with polished and sloped transfer ports, and all are available with chromed cylinders as an extra, but the standard Copperhead conversion comprises a replacement hard piston with new gudgeon pin, connecting rod and copper plated cylinder fins plus new bolts and gaskets. **Southern Radio Control** of Portslade offer this set to re-vitalise a 45 R/C "Better than new" at 86s. Copper plating has always been used as a means of promoting cooling, and with a hardened, lapped piston assembly the conversion should be good for long life.

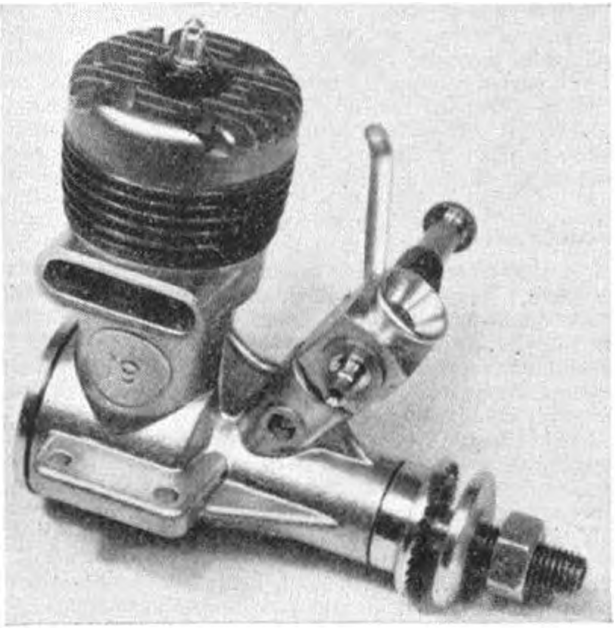
Another U.S. modification set is a rear disc assembly for 4 hole backplate engines, the Fox, K & B and McCoy 29's and 35's. Idea is to *use* the extra carb for more power—shades of Bill Atwood's 60 and its original twin intakes! Marketed by **National Engineering Associates** of Missouri, the *Hopkit*, costs $1.95.

A new name enters the British model engine trade this month from Slough, Bucks. **Dydesyne Ltd.** have secured the services of Gordon Cornell for design and development of high quality engines, starting with the *Dynamic* .049 diesel for which 0.1 B.H.P. is claimed at 17,500 r.p.m. This high performance .8 c.c. contest motor is a bold introduction which should meet the current demand for top performance in the rapidly expanding new comp. class. The engine is clean in external appearance and its central carburettor disguises what amounts to quite a new approach to induction. This is in the form of a drum valve which discharges *vertically* into the crankcase and for the most part, directly under the piston giving almost "Bicycle pump" induction, for want of a better expression. Starting has been said to be remarkably easy, and fuel draw more than adequate.

A prototype of this new style diesel has provided impressive results, the high performance being due in no small measure to the twin ball race supported shaft, unique induction and good working fits. In spite of the use of races, weight is still restricted to 2¼ ozs. which is not excessive for the capacity. Price is set at £4 19s. 6d. and deliveries will commence immediately.

Another new engine which has just been introduced is the latest version of the **Oliver** *Tiger Cub* 1.5 c.c. diesel, prototypes of which have been so ably demonstrated in the ½A team race class by Mike Bassett. The new Cub promises to more than maintain the enviable reputation of its elder and larger brother, sells for £6 10s. 0d. and will no doubt soon be building up a waiting list. The shaft is supported by the same races as used in the 2.5 Oliver Tiger and our example has that beautiful free running fit about BDC which one comes to expect of Oliver products.

As we go to press, first visits to the London Toy Trade Fair reveal that **A. A. Hales Ltd.** announce an entirely new series of **Cox** engines, to be imported soon as available off the production lines. To be known as the **Tee-Dee's** the capacities are to be ·010 (yes, 0.163 c.c.), ·020, ·049 and ·15 cubic ins. Great surprise is that all will have *front* rotary induction. Pressure nipples will be fitted on all the engines, and not unnaturally, all four newcomers will have greater power output than their predecessors. Prices will be £4 6s. 6d., £3 16s. 7d., £4 9s. 6d. and £6 14s. 11d. respectively.



Left: Latest from Australia is Gordon Burford's Gle-Chief 19 R/C which sells at A£5. 19s. 6d. Has gold anodised head, is .64 in. bore, .62 stroke

ENYA 15D

Mark II

Propeller — R.P.M. Figures		
dia. x pitch		*r.p.m.*
9 x 6	Frog nylon	10,600
8 x 4	Frog nylon	13,800
8 x 6	Frog nylon	11,500
11 x 4	Top Flite	8,800
10 x 6	Top Flite	8,800
10 x 3½	Top Flite	10,100
9 x 7	Top Flite	9,000
9 x 6	Top Flite	9,800
9 x 4	Top Flite	12,000
8 x 4	Top Flite	14,800
9 x 7	K-K nylon	9,000
9 x 6	K-K nylon	9,300
9 x 4	K-K nylon	12,700
8 x 6	K-K nylon	11,900
8 x 4	K-K nylon	14,400
9 x 4	Trucut	11,500
8 x 6	Trucut	11,300
7 x 9	Trucut	11,500
8 x 4	Trucut	14,600
7 x 6	Trucut	11,500
7 x 4	Trucut	17,000
6 x 9	Trucut	14,600
Fuel used	D-C "Quickstart" diesel fuel	

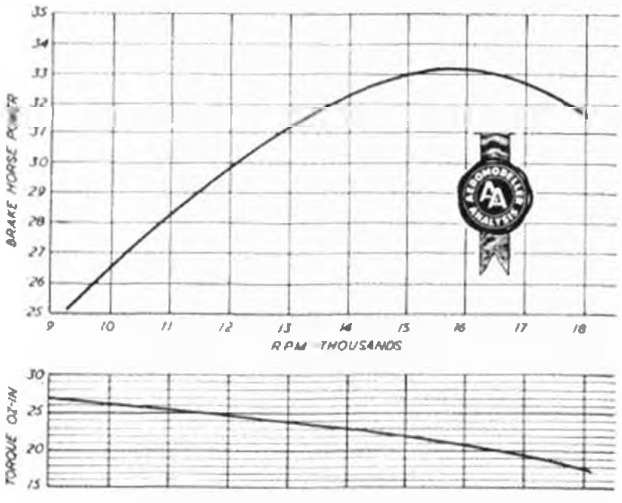
Displacement: 2·443 c.c. (·149 cu. in.)
Bore: ·589 in.
Stroke: ·547 in.
Bore Stroke ratio:
Bare weight: 6¼ oz.
Max. power: ·332 B.H.P. at 15,000 r.p.m.
Max. torque: 27 ounce-inches at 9,000 r.p.m.
Power rating: ·135 B.H.P. per c.c.
Power weight ratio: ·053 B.H.P. per oz.
Material specification
Crankcase unit: Pressure die-cast light alloy
Cylinder: Mild steel
Crankshaft: Hardened steel
Piston: Cast iron
Contra piston: Cast iron
Connecting rod: Light alloy casting with bronze bushings
Cylinder jacket: Turned dural
Spraybar: Brass; nickel plated
Bearing: One 11·5 mm. ballrace at rear; bronze bush (front)
Manufacturers
Enya Metal Products Ltd., Tokyo, Japan

ENGINE ANALYSIS No. 80

by R. H. Warring

CONTINUING TO DEVELOP their loop-scavenged 2·5c.c. diesel, Enya have beefed up their design somewhat in the Mark II version, improved the performance and offer a throttle unit as an extra to give a power plant which should be equally at home for racing or contest work, or general-purpose "sport" application (particularly radio control). Performance is way up in the top class — a measured B.H.P. on test of ·332 at 15,500 r.p.m. — and the Enya Mk. II is extremely robust, although this has been achieved at the expense of producing a somewhat heavy 2·5 c.c. engine (over 6 ounces). Handling characteristics are generally excellent; alternative venturis are provided for "stunt" and "speed" work and the barrel-type throttle control is both cleverly designed and about the most efficient of its type we have encountered on an engine of this size.

The loop-scavenged diesel is essentially a post-war Japanese development and is no longer a novelty, as such. The system offers certain advantages for high speed running — which is why it is generally favoured for the racing-type glow motors. Main new feature of technical interest on the Mark II Enya 15, therefore, is the truly enormous crankshaft — a full 11·5 millimetres diameter (·4515 in.) running in a ball race at the rear end with the front length supported by a bronze bushing in the crankcase.

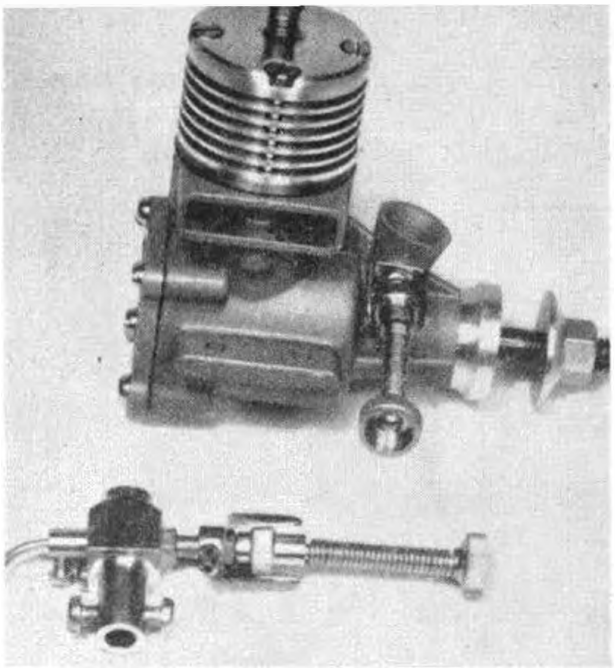


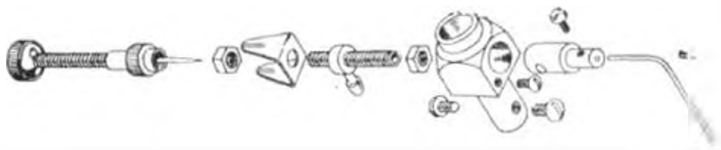
Large shaft diameters have been a favoured point in previous Enya designs and in the Mark II would appear to be carried to a logical limit. Specific advantages of a large diameter are reduced bearing loads and greater strength, at the expense of increasing the actual rubbing speed. Strength does not automatically follow as much depends on how the front end is "stepped" or reduced in section, as well as material specification and heat treatment. In this instance the front end of the shaft is stepped down to a ¼-in. diameter threaded length, the dural prop driver fitting on a narrow chamfer on the main (full diameter) section. In a sense, this does not realise the full material strength since the ¼-in. diameter length is entirely unsupported and virtually "cantilevered" from the front of the main section. Plenty of strength is left in the main length of shaft, the ¼-in. diameter central hole leaving a wall thickness of some 0·1 inch whilst the purely circular port opening is 5.16 in. diameter. Were it not for the fact that Enya obviously favour large shaft diameters we would be tempted to say that the use of a shaft of this diameter in a 2·5 c.c. diesel was as much a "gimmick" as anything else as similar overall strength and performance could undoubtedly be realised in a smaller size.

Accommodation of the shaft has called for a new crankcase design, although the external proportions are quite normal and the actual bearing length and overhang does appear to have been reduced, compared with earlier models. The intake tube is now quite short and angled forwards, bringing the needle valve rather near the propeller disc. However, the properly-engineered flexible extension means that adjustment can be carried out with complete safety — and it is a pleasure to handle a needle valve extension which is so positive and sensible.

For normal running alternative venturi inserts are provided to fit the intake tube, locating around the spraybar. There is very little actual difference in throat diameter, or in performance on bench test until the high speeds are approached. However, with the smaller throat opening, specified for stunt work, needle settings are definitely less touchy.

The throttle unit fits inside the intake tube (after removing the conventional spraybar) and is held in position by two screws through the holes in the wall left by removing the spraybar. A cubical section at the top houses a brass barrel valve controlling the throat opening whilst the fuel feed is from a tube on the right





Components of the T V (Throttle Valve) for all Enya engines, shows how needle valve body is firm, while choke revolves around the jet

hand side with the fuel feed teed into this tube at about its mid-length, controlled by a needle. This simple arrangement cleverly avoids the difficulty of having to locate the fuel feed hole accurately with respect to the barrel valve, as is the case when a barrel throttle is employed with a conventional spraybar arrangement.

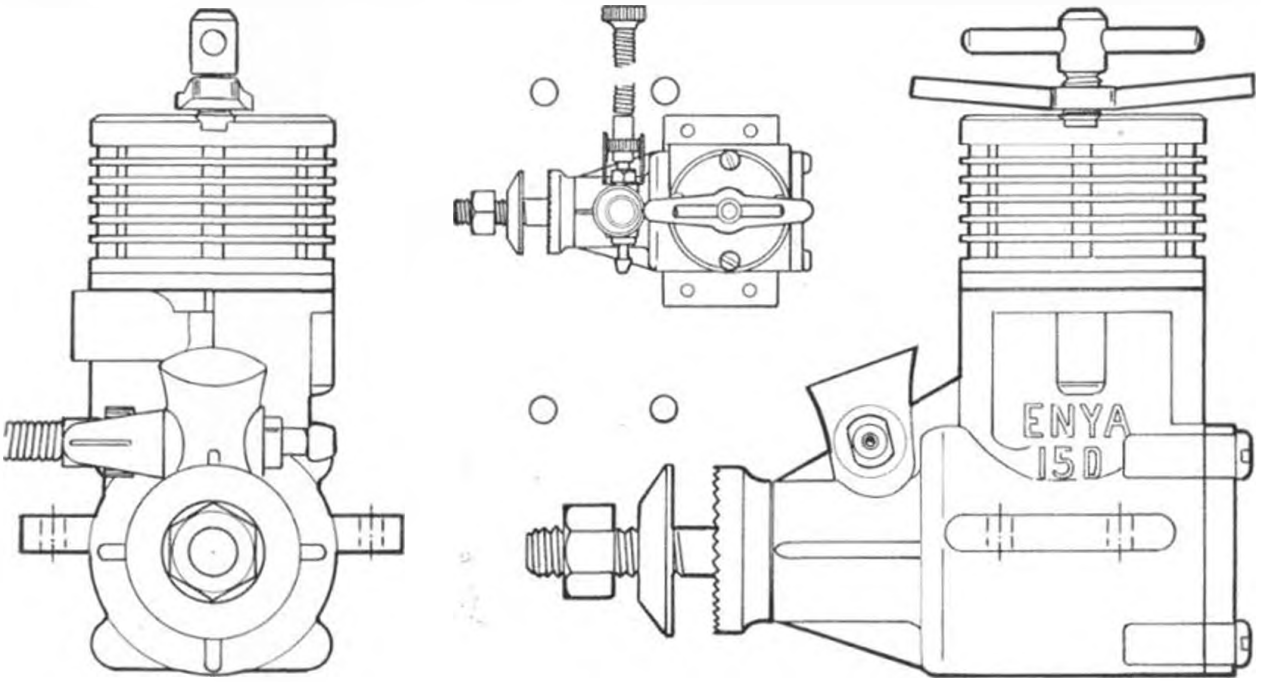
Throat diameter is appreciably reduced with the throttle control and results in a loss of approximately 1,000 r.p.m. at 11,000 - 12,000 r.p.m., compared with the standard set-up. The loss is somewhat greater than 10 per cent. at higher speeds, and less at lower speeds. Throttle effect is positive and progressive, with a minimum of lag. At minimum throttle setting, the engine is running slightly rich, but responds immediately to opening the throttle without hesitating. The Enya will start at low throttle setting, which is seldom the case with throttle controls. Minimum "low" speed which could be held consistently was 3,000 r.p.m., from full throttle load speeds in the region of 10,000 to 13,000 r.p.m. Although the throttle responds over the whole of its movement, it is only over the latter part that a substantial reduction in speed is achieved, but the performance is most consistent. Enya have obviously paid a lot of attention to developing this throttle and they have certainly got it just about as good as possible.

General running characteristics need little description, except to say that the Enya Mark II is a very easy engine to handle for a racing diesel. The chief characteristic is that a prime through the exhaust is virtually essential for starting — which may be a bit of a handicap for team racing applications. Also at propeller loads corresponding to *high* speeds one is not always quite sure of the settings and considerable inter-adjustment of needle and compression may be called for.

Slow speed performance is very good, with torque continuing to increase down to 9,000 r.p.m., although there is quite a marked loss of power on warming up at low load-speeds. With increasing speeds progressive opening of the needle is called for. Whilst peak power was achieved on test at 15,500 r.p.m., performance remains smooth and consistent at much higher speeds, even approaching the 20,000 r.p.m. figure.

Construction-wise, the Enya 15 D Mark II features an elaborate pressure-die-cast crankcase unit incorporating the lower cylinder housing and stub exhaust, with cast-in transfer passages. The cylinder is of substantial section, ·709 in. overall diameter, with a large diameter flange seating on the crankcase unit and sealing with a gasket. A rectangular transfer port 9/16 in. wide and $\frac{1}{8}$ in. deep is cut through the wall slightly staggered below a diametrically-opposed exhaust port of similar dimensions. Actual transfer, governed by the crankcase passages, takes place through the ends of the transfer port, the centre of the port being blanked off when the cylinder is assembled. The cylinder is of unhardened mild steel, ground outside to finish. The bore is, rather surprisingly, chromium plated.

The piston is of cast iron, with a conical top and one side wall cut away to provide transfer timing, leaving incidentally what could be a weak point since some 1/16-inch only of metal is left by the gudgeon pin hole. The gudgeon pin itself is 5 mm. diameter, fully floating, hollow



and fitted with brass end pads. The contra piston is quite conventional and again of cast iron. Piston-cylinder fit in the crankcase unit is very good. The cylinder is located and held down by four screws.

The crankshaft web is of normal diameter but quite thick and counterbalanced. The crank pin ¼ in. diameter, hollow, and the whole shaft hardened and then ground over journal length and crankpin. The connecting rod is a casting with cast-in big and little end bushes in bronze. The big end faces of the rod are machined and the bushes reamed to size. Fits are excellent.

The main ballrace is a press fit in the crankcase unit after machining the housing. The bronze plain bearing length is accurately finished by honing with a detectable clearance although when assembled there is no apparent "rock" on the shaft.

Altogether, in fact, it is difficult to do other than praise the Enya 15-D-II as an exceptionally well-made high-performance engine. It is obviously an extensively-developed engine and its performance speaks for itself. It is extremely well-made, with particular attention to accurate fits and finishes — not only where they particularly matter, but everywhere. A sound investment for contest work, its very effective throttle control unit makes it an equally attractive proposition for radio control, etc., with a somewhat "derated" performance.

CLUB NEWS

WE'RE OFF AGAIN! Who'll own up to being the chump who lost a four-foot radio job in the Slough, Bucks, area? I have a nice letter telling me that the model awaits collection; but alas it bears no identification. Here is a chance for someone to make money selling name and address labels. I claim no charge for the suggestion, all we need is a little enterprise from someone with a small print machine — and I do NOT refer to the one that knocks this copy out for you to read!

Northern

The exhibition held by **ROTHERHAM & D.M.F.C.** in conjunction with the Rotherham model makers on the 6th, 7th and 8th of October, 1960, proved a financial success with nearly £30 going to club funds, and it is hoped to make the exhibition a bi-annual event. New members will be welcomed at club meetings held on alternate Tuesdays at the A.T.C. Headquarters, William Street.

Fears that **HALIFAX M.A.C.**'s flying on the local field might be curtailed have been somewhat allayed by the granting of official permission. This was much appreciated by local modellers. Several of the sceptics were shocked recently when, in a combat bout, an old A.M. 25-powered *Skystreak* completely outpaced a Silver Arrow-powered *Peacemaker*. Little flying activity over the Christmas period was due to the freezing conditions, members preferring to stay indoors.

First-ever Wharfedale C/L Rally will be held at R.A.F. Rufforth in June. Provisional date is June 4th. Events will include combat, stunt, ½A, A & B team racing. Further details will be published at a later date.

At a recent club meeting it was unanimously agreed that Wharfedale should present a trophy to the S.M.A.E. to be awarded to a T/R competition. It was suggested that the trophy should be called the "Wharfedale Trophy" and may possibly be competed for at the 1961 Nats. The obvious event being Class ½A T/R. Sorry lads, the R.A.F. M.A.A. have beaten you to it!

Ray King, keen F/F power exponent, was placed top of the Northern Area power averages for last year, and members offer him congratulations. Club interest in F/F classes is growing. Members will assist in the running of T/R events at all Northern Area centralised meetings in 1961. Concentration will be directed towards International class racing, but other T/R classes will receive attention. Wharfedale invite any one interested in modelling in the Leeds/Skipton/Harrogate district to come along to the club meeting, held on the 1st and 3rd Friday of each month in the Salum School Rooms, **BURLEY-IN-WHARFEDALE.**

Since the influx of new members into **HUDDERSFIELD M.F.C.** some hot motors have appeared which, along with the new models hold promise of some exciting flying in the coming season. Eagerly awaited is the appearance of a multi-channel radio job with a 10 c.c. engine, it has been promised by a retired modeller at an absolute bargain price!! A sad occasion was the maiden flight of the Club Secretary's A/P.S. *Gypsy Moth*, one of the finest scale flights seen ended on the only building within flying distance. So endeth the Moth.

London

CHINGFORD M.F.C. feel they have made good progress during the past season, and it has been decided that the Club combat team should be revived. On last December 18th, the long-awaited duel with neighbouring *Debdenairs* was flown and a good time was had by all, in fact they are very anxious to obtain other such engagements in the near future.

On December 14th, **KENTON M.A.C.** held a novel indoor comp. Each club member (and girl friends) was given a sheet of paper of the same size to make a paper dart of any design. Contest was of three flights, total time of all three to count. Surprise winner was I. Bone, who made a helicopter!? "T"-shaped paper, pitch twisted into horizontal piece, wrapped round a piece of chalk, thrown to ceiling, chalk falls away, paper spins down — cheat! On January 11th Editor Ron Moulton gave them a film show, mainly of International championships. This went down very well and was much appreciated.

The Annual General Meeting of the **HORNCHURCH M.A.C.** was held on December 12th. The Secretary is now Harry Spiller who replaces Bob Wells. Bob is now out of hospital following his accident some months ago and has accepted the post of Treasurer. Hornchurch Aerodrome will still be available to them in 1961, although the future seems uncertain. Club meetings may possibly be held weekly now, which it is hoped will help to "pep" up enthusiasm.

A few days before the New Year, **NORTHWOOD M.A.C.** held its annual Christmas party, which was the most successful to date, turkey being included on the menu (wonder if it was carved by Razor Blade?).

They have been sending representatives to the London Area Meetings for over a year now and can heartily recommend it for up-to-date news and also a get-together between clubs. (Good to see that at least some clubs go to area meetings and play their part in the S.M.A.E.)

The younger members of **ST. CLEMENT DANES M.F.C.** seem to have lost interest. "Old faithfuls" still attend the regular club meetings. In spite of depleted ranks, several interesting models have been brought along, including a combat wing and a team racer powered by an E.D. Bee.

HAYES & D.M.A.C. would like to arrange a postal F.A.I.-team race contest with any other club in G.B. or *anywhere in the world*. Club can field up to six T/R teams. The final of their combat contests was between Dave Balch and Robin Greenaway, Dave emerging as victor. Unfortunately, it has been impossible to run off the T/R and speed competitions for lack of a tarmac or concrete area. Does anyone know of anything suitable in the London area? Apart from a reheat Rossi Vulcan jet job, the speed section of the club will be concentrating on 5 c.c. this year. At a recent club meeting Laurie Barr, who runs a model making concern, gave an illustrated talk on professional model finishing and it was brought home to all present that non-professionals are strict beginners when it comes to finishes.

ST. ALBANS M.A.C. held their A.G.M. on January 12th on which occasion an impressive array of trophies and diplomas were presented. Editor Ron Moulton made the presentations. No less than three S.M.A.E. diplomas were presented to Junior Champion M. Knight, who has done extremely well over the past season. G. Fuller is club champion, J. Simeons power and glider champion and B. Rowe rubber champion. Despite winter weather, flying is still taking place on Sunday afternoons as well as building in the permanent club room. J. Simeons' giant Anderson Spitfire, *Dixielander*, has made its maiden flight and has (so far) proved to be very stable.

On December 20th last, **FELTHAM & D.M.A.C.** held a social and prizegiving evening at "The Railway Tavern", Feltham, when the club cups were presented. Main concentration is now on control-line stunt flying, with eyes on all stunt comps. — especially the Nationals.

SPRINGPARK M.A.C. held its A.G.M. on January 10th. Officers' reports reflected a reasonably successful past season. The second round of the I.D.I.C.C.C. was reached by beating the West Middlesex M.A.C. by a narrow margin, but in the semi-final, that team was overwhelmed by St. Albans. The club's best team effort yet was 11th out of the 58 teams in the *Model Engineer* Cup.

The club has also been active at area level (wish more could claim the same!) and adds its voice to the many others appealing for increased support from London Area clubs. A much modified and simplified version of D. Williamson's A/2 has been produced as a club design. Regular meetings are held at the Assembly Rooms, Coney Hall, West Wickham, Kent, on Tuesday evenings at 7.30 p.m. to which new members are welcome.

"M.A.R.S." (Model A/C, Radio and Scale) flying club is now affiliated to the S.M.A.E., having members from all over London. Negotiations for the use of part of Biggin Hill Aerodrome are now in the final stages. Flying has already started this season, an R/C "Little Toot" suffering damage (though not serious) due to a little too much left rudder. Building is in progress for the coming season, the goal at the moment being the "Nats." Under construction are *Luscombe Skypal*, an *S.E.5A*, *D.H. C.1 Chipmunk*, *Ercoupe*, *Stosser* and a *Piper Cub*.

Midland

HINCKLEY & D.M.A.C. has had a face lift during the past year finishing with Dave Nixon being elected secretray. The club won the Midland Area F.A.I. T/R Championship with first place at the last three meetings and look forward to an even brighter future.

MARKET HARBOROUGH M.A.C. held its first competition of the New Year on January 12th, for engine starting. Needle valves had to be fitted as part of the proceedings and engine had to run for 15 secs. Event was won by Eric Vye with a Taifun Hurricane and an

average of 26·7 secs. in two starts. Top junior was Peter Driver with D.C. Bantam and 46·6 secs. — a *Quick*start? Attendances on the Dingley Road Flying Field for Sunday afternoons have been good. V. Redfern has fitted lights to his "Tomboy" to prolong the flying hours, but B. Michael, one of the club's leading radio men, crashed his multi *Smog Hog* while flying inverted.

Southern

R. Payne flies his Merco 35-powered R/C Deltas regularly at **EAST GRINSTEAD M.F.C.**'s flying field. Every development seems to make the models smaller and the latest one rally howls round the sky. On Sunday, January 8th, the club held an open glider comp. for which a very handsome shield had been made. Athough odds were on P. Smith to win, and he certainly looked like doing so with two max's and 1 : 20, L. Fuzzard's *Caprice* was consistent enough to eventually win by 6 secs.

HORLEY Club have no free-flight field so flying is mostly control-line. Members have a good selection of engines, if not planes, including six Silver Arrows, tuned ETA 29, several ETA 15s and an Oliver. Although there is little interest in sport free-flight, R. Vincent is building an *Inch Worm*, and plans are in hand for *Creeps*, *Heatwaves* and *Eurekas* to be prepared for the coming season.

Present number of active modellers in **LEE BEES** control-liners is down to six. Two of the better-known members, Ray Brown and Ken Day, are practising for the coming season, whilst others are concentrating more on team racing. Interest in all branches of the hobby are evident despite this specialisation. Flying takes place on Saturday and Sunday afternoons on Lee-on-Solent Air Station and modellers in the area, interested in joining,should contact M. Johnston, 24 Anglesea Road, Gosport, Hants.

SOUTHAMPTON M.A.C. clubrcom has just been redecorated by the council (Cheers!). Members consider themselves most fortunate as the colour scheme employed is the one they suggested! A club representative met members of the council, explained the situation fully and this had the desired effect.

North Western

URMSTON D.M.A.C. has a new clubroom and the promise of a new flying field and now boasts 25 enthusiastic members. For December, the monthly comp. was for weight lifting, finally won by Mr. W. I. Bennett, the club secretary, in sub-Arctic weather conditions — K. Hulme's twin-engined flying wing took second place. Annual Dinner was held at the Hughenden Cafe on Saturday, January 7th, attended by some twenty members, and was the occasion for a very pleasant social evening after an excellent meal.

After a period of club-room difficulty, **WALLASEY M.A.C.** are now firmly established in the Birkenhead Y.M.C.A. where they meet on the first Saturday in every month. Unattached modellers are known to be operating in these parts and all are invited to join the club. Radio expert, Stan Hinds, home for Christmas from the South, showed how powerful capacity effects can be, when sorting out John Hanney's Ford superhet Rx. The aerial has to be kept well away from battery leads, and battery and meter resistance must be kept low. When this was done the Rx, previously not operating, worked perfectly.

After spending exactly five months out on snow-covered Dartmoor John Hannay's Hill-equipped "Guidato" has been found! First examination reveals that the model is somewhat soggy — who's kidding! — the P.A.W. 2·49 appears serviceable; but what about the radio ! !(corr ! !) — reappearance of the model is awaited with interest.

WHITEFIELD M.A.C. now incorporating East Lancs Model Aircraft Society, has taken on a new lease of life. Their victory in the Rootes Trophy was the result of teamwork between seven flying members and nearly a dozen helpers. Several club contests have been well attended, including a Novices F/F event to give new members a bit of encouragement.

Flying activity in **LIVERPOOL D.M.A.S.** has been low lately due to the poor weather. However, there is much building board activity several new models nearing completion. The New Year appears to have brought a rash of madness with it as two radio controlled saucers are about to take the air, but the most ambitious project is an eight channel de Bolt *Pursuit*. Free flight power man A. Carter ended 1960 with a second place in the Frog Senior. A recent talk by John Hannay proved of great interest and several members are *thinking* of building an A/2 for the coming season.

Standard of flying is still improving in **CHORLTON M.F.C.**, mainly due to the influx of Olivers, Rivers and PAW's. Control line models are mostly wings with a couple each of *Peacemakers* and *Black Ghosts*. Apart from combat, B. Parslow has a 40 in. flapped stunter for Rivers 2.5 and Les Hart is building a "334 G" for his Oliver. J. Bowden flies an O.S. 29 class "B" T/R., speed is 95—100 m.p.h. over 40 laps. J. Birks gained the Junior National Championship for 1960 and K. McGee was N.W. Area C/L Champ.—good show Chorlton!

For your Diary

April 30th. High Wycombe C/L Rally. A, B T/R, Stunt, Combat. *R.A.F. Booker.*
June 4th. Wharfedale C/L Rally. *R.A.F. Rufforth.*
June 11th. Midland Area Rally. Open F/F, Chuck Glider, ½A Power, ½A, A, B T/R, Stunt, Combat, Concours d'Elegance R/C. *R.A.F. Wellesbourne.*
August 12th. Devon Rally. Open F/F, ½A Power, Combat. *Woodbury Common.*
October 1st. South Coast Gala. *Venue to be announced.*

South Western

EXMOUTH & D.M.A.C. held their first Annual Dinner on Friday, December 16th, 1960 at the "Deer Leap", Exmouth, 54 members, wives and friends devoured an excellent meal and had plenty of the cup that cheers. The club Chairman, P. M. Baudet presented the club trophies, after which the usual party games and dancing followed.

TAUNTON M.A.C. has had a steady intake of new members since May 1960. Present strength being 26 since the acquisition of ETA 15's and Rivers members have been getting down to some serious Team Racing practice for the coming season, but speeds are below the required standard as yet. Interest in C/L extends to Stunt, Combat, and the construction of suitable scale naval aircraft for the "Carrier Deck" to be built, later this year—let's hope this does materialise.

South Eastern

A new club known as the **BANSHEES M.A.C.** has been formed at Bromley in Kent. Meetings are held each Thursday in the William Morris Hall, Mason's Hill, Bromley at 7.30 p.m. anyone wishing to join is most welcome. Regular flying meetings are held each Sunday. Most interest is in combat and stunt and F/F Sport with recent enthusiasm for chuck glider, most members finding it more difficult than it seems. At a recent flying session, a *Peacemaker* "went F/F" due to flying circles converging, both lines were reversed and the Peacemaker ended its career in a tree.

On December 11th, **BRIGHTON & D.M.A.C.** conducted the fly-off for the Arthur Mullett Rose Bowl, postponed from November, West's *Dixielander* returned 5.56 against Fred Boxall's open rubber job's 3.36. On December 18th in conditions of mist, the Chairman's Cup for seaplanes was held at Ditchling and eleven members turned up, five with seaplanes. The conditions were such that there was no drift and de-thermalisers were dispensed with in truly still air conditions. Fred Boxall, flying a rubber model, scored three perfect maximums, including a last flight well over 4½ minutes. Ian Lucas, flying a Frog 150 R powered *Clot*, just missed a perfect score by 4 seconds on his second flight. Results: 1. F. R. Boxall—9 mins. 2. I. C. Lucas—856. 3. J. West—8.20.

A new club has come into existence at **RYE GRAMMAR SCHOOL M.A.S.** Twelve members have a room to build in, during lunch break, and flying takes place on Tuesday evenings after school. Interests are ½A Team Racing, Radio Control, Stunt, and combat.

East Anglia

A new club, to be known as the **BATS M.A.C.** has been formed in the Basildon New Town area, with main interest in Control-Line Combat. Recent acquisition of several new engines raises members' hopes to attend as many rallies as possible in the forthcoming season. Interested modellers in the Basildon area are requested to Phone: Laindon 3247.

Andy (The one and only) Anderton celebrated his first year with the **NORWICH M.F.C.** by winning the rubber and glider trophies and the 1960 Club F/F championship. Another newcomer J. Johnson won the power trophy. A/2 specialist M. Woodhouse won the new A/2 trophy after strong competition. Ex chairman A. Shorten would like to contact some F/F sport, scale and R/C enthusiasts as most club interest is in F/F contest or C/L models.

A Jetex twin appeared at the recent **CAMBRIDGE M.A.C. A.G.M.** No faster than the others but much more smelly, and it takes two bodies to hold the pole down! The club is hoping to repeat the success of last year's slope soaring rally—date and place are to be decided very soon. New secretary is Miss S. Allsopp, and P.R.O. C. Hall.

Western

Because of the bad weather the Sunday flying outings of **WESTON CONTROL-LINERS** to R.A.F. Locking have been cancelled for several weeks, much to the annoyance of the many keen modellers of Weston Control-liners M.A.C. who want to get in practice for the coming competition season. However, time will not be wasted and more models are in production. Bill Evans of the local Model Shop has an ambitious project at hand, in the shape of a control-line Handley Page V.1500 for four 2.5's. The span is 7 ft. and he has been asking for volunteers to help cut out the 250 ribs! This he hopes to fly at the Nationals. He is also having some speed pans made for his two Dooling 60's. Top speed on the first outing was 134 m.p.h.

South Midland

Interest in **KIDDERMINSTER & D.M.A.C.** has swung to radio control. There are at least seven sets and models about to take the air—most should already be there by the time this is published. Messrs. Fellows and Mountain are constructing multi-channel sets in the hope of emulating their past successes in the coming season. There is also a thriving interest in contest power. These trends give much more latitude to Club activities than has been the case in the past when control-line was dominant. However, for the moment at least, control-line still has most fans. Several large stunt models have appeared recently and there are more to come. Combat still retains popularity, and of two competitions held recently, the first for senior and junior members, the second for juniors only, results were Senior competition: Winner—M. Richards Runner-up P. Tawser. Consolation prizes were given to two juniors—D. Wood and R. Williams. Junior competition: Winner—A. Lewis—Runner-up B. Connell. The interest shown by the juniors of late, is outstanding (good show). In combat alone, they have proved that they can more than stand up to the seniors and at least one junior is entering into the field of radio control. New members are welcome and should contact, Mr. I. Mowbray, 51 Chester Road, South.

North Eastern

WEST HARTLEPOOL CONTROL LINERS M.F.C. was recently formed with a membership of 11 regular fliers. Sessions are held every Sunday morning at the local recreation ground, and on occasions Thornaby Aerodrome is used since it affords more space. Members do not have a club room, preferring to meet at members' houses, so saving club funds. During the coming season they hope to try three in a circle formation aerobatics. At the moment practice is quite promising although with only two in a circle so far. The models are 1.5 c.c. powered "*Hawker Furies.*"

Services

Competitions have been held in GUTERSLOH M.A.C. including a team race. "Bob" Grimwood using a Webra Mach 1 won by virtue of fewer pitstops but it was later proved that he was using a larger tank than the others (all tanks being home made!). Radio control is now an up-and-coming interest. One A.P.S. *Waveguide* owned by Bob Grimwood and one O.M.U. *Vanguard* owned by Flt./Lt. Glasspool (and son!) are awaiting trials, and of course, fair weather!

A/2 gliders are also popular. B. Carless forever trying to get more than 3 mins. and succeeding quite often even on cold days.

Ireland

On Boxing Day, BELFAST M.F.C. Team racers were blown out and the meeting postponed to February 18th at Maghabervvy Aerodrome where 1A, A. & B. Team Races will be run. While test flying his new "Red Devil" "A" racer, at the same time as running in a new Oliver, M. Doyle flew 1,000 laps *non-stop* (???) trying to beat 60 min. for the distance. The model flew at 80 m.p.h. for the first 25 laps, and 500 laps were covered in 29:50, but over the next 500 the lines had to be un-wrapped twice to give the pilot some control and final time was 61 min. 9 sec. which is reasonable for running in on an 8 x 8! Incidental result was that the Fuel Filter was well and truly hunged, so that practically no fuel would go through. Best time over 10 km. in the 1,000 laps was 5:32 and overall average 61 m.p.h. The Club sold Christmas Cards before Christmas to raise funds, a staunch effort by all bringing in sorely needed cash.

Peter Valentine's scaled down R6 B with Unitone has had one airing so far, but with a Lucky Lindy section and Eifflaender 1.5 pushing along, the model climbs at about 45 deg., and is rather hard to get used to, being too fast and too maneouvrable! This club would like to hear from clubs from South of Ireland, whom they are unable to contact.

Scotland

To the ANGUS D.A.L. 1960 was their most successful contest season in terms of numbers of competitors. League champion is once again (4th successive year!) David Petrie, who really excelled himself topping all the free-flight categories to score an aggregate of 4020 points, out of a theoretical 5400. Second and third were also from Montrose, W. Petrie, cousin of the champ, with 2512 and C. Campbell with 2425.

Montrose was the leading club, scoring 9367 points, however, Bucksburn have had quite a revival having initiated quite a lot of new aeromodellers to contest work this year, and are quite proud of their 6999. Arbroath have had a disappointing year and only made 710 points. Highlight of the League's activities last year was the challenge to the West Coast modellers. This was such a success that for 1961 there is likely to be a threeway comp. with the inclusion of the newly re-organised South East Area. Meantime the incidence of foot and mouth disease in this region has forced one club—Bucksburn—to ban all flying for the meantime (Better this, than incur the undieing wrath of the farmers so many of us depend on for flying fields).

Pen Pals

D. W. Drew of 7742 Paddington Drive, Normandy 21, Mo., U.S.A. would like to correspond with British or German adult active in rubber and intermediate R/C building own equipment. James E. Hayes (14 years and Claude W. Hayes (16 years) of Edgemeade Boulevard, Madison, Tennessee, U.S.A. wish to correspond with modellers in other parts of the world. Interested in all control-line events and also free-flight. Who would like to help an Indian modeller? N. K. Jhunjhunwala, P.O. Montinagar, Faizabad, U.P. India. Harold Yung, Christianstr. 26, Leipsig, C.1, East Germany, wants to correspond with British modellers in the German language.

The CLUBMAN

Secretarial Changes

Banshees M.A.C. (*Bromley*): C. J. Ralphs, 30 Manor Road, Beckenham, Kent. *Blackburn* (*Welfare*) *M.F.C.*: D. C. D. Coupe, 86 Northfield Lane, Harbury, Nr. Wakefield, Yorks. *Cambridge M.A.C.*: Miss S. Allsopp, 83 Gunhill Way, Cherry Hinton, Cambridge. *Croydon & D.M.A.C.*: D. Partridge, 126 St. John Road, Redhill, Surrey. *Derby Controliners*: R. Gibbard, 6 Holden Avenue, Ashton-on-Trent, Nr. Derby. *East Anglia Area*: L. J. Sayer, 58 Sherry Rise, Chelmsford, Essex. *Harlow M.A.C.*: I. M. Kimber, 35 Ward Crescent, Bishop Stortford, Herts. *Hinckley & D.M.A.C.*: D. W. Nixon, 11 Station Road, Elmesthrope, Earl Shelton, Leicester. *Hornchurch M.A.C.*: H. Spiller, 25 Nasby Road, Dagenham, Essex.

New Clubs

BATS M.A.C.: M. Taylor, Green Trees, Longden Hills, Basildon, Essex. *Coatbridge M.F.C.*: D. Brown, "Dundley", 40 King Street, Coatbridge. *Norwood* (*M.A.R.S.*): L. M. Blane, 7 Upper Beulah Hill, Upper Norwood, S.E.19. *Newton Aycliffe M.F.C.*: W. Snowdon, 25 Lightfoot Road, Newton Aycliffe, Co. Durham. 341 (*Preston*) *Squadron A.T.C.*: Flt./Lt. G. P. Briers, 3 Whitelens Avenue, Lea, Preston, Lancs. *Rye Grammar School M.A.S.*: B. Seale, Sport's Farm Cottages, Small-Lythe, Tenterden, Kent. *Stroud & D.M.C.*: M. W. Elderkin, 2 Frome Hall Villas, Bath Road, Stroud, Glos.

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PRESS DATE for issue April 1961, February 17, 1961

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Unmade KK Skystreak, Mercury Wasp, little used Dart, 60/- o.n.o. Bateson 9 Beech Avenue, Hexham, Northumberland.

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Mills 1·3 35/-; Frog 249, mod., 55/-; ETA 29, Mk. III, 40/-; several good Mighty Midgets, 6/- each; GHR PC Tx and Modulator, 70/-. 52 recent *American Modellers* and *Model Airplane News*; 100 AEROMODELLERS '50 - '59; 80 *Model Aircrafts*. Offers. Pask, 29 Highthorne Drive, Moortown, Leeds17.

E.D. Racer (flown twice), minus spraybar, 50/-; AEROMODELLERS, Oct. '58-Nov. '60 (two missing); 1959 *Aeromodeller Annual*; several M A P books; Plans to value £4/4/0. Sell for 35/-. S.A.E. please. Box No. 645.

A.M. 35, 45/-; A.M. 25, 40/-; little used; D.C. Spitfire, just rebored, 30/-. Amey, 305 Cherryhinton Road, Cambridge.

21 *Mechanix Illustrateds*, 8 *Model Airplane News*, 50 AEROMODELLERS. S.A.E. for list. Brian Shaw, Broomhurst, Ridgeway Road, Dorking.

Fuji 19, bench run only, 35/-; A.M. 3·5, 35/-. Anderson, "Halyards", Westfield Close, Uphill, Weston-super-Mare, Somerset.

The latest American radio control ORION, uncovered, £16. D. Burgess, 68 Salisbury Street, Amesbury, Wilts.

Selling up: Oliver Tiger Mk. 3, £5; Reworked Silver Arrow, £6/10/0; K.B. Torp 19, £5; O.S. 15 Mk. 2, just run in, £4; unused Merco 35, £5/5/0. Warren, Bromfords Villa, Borwick Lane, Wickford.

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EXCHANGE

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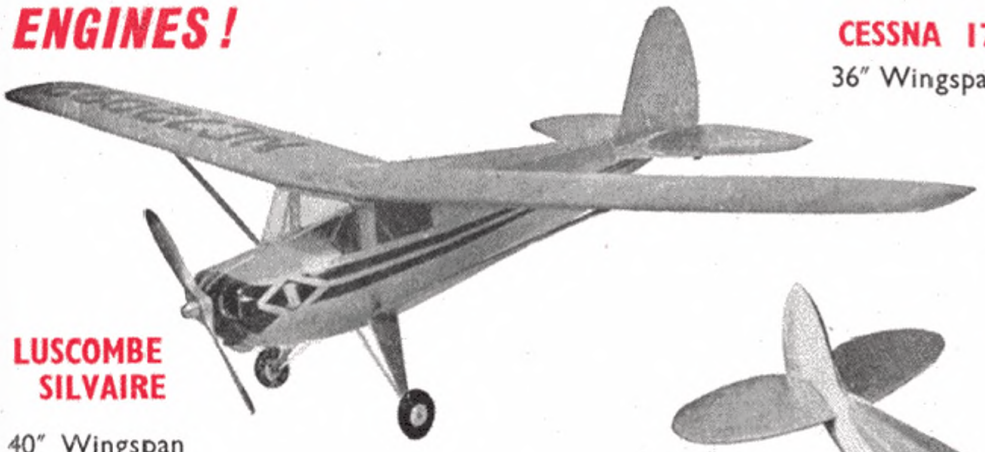

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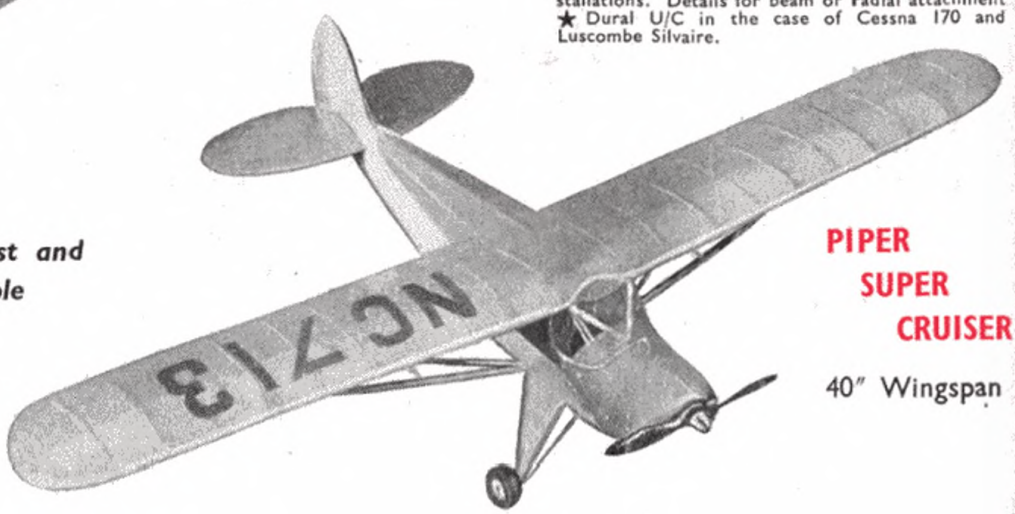

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