

MODEL

# *aircraft*

OCTOBER 1959

1'6



*Inside*

**World Glider  
Championship**

*full report*

# KEILKRAFT *For all your modelling needs!*

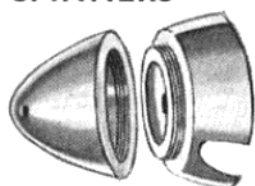
## KEILKRAFT PROPELLERS

For rubber powered free flight duration models

6" diameter	... 1/9
7" "	... 2/2½
8" "	... 2/6
9" "	... 2/7½
10" "	... 2/11
11" "	... 3/2½
12" "	... 3/8
13" "	... 4/8
14" "	... 5/10
15" "	... 6/3½
16" "	... 7/3½
17" "	... 8/0½
18" "	... 8/5½



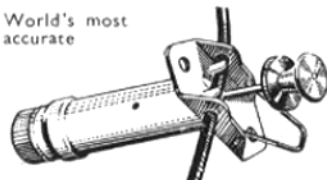
## KK "SCREW-ON" SPINNERS



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

## ELMIC TIMERS

World's most accurate



Mini-diesel with cut-out (illustrated)	... 8/9
Universal	... 14/7
Diesel	... 12/10
Petrol (electric)	... 12/3
Baby D.T. (dethermaliser)	... 6/5



## KK FUEL CUT-OUT

4/10

Positive action

KK FUEL FILTER ... 2/6

Not only do we manufacture Britain's largest and finest range of model aircraft kits, but we also make and distribute a big assortment of accessories a few of which are listed below.



## KEILKRAFT AIRWHEELS

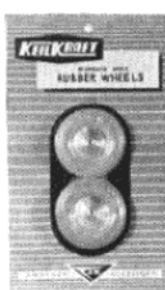
Fully pneumatic

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

## KEILKRAFT SPONGE RUBBER WHEELS

Either streamlined or balloon section.

1½" diameter	3/1
2" diameter	4/3

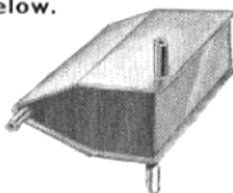


## WHEEL COLLETS

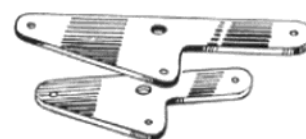


10 or 12 gauge. Plain or domed. 4d. each.

## KK FUEL TANKS



½ A 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



## KK BELLCRANKS

"Ranger" type (aluminium)	3½d.
"Stunt Queen" " "	3½d.
Small plastic type	3½d.
Medium " "	3½d.
Large " "	3½d.

## PLASTIC ENGINE COWLS

3 different types  
Suitable for models of 36"-48" span. 1½ each.



## KEILKRAFT CEMENT

An all-purpose cement that will not weaken. Colourless and fast drying.  
Midget ... 4d. Large ... 10d.  
Medium ... 6d. Monster ... 1/6

## KEILKRAFT DOPE



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



## MODELLING PINS

In the attractive Keilcraft Bubble Pack  
Per pack ... 1/-

## KK CONTROL LINE WIRE

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

Terylene Thread  
100 ft. on card 7½d.



## KEILKRAFT FUELS

Blended with B.P. ENERGOL lubricating oil, these fuels give clean running and super performance. In the list below the first two are diesel fuels and the last two are for glowplug engines.



Keilcraft Nitrat Diesel Fuel (10 oz.)	... 3/-
(20 oz.)	... 5/-
Keilcraft ReCORD Powerplus (10 oz.)	... 3/6
Keilcraft RECORD Methanex (20 oz.)	... 5/6
Keilcraft RECORD Super Nitrex (10 oz.)	... 4/9

## ★ 1959 KEILKRAFT HANDBOOK

Get your copy of this useful handbook and catalogue before it is too late. Price 1/6

Insist on

## KEILKRAFT SANDED BALSA the ONLY sanded balsa



Why not try one of these Keilcraft Hobby Packs of useful assorted sizes of sanded balsa sheet or block.

Sheet Balsa Hobby Pack	... 1/-
Block Balsa Hobby Pack	... 2/-

**BUY THEM AT YOUR LOCAL MODEL SHOP**  
**OVER 3,000 KEILKRAFT STOCKISTS in GREAT BRITAIN**





*Mr. Latern writes -*

I'm very tired, I have just had a holiday - a family holiday - so I'm going to let somebody else do my writing for me.

He is a good-looking fellow too, as you will see from his photograph, and with that hat I don't think any of you will have any doubt as to his nationality. And when you hear his name you won't have any doubt as to his ability as an aeromodeller.

What he has to say is written in his own hand-writing on the back of the photograph, so if you turn it over you will be able to see it for yourself. In case you can't read his writing here it is in type:-

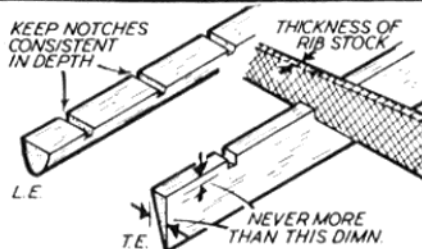


"During the whole of my aeromodelling career, I have used many grades and brands of balsa wood, but in latter years have used Solarbo exclusively, having bought my first supply from Hearn's Hobbies in Melbourne, Australia, whilst I was in the N.A.A.F. several years ago.

In my opinion, Solarbo excels in those qualities necessary for the construction of competition winning models. Consistency of texture, high grade of finish, and well controlled warp free seasoning."

(signed) Brian Horrocks

*British Nationals Gold Trophy Winner - 1959*



**BALSA TIPS . . . . . No. 24**  
 Notching the trailing edge of a wing or tailplane is generally to be advised for accurate rib location and maximum joint strength. A wing leading edge can also be notched, where the section used is fairly thick. The best tool for cutting these notches is a flat file. Keep the depth of notch small—just enough to locate the rib—and consistent at each rib position. And make sure each rib fills its notch, when assembled.

**THE BEST TIP OF ALL ALWAYS ASK FOR SOLARBO BALSA**



**THE BEST BALSA YOU CAN BUY COMES FROM SOLARBO LTD - COMMERCE WAY - LANCING - ENGLAND**

'Phone: LANCING 2866-7-8

'Grams: SOLARBO, WORTHING

# RADIO & ELECTRONIC PRODUCTS

G. HONNIST-REDLICH. Prompt Mail Order Service. S.A.E. for Price Lists and Information. Trade enquiries invited

## THE COMPLETE RANGE OF R.C. EQUIPMENT

### KITS

"AEROTONE" Receiver. Single or multi-channel "tone" ... 83 -  
 "AEROMODELLER" Receiver. Single channel "carrier" ... 64 -  
 "PRINTED CIRCUIT" Carrier transmitter. Pre-tuned ... 20/6  
 "MODULATOR" tone generator ... 38/8  
 "P.C." and "Modulator" combined are suitable for the "Aerotone". All kits are pre-assembled and contain all finished components.

### ACTUATORS

"UNIAC" motorised ... 44 -  
 "MINI UNIAC" motorised ... 52 -  
 "SOLENOID" for lightweight multi models, rudder control ... 30 -  
 "OMNIAC" motorised for single or multi, double geared M/M motor ... 60 -

### A Full Range of Accessories

R.E.P. 1/2-oz. Relay ... 24/- Telescopic aerials, switches,  
 3-Reed unit ... 35/- condensers, resistors, valves,  
 6-Reed unit ... 60/- transistors, equipment cases,  
 8-Reed unit ... 70/- etc.

★ 27 M/cs TRANSISTORS  
 Complete with Circuits and Component Values for "Tone" Single- and Multi-Receiver 44/-

### COMPLETE EQUIPMENT

Combining RANGE, RELIABILITY, DURABILITY, achieved by up-to-date "TONE SYSTEMS"

"UNITONE" single channel tone. Hand held transmitter ... £8/17/6  
 2 1/2 oz. Receiver ... £7/2/-

"TRITONE" 3-channel reeds. Hand held transmitter ... £9/3/5  
 5 oz. Receiver ... £11/6/-

"SEXTONE" 6-channel reeds. Crystal controlled transmitter with "Joystick" control. 8 oz. Receiver ... £30/-

"OCTONE" 8-channel reeds. Simultaneous operation. Transmitter and matched 10 oz. receiver ... £50/-

★ 27 M/cs CRYSTALS  
 Complete with Circuits and Component Values for "Carrier" and "Tone" Transmitters 40/-

You can order R.E.P. Equipment from your LOCAL MODEL SHOP

8 STATION PARADE, SHEEN LANE, MORTLAKE, S.W.14

Telephone: PROspect 9375

## POPULARITY PROVES VALUE

In sixteen Countries, in every Continent, R.E.P. Equipment is gaining place and prominence.

### R.E.P.

#### ★ STAR POINTS ★

- ★ "Tone Stability" achieved by use of tuned high "Q" chokes in all transmitters.
- ★ "Receivers" totally enclosed, protected from dust and exhaust fumes.
- ★ "Temperature Stability" ensured by choice of high stability components.
- ★ "Sextone" and "Octone" fitted with original "Neon Flasher" battery voltage signal.
- ★ "Pretuned", no adjustments or tuning required.

PARAGUAY • ARGENTINE • PORTUGAL • YUGOSLAVIA • SOUTH AFRICA • SWITZERLAND • ITALY • NEW ZEALAND • FINLAND • MALTA • BELGIUM • THE CONTINENT • INDIA • AUSTRALIA • HOLLAND

**SUPPLIES THE WORLD!**

**Equado**  
BALSAWOOD

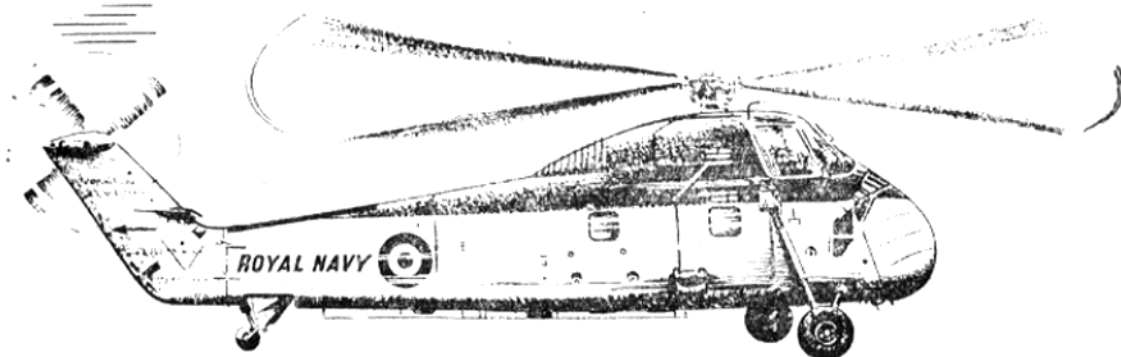
More and more satisfied clients the world over receive their regular shipments of Equado—such is the popularity of this fine balsa wood used by modellers everywhere. Equado balsa wood is supplied in metric and English sizes.

TRADE PRICE LISTS ON APPLICATION TO SOLE MANUFACTURERS AND SHIPPERS.

**E. LAW & SON (TIMBER) LTD.** 272-274 HIGH STREET • SUTTON • SURREY • VIGilant 8291-2



*A Royal Navy Wessex helicopter.*



# NEW 5 YEAR COMMISSIONS AS HELICOPTER PILOTS IN THE ROYAL NAVY

IT WAS THE ROYAL NAVY which pioneered the Service use and operating techniques of helicopters.

Their versatility makes them of vital importance to the Navy for anti-submarine duties, landing Marine Commandos, rescue work and many other tasks.

You can now join as a commissioned officer

for specialised training to serve as a helicopter pilot.

The term of engagement is five years and you will receive a tax-free gratuity of £675 on completion of service. The increasing and widespread use of helicopters offers opportunities to trained pilots in civil life afterwards.

Ages of entry are between 17 and 23.



*For full details, write to:*

**OFFICER ENTRY Dept. MAC/7, THE ADMIRALTY**

QUEEN ANNE'S MANSIONS, LONDON, S.W.1

FAA7

# Model Aircraft Books



## ANOTHER SUCCESS STORY!

ALL ABOUT MODEL AIRCRAFT shows signs of being as popular and as successful as the previous Peter Chinn book *How to Make Model Aircraft*. In fact the response to the new book has surprised us, and the first printing is starting to sell out. Make sure of your copy by ordering it now.



From your bookseller or model shop, or direct from

## PERCIVAL MARSHALL & CO. LTD.

19-20 NOEL STREET, LONDON, W.1

### ALL ABOUT MODEL AIRCRAFT

by P. G. F. Chinn. 6s.

A new book by a world famous author published in magazine size format (the same size as *Model Aircraft*). 112 large pages are packed with up-to-the-minute information on the latest methods of building and flying. The 24 chapters contain over 50,000 words and the text is enlivened by over 400 illustrations which include 350 "how-to-do-it" photographs. 6s. from your model shop or 6s. 8d. post paid from the publishers. (U.S.A. and Canada \$1.50.)

### RADIO CONTROL OF MODEL AIRCRAFT

by G. Sommerhoff. 7s. 6d.

Third edition. Contents include: an explanation of radio theory, descriptions and details for assembling various transmitters and receivers, including a transistorised receiver. Notes on commercial receivers and on trimming and adjusting. Circuits for simple control systems with an explanation of the author's own methods of control which were developed after a long period of trial and error. The installation of the equipment in the aircraft, etc. There are numerous drawings and diagrams. 7s. 6d. from your model shop or 8s. post paid from us. (U.S.A. and Canada \$2.00.)

### POWER DURATION MODELS

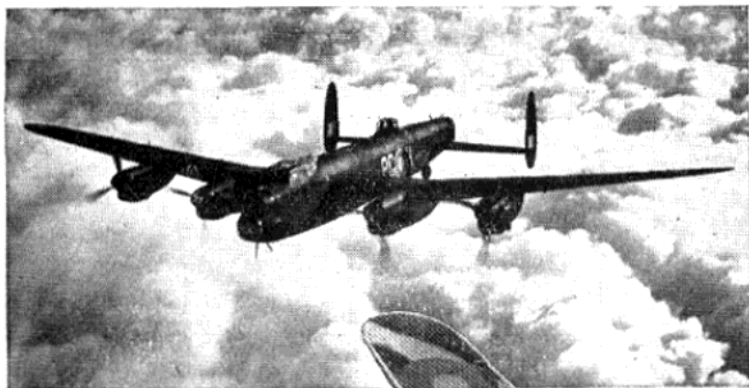
by R. H. Warring. 6s.

Numerous diagrams and tables. The author has analysed some 150 successful models and presented the result in tabular form. The book is divided into two parts: Part I summarises design data for a considerable number of various types and, subject to certain limitations, provides the would-be designer with all the facts and figures he needs in order to produce a successful model of one of these types. Part II takes each type of design layout in turn and describes optimum or best design proportions and layouts, with attendant structural details. 6s. from your model shop or 6s. 8d., post paid (U.S.A. and Canada \$1.50).

### CONTROL-LINE FLYING SPEED CONTROL-LINE MODELS STUNT CONTROL-LINE FLYING

All by R. H. Warring. Each 6s.

These three companion books by a famous author cover the whole subject in detail. One title 6s. 9d. post paid (U.S.A. and Canada \$1.50). Two titles 13s. 2d. (U.S.A. and Canada \$3.00). All three books 19s. 6d. post paid. (U.S.A. and Canada \$4.00.)



Copyright photograph by permission of Imperial War Museum.

## Just like the real thing!

Airfix kits are not just models — they're exact replicas, each series to a constant scale.

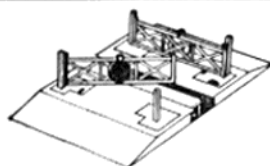
There are models galore in the Airfix range! Aircraft from fighters to bombers (all to the same 1/72nd scale), OO gauge railway accessories, vintage cars, historical ships. Airfix value is unbeatable — ask your dealer for the latest list.

Nearly 100 kits from 2/- to 7/6d.

# AIRFIX

THE WORLD'S GREATEST VALUE  
IN CONSTRUCTION KITS

From Model and Hobby Shops, Toy Shops and F. W. Woolworth



**TRACKSIDE SERIES**  
Level Crossing 2/-



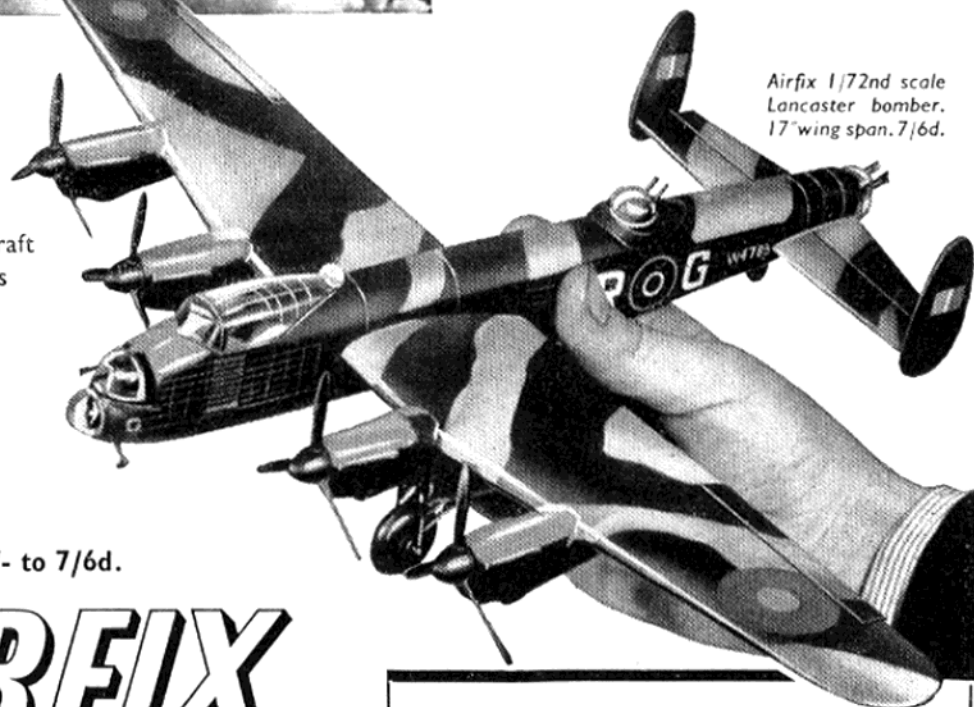
**VINTAGE CARS**  
1930 Bentley 2/-

**MODEL FIGURES**  
Lifeguard 2/-



**HISTORICAL SHIPS**  
H.M.S. Victory 2/-

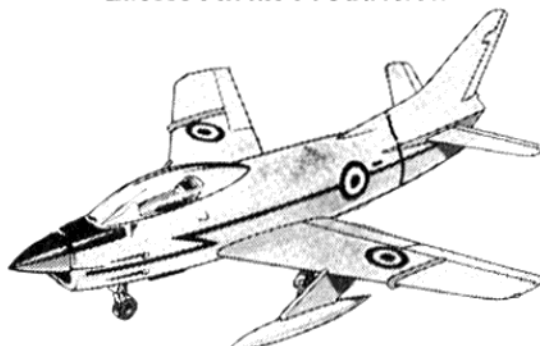
[A159]



Airfix 1/72nd scale  
Lancaster bomber.  
17" wing span. 7/6d.

## STOP PRESS!

Latest Airfix Production



**FIAT G91** Accurate 1/72nd scale model of the famous NATO strike fighter. Complete with markings. 2/-.

**Also new:** 1923 "Bull Nose" Morris Cowley (2/-) and OO gauge Platform Canopy (2/-).





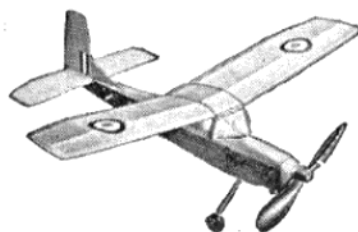
# JETEX POWER MAKES THE MODEL

No other form of model-power can match Jetex for performance and realism. Now new Jetex fuel gives even greater thrust and better flying for only about 1d. a flight. New Jetex motors have been developed to control this extra power, which could fracture or distort certain original-type casings unless modified. Ask your model dealer for full details

**New Jetex Fuel**  
motors, models and kits are exclusive products of the Jetex Division of

**SEBEL PRODUCTS LIMITED**  
WEST STREET, ERITH, KENT. TEL.: ERITH 3020.  
GRAMS: SEBELCO, ERITH.

## Easy to BUILD-Easy to FLY!



**SPOTTER**

**SPOTTER**

An 18-inch rubber model complete with plastic prop and noseblock, plastic wheels, cement, sandpaper, transfers, tissue and rubber motor. Quality balsa is used throughout and all parts are accurately printed. Suitably modified it is an ideal model for the Allbon "Bambi".

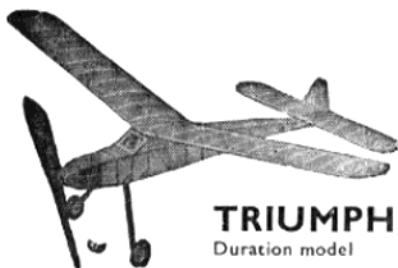
Price including tax **5/11**

**TUTOR**

A beginner's kit containing die cut balsa parts for easy construction. Cement, sandpaper, transfers, acetate, and tissue supplied. Wing span 30 in. Retail price **6/7**



**TUTOR TOWLINE GLIDER**



**TRIUMPH**  
Duration model

**TRIUMPH**

A beginner's duration model kit containing selected balsa parts die cut for easy construction. Contains tissue, wheels, balsa propeller, transfers, all necessary small parts, except rubber motor for which 9 yards of 3/16" x 1/30" flat rubber is required. Wing span 33 inches. Retail price **8/9**



**TROJAN**

Control line model

**TROJAN**

A model suitable for a beginner who wishes to build his first model. An exceptionally strong model of a most pleasing appearance. Profile fuselage and solid sheet wings. Wheels, transfers and all small parts supplied. All parts preshaped. Wingspan 18 inches. Suitable for engines .5 to 1.5 c.c. Retail price **10/3**

Ask your nearest stockist or write direct:

**JUNIOR AIRCRAFT SUPPLY CO. LTD.**

129 EASTBANK STREET · SOUTHPORT

# 15- AND A CRAFTSMAN IN THE MAKING!



(and good  
money in his  
pocket too)

**T**HIS lad's learning how to weld at an Army Apprentices' School. He's only 15, but already he's doing a man-sized job amongst lads his own age.

What's more, he's getting a good solid grounding in every aspect of his job. If he'd wanted to, he could have chosen a mechanical or electronic trade, or any of 40 others, most of them recognised by the T.U.C. Whatever his particular bent, the lad at an Army Apprentices' School gets first-class technical training - and good money at the same time.

An Army Apprentices' School has so much else to

offer. Free board, lodging and uniform - TWO MONTHS' PAID HOLIDAY with free travel every year - and plenty of spare time for hobbies, sport and study. G.C.E., O.M.C. and City and Guilds Certificate are all within his reach. So is £20 a week as a top technician in the New Regular Army - more still if he becomes an officer.

It isn't easy to get into these Schools; but if you're between 14½ and 16½, if you're keen as mustard and really mean to go places, you stand a good chance.

Why not find out more about it? Send in the coupon below. It doesn't put you under any obligation.

POST THIS TODAY  
to the War Office,  
(MP6), London, S.W.1

Please send me details of the  
Army Apprentices' Schools  
(with no obligation on my part)

NAME ..... AGE .....

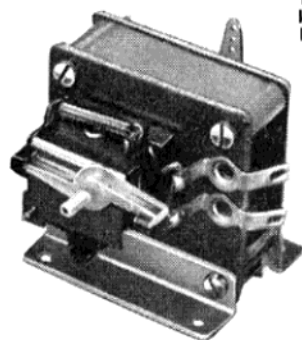
ADDRESS .....

TOWN ..... COUNTY .....

Applications for the next entry examinations must be in by Sept. 22nd 1959. AA7/(MAC)

## RELIABLE RADIO-CONTROL EQUIPMENT

The Fred Rising escapements are now firmly established as being the best of their kind available today. Precision made, by craftsmen who are themselves practical R.C. fliers, they do the job for which they are designed supremely well.

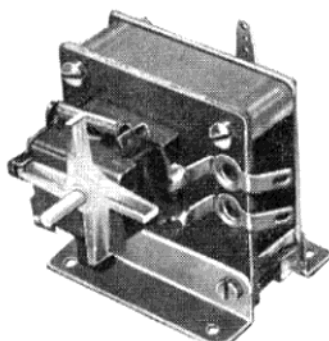


### 4 PAWL CLOCKWORK

Weight ... 1½ ozs.  
Size ... 1½ in. sq.  
Working voltage ... 3-6

Hold-on current 0.35 amp. at 3 V. 400 movements for full wind.

**44/3**



### 2 PAWL CLOCKWORK

Weight ... 1½ ozs.  
Size ... 1½ in. sq.  
Working voltage ... 3-6

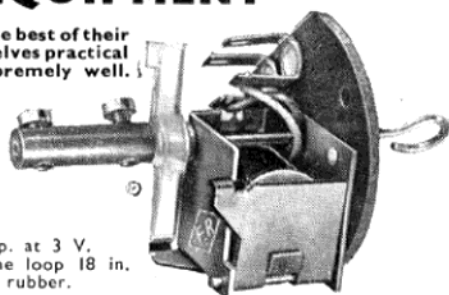
Hold-on current 0.35 amp. at 3 V. 200 movements for full wind.

**41/4**

### SUPER LIGHTWEIGHT RUBBER DRIVEN ESCAPEMENT

Weight ¾ oz.  
Size of base 1½ in. diam.  
Working voltage 3-6.  
Hold-on current 0.35 amp. at 3 V.  
Recommended motor: one loop 18 in. long of ⅛ in. x 1/24 in. rubber.

**25/3**



### RUBBER DRIVEN COMPOUND ESCAPEMENT

Weight ¾ oz.  
Size of base 2½ in. x 1½ in.  
Working voltage 3-6.  
Hold-on current 0.35 amp. at 3 V.  
Recommended motor: one loop 18 in. long of ⅛ in. x 1/24 in. rubber.

**49/II**

WE ARE ALSO TRADE DISTRIBUTORS FOR THE LATEST R.E.P. RANGE OF RADIO-CONTROL EQUIPMENT INCLUDING: OCTONE EIGHT-CHANNEL SIMULTANEOUS EQUIPMENT COMPLETE £50; SEXTONE SIX-CHANNEL WITH "JOYSTICK" CONTROL COMPLETE £30; TRITONE THREE-CHANNEL TUNED REED WITH VALVE-TRANSISTOR RX £20-8-3; UNITONE SINGLE CHANNEL TONE EQUIPMENT COMPLETE £15-19-6; OMNIAC MOTORISED SERVO FOR UNIVERSAL APPLICATION £3. SEND 6d. IN STAMPS FOR LATEST R.E.P. LIST.

THIS ESCAPEMENT USED IN CONJUNCTION WITH AN FR CLOCKWORK ESCAPEMENT GIVES SELECTIVE LEFT AND RIGHT RUDDER CONTROL WITH ENGINE CONTROL.

# HENRY J. NICHOLLS, LTD.,

(Wholesale)  
308 HOLLOWAY ROAD, LONDON, N.7  
Phone NORTH 4272



## for BIGGER value than ever!

For variety and value you can't beat Aurora. More wonderful new models are now being introduced to the Aurora range—look for them at your model shop!



### ★ HERE'S A SUPERB EXAMPLE! PAN AM. BOEING 707 .. 15/11

The U.S.A.'s first and excitingly new jet luxury airliner carries 145 passengers at altitudes of 25,000 to 40,000 feet, cruising at speeds up to 700 m.p.h. It can fly from New York to London in just 6 hours. Wing-span 15 in. Length 15 in.

#### THE RANGE INCLUDES:

National Figures from 6/11; Knights in Armour from 7/11; Aeroplanes from 2/-; Famous Ships from 6/11; Army Equipment from 6/11.

Send 3d. stamp for catalogue to Dept. F.

**PLAYCRAFT TOYS Ltd., 120, MOORGATE, LONDON, E.C.2**





EDITOR: N. J. BUTCHER

Assistant Editor: J. D. McHard

Consulting Editor: A. F. Houlberg, M.B.E., A.F.R.Ae.S.

Advertisement Manager: A. R. Miller

OCTOBER 1959

No. 220

VOLUME 18

EXECUTIVE EDITOR: C. E. WALLER

## IN THIS ISSUE

Here and There	247
A Gas/Transistorised Receiver	249
D.F.S. Reiher	252
Engine Tests—Enya 29 Series 3	254
A/2 Championships	256
Plane of the Month	261
Cloudpin	262
Aviation Newpage	264
Topical Twists	265
Over the Counter	266
Reader's Hints and Tips	268
Zurad's Wakefield	270
Roving Report	272
World War I Props	273
Latest Engine News	274
Club News	276
South Midland Area Rally	276

The official Journal of the  
SOCIETY OF MODEL  
AERONAUTICAL  
ENGINEERS

Published on the 20th of each month  
prior to date of issue by

PERCIVAL MARSHALL & CO. LTD.  
19-20 NOEL STREET, LONDON, W.1.

Telephone: GERrard 8811

Annual subscription 22s. post paid.  
(U.S.A. and Canada \$3.)

© Percival Marshall & Co. Ltd., 1959

## Here and There

### 'Bob-a-nob' scheme for 'free' International Travel

DURING the World Glider Championships at Bourg Leopold in Belgium, which are fully reported elsewhere in this issue, M. Roussel, president of the Model Commission of the F.A.I., put forward the following interesting proposal to Press representatives.

As everyone knows the absence of funds is the chief obstacle in sending teams to world championships. Since the war, much effort has been expended in Britain alone to raise funds with which to send representatives to overseas meetings, although the response to appeals, cash raising competitions, etc., has been singularly unsuccessful to date.

To overcome this difficulty, which is common to all countries, M. Roussel suggested an International Contest Fund run by the F.A.I. on similar lines to the Davis Cup Fund. He suggested that regional championships be held in each country and that every entrant be required to pay an additional entry fee of about one shilling. This extra levy would be forwarded to the central committee who would allocate a proportion of the capital for the provision of diplomas to be presented to top men in the competing countries.

The majority of the money would pay the travelling expenses for every winning team, thus although a country with few modellers (such as Pakistan) would be unable to raise sufficient money to send a team to Europe, the air fares would be met out of the central fund, irrespective of how much the individual country had contributed.

There would be no charge to competitors travelling up to 1,000 miles. For greater distances an additional charge would be made, but this would be only a small fraction of the cost of the unaided travelling expense and would vary according to distance.

One aim of the suggested fund would be to encourage the younger competitor and as an initial experiment, Roussel suggested starting with one class only, such as A.2 glider.

It was pointed out that the interest in the international classes might be insufficient to provide an adequate number of shillings to finance the fund's aims. Assuming this were so, M. Roussel thought that an additional levy might be put on *all* nationally organised contests, whether they were to the international contest class or not. Another suggestion was that the team numbers might be further reduced.

Great emphasis was laid on the fact that the above suggestions were only intended as a starting point. All the model magazines represented at the A.2 Championships undertook to give publicity to the proposed

scheme and to invite further ideas and criticisms.

So come on M.A. readers, Let's hear what you think about it. We'll print the best letters and award a Multicraft tool chest to the one which, in our opinion, contains the most *practical* suggestions.

### A max for fly-offs ?

THE circumstances of the four-man fly-off at the glider championships again emphasised the unsatisfactory nature of this means of deciding a contest.

Jerry Ritz was the undoubted winner under the present fly-off rules, simply because his model remained in the timekeeper's sight longer than Sokolov's; but the fact that Sokolov was still airborne well after Ritz landed caused a little bitterness in some quarters.

The interesting outcome of this situation was that quite independently, both the U.S. and U.S.S.R. teams put forward the same solution. This was to allow maximum points men to continue making 3 min. max. flights until, by elimination, the winner was found beyond all speculation.

This system would undoubtedly

prolong a contest, and it is not the first time that it has been proposed. Remember though, both Ritz and Sokolov were the only two in the A.2 fly-off to exceed 3 min., and one more flight in the rapidly cooling evening air might well have proved conclusive.

### Bravo !

IN last month's Here and There (Cover Story paragraph) we mentioned the subject of interpreters at international meetings. We must, therefore, give full credit to the Belgian Royal Aero Club, which, upon a request from New Zealander John Sheppard, immediately supplied a competent interpreter to assist him in his dealings with the excellent Belgian proxy fliers during the A.2 Championships.

### Cover Story

OUR cover picture this month shows G. Foster just releasing fellow Canadian W. Thompson's model for its fourth consecutive 3 min. maximum in this year's A.2 Championships. The nature of the ground can be clearly seen in this picture, with the extensive wooded area directly downwind.

### We run them in . . .

THE "public guardians" in this picture are doubtless "bold" and were, we trust, "wary" in keeping clear of the model during its last manoeuvre which would appear to have been rather violent! Having his name taken is M. Navaro of Menton in Monaco, a friend of the builder Robert Bardou, who runs a flourishing model and photographic business in Menton, and yet finds time to design, build and fly some very interesting stunt models.

M. Bardou believes in experimenting with the latest techniques and, in the second photo, shows us his latest creation. An all fibreglass leading edge has enabled a sparless yet extremely rugged wing to be built, which would, in all probability, have survived the impact that shattered model number one.



### Harvest Bee

JOHN O'DONNELL writes to tell us of an E.D. Bee Mk. II (No. XE6127) which was found after harvesting near Wigsley, following the Area Championships. The model attached to the engine was destroyed and no address remained. If the owner will write to John at 2, Park Road, Pendleton, Salford, 6, stating the type of motor run limiting device employed, the engine will be returned.

### Stray Tiger

IRISH modellers are requested to keep their eyes open for a missing Oliver Tiger, No. T3011, which was stolen from a team racer at their C/L Nationals.

This engine belongs to Paul Brennan of 39a, Castle Avenue, Clontarf, Dublin, Phone 335917.

We are perturbed at such pilfering and hope that a few offenders can be caught to serve as an example.

### Personal Exports !

WE were interested to read in the Editorial Column of our Australian contemporary, *Model News*, the following comments.

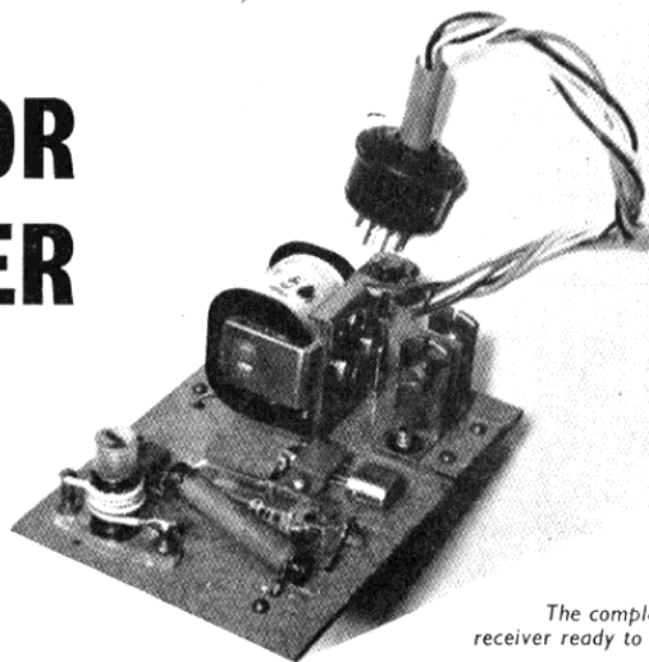
"Ever since Australia and New Zealand were first settled they have been considered as 'Colonies,' 'Down Under' countries, and very few people knew much about us. The visitor usually gets a shock to find, not only are we civilised, we don't throw spears, we have huge industries, cities with a population of two million, and most important of all we fly model aeroplanes."

The writer then goes on to mention the goods—engines, R/C equipment and kits—that are manufactured in Australia and New Zealand and are finding ready markets in countries overseas including Britain. He does not, however, amplify his statement "... and most important of all we fly model aeroplanes."

We are surprised at this, because fly model aeroplanes they certainly can, and "exports" of the calibre of Bond Baker, Allan King and Brian Horrocks, to name only three, have done much to spread the word of what gives Down Under. These three have shown us how to fly rubber, power and C/L stunt, and are first rate ambassadors of the model movement—what better "export" could there be?

# build your own . . . GAS/TRANSISTOR RECEIVER

an under £3 project for R/C  
enthusiasts described by  
WILFRED G. ROWELL



The completed receiver ready to use.

FOR nearly ten years I have experimented with radio controlled models and during this time have had a number of different receivers in use. The first receiver that was made was a single valve set fitted with a gas valve (Hivac XFG1). Whilst warnings were given as to the short life of the valve, the fact remained that a great deal of flying was done, and this valve, working with a Siemens high speed relay, proved a most reliable combination. Two years later the valve was still working well, but like most other R/C fliers the appeal of the hard valve with its 1,000 hours' useful life put the old gas valve into retirement.

The single hard valve set I next made was not, however, a huge success in my hands. After a few flyaways and mighty cartwheels—albeit mixed in with some successful flights—this type of hard valve set was rejected as not

completely reliable—it was just too critical to adjust.

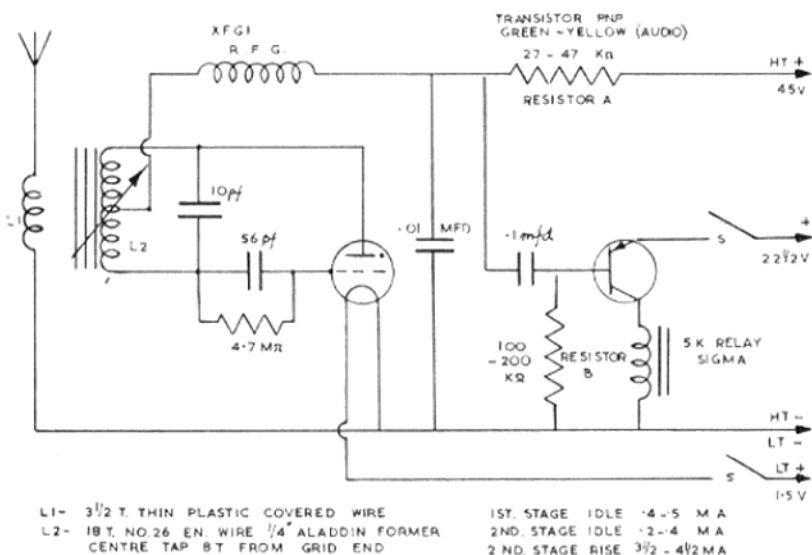
At this stage I went back to the good old faithful—the gas valve—and made another receiver, fitted with a new valve (the old one having gone south of the Border with an English friend who wanted it) and another relay (weight 1 oz.). This relay I adopted on account of lightness; it was a popular one sold to the modelling fraternity, and whilst on the whole it worked reliably, now and again it would decide to misbehave and was inclined to alter its setting. I could not help throwing my mind back to the excellent Siemens relay, used on the previous set, which never let me down, and I came to the conclusion that the extra ounce or so of weight required to carry a good relay was weight worth carrying. This set was laid aside for a while but has come out again and is to be fitted with a

Sigma relay for further service.

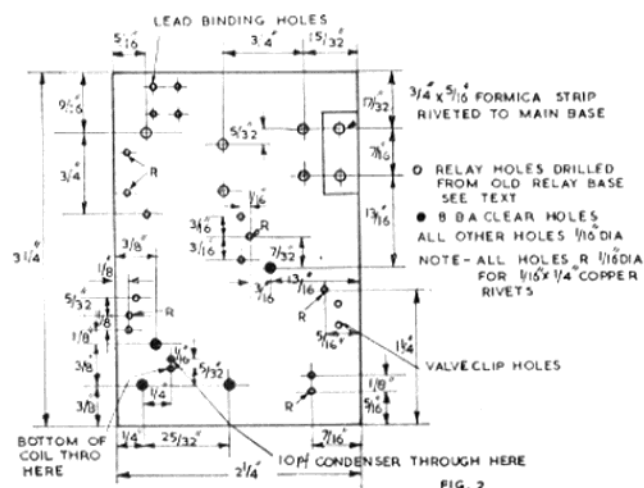
I also used the H.M.V. Wright receiver (two hard valves) for a time, and, working with its "relaytor," have nothing but praise for this excellent combination. The sequence control of this combination is, however, now out of favour as far as I am concerned, as one bleep for right turn; two bleeps for left turn; three for up-elevator is much easier on the nervous system than is sequence control. The Wright receiver could, of course, operate a normal type relay in place of the "relaytor" direct, which would then allow this particular set to operate a normal escapement.

The gas valve has declined in popularity in this country and few serious modellers would adopt it in preference to the hard valve. In the U.S.A., however, the gas valve is favoured by many as a simple means of reliable R/C. Mind you, it is normally used with a second valve in sets such as the Lorenz twin tube, but, even so, according to American reports in the model journals, some 40,000 sets of this type are in use today. Contest results of the past years show that as many as 80 per cent. of the highest scores were achieved using some version of a gas tube set, while recent articles by top line fliers recommend their use, which is, I feel, sufficient proof of their suitability and high degree of reliability.

The advent of the transistor has, moreover, made it possible for the gas valve to be used in a circuit where its maximum anode current will never exceed 0.5 m.a., which, of course, means its useful working life will be increased very considerably. In contrast to the old single gas valve receiver which did require fairly frequent adjustment, this new circuit is such as not to require frequent retuning. Using a gas valve followed by a transistor, we have a set-up where the hiss of the gas valve is





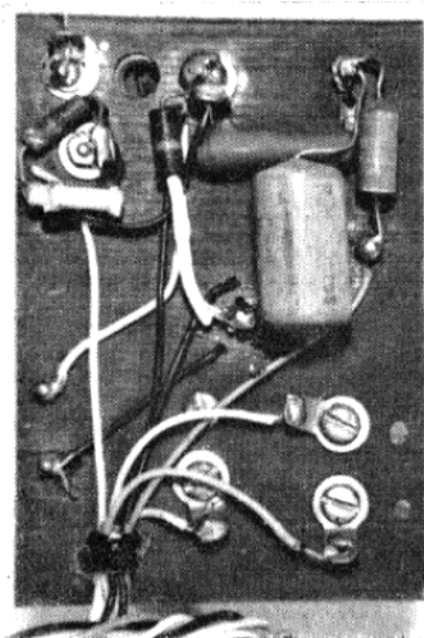


used to bias the transistor current down to about 0.2 m.a. When a signal is given, the gas valve ceases to hiss and the bias drops, causing the transistor to pass full current rise, usually about 4 m.a.

I first noticed this gas valve/transistor set-up in *Model Airplane News* some years ago, although it is today commercially produced on both sides of the Atlantic. This set found favour with myself first of all because it incorporated a gas valve, a type which has given faithful service in the past, and also because it is cheap to make; easy to tune and stable in use, and lastly provides a good range of control.

This receiver has a current change of nearly  $4\frac{1}{2}$  m.a. and at half-mile range still has a 3 m.a. change. Maximum distance tested was 0.8 mile which still gave a 2 m.a. current change.

The Sigma relay incorporated is a wonderful relay, and is *reliable* right down to under  $1\frac{1}{2}$  m.a. operation, so that great range can be obtained. My relay is set to make at 2½ m.a. and fall out at 2 m.a.



which gives half-mile radius operation with complete certainty. The longer the aerial used, the more sensitive is the receiver and the figures given were obtained on a 48 in. long trailing aerial.

The complete weight of the receiver with box, cable and 7-pin plug is  $4\frac{1}{2}$  oz., which is suitable for planes of 48 in. span and upwards. The use of a lightweight relay would reduce the weight to just over 3 oz., but the

extra weight is nothing compared with the reliability of the heavier Sigma relay. The set, made as shown, will be ultra-reliable in operation and can be built for under £3 in total cost.

Before reading on to the construction it will be as well to refer to the list of parts together with suppliers' names and addresses given opposite.

### Construction

Cut a Paxolin panel to the size shown in Fig. 2 and accurately mark the posi-

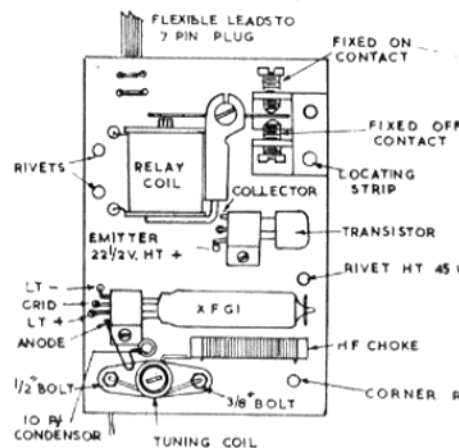


FIG. 3

tion of all holes. Holes marked "R" should be a tight fit for  $\frac{1}{16}$  in. rivets which are driven in to provide soldering points for components. The shaded relay holes should be drilled using the circular base provided with the relay, as a template. (It is, of course, removed from the relay before it is put to this use.) A locating strip of Paxolin is riveted into position as shown—the purpose of this is to prevent the fixed contact brackets from turning as they are both of single screw fixing. Fit tags before screwing relay screws into position.

The valve and transistor holders can now be fitted into place, each being held

An underside view of the receiver showing the wiring.

by a single 8 B.A.  $\times \frac{1}{4}$  in. brass bolt. The valve holder bolt also carries a tag on the underside termed the coil tag, the tag end being bent upwards at 90 deg. to the panel. The coil can now be fitted. The coil former is held in position by  $\frac{3}{8}$  in. and  $\frac{1}{2}$  in. 8 B.A. brass bolts—don't forget to fit tags to these bolts on underside of the panel.

Take the 26 S.W.G. enamelled copper wire, poke it down through the  $\frac{1}{16}$  in. hole next to the former and solder the end to the coil former tag. Now, winding up from the bottom (clockwise), wind on eight turns. Form a U shaped  $\frac{1}{4}$  in. loop here; nip the sides together; scrape clean and solder. (This forms the coil centre tapping to which the HF choke is attached.) Wind on a further 10 or 11 turns, then cut off, leaving a 2 in. end beyond the coil. Holding the coil with the left hand to prevent it slipping, scrape the wire clean and form a small loop at the top of the coil (this is already shown in Fig. 3), then bend the end of the wire down and solder it to the anode on the valve holder.

The 10 PF condenser is now fixed in position, the top end to the loop at top of the coil, and the bottom lead down through the panel where it is soldered to the coil tag. This condenser helps to make the coil rigid.

Next take a short length of thin plastic

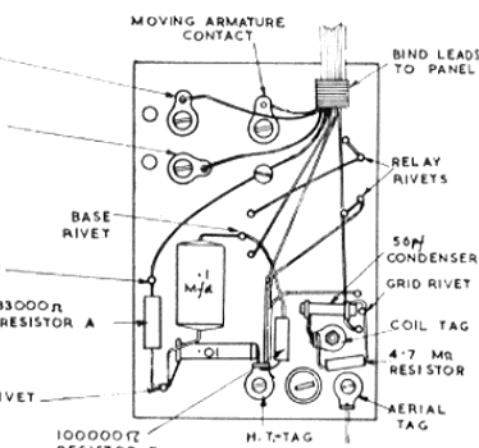


FIG. 4

covered flex and, scraping one end, solder to the top of the  $\frac{3}{8}$  in. brass bolt holding the former. Wind  $3\frac{1}{2}$  turns around the middle of the tuning coil and solder the end to the  $\frac{1}{2}$  in. brass bolt. (This bolt carries a tag to which the aerial lead is attached.) The coil can now be left until the receiver is tested, as the aerial coil may want shifting up or down on the former a little to find the position where it gives the greatest current rise. Once this is found it can be given two coats of clear dope to lock the whole coil assembly in position.

The H.F. choke can now be soldered in position between the coil centre tap, and the other end poked down through the  $\frac{1}{16}$  in. hole and soldered to the corner rivet. Add the 33,000 ohm

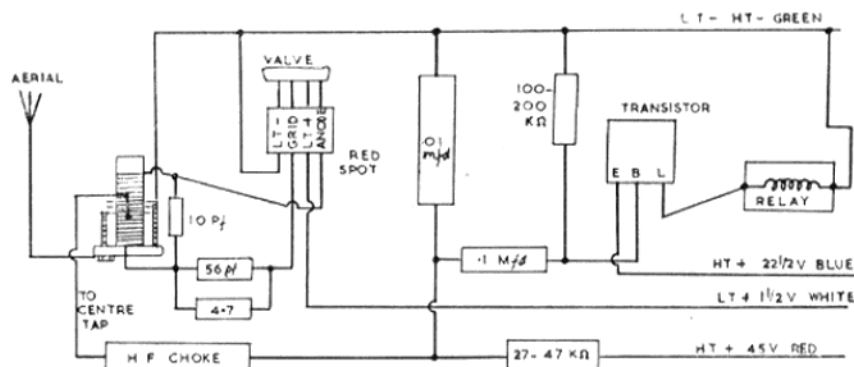


FIG. 5

resistor by fixing between the corner rivet and HT 45 V rivet. The 0.01 condenser is fixed between the corner rivet and the HT-tag as shown, also the 0.1 MFD condenser between the corner rivet and the base rivet at the transistor holder. Add the 100,000 ohm resistor "B" between the HT-tag and the base rivet.

The 56 PF condenser and the 4.7 MΩ resistor are now added in parallel across the grid rivet and the coil tag (see Fig. 4). The base rivet, it will be noted, lies directly underneath the base tag on the transistor holder, and the tag should be soldered to the top of the rivet head; the rivet passing down through the panel provides a sound mechanical soldering point. The same applies in the case of the grid rivet which lies directly under the grid tag on the valve holder. The two ends of the 5,000 ohm relay coil pass down through holes in the panel and are soldered to the relay rivets on the inside of the panel. Using thin plastic covered flex connect the top relay rivet to the collector tag on the transistor holder, and the bottom relay rivet to the HT-tag. Connect the LT-valve holder tag to the HT-tag.

It is now necessary to add the seven flexible leads to the wiring. Cut off seven different colours each 12 in. long, and remove 1/4 in. of plastic covering from one end of each length, then connect as follows:— (1) Green lead to HT-tag. (2) Blue lead to emitter on transistor. (3) White lead to LT+ on valve holder. (4) Red lead to rivet HT+ 45 V. (5) Pink lead to moving armature contact tag. (6) Orange lead to fixed 'on' contact tag. (7) Yellow lead to fixed 'off' contact tag.

For normal operation of escapements, the pink and orange leads will be used. The yellow lead will only be used if the back contact of the relay is required, i.e. engine control, servos, etc. Some means of spark suppression at the relay contacts is absolutely necessary, for it is no use having a top-rate relay and then getting oneself into trouble with sticking contacts. The inductive kick by counter EMF action when the operating voltage is switched on and off is considerable. Just have a look at the points in the dark whilst keying the receiver, preferably looking through a magnifying glass, and you will see a mighty fat spark which must be suppressed. It is best to fit

spark suppression gear at the source (the escapement) but in some cases it is found desirable to fit it at the relay.

Although not shown on the drawings, suppression can be effectively carried out by inserting a 0.1 MFD condenser and 47 ohm resistor in series across the moving and fixed 'on' contact tags. Alternatively a germanium diode may be used connected in parallel across the actuator coil, noting polarity. A B.T.H. CG6M should be suitable in most cases. Should the receiver be required for use with a pulse system of control with the back fixed 'off' contact being required, a second condenser/resistor in series will also be required across moving and fixed 'off' contact tags.

The gas valve should rest on a 1/2 in. length of valve rubber to cushion it against the panel—a short length of 26 S.W.G. copper wire through the valve clip holes in the panel and then passed around the end of the valve will hold it securely in position. It should be mentioned that for this type of receiver to operate at highest efficiency a new gas valve must be fitted. If an old valve is

used (one which has been operated previously in a single gas valve, set at a normal operating current of 1 1/2 to 2 m.a.), it may refuse to operate when called upon to trigger at the low standing current used in this type of circuit.

It should also be mentioned that the Sigma relays available from Sallis have only one silver point on the armature to make with the fixed 'on' contact and the underside appears to be copper. A silver contact will have to be added to the underside of the armature if the set is required for pulse systems.

### Tuning adjustment

Insert valve and connect LT- and LT+ to a 1 1/2 volt battery—observe if the filament is glowing—if O.K., then disconnect the battery and insert the transistor.

First of all it will be necessary to

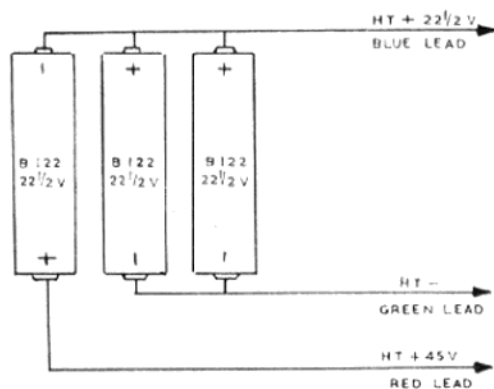


FIG. 6

observe the flow of anode current through the valve, so connect a 5 m.a. meter in the HT 45 V+ lead and switch on. The current will vary between 0.3 and 0.5 m.a. but should preferably be between 0.4 and 0.5 m.a. If the reading is below 0.4 m.a. it will be better

*Continued on page 270*

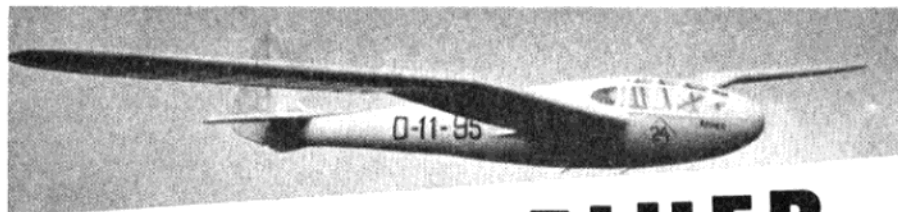
## YOU WILL NEED . . .

- 1 Piece of Paxolin or "Formica" 1/8 in. x 3 1/2 in. x 2 1/2 in.
- 1 1/2 in. Aladdin coil former and slug.
- 1 10 PF Ceramic Condenser.
- 1 56 PF " " "
- 1 0.01 MFD " " "
- 1 0.1 MFD Tubular Condenser.
- 1 4.7 MΩ 1/4 Watt Resistor.
- 1 33,000 ohms watt resistor, and
- 1 100,000 ohms watt resistor.
- (See text regarding these two resistors.)
- 1 XFGI Gas Valve (Hivac).
- 1 Transistor P.N.P. Green Yellow (Audio).
- 1 Gas Valve Holder.
- 1 Transistor Holder.
- 1 Sigma Relay 5,000 ohms.
- 2 8 B.A. x 1/4 in. brass bolts and nuts.
- 1 8 B.A. x 3/8 in. brass bolt and nut.
- 1 8 B.A. x 1/2 in. brass bolt and nut.
- 1 3 ft. length of 26 S.W.G. enamelled Copper Wire.
- 1 H.F. Choke.
- 7 yards of thin flexible plastic flex (1 yd. each of seven different colours).
- 6 Single sided tags.
- 8 1/8 x 1/4 in. Copper Snap head Rivets.
- 1 7 Pin Plug.

The Sigma Relay is obtainable—price 18s. 6d.—from Arthur Sallis, 93, North Road, Brighton, Sussex.

The Transistor is obtainable from most radio dealers or direct from Henry's, 5, Harrow Road, Paddington, London, at 7s. 6d. each.

The remainder of the components can be obtained from Radio and Electronic Products, 8, Station Parade, Sheen Lane, Mortlake, London, S.W.14.



## D.F.S. REIHER



**An unusual scale prototype, this 6 ft. 3 in. wingspan glider has all the grace of the original says designer PETER LEWIS**

SINCE the high-performance sailplane became an accomplished fact, purity of line has become a quality expected of it. The designer of powered aircraft is only comparatively rarely able to indulge in what is, to him, almost the last luxury but, in complete contrast, the creator of the glider is unhampered by considerations of load-carrying, power-plants, fuel tanks and the multitude of other components which go to make up an aeroplane which has to earn its living.

From Germany, foremost country in developing the sailplane during its early days, came one of the most elegant designs of all—the *Reither*. This outstandingly refined and beautiful machine, with its gliding angle of 1 : 33, was flown in the International Gliding Championships held at the Rhön during July, 1937, the pilot chosen being the young Fraulein Hanna Reitsch, later to become prominent as a very capable test pilot.

The full-size machine's 67 ft. 4 in. wingspan has been scaled down to 6 ft. 3 in. for the model, which possesses all the grace of the original.

### Fuselage

This is built on the crutch principle for accurate alignment, and for speed and ease of construction. Use  $\frac{1}{8}$  in. hard sheet for the crutch itself, and after tracing the outline on to it cut out, at the same time removing the area occupied by the cockpit between formers F2 and F6 but leaving  $\frac{1}{8}$  in. sides. Mark the positions of all formers on the crutch and then cut F1 to F17 from  $\frac{1}{8}$  in. sheet. Cement the formers in place above and below the crutch, setting them at the

angles shown on the plan. The two tow-hooks are shaped from 18 G. wire and then bound and glued to their mount of hard  $\frac{1}{4} \times \frac{1}{8}$  in. balsa which is, in turn, fitted in place between F6 and F8.

The stage has now been reached where the planking of the fuselage can be started. Use strips of  $\frac{1}{4} \times \frac{3}{32}$  in. and commence on the sides, working above and below the crutch line—remember that the strips will need to be tapered to fit the decreasing space towards the front and the rear. Note that an  $\frac{1}{8}$  in. sheet platform is provided as seating for the tailplane. When the planking is complete, sandpaper the entire fuselage.

The next step is to provide the wing roots and fixings. Two pieces of  $\frac{3}{16}$  in. hardwood dowelling are employed as wing mountings; both of them are cut to length and steamed at the centre to the correct dihedral angle, which is finally set by binding and gluing to the dowels short lengths of 16 G. wire. Both front and rear dowels are passed through the holes made in the sides of the fuselage. The pair of wing root fairings are cut to shape from  $\frac{1}{8}$  in. sheet, passed along the dowels and cemented firmly in place.

The nose portion of the fuselage is removable to provide access to the weight box situated between formers F1 and F2, and it is retained by two press-studs sewn and cemented in position. Plastic wood is used to fair both the wing roots and the tailplane platform into the fuselage. The landing skid is cut from hard  $\frac{1}{8}$  in. sheet fixed to the underside of the fuselage and when it is firm, a piece of 18 G. wire is recessed into a

groove cut along the length of the skid. Two paper or aluminium tubes of  $\frac{1}{8}$  in. internal diameter are provided for the fin fixing dowels and are positioned as shown on the plan. A press-stud is sewn and glued to the top of the fuselage to anchor the tailplane.

### Tail unit

The fin, rudder and tailplane are constructed direct on the plan. Cut the fin's leading edge and spar from  $\frac{1}{8}$  in. sheet and pin down; a second spar running the full height of the rudder is now added and then the trailing edge. The  $\frac{1}{16}$  in. ribs and tips are cemented in place and the whole allowed to dry. After removal from the plan, the  $\frac{1}{8}$  in. bamboo dowels are inserted and the fin only covered on both sides with  $\frac{1}{16}$  in. sheet. A thin aluminium hinge joins the rudder to the fin. The one-piece tailplane/elevator structure is made in the same way,  $\frac{1}{16}$  in. sheet being used to cover the forward section back to the spar and also between the centre ribs.

### Wings

The same procedure as used for the tail unit is followed for the wings. The leading edge is from  $\frac{3}{16}$  in. sq.,  $\frac{1}{8}$  in. wedge section is used for the trailing edge, while the spars consist of  $\frac{1}{8}$  in. sq., and when these are pinned in place the ribs are cemented in position. (Ribs R1 to R32 are from  $\frac{1}{32}$  in. sheet and cut on the "sandwich" principle, i.e. R1 and R31 are cut out, and between them are sandwiched 29 suitably sized pieces of sheet, the whole is pinned together and cut and sandpapered to the contours of end ribs. The final ribs R32 to R36 are cut individually.) Add the upper spar and the sheet tips, then crack the spars at R12 and set the dihedral. Internal braces are installed as shown and  $\frac{1}{16}$  in. sheet is used to cover the upper and lower leading edges to the front spars.

Rolled paper tubes accommodate the wing-fixing dowels and press-studs are sewn and cemented on to the faces of the root ribs, with  $\frac{1}{32}$  in. sheet facings added so that there is no gap when the wings are in place.

### Covering and finishing

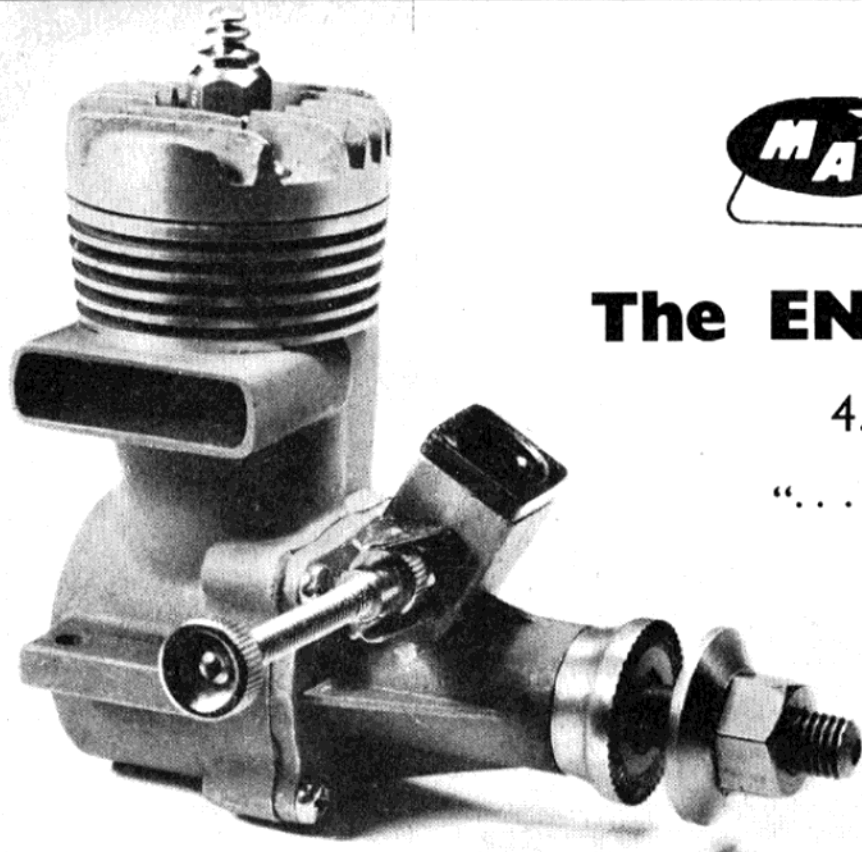
A smooth surface finish is essential to complement the fine lines of the *Reither* and it is obtained by using sealer and sandpaper until the surfaces are filled completely.

The entire airframe is covered with medium-weight tissue. After water-spraying the tissue flying surfaces, several coats of clear dope are applied, alternating with sandpapering. White is used for the final finish, the markings D-11-95 on the rear fuselage and the competition number 24 in a diamond on the nose being in black. The name REIHER is just below the cockpit, and the red band around the fin and rudder carries a black swastika on each side in a white circle. Finally, the 18 G. wire cockpit frame is fitted, covered with celluloid, and the model is ready for assembly and flying.





FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT,  
19-20, NOEL STREET, LONDON, W.1, 5s. 6d., POST FREE



## ENGINE TESTS

# The ENYA 29-Series 3

4.9 c.c. Glo-plug motor

"... one of the most impressive 29's we have tested ..."

THE Enya 29 Model 5103, or "Series 3," is one of several leading Japanese-made model engines now freely available to British modelers through Keilcraft stockists. This particular engine, successor to the earlier 29 Model 5001, was first introduced nearly three years ago and has been commented upon, in past issues of M.A., as being an especially outstanding example of modern 5 c.c. engine design.

This Enya is, in fact, one of the most impressive 0.29 cu. in. motors we have ever tested, equalling, and, in many cases exceeding, the performance of most disc-valve, ball-bearing racing 29's, in the higher r.p.m. bracket, and bettering not a few 35's on typical stunt size props. Quite possibly, not all 29-3's have such a high output as our two test samples, some variation between individual production examples being inevitable. That similar performances are, however, possible with perfectly stock off-the-shelf 29-3's is clear from checks made on two such engines, and by reports that have reached us of team racer speeds as high as 118 m.p.h.

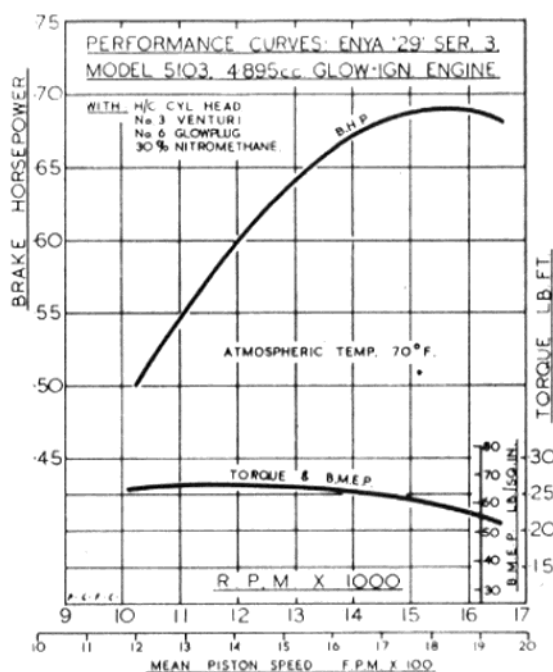
Potential performance is also dependent on the care with which a new engine is run-in. Notwithstanding the modest break-in period mentioned in the makers' leaflet, we would advise at least one hour of rich mixture running. Some engines may require a considerably longer period. The important point is to avoid any risk of the overheating or seizure that can occur if a new motor is allowed to two-stroke on a lean

needle-valve setting. The needle should be opened up to produce reduced-power "fourstroke" running which will provide the added lubrication and extra cooling necessary for safe running-in.

This, of course, applies in equal measure to most modern lapped-piston glow engines, except the smaller capacities. Experience with recent American 29's and 35's has shown that anything up to 4 or 5 hours' running may, in fact, be necessary before any of the hotter varieties of fuel can be safely used. Obviously, for running-in, a mild fuel—either a straight 2½ : 1 methanol-castor mixture, or a blend containing not more than 3 or 4 per cent. nitromethane and not less than 30 per cent. castor-oil—is advisable.

In connection with running-in the Enya, it should be mentioned that the most recent (29-3B) examples to leave the factory are now being supplied with two interchangeable cylinder heads, having deeper cooling fins. In place of the standard 10 : 1 and 9 : 1 cylinder heads formerly used, the standard head, as installed, is now 7.5 : 1 and the spare, high compression, head is 9 : 1. The makers recommend running the engine for at least two to three hours on the standard head before using the H/C head.

The basic design of the Enya 29-3 is to the usual shaft-intake, loop-scavenged layout with lapped piston and bushed main bearing, but it is obvious that a good deal of thought has been brought to bear on the problem of increasing volumetric efficiency, the first essential of high performance in any engine. Starting at the rotary-valve, it is observed that the shaft port, nearly ½-in. long by ⅜ in. wide, registers with a bearing aperture of the same dimensions, i.e. a rectangular aperture, not the usual



round or elliptical shape. The result of this is that the valve opens and closes more abruptly and the effect can be likened to that of a quick-lift cam in a racing fourstroke engine. The crankshaft itself is generously dimensioned, with a 11.5 mm. (0.452 in.) dia. journal, allowing an 8 mm. gas passage. From the crankcase, gas is offered every encouragement to complete its journey as easily as possible. The transfer passage is of truly massive proportions and further aids to unrestricted flow are the short cylinder liner skirt and the specially shaped back wall of the crankcase.

Structurally, the Enya features a one-piece crankcase and cylinder barrel, the front bearing housing being a separate unit. The hardened cylinder liner, of high finish, is closely fitted to the barrel and a ground, metal-to-metal head joint is used, thus facilitating the interchange of cylinder heads without the bother of replacing gaskets.

Three interchangeable venturi inserts are provided to suit the differing requirements of stunt, F/F, team-racing, etc. Alternatively, when absolute maximum b.h.p. and revolutions are required, a pressure fuel system can be used and the venturi discarded entirely.

### Specification

Type: Single-cylinder, air-cooled, loop-scavenged two-stroke cycle, glowplug ignition with crankshaft type rotary-valve induction.

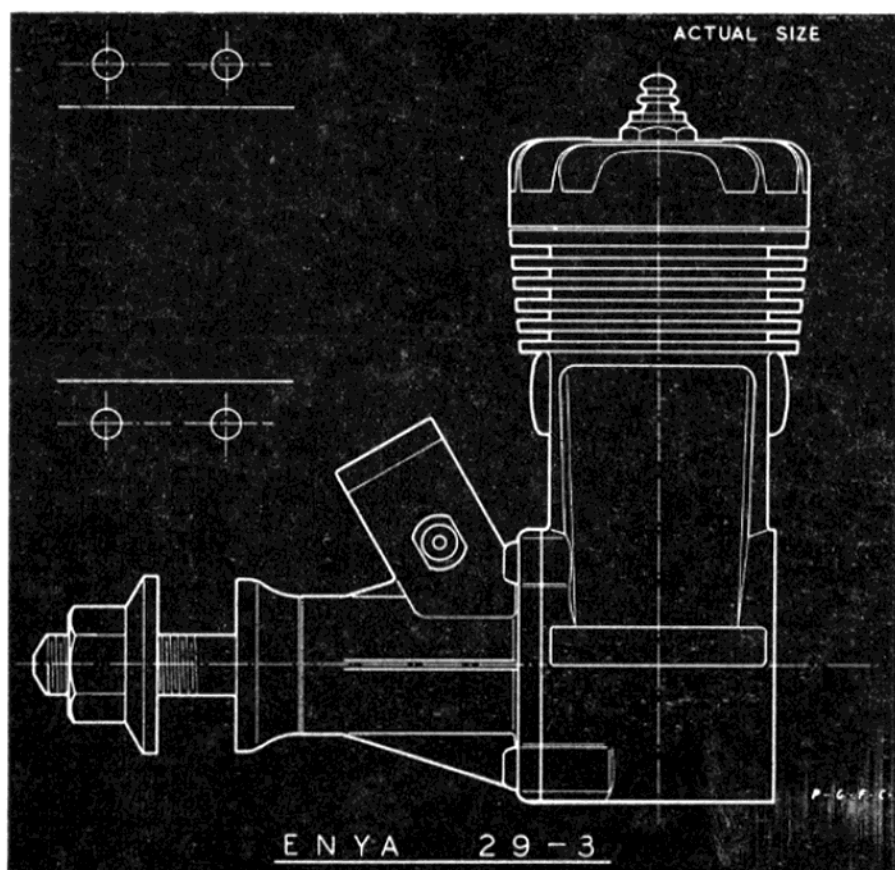
Bore: 0.735 in. Stroke: 0.704 in.  
Swept Volume: 0.2987 cu. in. = 4.895 c.c.

Stroke/Bore Ratio: 0.956 : 1.  
Compression Ratio: 9 : 1. (7.5 : 1 optional.)

Weight: 6.8 oz.

### General Structural Data

Pressure diecast aluminium alloy crankcase and cylinder barrel with inserted liner. Pressure diecast aluminium alloy front housing with bronze main-bearing, supporting hardened, counterbalanced crankshaft. Lapped, lightweight piston with straight fence baffle and 5 mm. dia. fully floating tubular gudgeon-pin with aluminium end-pads. Heavily proportioned pressure diecast aluminium alloy connecting-rod with bronze big-end bush. Deeply-finned aluminium alloy cylinder head having cast-in bush for glowplug and attached to cylinder, via metal-to-metal joint, with four screws. Mach-



ined alloy prop driver, fitted to matching taper on shaft. Nickel-plated spray-bar type needle-valve assembly with flexible control stem. Beam mounting lugs.

### Test Engine Data

Running time prior to test: 4 hours approximately.

Fuel used: Record Super-Nitrex (30 per cent. nitromethane).

Ignition plug used: Enya No. 6, platinum-rhodium filament, cold rating.

Venturi used: No. 3 (large).

### Performance

The excellent performance of the 29-3, as revealed in preliminary tests, suggested to us that this could make a very good Class "B" team-race engine. Accordingly, it was decided to test the engine, as it might be used in a team-racer, i.e. on a fairly heavily nitrated fuel, using a "cold" type racing plug and with the largest venturi installed. The results of this test are seen in the accompanying performance curves.

The first thing that became apparent was the outstandingly high torque developed; far in excess of usual 29 standards and equalling some of the better 35's. Expressed

in terms of b.m.e.p., this was equivalent to a figure of 67 lb./sq. in. at between 11,000 and 12,000 r.p.m.—which has only been equalled by two other engines tested in this series: the McCoy 60 Series 20 and the Fox 29R racing engines.

The peak output realised as a consequence of this high torque—0.69 b.h.p. at close to 16,000 r.p.m.—is, needless to say, phenomenally good.

Handling qualities were good. The engine was easy to start from cold and required only finger choking for a hot restart. The characteristic Enya needle-valve was pleasant to use and positive in operation. Running qualities were excellent, with no excessive vibration detected at any speed and consistent running over the whole range of speeds tested.

In conclusion, we should mention that, when comparing the performance reached in this test with that of some other motors, it should be noted that we do not normally employ a fuel containing as much as 30 per cent. nitromethane and that, on a milder fuel, the 29 would naturally deliver a somewhat lower performance.

Power/Weight Ratio: 1.47 b.h.p./lb.

Specific Output: 141 b.h.p./litre.



Doug McHard reports  
from Belgium —

# The A.2 GLIDER CHAMPS

THIS year will surely be remembered by European model flyers for many seasons as a time of almost freakish good flying conditions, and the weather at Bourg Leopold in Belgium, on the occasion of the World A2 Glider Championships, could hardly have been bettered. Throughout, the wind was very light and the sun shone continuously.

The contestants' assembly point in Brussels was the Belgian Royal Aero Club, where between 2 and 4 p.m. on Friday, August 21st, a steady stream of competitors were received. Upon arrival everyone was given a beautiful gold embossed document case containing his lapel badge, complete contest rules, meal tickets and two issues of the Belgian magazine, *Model Avia*. The F.A.I. rules governing model specifications and general contest rules, and the contest timetable, were printed in both French and English. The equally important and very comprehensive document relating to the running of the actual contest was, however, in French only.

Bourg Leopold is some 40 miles east of Brussels and two Sabena coaches were provided to transport the 20 competing teams and their supporters there. Upon arrival the British party were shown to a room which they shared with the Dutch, Hungarian and Israeli teams, and shortly after the coaches transported everyone to the mess (half a mile away) for supper. A bar was available, and many were the new friendships made, and old ones renewed, during the course of the evening.

Early Saturday morning many contestants were making the one and a half mile trek to the flying field to get in as much trimming as possible. The wind was very light and there were thermals even at this early hour.

The flying "field" was very large, but the Belgian Army use it as a tank training area, resulting in a surface devoid of grass, very rough, and, following the warm weather, extremely dusty. When it rains it turns the area into a sea of mud (rather like Chobham without the undergrowth!).

Processing commenced promptly at 9.30 a.m. and each of the 20 competing teams were allowed 20 min. in which to have their models checked. Each entrant had a separate processing team and formalities were efficiently concluded to schedule.

The British team had their models processed at 3.20 p.m. and immediately returned to the flying field. Seventeen-year-old Eddie Black from Glasgow lost his first model during the afternoon when his d.t. failed to operate, the model disappearing at high altitude. Eddie was not allowed to have a third model processed so the British team had the theoretical disadvantage of having only five models. We were not alone in this situation though, for so intensive was the test flying that several models were lost.

In the evening, the town of Bourg Leopold laid on a reception for the competitors in the town hall. The speeches were commendably short and liquid refreshment plentiful!

Sunday, the contest day, dawned fair and warm with even less wind than Saturday, in fact, only a gentle breeze. When we reached the field

- Five-man fly-off—U.S.A. and Russia outstrip field in fight for top place
- Consistent flying secures team award for Finland

we found that five large tents had been erected to shelter the competitors and their models during the contest.

The field and timekeeping arrangements were somewhat unorthodox. Five large sun umbrellas were spaced out along a 125 yd. line, and under each umbrella was a table at which sat the timekeepers and the inter-round processors. Directly in front of each umbrella were two marking posts, at a distance of 50 and 100 metres, which were to be used as line checks.

During the contest the timekeepers remained seated behind their tables! This arrangement was fairly satisfactory while the wind remained substantially from the timekeepers' backs, although when occasionally the entrant took a long run, the model was released almost above the umbrella. In order to enable him to determine the start of the flight a timekeeper was compelled to scamper out from under! When, however, the wind changed, and was blowing across the front of the tables, it became increasingly difficult for the timekeeper to identify the model he was supposed to be timing, as the launch, in many cases, took place over 100 yards away!

One modeller is known to have lost a flight owing to the timekeeper being unaware that the flight had been made, the round ending before the model could be retrieved, while on at least one occasion, a timekeeper is known to have timed the wrong model! This is not meant as any reflection on the timekeepers, who did a fine job, but pinpointed the severe limitations of the arrangements.

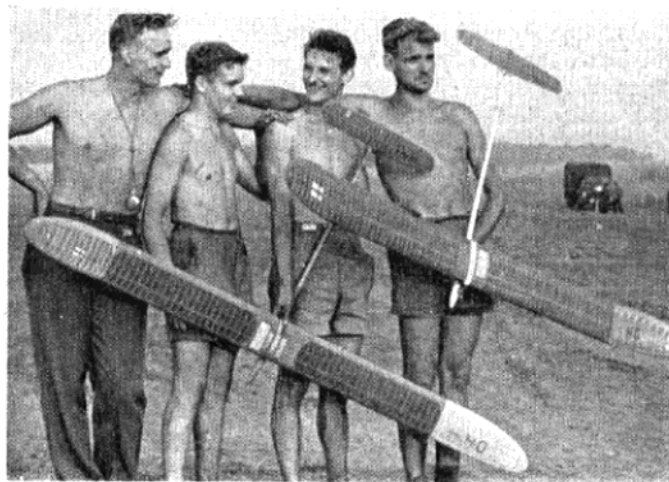
Each one-hour round was divided into three 20 min. periods and one team member was required to fly in each period which was identified by a colour, the first being green, the second white and the third red. A Very light of the appropriate colour was fired at the start of each period and as most of the flares were still alight upon reaching the ground, and frequently fell in the launching area, a sharp look-out was required!

During each period, the entrants for the following period were being processed and this arrangement seemed to work quite well.

At the end of the first round Finland, Denmark, Holland, Sweden and Czechoslovakia, each had three maximums. Next came Britain and Russia with an equal score, Sokolov, Averyanov, Black and Monks all making 3 min., while Shirt and Simonov put up only 96 sec. each. It was fairly obvious during the first round that the thermals had to be sought after in a cool and calculating manner. Experience and patience were needed in abundance. Upon the Very light being fired to herald the commencement of subsequent rounds, instead of the bustle that had been noticed earlier, to get the models into the air, not a model would be seen airborne!

All were poised ready to release but nobody wanted to be first away! Eventually, the strain would tell and a launch made, all eyes would be glued to the model—was it in lift? If a thermal was caught there would be a frantic panic to get fuses alight and models flying; if not, the nerve-racking wait would continue. The ones who were panicked into launching early were usually the low scorers.

The winning Finnish team after the fly-off with their two remaining models. From left to right are Hyvarinen, Kekkonen, Ella and Tahkapaa.





There were other ways of finding lift, of course—one entrant, wearing shorts, just kept running until his temperature sensitive legs indicated the presence of a thermal! This led to the suggestion that Scotsman Eddie Black should, in future, wear a kilt to assist in thermal hunting!

Habib Habib of Pakistan, whose keenness, enthusiasm and skill won many admirers, lost his number one model in a thermal during the first round despite the fact that the dethermaliser operated successfully! When a riser was found it was usually a powerful one. One second round thermal hooked by Arne Hansen of Denmark was pulling so hard that rather than risk the structural failure of his model, he threw the winch and, of course, under F.A.I. rules his flight was disqualified.

At the close of the second round only Finland had a perfect score. Great Britain had dropped to 13th place, an unlucky number which was to remain with us until the end.

During the second round the wind began to veer so that a formidable wooded area was immediately downwind. Models remaining airborne for 4 min. or more came down in the trees, and this fate was suffered by Black's one remaining entry. Fortunately, it was recovered just in time for the third round, which followed the half-hour lunch interval during which packed meals were served on tables outside the refreshment tent.

The Finns were still the leading team and with their beautifully built models were increasing the gap between themselves and their nearest rivals. Two members of their team (Kekkonen and Tahkapaa) now had three maximums, and such was the quality of their flying that an all Finnish victory seemed distinctly possible.

Thermals were by now stronger than ever and it was not unusual to see six or seven models all circulating in the same riser! Scheu of the Swiss team caught such a powerful thermal whilst still on the line, that his port wingtip broke at the dihedral joint and to avoid further damage, Scheu released his hold on his 17 oz. winch. Despite having only three-quarters of its original wing area the model lifted the winch to an altitude of some 50 ft.!

During the fourth round, Jerry Ritz (U.S.A.) lost his number one model in the woods following a spectacular launch during which the model described a complete circle on the tow-line, yet was under complete control, and at no time seemed to be in danger of premature release. Despite the efforts of the recovery Boy Scouts stationed downwind, he was unable to find it. This, to Jerry, was quite a blow, as his number two model's tail-plane had been trodden on the previous day, and although now repaired, the model was untrimmed. However, hurried adjustments were made to it during the 20 min. interval between the fourth and fifth rounds and Ritz had to hope for the best.

Kekkonen of Finland also lost his first model during this round and did not recover it, while yet another four-maximum model "wooded" was that of R. Wilson of New Zealand, being flown proxy by Belgian S. Pieterhon.

The leading Russian flyer, Sokolov, was also "wooded" but the jovial Alexander Tatyanchikov, whose services as interpreter were much appreciated, also proved to be something of a Tarzan and despite abrasions to his arm, recovered the model in one piece.

Eight competitors entered the fifth round with a perfect score, Slobodan—Yugoslavia, Tahkapaa—Finland, Kekkonen—Finland, Jansson—Sweden, Ritz—U.S.A., Sokolov—U.S.S.R., Thompson—Canada and Habib—Pakistan. Kekkonen scored a final maximum with his second model making him eligible for the fly-off, but, unfortunately, this model, too, became lost and was not recovered. Slobodan, Jansson and Thompson failed to make 3 min. and this left four men for the fly-off.

Ritz's fifth round flight was nothing if not exciting. Being compelled to use his second (repaired) model, he was unable to take the liberties with it that he is accustomed to exercise with his first model. Despite careful coaxing, it insisted on turning left and was eventually released at about 60 ft. All seemed lost and loud was the gnashing of teeth in the U.S. camp; the Ritz luck did not desert him, however, for, after descending even farther, his model began, very slowly, to rise—for another maximum.

It was now 6 p.m. and all set for the fly-off—which, in the event, was to become a fight between U.S.A. and U.S.S.R.

Launches were at one minute intervals, Ritz was first away and we mean away! His declared intention was to keep the model on the line until he found sufficient lift, even if it meant running into Bourg Leopold! There was very little wind and a high speed run was necessary to gain altitude. He encountered one small riser after running for about 100 yd. but considered it inadequate and so continued on, and on, and on! After negotiating a small ditch and other hazards Jerry found some lift and released. It seemed at first as though all his exertions had been in vain, for the model was definitely losing altitude. After about a minute the descent was arrested and until the dethermaliser operated—out of sight of the timekeepers—the model continued its steady climb for an o.o.s. time of 6 min. 41 sec.

Sokolov was second man away and he immediately went into lift going o.o.s. downwind after 5 min. 29 sec. Sokolov's launch was smoother and he got away better than Ritz but his model was of shorter span and orange in colour, whereas Ritz had a long span high aspect ratio model of a deep red hue. Ritz's model stayed fairly low and remained in sight longer, firstly because of its colouring and altitude and, secondly, because Ritz ran so far upwind that almost 50 sec. had elapsed before the model arrived back over the timekeepers' positions! Sokolov's model was still in the air when Ritz dethermalised but because of these factors, and the light colouring of Sokolov's model blending with the evening haze, it went o.o.s. more quickly.

The most unlucky man in the fly-off was Habib Habib, who had flown so consistently well all through the contest against tremendous odds. During his run over the very undulating rough ground he tripped and fell, the model unhooked and returned a time of only 86 sec.



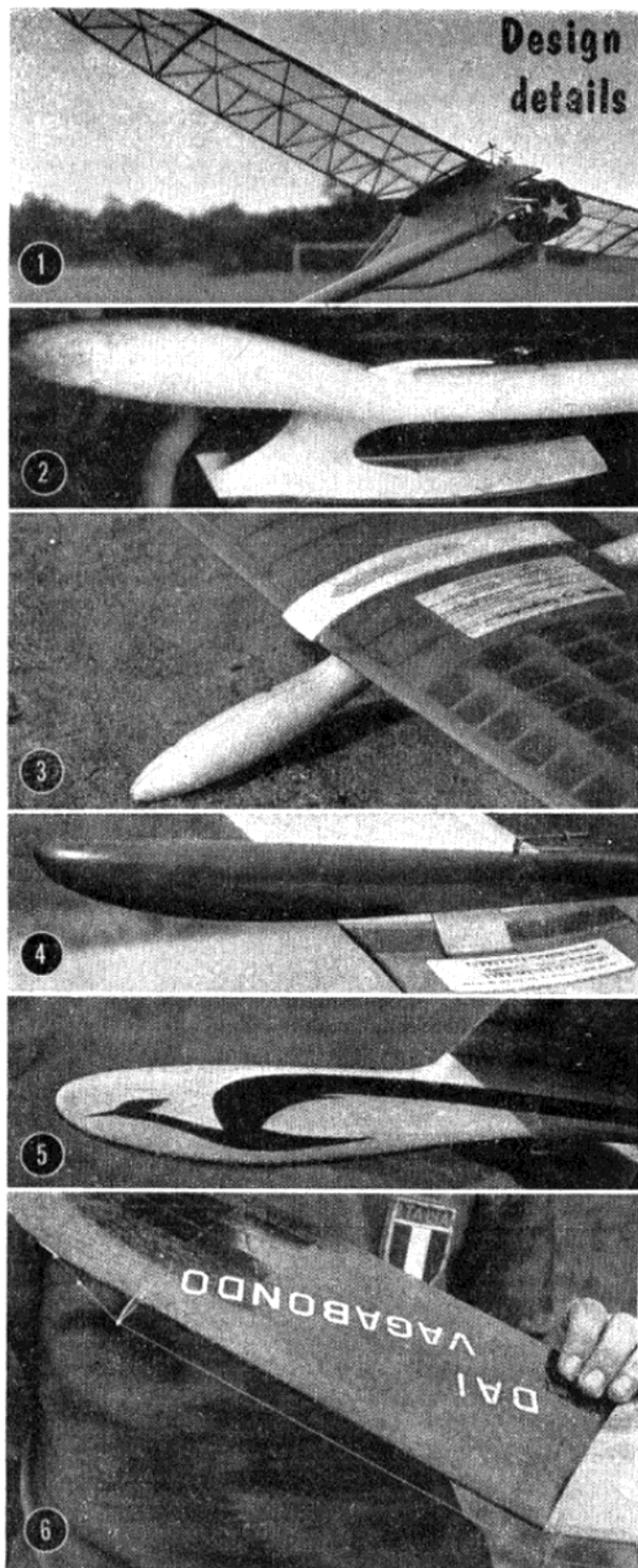
E. de Pelsmaeker, the Belgian team manager, walks to the pre-flight processing table with G. Zimmerman's colourful Harlequin decorated models.

Lucky model being weighed by Mme. Libert and Mme. Lippens belongs to French competitor Caron.

Pakistani heroes of the contest Habib Habib, and Rafik Habib, from Karachi. Between them, and flying proxy for Rafik Mohamedai, is Dachau of Belgium.

#### CAPTIONS TO PHOTOS TOP TO BOTTOM

The Canadian team of Tuck, Thompson and Foster, are here seen in their smart "whiter than white" outfits having their models processed.



## CAPTIONS TO PHOTOGRAPHS

1. Interesting pylon-mounted tailplane construction was on model built by R. Krook of Holland.
2. Tahkapaa's model had the most beautiful front end on the field. Pylon, nose and wing centre section appeared to be carved from one piece of Beech split down the centre and reinforced with 1/32 fly.



In happy mood Sokolov, watched by Horyna (Czechoslovakia), repairs a damaged wing panel.

Tahkapaa, the fourth man, made a good launch but the air was rapidly cooling and thermals were not over-abundant. He failed to find one and recorded a mere 71 sec.

The dinner and prizegiving were at 8.30 p.m. in the Officers' Mess. Speeches were made, badges and addresses exchanged, the U.S.S.R. team presented beautiful red and gold pennants to the winning Finnish team and to Col. Borgniet, who accepted it on behalf of the Belgian Royal Aero Club, the conversation became more and more animated and thus the evening changed to morning and drew to a close.

At 10 o'clock on Monday morning the two coaches, that had served us so well during the contest, transported everyone into Brussels and so ended a fine contest, an expert's contest, one from which everyone who attended must surely have returned wiser, and with a determination to do even better next time.

## RANDOM NOTES

We predict a bright contest future for Eddie Black, the youngest member of the G.B. team. He flew well and tirelessly throughout, determined not to let the handicap of his lost model affect the team.

\* \* \*

The two Pakistan team members who travelled overland to the A.2 Championships paid \$100 to get their gliders through the Iran Customs.

\* \* \*

Some idea of the prevailing flying weather in Pakistan may be gained from a remark by Habib Habib, who insisted that at home he would not fly in the blustery conditions prevailing at Bourg Leopold!

\* \* \*

Dr. Keith Hoover, well-known American modeller, shattered the A.2 silence by demonstrating the fantastic climb of his Holland Hornet powered 150 sq. in., very high thrust line model, during the second round, much to everyone's consternation!

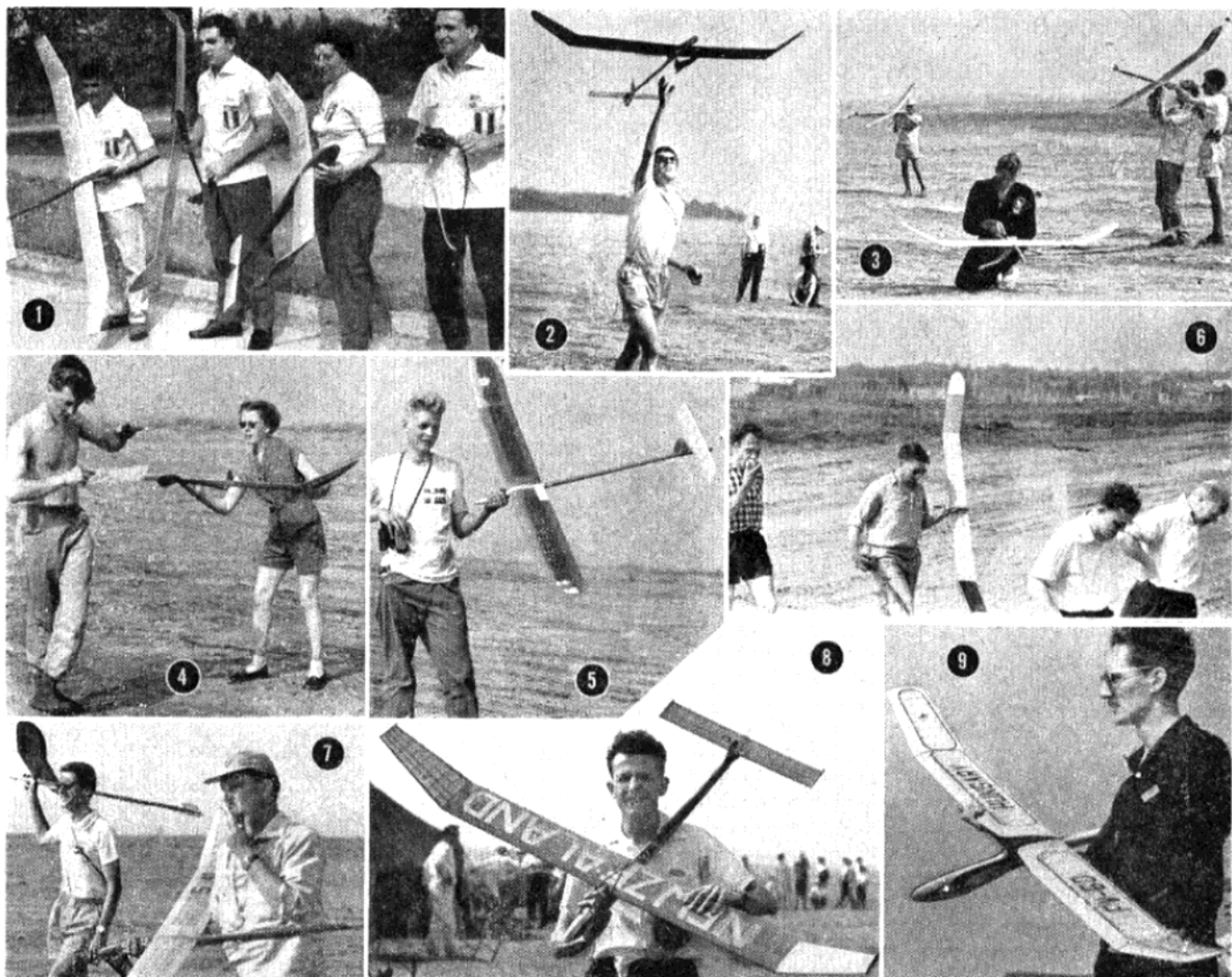
\* \* \*

Gerry Ritz, besides winning the trophy, also had another close shave when he won an autographed 10s. note from a British journalist in a screw bet—he's going to frame it.

\* \* \*

The Dutch models were decorated with Dutch cheese labels! Very tasty.

3. Another view of Tahkapaa's A.2 showing the natural polished wood nose and straightforward wing construction. Not only a good-looker, this one reached the flyoff.
4. From Czechoslovakia came this delightfully functional dural pylon, built by O. Prochazka, it had the wing tongue slotted and riveted across its upper end.
5. Power Champion Ervo Frigyes' model was covered with light yellow tissue, very highly finished and with this abstract bird motif in black tissue on the fuselage side.
6. Not a Welsh entry, but a novel disruptor used by Italian G. Taverna. Perspex distance pieces, nylon "wire" and spring tensioner to the wing tip.



New nylon type tow line material used in U.S.A. is called Stren. It is sold as fishing line, is light blue, light in weight £1 10s. 0d. per 100 yd. and does not stretch.

Each pair of timekeepers consisted of one modeller and one member of the Belgian Army, and very good they were.

Although the public barrier rope was, for most of its length, lying on the very dusty, dirty ground, not one member of the public attempted to cross the line! How about holding the British Nats. in Belgium in future?

At breakfast on Monday morning 15 modellers came forward to give details of missing models to the Belgian Army spokesman who organised a search party. Eddie Black's model was recovered and returned at Brussels Airport just as the party was preparing to board the *Viscount* for the return trip. It had a .22 bullet hole through the fuselage!

The American team, despite an intensive personal search, failed to recover Ritz's first model but found and returned Ray Shirt's model undamaged.

When the final results were published at the presentation dinner, American Bob Sisfleet's last maximum had been omitted from the list. The resulting low team points placed the U.S.A. in 14th place instead of the correct position of 5th place. The error was spotted quickly—by Bob Wehle. Col. Borgniet announced the error and correction was made.

Of the 50 member nations of the F.A.I. 34 have aeromodelling interests yet only 20 of these have sent teams to the Wakefield and A.2 Championships.

1. Only woman competitor was in the French team from left to right: Caron, Braud, Mme. Magniette, and manager Guidici. Despite eight consecutive max's in the French eliminators Mme. Magniette was unable to find any lift at Bourg Leopold.
2. H. Thoman, Swedish team manager, launches for Bilson during the second round.
3. Lone New Zealander at Bourg Leopold was John Sheppard. Here he kneels in front of the Israeli/Swedish entries waiting to launch Richie's model in the second round.
4. British team man Ray Shirt from Sheffield, despite assistance of his wife, Freda, was unable to find one of those elusive thermals during the first two rounds.
5. Jansson of Sweden holds one of the magnificently built Swedish models for the benefit of the many interested photographers.
6. Looking for sixpence Ray Monks (spelt Monkx by the Belgians) strolls out for his first max, accompanied by supporters and fellow clubmen Johnny Bickerstaffe and Eric Barnacle, keeping the doctor away!
7. Has that model hooked a thermal? H. Thoman of Sweden and Wilim Kamock with one of the intricate Yugoslav models hold back. No-one wants to be first to launch!
8. S. Pieterhons of Belgium flew proxy for R. Wilson of New Zealand. After four maximums he lost the model in the woods. The words New Zealand were applied to the wing top surface in aluminium foil!
9. Hungarian refugee modeller now living in Paris is Belhazy, who assisted the Hungarian team during the contest. He is here seen holding Erno Frigyes beautiful yellow and black entry.

RESULTS AND MORE PHOTOS OVERLEAF



## Ritz's recipe for success . . .

## RESULTS



Preparing for the fly-off Jerry Ritz partakes of a stimulant.



The winning formula—keep running until you find a thermal—distance no object.



This is how it feels to be top man (and he's still running).



"I wonder why everyone wants my picture?"



Thank goodness that's all over, but boy was it worth it!

	1.	2.	3.	4.	5.	Total
1. Ritz . . . U.S.A.	180	180	180	180	180	900+401
2. Sokolov . . . Russia	180	180	180	180	180	900+329
3. Habib . . . Pakistan	180	180	180	180	180	900+86
4. Tahkapaa . . . Finland	180	180	180	180	180	900+71
5. Kekkonen . . . Finland	180	180	180	180	180	900
6. Buiter . . . Holland	180	180	164	160	180	864
7. Jansson . . . Sweden	180	180	180	180	140	860
8. Bulgheroni . . . Italy	180	180	126	180	176	842
9. Wagner . . . Austria	110	180	180	180	180	830
10. Ella . . . Finland	180	180	101	180	180	821
11. Nilsson . . . Sweden	180	180	92	180	180	812
12. Babic . . . Yugoslavia	180	180	180	180	90	810
13. Monks . . . Great Britain	180	180	180	180	160	808
14. Michalik . . . Czechoslovakia	180	106	180	180	159	805
15. Taverna . . . Italy	97	180	161	180	180	798
16. Hansen, B. . . Denmark	180	75	180	180	180	795
17. Thomson . . . Canada	180	180	180	180	70	790
18. Kunz . . . Germany	145	180	180	96	180	781
19. Kool . . . Holland	180	108	180	180	127	775
20. Horyna . . . Czechoslovakia	180	164	180	180	69	773
21. Schnurer . . . Austria	85	180	141	180	180	766
22. Petit . . . Belgium	180	180	87	180	135	762
23. Kalen . . . Sweden	180	41	180	180	180	761
24. Frygyes . . . Hungary	180	77	180	125	180	742
25. Krook . . . Holland	180	145	68	180	166	739
26. Radoczi . . . Hungary	133	164	180	180	79	736
27. Hansen, H. . . Denmark	180	180	123	71	180	734
28. Soave . . . Italy	109	180	100	160	160	729
29. Marchand . . . Belgium	180	82	105	180	180	727
30. Weihle . . . U.S.A.	154	180	102	105	180	721
31. Wilson . . . New Zealand	180	180	180	180	—	720
Proxy: Pieterhons.						
32. Feldleit . . . Israel	87	180	180	180	88	715
33. Black . . . Great Britain	180	149	77	125	180	715
34. Vuletic . . . Yugoslavia	180	180	55	180	115	710
35. Braud . . . France	180	71	180	86	180	697
36. Scheidler . . . Austria	87	180	180	62	180	689
37. Prochaza . . . Czechoslovakia	180	112	180	50	164	686
38. Averyanov . . . Russia	180	180	87	55	180	682
39. Sisflet . . . U.S.A.	60	77	180	180	180	677
40. Roser . . . Hungary	159	180	66	180	92	677
41. Hauenstein . . . Switzerland	62	83	180	180	171	676
42. Driher . . . Yugoslavia	85	179	103	180	128	675
43. Maromedali . . . Pakistan	180	—	180	180	121	661
Proxy: Duchau.						
44. Sumonov . . . Russia	96	55	147	180	180	658
45. Caron . . . France	68	49	180	180	180	657
46. Hansen, A. . . Denmark	180	—	180	179	116	655
47. Tuck . . . Canada	67	180	94	125	177	643
48. Dawood . . . Pakistan	31	66	180	180	180	637
Proxy: Preud Homme.						
49. Shirt . . . Great Britain	96	86	180	85	180	627
50. Scheu . . . Switzerland	141	180	—	180	97	598
51. Foster . . . Canada	171	70	50	142	161	594
52. Kiflawi . . . Israel	79	51	98	180	180	588
53. Sheppard . . . New Zealand	25	148	130	180	103	586
54. Beutler . . . Switzerland	96	56	55	180	180	567
55. Benkert . . . Germany	180	53	72	64	180	549
56. Ritchie . . . New Zealand	180	50	85	166	61	542
Proxy: Buykx.						
57. Zimmerman . . . Belgium	55	180	43	180	79	537
58. Magniette . . . France	83	104	149	81	113	530
59. Kadmon . . . Israel	—	180	36	180	102	498
60. Kathoff . . . Germany	140	27	71	175	77	490

## TEAM RESULTS

1. Finland . . . 2,621	8. Russia . . . 2,240	15. Belgium . . . 2,026
2. Sweden . . . 2,433	9. Pakistan . . . 2,198	16. France . . . 1,884
3. Holland . . . 2,378	10. Yugoslavia . . . 2,195	17. New Zealand . . . 1,848
4. Italy . . . 2,369	11. Denmark . . . 2,184	18. Switzerland . . . 1,841
5. U.S.A. . . . 2,298	12. Hungary . . . 2,155	19. Germany . . . 1,820
6. Austria . . . 2,285	13. Gt. Britain . . . 2,146	20. Israel . . . 1,801
7. Czechoslovakia . . . 2,264	14. Canada . . . 2,027	

Below: Here are the five men who shared top honours by reaching the fly-off—Sokolov, Ritz, Habib, Kekkonen and Tahkapaa. Ritz is 43 years old, and has been modelling since 1928. He has six children and when not modelling runs his own furniture manufacturing company.





# THE TRACKER FAMILY

WHEN it was learned back in the early 'fifties that Grumman's S2F-1 anti-submarine aircraft would be powered by two piston-engines, this was considered a rather retrograde step. Quite apart from the fact that almost all carrier-based aircraft, except helicopters, were switching to turbine power by then, it was felt that the pilot's field of view would not be improved by having two large 1,525 h.p. Wright R-1820-82 radials hanging outside his windows. Experience has since shown that Grumman's vast experience of producing naval aircraft has more than offset any apparent disadvantages.

Basic design philosophy behind the S2F was that it should be a single-package combined hunter-killer to replace the two-plane teams of *Guardians* then used for anti-submarine duties. This could hardly produce a handsome aeroplane, as it involved packing an incredible variety of equipment and armament into a comparatively-small airframe; and, of course, the wings had to fold for carrier operation.

The main search radar was installed in a retractable "dust-bin" under the fuselage, with more electronics in a streamlined fairing above the cabin and MAD (magnetic airborne detection) in an extendible tail-sting. A searchlight was mounted under the starboard wing, and the search equipment was completed by putting sonobuoy housings in the rear of each engine nacelle.

For the "killer" half of its job, the S2F was given a large fuselage weapons-bay, capable of accommodating depth charges including the nuclear (Betty) torpedoes, bombs and mines, plus six underwing racks for rockets, bombs, flares and other stores. With so much ironmongery to cope with it, was considered essential to carry a crew of four, comprising pilot, co-pilot/navigator, radarman and MAD operator.

The prototype XS2F-1 flew on December 4th, 1952, and went into production that same year. The S2F-1 *Tracker* was followed by the S2F-2, with an asymmetrical bulge on the port side of its weapons-bay to accommodate a larger homing torpedo, and some 700 aircraft of these two marks have been delivered. Most have gone to the U.S. Navy, but 30 were allocated to the Japanese Maritime Self-Defence Force and six to Italy, while *Trackers* will also equip units of the Royal Netherlands Navy. In addition, 100 S2F-1s are being built for the R.C.N. by de Havilland Aircraft of Canada, under the designation CS2F-1.

Latest version is the S2F-3 (first flight late May, 1959) with rounded, extended wingtips and a longer fuselage to improve crew comfort and provide space for the latest electronic gear.

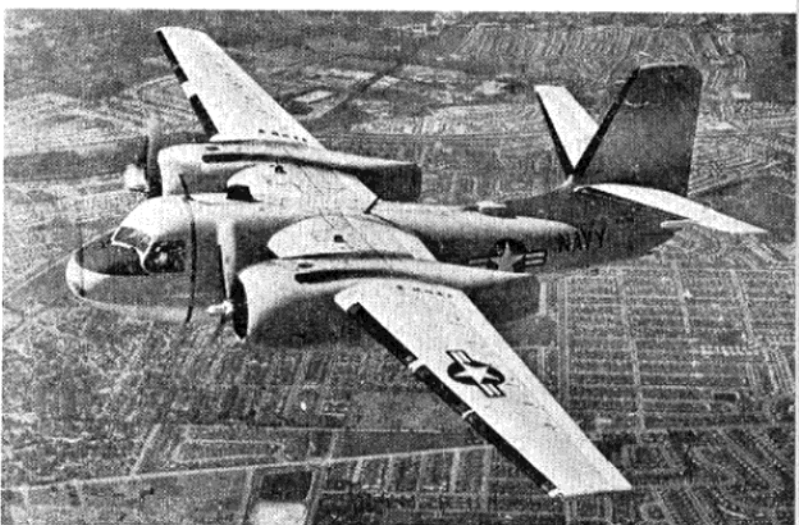
It was apparent from the start that the basic design offered considerable scope for development in other roles. First major variant to appear was the TF-1 *Trader*, serving the dual purpose of a carrier-operation trainer and a personnel and cargo transport for re-supplying the fleet at sea. Main difference, apart from deletion of operational equipment, is that the *Trader* has a deeper, more roomy cabin, accommodating nine passengers. Like the S2F, it has full navigation aids for all-weather operation and can take off and land with a full load from the smallest carriers.

From the *Trader* has been evolved the WF-2 *Tracer*, intended for the vital job of providing early warning of the approach of enemy aircraft and surface forces for the fleet at sea. Major mods, in addition to mounting a vast radar scanner above its fuselage, are the introduction of twin fins to reduce radome wake effects and a switch from upward to rearward wing folding.

Data (S2F-1): Span 69 ft. 8 in.; length 42 ft. 3 in.; height 16 ft. 3½ in.; wing area 485 sq. ft.; loaded weight 21,000-24,000 lb.; max. cruising speed 240 m.p.h.; endurance 8 hours at 100-180 m.p.h.

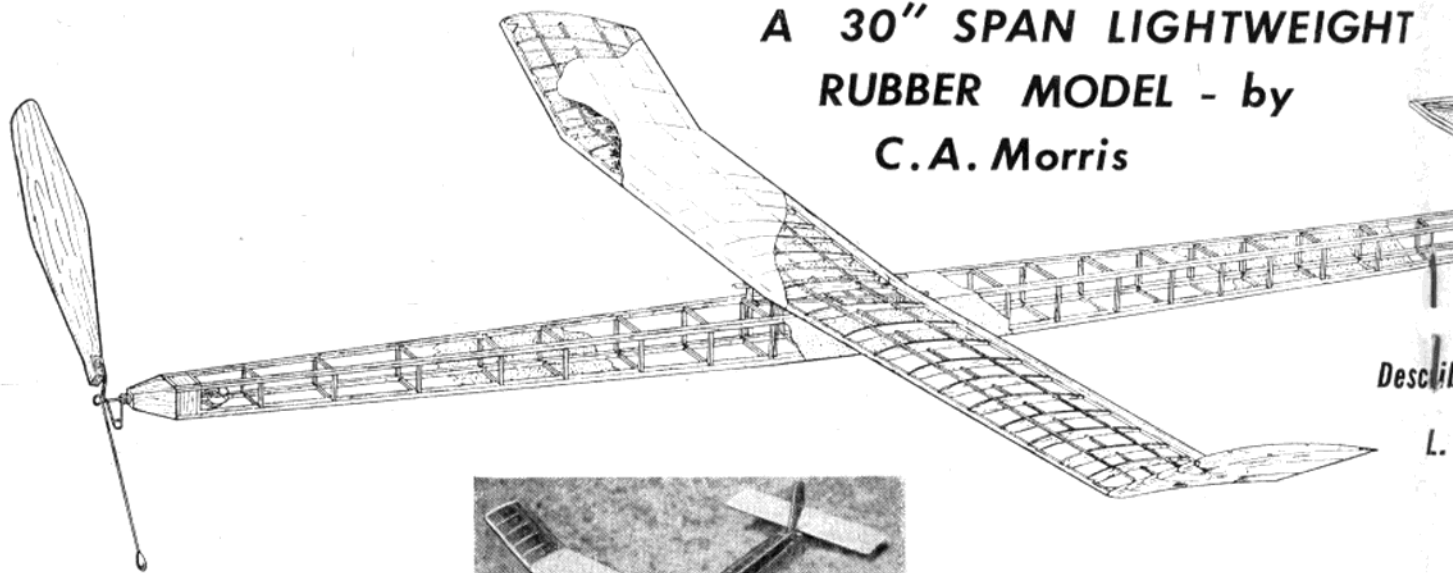
Top photo shows the S2F-1 in U.S. Navy midnight blue. The underside view in the next photo is of the Italian S2F-1. The typical "tubby" Grumman configuration is well brought out in the third photo of an S2F-1 in the grey and white U.S. Navy colour scheme.

Bottom photo was taken inside the de Havilland Canadian factory where the S2F-1 is being built for the Royal Canadian Navy with the designation CS2F-1.



# CLOUDPIN

A 30" SPAN LIGHTWEIGHT  
RUBBER MODEL - by  
C.A. Morris

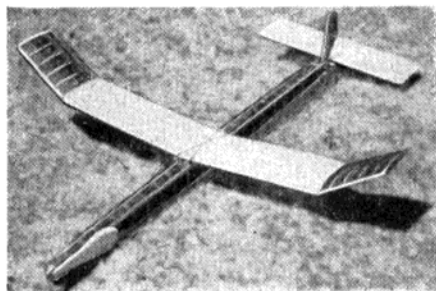


**Y**OUTH is the keynote of this rakish lightweight. Designed in the contemporary, long fuselage idiom, its inexpensive construction and up-to-date lines should have a particular appeal for the up and coming young modeller.

In describing *Cloudpin* it is well to remember that for some years the rubber lightweight has been lost sight of in the general preoccupation with larger, Wakefield size models. This is a pity, as the lightweight has much to offer both the contest and fly-for-fun modellers. Quick and economical to produce, replacement value is low, both in time and money, and a lost or damaged model becomes a mishap rather than a disaster.

Rubber costs, too, are modest. Fewer strands means greater uniformity of tension along each individual strand, thus reducing fatigue and lessening the incidence of breakage. This gives the lightweight an advantage over its big brother in that a consistent performance can be obtained without getting a "new motor per flight" complex. Nor is high quality rubber so important. If there does exist any difference in quality between specially imported strip and over-the-counter rubber, *Cloudpin* is unaware of it, as it performs quite adequately on the latter.

Since the rubber motor is, in effect, the heart of the model the design approach to *Cloudpin* was essentially



logical. Instead of first producing the model, and then arranging a motor to suit its characteristics, *Cloudpin* was designed around the motor. The idea was to evolve the largest possible model that would fly on the minimum feasible amount of rubber; six strands of  $\frac{1}{4}$  in. strip. A motor of this small cross section gives a very consistent output of power throughout the motor run, provided of course, that it is of reasonable length. Consistent power output, or flat torque curve, keeps the nose down on the initial burst and the nose up on the last few hundred turns. It also facilitates trim adjustment. On *Cloudpin*, for instance, no variation to the thrustline was found necessary.

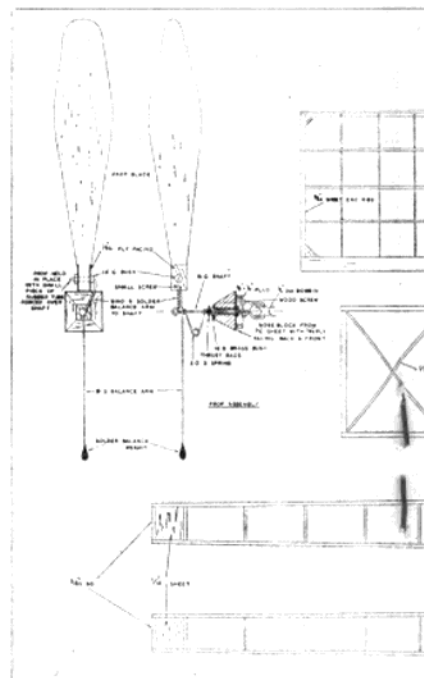
Quite as important as the motor is what it turns, and how it turns it. For this reason much thought and experiment has gone into the propeller and its mechanism. Such minor points as ply facings on the noseblock and prop hub safeguard against major airfield failure, and the wire assembly is robust and positive in action.

Much of the success of your *Cloudpin* model will depend upon correct carving and pitch alignment

of the propeller. Care should also be taken to ensure that the blade is correctly balanced, and that it folds flush along the left side of the fuselage.

Construction of *Cloudpin* follows normal practice, but study the plan carefully before you actually start to build. Good quality wood should be used throughout, with fuselage longerons

**THE DES**  
Sixteen years of modelling since the is a De Havilland a member of both the Hornchurch clubs. in power duration t is rubb





s of age. Has been  
the age of ten. He  
and apprentice and a  
h the St. Albans and  
ubs. Dabbles a little  
ion but main interest  
rubber.

proof paper between. Join up the two sides with the help of set squares, lining up carefully on plan to avoid distortion. See that the uprights of the parasol wing mount are cut to

The prop hub and wire assembly is made robust by the use of ply facings and solid bushing. The assembly is fully detailed on the plan, and attention need only be drawn

The two predecessors of *Cloudpin* were lost o.o.s., so don't forget the d/t.

[illegible]

# AVIATION NEWSPAGE



by J. W. R. Taylor

**FLYING TIGERS** above are fiercely-decorated Grumman F11F-1s of the U.S. Navy's VF-21 Squadron. Little has been heard of this lightweight interceptor since it entered service, but its quality is shown by the fact that it equips the Navy's crack Blue Angels aerobatic team and has been chosen as the standard fighter for Japan's Air Self-Defence Force, against competition from the *Starfighter* and other types.

Japan's G-98J-11 *Tigers* will be powered by a General Electric J79-GE-7 turbojet, giving 15,560 lb. s.t. with reheat. With a normal loaded weight of 15,000 lb. and overload weight of 23,630 lb., they will have a top speed better than Mach 2 (1,320 m.p.h.) at 40,000 ft. and an initial rate of climb of close on 23,000 ft./min. The standard F11F-1 can attain 890 m.p.h. with a Wright J65-W-18 turbojet (11,000 lb. with reheat) and is armed with four 20 mm. cannons and four underwing Sidewinder missiles.

Cinema-style **TIP-UP SEATS**, with folding arm-rests and 14 in. of shin clearance for long-leggity passengers, help to make B.E.A.'s newly-converted 63-seat *Viscount* 701s more comfortable than you would expect. The Corporation anticipates little trouble in filling the extra seats. Since it slashed its week-end fares between London, Belfast, Edinburgh and Glasgow to levels strictly competitive with the cheapest surface transport, traffic has increased by 45-50 per cent., with 75-80 per cent. load factors, and it is now going all out for

15-20 per cent. fare cuts on other routes, particularly London-Paris.

**TWIN PIONEER** which lives up to its name is G-AOER (*below*) which carries new-type geophysical survey equipment in finned fibreglass pods that form wingtip extensions and give it a span of 85 ft. 6 in. Owned by the Rio Tinto company, it will be used to detect mineral-bearing ore deposits lying on or beneath the earth's surface. Its equipment is so advanced that geophysicists will be able to tell easily whether or not the deposits are worth exploiting.

In addition to the Mullard Electromagnetic Detector, the coils for which are enclosed in the wingtip pods, G-AOER carries a magnetometer in its rear fuselage and a scintillometer. The equipment is quickly removable, enabling the aircraft to be used for freighting, executive transport and photographic survey.

**SOVIET SURPRISE** was the recent claim that a T-431 single-seat jet aircraft, flown by Major V. S. Ilyushin, has exceeded the *Starfighter's* world height record with a climb to 94,333 ft. It is reported to be a Sukhoi delta.

**JERRY LAWHORN'S** home-built *Kee Bird* (*above*) is not the kind of aeroplane that presents spotting problems. The 40 ft. wings, with full-span one-piece aileron-flaps suspended below the trail-

ing-edges, come from a Boeing YL-15 *Scout* observation aircraft. The rest is pure Lawhorn, designed to make the machine ideal for huntin', shootin' and fishin' trips in Alaska.

Powered by a 190 h.p. Lycoming, the *Kee Bird* weighs 2,250 lb. and has a top speed of 125 m.p.h. Its 35 in. diameter tyres enable it to unstuck in 125 ft., even from rough ground, and are interchangeable with floats or skis. The three seats are removable and, together with the overhead control column, enable Lawhorn and his pals to sleep comfortably in the cabin during trips to remote areas. The doors hinge up for loading freight and for the old Alaskan



Jerry Lawhorn's home-built "Kee Bird."

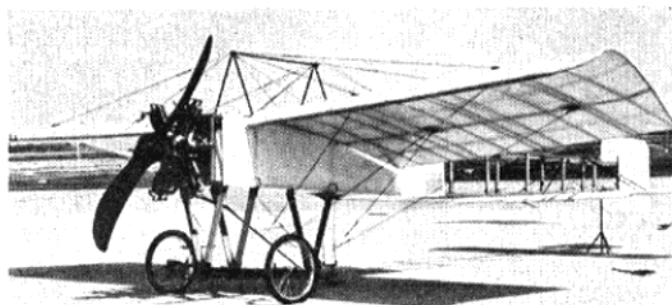
custom of shooting wolves from the air, and the luggage space is long enough to take snowshoes, bedrolls, fishing rods and guns. All of which makes the *Kee Bird* quite a plane.

**BEST ARGUMENT YET** in favour of economy-class travel is the news that Continental Airlines are installing TV in the first-class lounges of their Boeing 707s. They report excellent reception at 35,000 ft. on their Chicago-West Coast routes.

**NO BLERIOT**—The 1911 monoplane illustrated below is in fact a replica of the first successful aeroplane built by Clyde Cessna. Made for Cessna Aircraft by Burrell Tibbs of Oklahoma City, it is based on original drawings and notes made by Tibbs during personal meetings with Cessna before his death in 1954. The original monoplane was nicknamed *Silver Wings* and was powered, like the replica, by a six-cylinder Anzani radial, giving 50-60 h.p. and a speed of around 50 m.p.h.



Below: the survey equipped Pioneer.



A Replica of Clyde Cessna's 1911 Airplane



# Topical Twists

by PYLONIUS

## Just Dandy

When you think of the animated scarecrows which were the scourge of the "Keep Britain Tidy" campaign a few years ago, you have to admit that the modeller of today is a more elegant and hygienic creature than his wild and unkempt predecessor. Those crumpled, oil soaked bags, once the hallmark of the devout enthusiast, have given way to well tailored reach-me-downs, and that off-black shirt, guaranteed to make any detergent manufacturer froth soap bubbles, has been replaced by a foppish garment of whiter than white brilliance. Chins, too, are now worn several shades lighter in hue, which suggests that razor blades have been given a new priority, while that sheep dog hair style has been cut well back above the eyes, and slicked down with more socially acceptable oils than diesel and glow fuel.

Altogether, the modeller of today has become so presentable a specimen that the good ladies who dish out the rally hardware can go a whole session without once being revived with smelling salts.

Blame all this loss of character on to the cosmetic influence of the telly commercials if you will, but I put it down to those extra two wheels which have been added to the modeller's transport. Gone is the rugged individualist of the two-stroke, two-wheel era; in his grimy and effluent place we have the well-groomed car owner—very conscious of his new found status, and more concerned with keeping back seat Mother-in-Law in good humour, than in winning a model contest.

But does this mean we modellers are getting soft? Well, we can take comfort from the thought, that, in all other respects, the old anarchist traditions survive. Few clubrooms in the country can boast an unbroken stick of furniture, and if, on occasion, the Chairman's cry is heard above the general uproar, it is only that four-wheel gossip can be carried on with less noisy demonstration than the two-wheel variety. What is more, the mechanical geniuses still react with the same hurt surprise when asked to turn their engrossed attentions to trivial model affairs.

On the whole, you might say, the modeller has not become so soft as well upholstered.

But, on the debit side, our fashion plate modeller doesn't acquit himself quite so gamely in the jungle fringes of the airfield as his near-to-nature antecedent. By the time he has picked his fastidious way through the undergrowth the local scavengers have snaffled his engine, and all other whippable components. And, if the model gets treebound, be it a co-operative sort of outgrowth, with thoughtfully provided footholds, and not the usual monster, with a bark smoother than that of a pampered poodle, he's had it. That monkey business is a thing of the primeval past.

Cornfields, too, present a pretty problem. The old scarecrow modeller outwitted the ever vigilant farmer by playing O'Grady. When spotted he only had to stick a straw in his mouth and extend his arms to become part of the landscape. White flannels, on the other hand, present much too tempting a target to any shotgun toting farmer.

On evidence, it would seem that to be a successful contest modeller you have to stick to the scruff order traditions. In fact, the only one who keeps the old style shirt tails flying, is the one who never loses a model—or a contest.

## Under Starter's Orders

We may not know where flyers go in the winter, but, at least, we have a clue to where novices go in the summertime. I had always imagined the species existed merely for the

sabotage of club meetings as they avoid the flying field like the plague. But, apparently, they only use the clubroom as a training ground. Their real effort goes into the organising of our contests, to which they bring that brilliant understanding which has brought so many clubs to the brink of ruin.

With all the clueless types falling over each other in the mad rush to run our contest events, qualifications for the job are necessarily high. The first requisite is the complete inability to read a stop watch. Next comes a total incapacity to distinguish one model from another. This ensures that a model entered in the radio event has an equal chance of winning the power duration as a combat model.

Don't think, however, that the novice officials are only concerned with creating chaos and confusion among the experts. They have their own bit of fun on the side. Instead of timing the wrong model, as is the usual practice, they all time the same one. The one getting nearest to the secret time is the winner, provided he doesn't time the flight correctly, in which case he would be disqualified.

Only in running the team race and combat events do the novices come unstuck. They are completely outwitted by the entrants, who manage to gum up the whole affair before the novices can make a move.

## Bilt Up Area

I wonder just how long we do-it-yourself modellers can resist the tide of over-the-counter automation. Already the threat of the all plastic, radio model hangs over our yet unbowed heads like a ready made vulture, and, soon, the only building going on will be the blocks of flats on our last few flying fields. By then, the reddi-bilt, self-trimming toy plane will be in the grubby grasp of every youthful paw in the country, and, with the coming of the toy maker's millenium, the home made model will just be a fatiguing memory of the slavish past.

The day will eventually dawn when some exploring archaeologist will dig up the relics of Balsa Age Man, and perhaps ponder on the possible uses of the rusted razor blade, the solidified tube of cement, and the little can of midnight oil. Meantime, we can take heart from the fact that the building board is being bashed with undiminished gusto. Tissue and balsa continue to be the chief form of flying field decoration, and, altogether, we can be proud of the heroic resistance that the home-made model is putting up in this plastic, polymanic age.

Encouraging, too, is the behaviour of the present day, reddi-bilt, five bob model. With a flight performance more reminiscent of the Stone Age rather than the Balsa Age, it creates havoc among the family picnicking parties. The diminutive, but headstrong, missile stubbornly thwarts all the stalwart efforts of wiseacre Dad and Uncle to get it airborne. This upsets Sonny no end. If dim Dad can't fly a silly toy plane he's not likely to be the first man to reach the moon after all. And as for useless Uncle, he even smashed the plastic rotor kite.

Still, the sonnies of the future may not be so disgruntled. With Dad safely tucked away on the moon, and Uncle somewhere in orbit, there'll be no one to spoil his fun with his press button, crashproof, guaranteed to fly toy plane.

## A Fete Worse . . .

I can't believe I deserve it. There I was, enjoying a get-away-from-it-all respite at a quiet garden fête, with nothing more obtrusive assailing my sensitive ears than the gentle plop-plop from the hoopla stall, a happy gurgle from the Baby Show, and the odd, bony rattle from the Knobbly Knees contest, when, suddenly, the peace of the summer afternoon was shattered by a familiar and sinister sound—that of a wailing diesel in full, unholy spate.

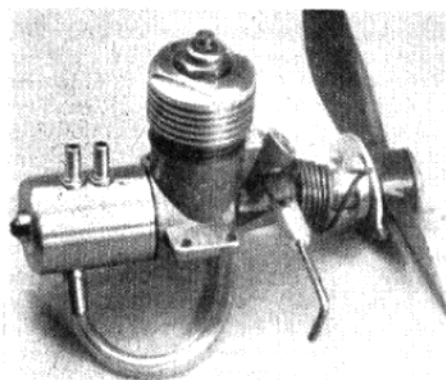
Behind my unsuspecting back a gang of wild looking characters, whom I had innocently taken to be entrants in the sack race, had invested the green lawns with their accoustic gadgetry. And before you could say Heath Robinson (but not hear yourself) they were going at it Combat hammer and tongs.

So quickly was I off the mark that I was out of the gate before the first model crashed. Which, though I say it myself, was some going.

# Over the Counter

The newest plastic kit from **Revell** is the *Bell Airacobra* produced to 1/45th scale. One of the notable points about this model is the moulding of the wing and tailplane trailing edges, which are so beautifully "knife-edged" that the plastic is almost transparent! The cabin door can be fitted either open or shut, and pre-war pattern U.S. transfers are included which give the model considerable character. Price of this 9 in. wingspan beauty is 7s. 11d.

The latest gimmick from the engine manufacturers is the spring starter—various types are about to flood the market—as readers of Peter Chinn's "Latest Engine News" will be aware.



After much development **Davis-Charlton** have now finalised the design of their "Quickstart" spring starter incorporating a metal cam behind the airscrew. This can be seen in the accom-

panying photograph of the new D.C. *Bantam* 0.046 c.c. glow engine. The *Bantam* costs 34s. 10d. and comes in a distinctive triangular box. Accessories available are the *Bantam* multi-purpose spanner/screwdriver at 1s. 6d. and an ingenious quick-release battery lead connector, the "Quickclip" costing 5s. 5d. with battery leads.

Davis-Charlton also plan a range of super efficient nylon propellers, the first of which will be in the shops early next month. They will be 6 x 3 in. and 5 1/2 x 3 in. and suitable for the *Bantam*. "Quickstart" glow fuel will be available at about the same time.

One of the largest West German model manufacturers and distributors is **Johannes Graupner** of Kirchheim-Teck. Many British items are to be found listed in his latest catalogue just received. This lavish publication measures over 8 1/2 x 11 1/2 in. and contains 130 pages of models and accessories. Many single products have complete pages devoted to them and there are engine cutaway drawings, photographs (some of them full colour), and comprehensive specifications of all the goods offered.

New **Frog** products this month include a range of completely redesigned airscrews. Three sizes are at present available moulded in nylon—7 x 6 in., 8 x 4 in., and 9 x 4 in. The first two are also available in polystyrene at about half the price of the nylon product.

The latest addition to the **Frog** "World War Fighters" series of 1/72nd plastic models is a *Spitfire*. Much care

has been devoted to the preparation of this model, particularly around the engine cowling, the exact shape of which seems to elude most manufacturers. Production of the long awaited *Rotodyne* is also well advanced, and it may be in the shops by the time this issue appears. Other **Frog** plastics in preparation are the *Blenheim*, *Hampden* and *Wellington*. Although no price has yet been fixed they will probably retail for around 3s. 6d. each, and will, we are sure, be extremely popular.

Buzzing around the **Frog** camp at the Northern Heights meeting this year was a delightful little C/L S.E.5. We now learn that this is to be produced in kit form in the not too far distant future.—If the standard is as high as their new *Tempest* kit it will be well worth waiting for.

Changes in contest rules have always been a headache to manufacturers, and one to be affected by the recent change in the "1/4A" team race requirements is Peter Donavon-Hickie. He had added a "1/4A" pilot to his family of **N.A.T.O.** pilots and it is now, of course, too small. Fortunately, however, it was scaled to 1/2 in. to 1 ft. so it can be used in any of the wide range of scale kits on the market which conform to this size. It is available (retail and trade) from Henry J. Nicholls Ltd., in the latest Mercury "Minipack" containers.

We were very impressed by the performance of the German **O.M.U.** R/C equipment which we saw in use at a recent rally. There is a wide range of single and multi equipment, actuators, servos, etc., now available in this country, so anyone interested in R/C would do well to drop a line to the British distributor, E. Johnson, The Stores, Larkhill, Wiltshire, for full details.

## Over the Counter reviews

### The Fred Rising Escapements

Technical report by F. C. Judd, A.Inst.E.

#### The FR Mk1 Clockwork Escapement

Two types of the FR Mk1 escapement were submitted for review, a 2-pawl and a 4-pawl. Both these units are clockwork driven, and I must say I have yet to see a more robust escapement so small and light in weight.

Here is the maker's specification for both types:—

Weight ...	1.25 oz.
Space requirement	1 1/8 in. square
No. of revs per winding	100 plus (200 movements)



Working voltage 4.5 v. at 0.3 amp  
or 3 v. at 0.35 amp.

The above current rating is for the "hold on" condition. During intermittent operation it is, of course, considerably less. The escapement is nicely packaged complete with operating instructions and a crank arm that can be mounted on either end of the escapement

arm spindle. Extra brackets are supplied for alternative mounting.

#### Functional Tests

One of these units was put through tests simulating conditions that would never be found in normal usage in model aircraft or boats and was, in fact, tested to almost complete destruction. It was subjected to continuous running tests from a pulsed amplifier, the escapement solenoid being connected across the output of the amplifier and operated between 1.5 times per sec. and 10 times per sec. Although the pulse current through the solenoid was at several times greater than the normal rating and caused the windings to overheat badly, it worked perfectly at five to six times per sec. for its full wind without one failure or mis-step of the pawl and was further tested satisfactorily several times under normal working conditions.

It survived a drop test on to concrete from a height of 6 ft., after which it still continued to function satisfactorily and suffered only a bent bracket. A drop test from a height of 20 ft. on to concrete

proved fatal for only then did it refuse to function any longer. This escapement was returned to the makers who were able to repair it even after the terrible punishment it received, and it again functions perfectly.

Each of the clockwork escapements was subjected to high-amplitude vibration tests whilst actually operating, vibration being applied at frequencies between 10 and 90 c.p.s. The escapements showed no inclination whatsoever to miss or jump movements whilst being operated continuously at 1.5 times per sec.

An additional test included checking the lowest voltage at which the escapement would operate satisfactorily, e.g. when loaded. A minimum voltage of 2.5 v. is required.

Perhaps I should explain that I have been directly associated with prototype testing of full size aircraft electronic equipment and anyone who has witnessed such tests will agree that they are both thorough and drastic. Units passing these tests at all stages are generally labelled "Type Approved." I feel that the Mark 1 has more than earned its "Type Approved" label and I have no hesitation in recommending it.

#### The Rubber Motor Escapements

The other escapements sent for review were a 2-pawl lightweight unit

and a 2-pawl compound escapement, both for rubber motor drive. These are known as the "Super Lightweight Escapement" and "Super Lightweight Compound Escapement" respectively. I felt there was no need for other than current consumption, vibration and normal operational tests as both these escapements are constructed with the same robustness and precision as the clockwork units. Here is the Fred Rising specification (Compound Unit).

Weight	... 1/4 oz.
Size of base	... 2 1/4 in. x 1 1/4 in.
Working voltage	... 3 to 6 v.
Operating current	0.35 amps at 3 v.
Recommended rubber motor	... One loop 18 in. long of 3/16 in. x 1/24 in. elastic.

This unit enables the user to get positive rudder and engine control with a single channel radio, and to obtain engine control a second escapement may be used in conjunction with an additional contact on the compound escapement. A circuit diagram for the above operation is provided.

The Super Lightweight model operates at 3 to 6 volts with a nominal rating of 3 v. at 0.35 amps. A single loop rubber motor of 1/8 in. or 3/16 in. 18 in. long, suitably lubricated, will take 200 turns.

Both escapements are uniquely packaged in plastic containers complete

with instructions and shaft couplers.

Each escapement was tested for continuous operation from a rubber motor drive and tested for over 200 complete turns at repetition rates between 1.5 and 5 c.p.s. per sec. Only on one occasion did a mis-step occur. A test was made to ascertain the tension that could be withstood by the pawl arms against the armature stages by winding the rubber drive to almost breaking point. The nylon arms are more than strong enough to withstand full tension from the recommended size rubber motor.

Each of these escapements will work with a battery voltage as low as 2.5 v. but are intermittent at any voltage below this. Voltage and current ratings for all the FR escapements otherwise agree with the specification. Again I feel that "Type Approved" should be appended to these products and can therefore recommend them.

My only criticism is that the bobbins are made from a plastic material which would melt if the windings became overheated through leaving the escapement operating continuously, e.g. with full current flowing. This might occur if the receiver relay failed to open, thereby leaving continuous current flowing through the escapement solenoid. In any case the bobbin wire insulation would also be damaged under such an extreme condition as this.

#### Trade Topics . . .

### Something for everyone in the R.E.P. range of Radio Control equipment

A PARALLEL can be drawn between the present position with commercial R/C equipment in this country, and the engine situation 10 years ago—when high performance is required the general reaction is immediately to think of American goods. This reaction is unfair to our own manufacturers, who endeavour to supply high quality, reliable products at realistic prices, to a market which is, to a large degree, limited by lack of commonsense, basic grounding in modelling, and a too ambitious start. All of this adds up to failure and consequent poor advertisement for the trade. This situation will, as with engines, sort itself out in time, but what is being done about it now?

In a discussion at the Nationals we presented this viewpoint to George Honnest-Redlich, a leading expert on R/C equipment, and possibly the first person to fly a model under R/C in this country. He agreed that (like engines) much of the equipment sold was never installed in a model, was never, in fact, operated successfully even on a bench. Therefore, the first step towards popularising R/C was to sell beginners a receiver wired ready to connect to batteries, and relay, and completely pre-tuned to a transmitter—no adjustments necessary.

To see how he had tackled this problem we called to see him at his business, Radio and Electronic Products, 8, Station Parade, Sheen Lane, Mortlake, S.W.14, and came away more than impressed by the quality of the equipment manufactured.

There are four ready-to-use sets available—the Unitone (single channel—"tone" with valve transistor receiver, or fully transistorised receiver and crystal transmitter). Tritone (three-channel) and Octone (eight-channel). The Unitone (tone) and Tritone sets are supplied factory pre-tuned and require absolutely no adjustment—merely connect batteries and actuator and they are ready to use. Rather more than this is obviously required for the Octone set, but then eight-channel simultaneous equipment should not come into the hands of beginners!

The performance of the Octone is certainly good but the best recommendation of all is that it is in urgent demand (after models equipped with it were seen flying) in South Africa—a country with a free choice of equipment from the American market.

Realising that many aeromodellers are not happy buying ready-to-use equipment (finance as well as ego comes

into it here we suspect), George also produces a range of kits. Perhaps kit is not quite the right word because these are no handful of components in a box. Each receiver kit—there are three—contains a drilled, preassembled panel, while the transistors, valves, diodes, etc., are mounted on a card and clearly labelled—what they are and what their value is. There is also a printed circuit, single-channel transmitter kit pre-assembled and pre-tuned to the R/C band and a Modulator kit for connecting to a single-channel transmitter to convert it to multi or tone operation.

Other items available include reed relays, actuators, including a new motorised one—the Omnicac—with five interchangeable commutators, and various frequency crystals, supplied complete with circuit.

So far we have not mentioned prices. These are very competitive without any sacrifice of quality or reliability and are possible due to careful thought in standardising as much as possible. (As an example the hand-held transmitter cases are common to all types while the single and three-channel transmitters use the same chassis.) Another important factor is that the bulk of the equipment is manufactured "on the premises." The cases and chassis are made, and some preliminary assembly is done, at the Byfleet factory, while the final assembly, tuning and testing is done at Sheen Lane, where, to cope with increasing demands, additional premises have had to be obtained.

# Readers' Hints and Tips . . .

THIS month we present another selection of Readers' "Hints and Tips" and, the lucky tool chest winners are Capt. R. D. Willoughby and W. D. Pudney—as usual the other contributors will each receive 10s. 6d. We will still be pleased to receive original ideas, so if you have a useful tip, send it to MODEL AIRCRAFT, Readers' Hints and Tips, 19-20, Noel Street, London, W.1.

In view of the hundreds that we have received there has, of course, been some duplication, which has led to disappointment when we have had to refuse ideas, but to be fair we insist on "first come, first served."

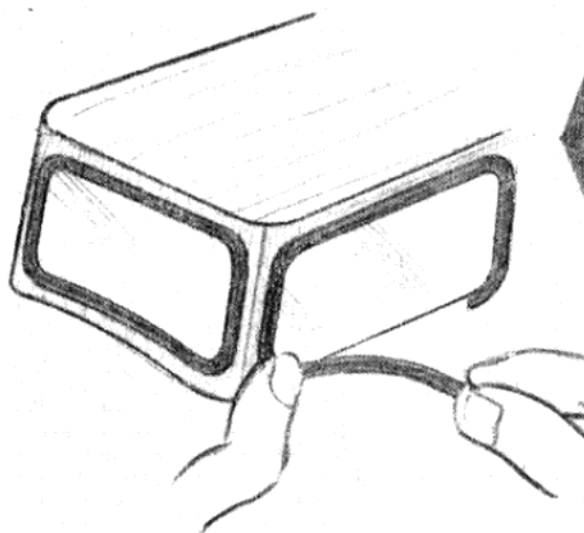
Fablon, and similar types of self-adhesive plastic decorative shelf covering, can be employed as a mask when using a spray gun to decorate your models. The advantage of using this type of mask is that it is sufficiently adhesive to be efficient, yet can be easily removed, the backing paper replaced, and used again at a future date. This idea has been successfully used by George Fletcher.

G. Burne of Ballsbridge, Dublin, suggests using a mixture of 25 per cent. balsa cement and 75 per cent. dope thinners to produce a clear dope substitute. Very useful in emergencies, and incidentally much cheaper than genuine clear dope.

Twelve-year-old R. Burchby, of Melbourne, Derbyshire, uses a fine sandpaper block to remove surplus tissue from around the covered airframe. Used at right-angles to the edge of the framework, it is superior to scissors and very much quicker.

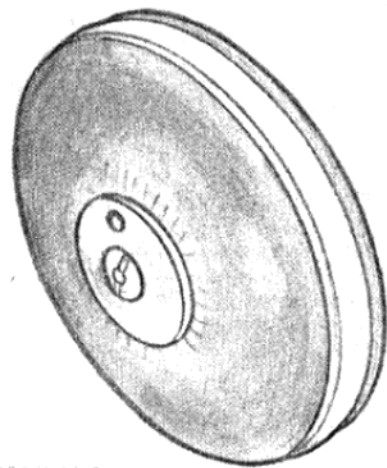
Next we have two simple ideas for producing larger heads on steel pins to make them less painful to push into the building board! The first comes from R. Linton of Manchester, who suggests dissolving—in a tin lid held over a candle—the connecting stems remaining from a plastic kit. The head of the pin is immersed into the molten plastic, twirled round and lifted clear. The plastic blob thus formed will dry very rapidly and form a durable modelling pin head.

The second idea is rather quicker although perhaps not quite so elegant. Fourteen-year-old Alan Coulson sent it in to us; he simply cuts off a number of short lengths of neoprene fuel tubing, pushes the pin through the walls of the tube at right angles to the hole and fills the open ends with cement. We suggest that an improvement to this idea would be to push the pin through one side only of the neoprene section, thus leaving the pin head within the tube.

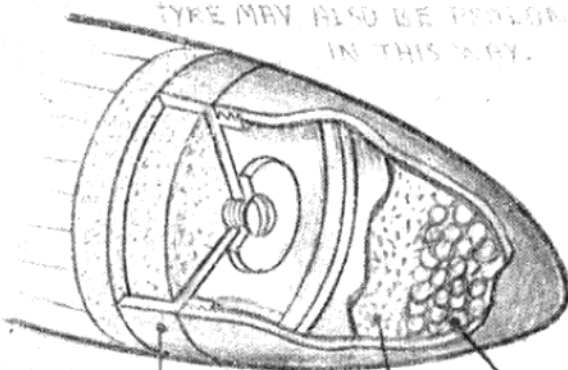


THICK PLASTIC INSULATING TAPE AVAILABLE IN A VARIETY OF COLOURS CAN BE CUT INTO VARIOUS STRIPS AND USED TO OUTLINE CABIN WINDOWS ETC. WHEN IN POSITION FIX WITH A COAT OF CLEAR DOPE. THE IDEA COMES FROM CAPT. R.D. WILLOUGHBY OF THE U.S. AIR FORCE IN VIRGINIA, U.S.A.

PERIMETER PUNCTURES IN AIRWHEELS CAN BE QUICKLY AND NEATLY REPAIRED BY MEANS OF A  $\frac{1}{8}$ " FLAT RUBBER BAND THE SAME DIAMETER AS THE INFLATED TYRE. 12 YEAR OLD W.D. PUDNEY OF SOUTHAMPTON WHO SENT US THIS IDEA USES RUBBER SOLUTION TO STICK THE BAND TO THE TYRE. THE LIFE OF A WORN THIN

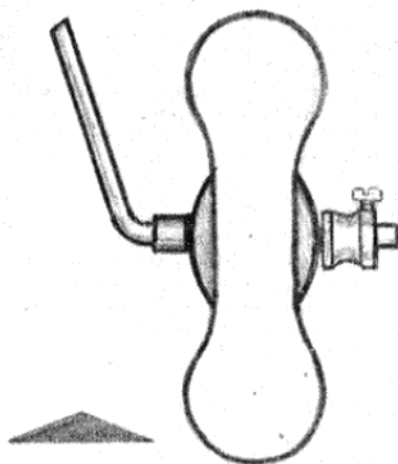


TYRE MAY ALSO BE PROLONGED IN THIS WAY.



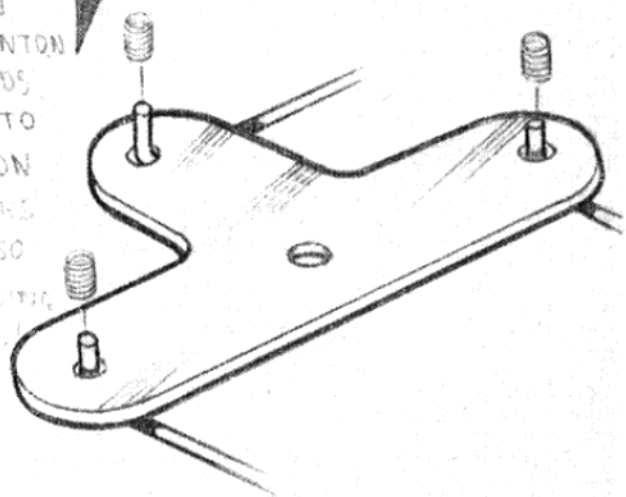
K. KNIGHT OF FELIXSTOWE SUGGESTS USING A SPIN ON PLASTIC SPINNER TO ENCLOSE THE TRIMMING WEIGHT ON A GLIDER NOSE.



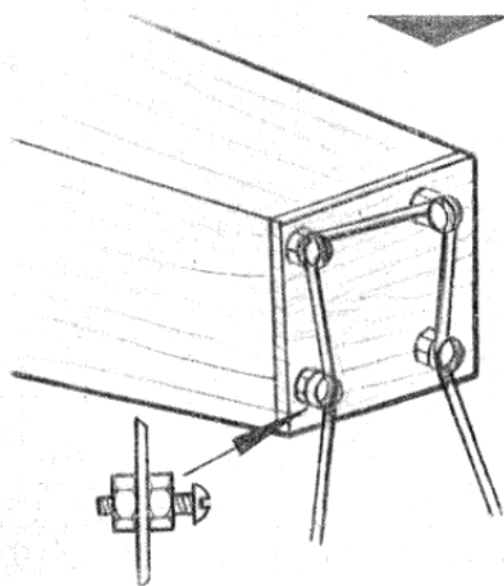


THE SMALL BRASS TERMINALS FOUND IN ELECTRICAL PLUGS AND SWITCHES CAN BE USED TO RETAIN WHEELS AS SHOWN. NEOPRENE TUBING PREVENTS THE WHEEL RIDING UP THE DUE LEG, FROM D. DREDGET WEST WICKHAM.

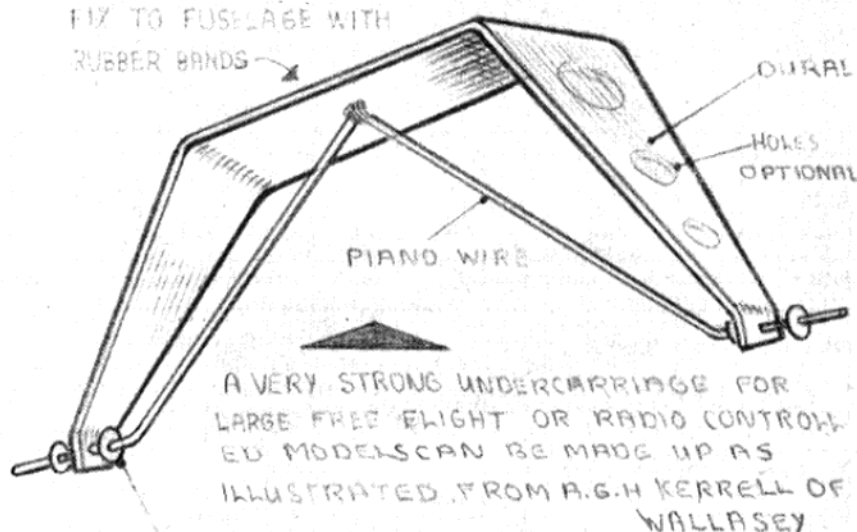
PIECES OF CIGARETTE LIGHTER SPRING EMPLOYED BY FLY-IT "BEN" CUNN OF CHURCH FENTON TO RETAIN PUSH RODS. THEY ARE EASIER TO SOLDER IN POSITION THAN CUP WASHERS WHICH THEY CAN ALSO REPLACE IN BUILDING WHEEL RETAINERS.



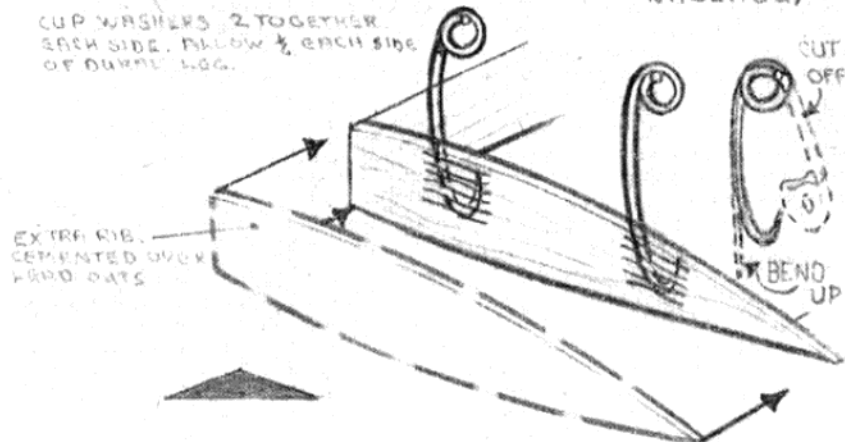
THIS QUICKLY DETACHABLE UNDERCARRIAGE FOR FIREWALL MOUNTING MAKES THE MODEL LESS BULKY TO TRANSPORT AND ORIGINATES FROM T. JAMIESON OF ROSYTH, SCOTLAND.



FIX TO FUSELAGE WITH RUBBER BANDS



CUP WASHERS 2 TOGETHER EACH SIDE. ALLOW  $\frac{1}{2}$  EACH SIDE OF DURAL LEG.



SAFETY PINS CAN BE UTILIZED AS VERY NEAT AND STRONG LEADOUTS ON CONTROL LINE MODEL WING TIPS AS SHOWN SENT BY DAVID WILLIAMS.



Polish expert Stanislaw Zurad describes his 1959 Wakefield, the latest in a series of models that have brought him considerable International success

**T**HIS model is a development of the 1958 design which I flew to second place at Cranfield last year.

The 1959 model has a higher rate of climb, achieved mainly by increasing the number of strands in the motor (16 of  $6 \times 1$  mm. Pirelli) and fitting a propeller assembly capable of usefully

converting this additional torque. The use of two journal ball bearings, in addition to the usual thrust race, has also helped by reducing frictional losses.

The initial burst of power has enabled me to adopt a new launching technique—a kind of javelin throw—without fear of the model stalling. This is helped by

the fact that the model is very stable due to its long tailplane moment arm and the concentrated mass of the short rubber motor.

Trimming for right turn on power is achieved by using 2 deg. right thrust (there is no down-thrust), counteracted slightly by a small amount of wash-in on the right wing. This, together with left deflection of the fin trim tab, gives a left turn on the glide. In addition the fin tab helps to keep the nose up during the power flight.

An effort was made to reduce fuselage drag, as it was felt that this might be noticeable due to the higher speed. Thus the fuselage is built from sheet balsa to an octagonal section and is then sanded to an elliptical shape.

The wing, in two parts joined by a tongue and box, is of multispar construction, with half ribs on the upper surface extending from the leading edge to the first top spar.

The entire model is covered with jap tissue and very sparingly doped to prevent distortion caused by differential shrinking in varying climatic conditions.

A rubber motor wound to 400 turns gives 40 to 45 sec. power flight. I use castor oil for lubrication, as other media, mainly based on glycerine or soap, tend to dry rapidly in warm weather.

One final word of advice. To get full benefit of the reduced friction losses of ball bearings—keep them clean. The propeller bearing assembly is designed for dismantling for cleaning, even in field conditions.

**DETAIL DRAWINGS OPPOSITE**

## build your own . . . GAS/TRANSISTOR RECEIVER

*Continued from page 251*

to decrease the value of resistor "A" to possibly 27,000 ohms or a little higher so as to step up the current flow to nearer 0.5 m.a. Readers may wonder why we want to step up the anode current in the valve—well, it takes a certain minimum flow to bias the transistor sufficiently to keep its idling current down to a low figure.

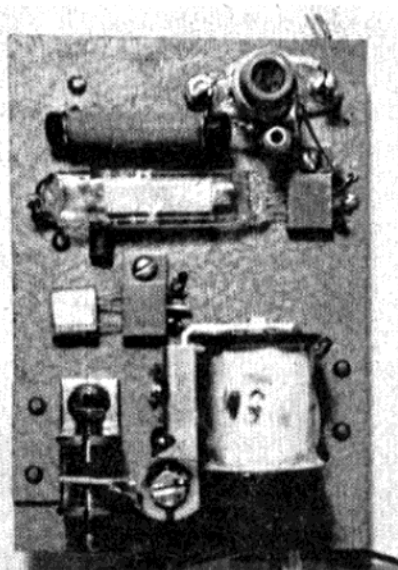
Having settled this point, remove the milliammeter from the 45 V+ HT lead and insert it in the 22½+ HT lead to the transistor. Complete all connections to the batteries and switch on. The idling current flow should read 0.2 to 0.4 m.a. Next switch on your transmitter and whilst keying same, rotate slug in tuning coil, using an insulated screwdriver (made from dowel) until the current rises to its maximum, which should be nearly 4½ m.a. If maximum current rise is less than 4 m.a., it may call for a reduction in resistance value of resistor "B." The stated resistance, 100,000 ohms, should, however, be the minimum required. Note:—the lower

the value of resistor "B" the higher will have to be the current flow through the valve. A compromise has therefore to be arrived at and the values stated should not be far out, but transistors do vary a bit and the set may have to be adjusted to its own particular transistor.

Whilst the green/yellow transistor is specified and is satisfactory in use, there is no reason why other transistors should not be used, although the writer has not tried them in this particular receiver. Alternative types that should be suitable are the Brimar TS3, Mullard OC72, and "red spot" types.

The battery requirements of this receiver consist of three B122 Ever-Ready 22½ v. batteries, or alternatively of one B110 and one B122 (see Fig. 6). The filament battery should preferably be of Ever-Ready type D18 or a U2-1½ volt cell will be suitable.

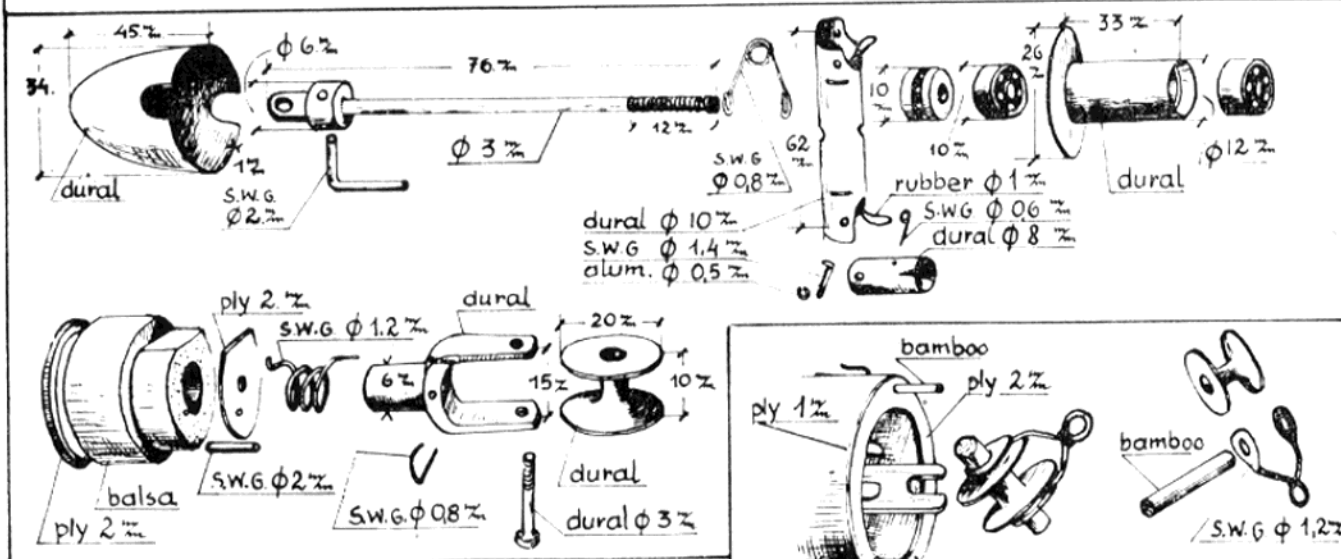
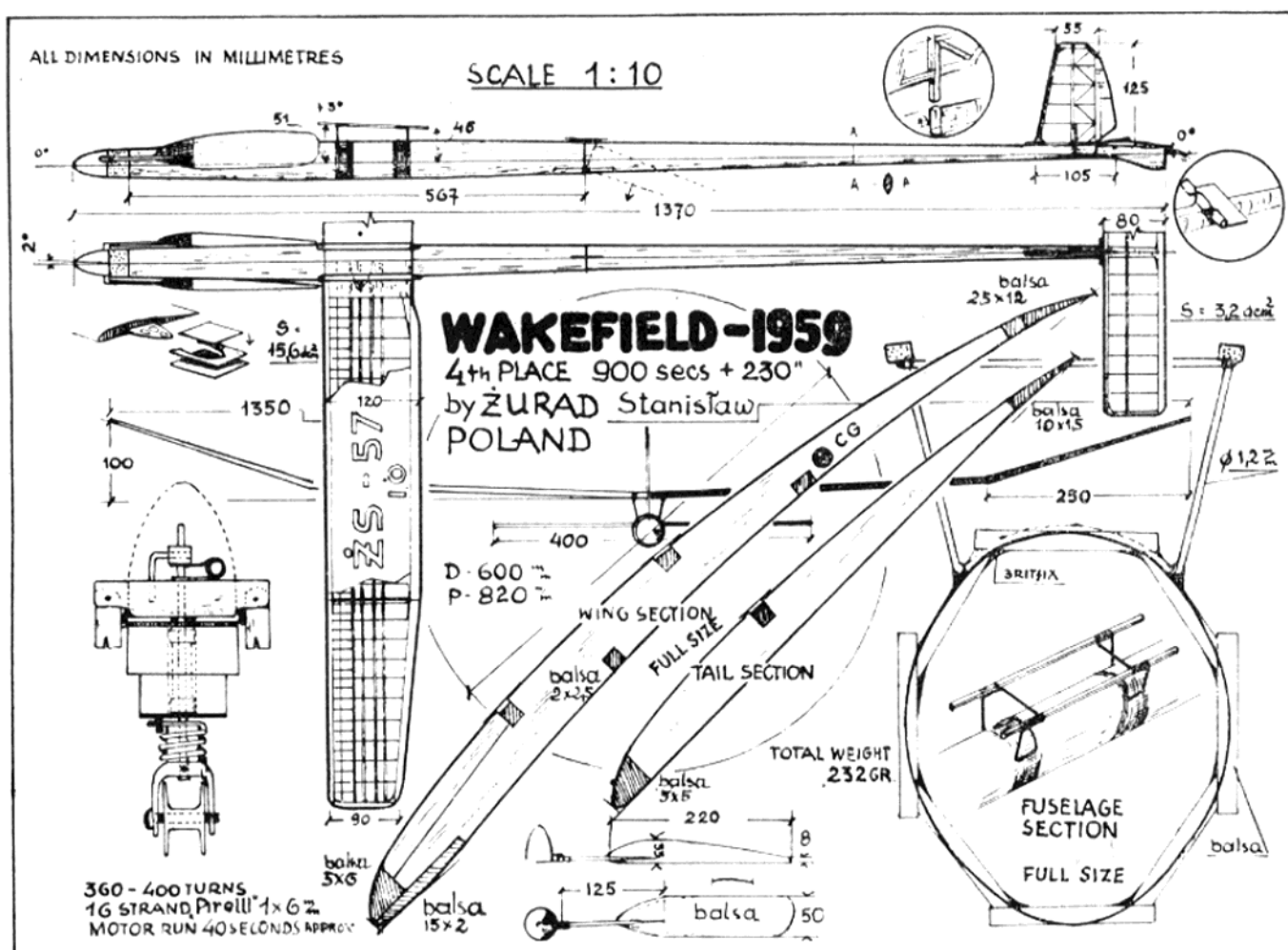
This type of set requires a fairly long aerial if long range is required—48 in. is ideal, although increased readings are obtainable with a 72 in. aerial. The receiver is best fitted into a small box which can then be mounted or packed inside foam rubber—not foam plastic. The original was enclosed in a box made from 3/32 in. obechi, the panel sliding into grooves, and the lid a snap-on fit made completely secure with a rubber band. The relay will not need attention



*A top view of the completed receiver*

once it is properly adjusted, but a ¾ in. dia. hole in the top of the box will be needed to enable the coil to be tuned.

Well, the best of luck and make a good sound job of building your set, which should then keep you in reliable radio contact with your model at all times.



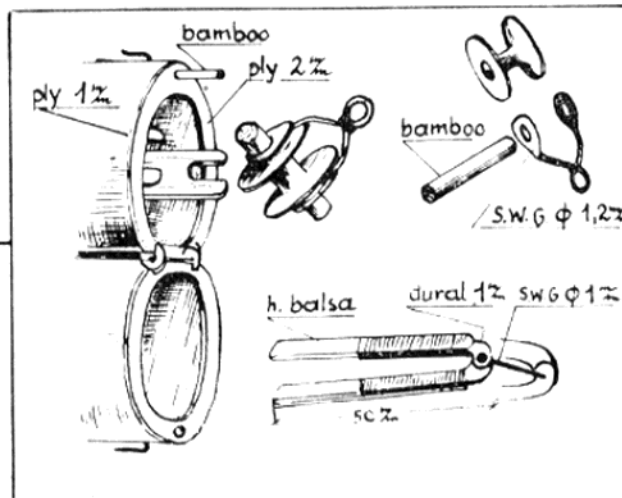
## DIMENSIONS

Prop. dia. ...	600 mm.
Pitch ...	820 mm.
Wing area ...	15.6 sq. dcm.
Tailplane ...	3.2 „ „
Total	18.8

Wing	...	...	57
Fuselage	...	...	60
Tailplane	...	...	7
Fin	...	...	3
Prop. assembly	...	...	55
Rubber (with lube)	...	...	50

*Loading*  
12 grammes/sq. dcm.

Total	232
-------	-----



# Roving Report



**H**AVE you ever heard of the Max-Mect? It has nothing to do with Max Coote, O.S. engines or dog food. . . . It is a new kind of American contest in which the sole aim is to accumulate as many consecutive maximum flights—usually 3 minutes—as possible: nothing else counts. Moreover (and here's the attraction) it is a sweepstake event and, with a good model, plenty of energy and a spot of luck, you can collect a handsome cash prize. Wakefield flyer Herb Kothe took home \$70 (£25) from one of the first meetings organised in Texas.

The rules are simple (at present, anyway). Any type of model conforming to A.M.A. regulations is eligible. You pay a dollar to enter and start flying and retrieving just as hard as you can go. Only consecutive maximum flights count. If you fail to get a max, your score stops at that point and, if you want to try to better it, you pay another dollar and start all over again. Some of the real experts fly half-a-dozen or more max's, then have another dollar's worth and try to beat their own score and so, perhaps, win second prize as well. . . .

If you think that all this sounds like hard work, you are absolutely right. . . .

*This monster R/C glider of 16 ft. 4 in. span was built by Wenzel Wohlrab of Walldorf/ Baden—a group which appears to have a liking for large models. They also build C/L scale models around a 30 c.c. Kratsch engine.*

In last month's Roving Report (delayed three months due to the printing dispute) we described the first of the new high selectivity superheterodyne R/C receivers. These have begun appearing in the U.S.A. as a result of the new Federal Communication Commission's regulations permitting the use of five additional spot frequencies in the 27 Mc/s band.

As expected, the C.G. Electronics Corporation has now announced a superhet also. This, the "Mercury" single-channel receiver, is priced at approximately £25 in the U.S.A. (\$69.95—the same as the Citizenship single-channel superhet). An all-transistor set, the "Mercury" operates on only 3 volts and weighs but 3½ oz., its metal case dimensions being 2½ in. × 1¼ in. × 1½ in. As with most modern American high-quality sets, the receiver is unaffected by extremes of temperatures: it is guaranteed to remain stable over a 0-130 deg. F.

range. The set is positively tuned to any one of the recognised frequencies by plug-in crystals, ensuring interference-free operation of several channels—or separate models—simultaneously.

A commendable idea for taking some of the expense out of graduating from single to multi-channel R/C is the American Min-X "Convertible." The standard Min-X all-transistor receiver is a single channel unit that can be factory-converted to six or eight channels by the substitution of a new, miniature reed-bank and the addition of a separate unit containing relays, etc. Operating on a 3-volt (pen-cell) supply, the complete eight-channel set-up weighs but 9½ oz. complete with batteries; the six-channel 1 oz. less. By taking advantage of the conversion scheme, Min-X owners save approximately £11 by comparison with the cost of a complete new six or eight channel set.

Still on the subject of American R/C, the endurance flyers are at it again and there is little doubt that an all-day flight is a technical possibility. The biggest problems now are organisational ones. And a project of this kind takes a lot of organising. . . . First you have to acquire the use of an airfield or suitable flying site, free from interference of any kind. Probably this means transporting the whole *équipe* a hundred or so miles and setting up camp for a long weekend. Most likely there will be three or four of you co-operating in the attempt. Then there are the officially appointed F.A.I. observers and timekeepers who must be given a firm date for the attempt. Obviously, too, the date has to be one which will not conflict with prior commitments of observers, team members or anyone else directly involved. When you have all this arranged, you just hope the weather will be somewhere near right, and that there will not be any last minute hitches.



At the German Slope Soaring Nationals, Hans Schumacher won the R/C class with this two-channel rudder-only model. Schumacher is the manufacturer of several of the commercial R/C receivers and transmitters sold on the German market under the Radio-Rim and Graupner trade-marks.

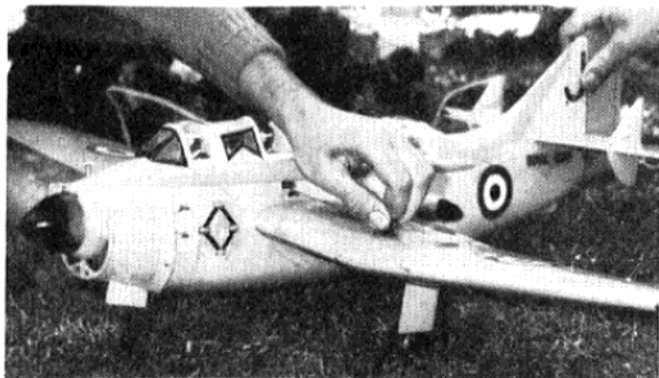


At the "People's Democracies" International, this year held in Poland, Julian Falecki flew this Schier "Kormoran" design in the power class to top the Polish "B" team results. The popular Czech modeller, Vladimir Hajek, won the event with the only perfect score of the meeting.



The present American (and world) record for powered R/C models stands at 5 hours 29 minutes, held by the well-known West Coast modeller, Ken Willard. He used a fairly conventional design, powered by a 3.27 c.c. K & B 19 engine with Walker type tanks. On the East Coast, Bill Winter, editor of *Model Airplane News*, with the co-operation of Norman Rosenstock (airframes), Ed Lorenz (radio) and MODEL AIRCRAFT

Benno Schlosser, former manufacturer of the East German Schlosser 1 c.c. and 2.5 c.c. engines and who, last year, left East Germany to manufacture a 0.5 c.c. diesel in West Germany in partnership with Klaus Krick, is reported to be now devoting his energies to building limited production, high-performance engines for contest use. Krick is continuing production of the Schlosser 0.5, now known as the "Tomboy."



Barry Reid of Melbourne, Australia, built this fine O.S. Multi-speed-35 powered C/L Fairey Gannet. The model is equipped for carrier deck events and an American J. Roberts Flight Control 3rd line system is used to operate throttle and arrestor-hook.



Winner of the Jet Speed class at the 1959 Chrysler-Plymouth meeting, Helsinki, Finland, was Olli Jovero, who achieved 131.11 m.p.h. with this O.S. Type II Jet powered model.

contributor Peter Chinn (engine and fuel system), has been making innumerable long flights with small diesel (1.5 and 2.5 c.c.) powered models having a potential 12-15 hours' endurance. Fuel is pressure fed, via a float chamber from a large, baffled, glass-fibre tank, pressure being tapped from the engine crankcase. Diesels were chosen for their lower consumption and better performance on big props. One snag, however, has come to light, and that is the serious effect of the American mid-summer climate on diesel performance. With temperatures 20 deg. F. or so above normal British levels, it has been found that much richer needle settings are required to maintain power and, in consequence, fuel consumption has suffered very considerably.

Also in New York State, Ed Yulke, another well-known magazine contributor, has been trying a somewhat different approach. His model, K & B 19 powered, carried approximately 8½ lb. of fuel for an all-up weight of nearly 15 lb. After 18 months of experiment, Yulke undoubtedly has most of the problems worked out and his model showed great promise. Unfortunately, a recent flight cost him the complete model, only the wheels and fuel tank being salvageable. The model had taken off with a 14-hour fuel load and, after 20 minutes, failure of a minor component in the radio resulted in its heading eastwards towards Europe. The model was picked up in the Atlantic a week later, after drifting back to within 20 miles of the coast, by a fishing vessel. From the amount of fuel remaining in the tanks, it was estimated it had flown 9½ hours. It is hard to say how far its ocean flight had taken it, but it would seem a safe bet that it flew farther than any other model plane to date. Undaunted, Yulke now has another model well under way.

## Carving World War I Props By PETER LEWIS

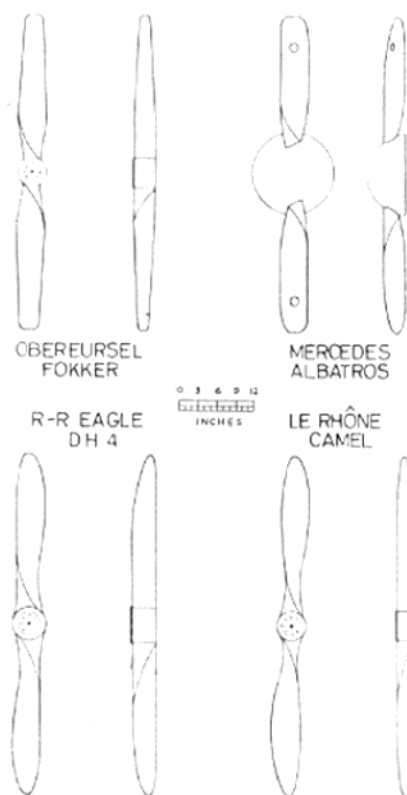
THE propeller is one of the most fascinating and satisfying parts to make for a model, and its prominent position demands that it should be as correct as possible. With a little trouble expended in research and construction, just the right effect can be obtained.

Most of those of the 1914-18 War fall into the two- or four-bladed category, and were made of laminated woods or from solid blanks. Thin strips of alternating light and dark hardwoods—not balsa—glued together to the necessary thickness, make up the laminated blank. The solid type is, of course, simply cut from a straightforward block. Photographs of the noses of aircraft—seemingly more popular than their rear ends!—are quite plentiful for exact shaping which may not always be shown on the working plans of the aeroplane. The Science Museum and the Imperial War Museum, both of them in London, have quite a number of the actual propellers of the period on show, exhibited on their own and installed on aircraft.

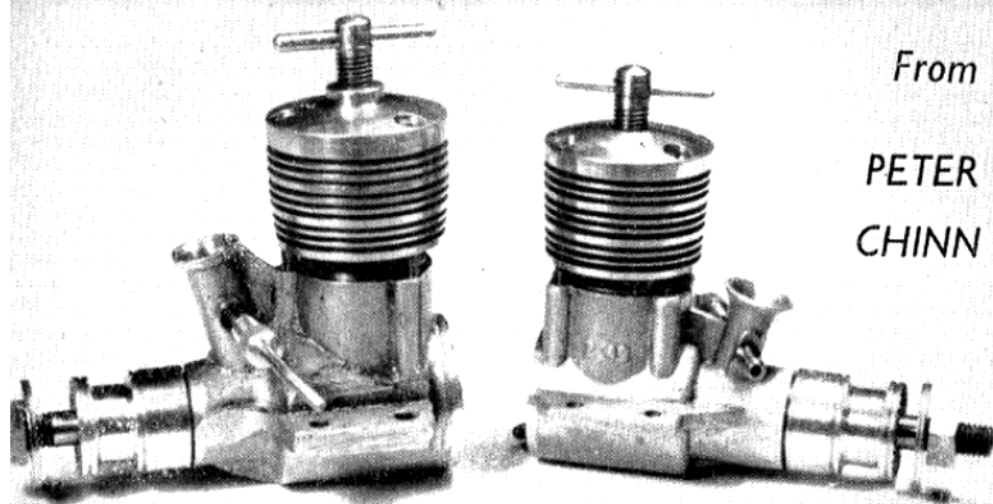
Where four-bladers are concerned, they were spliced at the bosses so that the four blades lay in the same plane. For model props, the two sets are easily joined by making a cut-out in the back of the front one and on the face of the rear and then mating together. In a few cases, a pair of two-bladed propellers were butt-jointed together, one behind the other, boss to boss at right angles.

If the wood is to be left in its natural colour, French polish the blades after sanding. If mahogany

colour is required, stain with a medium strength solution of permanganate of potash. Walnut finish is obtained with Vandyke brown crystals mixed with water to the right strength. Sand again after staining as the water will, of course, bring up the grain, then polish for the final finish.



# Latest Engine News



From  
**PETER  
CHINN**

employed when small glow engines are so fitted.

The starter-spring is similar to that seen on some American and Japanese engines and consists of six turns of 19 S.W.G. spring steel wire, anchored to the spraybar and engaging a special cam behind the prop. This latter, cut from 20 gauge aluminium alloy sheet, is simply clamped between the prop driven hub and prop. The system known as the "Cam/Quickstart" is the subject of a British patent.

A full test report on the Bantam will follow shortly in M.A.

Since our last report was written, two months ago, the Merco 35 has, after many delays, at last reached the model shops. Indications are that this, the first British engine in the American 0.35 tradition, will be keenly welcomed. It is finely made and to a high standard of finish. We have been able to trace the development of the Merco from the original one and only prototype (August and September 1958 M.A.), via Bill Morley's personal pre-production model, to the present production version and it is pleasing to see that the production model confirms the high promise of the prototype on which we carried out tests for the manufacturers.

Apart from the adoption of a pressure diecast crankcase in place of the original sandcast case, the production Merco shows a number of detail changes. Some of these, notably the abandonment of the right-angle fuel nipple and taper-fitted prop driver, are the result of a need to keep the selling price within reasonable bounds, but, in general, all other modifications have been adopted solely as shown necessary or desirable in the course of development. These include a revised piston interior design, aimed at eliminating the possibility of skirt ovality, a slightly higher piston baffle, deep head bolt lugs extending well down the cylinder barrel sides and a black corrosion-resistant finish for the crankshaft which now also has a slightly differently shaped web.

The bore and stroke have now been standardised at 0.798 x 0.703 in., giving a capacity of 0.3516 cu. in. or 5.762 c.c. Weight, with a standard K.L.G. plug installed, is 7½ oz. Actually, as in the case of the Japanese and Australian engines currently imported, the U.K. selling price does not include a glowplug, but, to compensate for this omission, the Merco is guaranteed for a full six months instead of the more usual 30 or 60 days.

We have been testing, for the manufacturers, one of the four Rivers 3.49 prototype engines. This is the engine that has been creating quite a stir in combat circles. A full report will follow just as soon as production models are available, but, in the meantime, we might mention that this prototype was the hottest diesel 3½ we have yet encountered. Moreover, its high r.p.m.

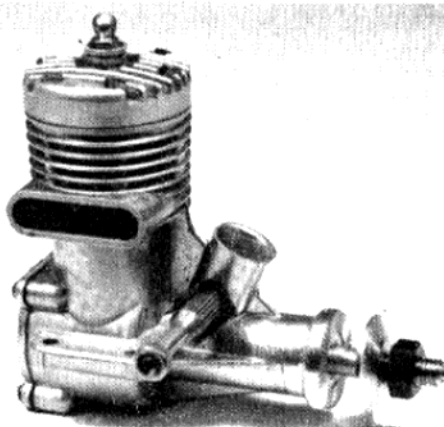
## Great Britain

**F**IRST of the new "Half-A" size glow engines to reach us is Davies Charlton's "Bantam." This engine breaks all records on price. Retailing at only 34s. 10d., inclusive of purchase tax, it is by far the cheapest model internal combustion engine ever offered on the British market.

The Bantam should prove valuable in furthering the popularity of model aircraft construction and flying. Obviously, it will bring power modelling within the means of more youngsters than ever before. The engine is supplied complete with an integral fuel tank, which is suitable both for F/F, or general purpose C/L use, and a spring starter. Such accessories as a starting battery with leads and clip (to be known as the "Quickclip"), nylon props in 6 x 3 and 5½ x 3 sizes, a suitable blend of glow fuel and a special multi-purpose spanner, will be available at competitive prices to keep operating costs as low as possible. The glowplug is the compact new K.L.G. low-priced miniature plug, especially made for this and other small glow motors.

The prototype Rivers 3.5 c.c. roller-bearing diesel, compared for size with the 2.5 c.c. Rivers Silver Streak.

The Bantam crankcase is readily identified with that of D.C.'s Dart 0.55 c.c. diesel. The crankshaft, however, has a rectangular valve port and is internally threaded for a replaceable screw type prop fitting. The stroke is the same as that of the Dart (0.350 in.) and the extra swept volume is accounted for by the increased bore (0.408 instead of 0.350 in.). Actual piston displacement is, therefore, 0.04576 cu. in. or 0.7499 c.c.—slightly smaller than the popular American 0.049s. The cylinder liner, radially ported with three transfers and three exhausts, screws into the crankcase and is topped by a neat, machined alloy cooling barrel and head. The piston is flat topped and has a fully-floating gudgeon-pin. The aluminium tank on our pre-production sample is an extremely neat affair, machined from the solid and an excellent fit on the backplate. We assume that this is the type to be fitted to production engines: it is a pleasing improvement on the spun or drawn metal tank usually



Bill Morley's personal Merco 35 engine. This pre-production example is without the matt crankcase finish and orange stove enamelled head of the production engines.

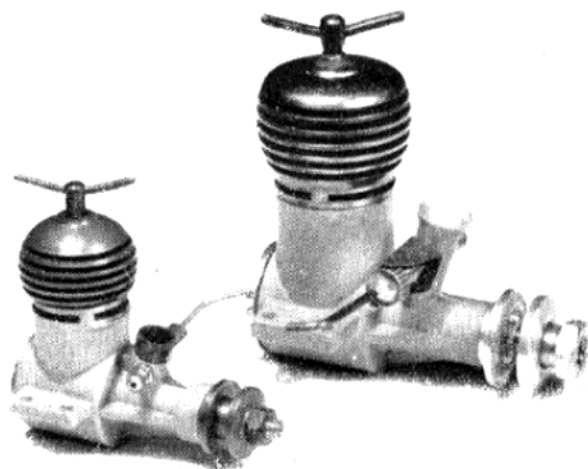
handling and smooth running qualities were of a standard that puts it on a par with the better glow 0.19s—properties which we had long since despaired of seeing in a “big” diesel. The engine is not, by the way, a bored-out Silver Streak but is a new design, bigger all round. Weight is a shade under 7 oz.

#### U.S.A.

As mentioned in last month's footnote, we have recently tried one of the new Veco 35C engines from the U.S.A. This is a development of the 5.73 c.c. Series 100 Veco 35 engine first introduced a little over two years ago and which was dealt with in M.A. at the time.

The 35C or “Combat” model is primarily intended for use with a pressurised fuel system and is provided with a crankcase pressure outlet for coupling to a suitable sealed tank. This outlet takes the form of a nipple which is screwed in place of the upper left backplate screw. When it is desired to operate the engine on normal suction feed, the fitting is replaced with a spare

The Hungarian Alag X-05 1 c.c. and Proton 2.5 c.c. engines, both of which are now available in the U.K.

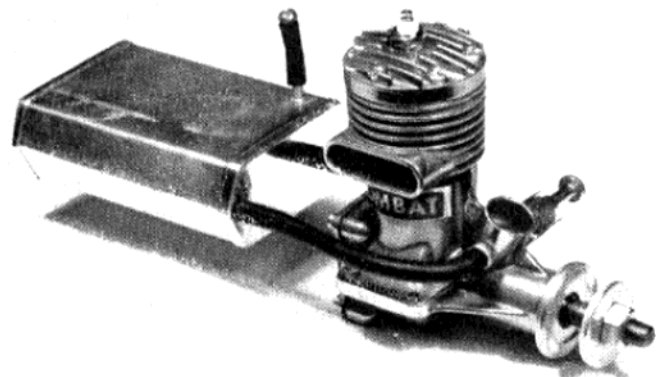


is the new Fox Rocket 35. This is a new model aimed at the low-price field, alongside the Fox 09 and 15, and all three will be known, henceforth, as the Fox “Rocket” series, to distinguish

ducts, being lighter and more compact than any domestic 1 c.c. motor. It is only 1 1/8 in. high, excluding the compression screw, and weighs less than 2 oz. It is, nevertheless, quite robustly made and features a 6 mm. shaft. General construction and appearance closely follows that of the Alag models already quite well known in this country; the 1.48 c.c. X-04 and the 2.47 c.c. X-3. Like these, it is of the shaft valve, radial ported type.

The Proton is an improved and cleaned up version of the earlier Proton shaft-valve model (a disc valve Proton was made earlier) which was described in our July, 1956, issue. As then remarked, the engine suffered a somewhat over-generous exhaust period as a consequence of ultra-short stroke allied to Arden type porting. This has now received attention together with a number of other details. A longer carburettor intake and a neat, red-anodised cylinder barrel are among the more obvious external changes. The engine employs a composite piston construction in which the gudgeon-pin is carried in an alloy insert. Three radial exhaust ports and six transfer flutes are featured. The Proton weighs 4 1/2 oz.

These two engines sell at 45s. and 79s. 6d. respectively and a full range of spares for them is available.



The new Veco 35C engine complete with special Veco T-31C sealed fuel tank. Fuel is forced to the engine automatically by pressure tapped from the crankcase.

screw provided. For pressure feed, the carburettor insert is removed.

Modifications to the 35C, as compared with the 35, include a new cylinder sleeve with enlarged ports and an entirely new crankshaft. The latter has a larger diameter journal and considerably increased counterbalancing. These modifications are in accordance with the latest trends aimed at increased output and smoother running and have already paid dividends with Enya, Fox and O.S. engines. In the Veco the increased journal diameter has allowed the gas passage to be opened up nearly 50 per cent. in area.

The 35C is, in our opinion, an all-round improvement on the standard 35. Perhaps it will not suit the stunt enthusiasts as well—we cannot comment on its qualities in this respect—but, in addition to having about 10 per cent. more power on a similar fuel, we also found it easier to handle. The makers rate the engine at 0.65 h.p. and tests indicated that, after several hours' running and, with a reasonable amount of nitromethane in the fuel, this is not an exaggerated claim.

Latest arrival from the U.S.A.—as the foregoing notes were written, in fact—

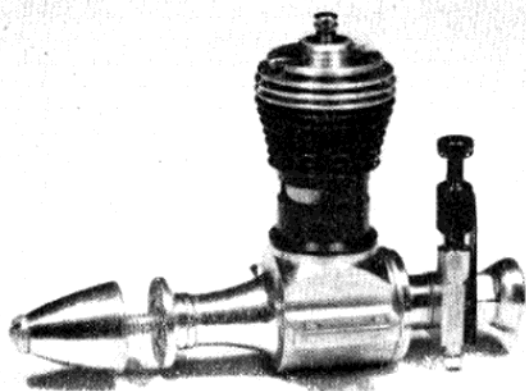
them from the more expensive Fox models. We shall be describing the Rocket 35 in due course.

#### Hungary

The newest Hungarian engines now being offered by Relum Ltd., the British importers, are the 1 c.c. Alag X-05 and the Proton 2.5 c.c. diesels.

The Alag X-05 makes an interesting comparison with current British pro-

The Cox Space-Hopper 0.8 c.c. engine, successor to the famous Space-Bug and Thermal-Hopper models.



# Club News

## FELTHAM & D.M.A.C.

This club has been formed to cater for modelers in Feltham, Ashford, Staines, etc. Anyone in these areas interested in joining should contact the secretary (see New Clubs). We will be holding flying meetings at Richmond Park, Hounslow Heath, Chobham Common, and Hanworth Air Park, and anyone from our district will be extended a cordial welcome from the club members.

## ST. ALBANS M.A.C.

We have been getting around to most of the competitions this year. Two members went to the power trials at Wigsley where B. Cox managed 28:22 for 5th place, but George Fuller did not have so much luck.

Two members reached fly-offs in the Surbiton gala. D. Knight won the open rubber with a fantastic 18 min. 54 sec. fly-off time against seven others. George Fuller reached the fly-off in power but was not quite so lucky, coming 3rd.

Our other recent victory was the Model Engineer Cup for which we have been striving for years.

## OUTLAWS (CANNOCK) M.A.C.

The membership has received a boost of late, thanks to several C/L members of the Walsall M.A.C. who have joined our ranks. One of these, Eric Burke, helped to maintain our record of placing at every meeting entered this year, by coming second in Stunt at the recent Cheadle C/L rally.

F.A.I. team race is catching on fast, to the detriment of combat, and Alan Cooper is doing 43 laps at 75 m.p.h. with a standard Oliver in a

Lockley creation which bears hardly any resemblance to the designer's original.

## CAMBRIDGE M.A.C.

We are organising a slope-soaring rally at Ivinghoe Beacon, near Dunstable, on October 4th, commencing at 10.30 a.m. and closing at 5 p.m. There will be two classes, R/C and F/F (any type of F/F glider but no umbrellas with bricks attached, please!). The entry fee for R/C will be 1s., covering two flights, and 6d. for each subsequent flight; the best single flight wins. Entry fee for F/F will be 1s. 6d. covering four flights, the best two of which will count. We hope that as many clubs as possible will support this meeting.

It seems that some people are never satisfied, even with Ivinghoe, for C. King and R. Godden, well supplied with models and Wright R/C equipment, went to Wenlock Edge for a slope-soaring holiday at the end of August, and Cambridge models have also been catching lift off the mountains of Italy where two members spent their holidays.

Two recent, unexpected wins were that of a Lulu over several Lucifers and a Petrel in the club glider comp., and that of D. Miller who won the stunt event at the E. Anglian C/L gala with a 1.5 model built for combat.

## WHARFEDALE & D.A.

While testing a new ETA VI at a local unused ex-R.A.F. field we came across a not unknown phenomenon in high speed C/L work, namely that of excessive line tension. This point was borne home to us rather heavily as Ken Long's model plunged into the tarmac at over 115 m.p.h.

This incident gave a warning of the impending increase in the dangers which will undoubtedly follow in the wake of the new and more powerful class "B" models now emerging in the club.

Twelve members made a successful visit to the P.A.A. Rally held at R.N.A.S. Abbotsinch. Unfortunately, bad weather spoiled the meeting but it did not prevent a very interesting team race with the Les Davy/Ken Long team winning class "A" with Les's *Tigress* model; class "B" was won by the Ray Edwards/J. Locking team flying Ray's ETA-powered model; the J. Horton/F. Baxter team took 3rd place in class "B" with their fantastic Frog 500 model.

## WEST BROMWICH M.A.C.

The club is holding a series of competitions for which cups, tankards and plaques will be presented to the various winners at the A.G.M.

The club gave its third display of the year, a few weeks ago. It went off very well, with the possible exception of one of the boys who bent the shaft on his "Oliver," and another who pranged his Fox 35-powered stunt job (his second of the week!). Fortunately, due compensation was awarded, and one member received a pound note from a sympathetic spectator.

## BLACKHEATH M.F.C.

The Blackheath gala will be held at Chobham on October 25th. Comps. will be:— Bill White Cup—open rubber—together with a glider and a power comp. Entries are 1s. 6d. per comp. For further details contact:— P. Crossley, 11, Bradfield Road, Catford, S.E.6.

## SHEFFIELD S.A.

We have presented to the Northern Area a trophy to be known as the "E. C. Muxlow Memorial Trophy," and a competition for this will be held at R.A.F. Rufforth, near York, on October 11th.

The rules for this trophy are:—  
(1) The competition is open to all S.M.A.E. members.



## South Midland Area 1959 Rally

THIS year's South Midland Area Rally, held at Cranfield, was, as befits a meeting which is rapidly becoming one of the most popular events of the calendar, blessed with almost perfect weather conditions. Some of the F/F entry were deterred from flying by the wind direction, which was carrying the models towards the village, but even so, a fly-off was necessary in all events, and, in the case of the glider, a second fly-off had to be held to decide the third place.

R/C attracted a large entry and some really first class flying was seen in both the single and multi classes. It was in the Class B Team Race final, however, that the greatest excitement occurred, and we can have a "centre of the circle" account of this, because Norman Butcher had been pressed into service, at the last minute, to fly Gadget Gibbs's model.

This was the first model off, followed almost immediately by Whitbread's. McNess (most unusual for him) was slow off the mark and Place's model ran into his lines. Mac sorted this out, so he thought, but when the model was released the lines were crossed and the inevitable happened. The first intimation that Norman and Charlie Taylor (flying for Whitbread) had that all was not well was when they felt themselves being drawn together by McNess's lines which were wrapped round their feet as Charlie remarked, "quite like old times."

By now the circle was filled with helpers with wire cutters, etc., who were treading Mac's model, which had been drawn into the centre, underfoot, but Mac, ever the optimist, arrived with a spare prop—as he put it, "just in case." One look at the model and bent engine damped even his enthusiasm, and by popular vote the final results were decided with a coin.

All the other events were decided in a rather more orthodox manner and the general opinion was that this had been a very good meeting.

Full results on opposite page.

## CAPTIONS TO PHOTOGRAPHS

Top: Two young members of the Apsley club, K. Upton and G. Odell, prepare their F/F duration model.

Left: Trevor Airey is assisted by his daughter in preparing his E.D. 2.46 powered Junior 60, for a flight in the R/C Contest.



- (2) The models must conform to the current Wakefield specification.  
 (3) Five flights with 3 min. maximums.  
 (4) The trophy will be competed for annually.  
 It is hoped that all Wakefield fliers will turn up and make this comp. a fitting memorial to "Ted" Muxlow.

#### SURBITON M.F.C.

How to stop the ridiculous fly-offs? A subject for discussion not by the F.A.I. this time, but by the club after its gala. August Bank Holiday Sunday proved to be a fine day with a bit of a breeze and early competitors were asked whether they wanted to fly 3 min. maximums and see where the model landed or move and fly for 4 min. but not see them down. Somehow our friends didn't trust Chobham and they plumped for 3s. They then saw them all right and eight of the rubber men and seven of the power men had to see them in the fly-off. Very good times were put up but what did it mean? Our only idea for next year is for every competitor to make a fly-off flight first and then try to qualify by doing three maximums. Seems a mad enough idea even for the F.A.I. but WE are only kidding.

#### Results

<b>Power fly-off</b>			
Coward ..	Reigate ..	10.30	
Thorn ..	Letchworth ..	7.42	
Fuller ..	St. Albans ..	7.25	
<b>Rubber fly-off</b>			
Knight ..	St. Albans ..	18.54	
O'Donnell ..	Whitefield ..	9.39	
Lennox ..	Birmingham ..	7.50	
<b>Glider (no fly-off)</b>			
Foxall ..	Northwick Park ..	8.10	
O'Donnell ..	Whitefield ..	7.33	
Mrs. Giggles ..	Stevenage ..	7.08	
<b>Team Glider</b>			
<b>Leamington</b>			
<b>Gala Champion</b>			
<b>John O'Donnell</b>			

Entries were up on last year and the surprising thing was that at least half the competitors were from way outside the London Area ranging from Manchester (who else) to Exmouth and Southampton.

#### EXMOUTH M.A.C.

The 1959 Devon Rally, held on Woodbury Common, was once again blessed with good weather, only one short shower marring the day.

For this year's rally the maximum flight time was fixed at 3 min., and from early in the day it looked as if placings would be decided by fly-offs.

The power event just missed being a fly-off. Peter Manville had recorded three max's and Pete Buskell and Tony Young both had two each, but, on their third flights, they touched down just short of the 3 min.

Rubber should have been a fly-off between George Fuller and Eric Barnacle but, unfortunately, George lost his model on his third flight (it was later handed over to the Exmouth club comp. secretary by its finder as he was leaving the Common for home!). This meant that

### CONTEST CALENDAR

Sept. 27th	Southern Area Rally, Beaulieu, is CANCELLED.
" "	R.A.F. M.A.A. CHAMPIONSHIPS. R.A.F. Debden. THURSTON TROPHY. Wakefield open to S.M.A.E. members. Entry on field or pre-entry, Sqn. Ldr. Drinkell, Air Ministry. Phone: TRA 8811, ext. 7072.
Oct. 4th	South Coast Gala, R.A.F. Tangmere, nr. Chichester.
" "	Cambridge S/S Rally, Inverhoe Beacon R/C and F.F.
" "	Southern Counties R/C Rally, Middle Wallop. Entry to 'drome by permit only from E. Johnson, The Stores, Larkhill, Wilts.
" 11th	E. C. Muxlow Memorial Trophy. See Sheffield club report for details.
" 25th	Blackheath Gala, Chobham Common. R/G/P.
Nov. 15th	Loughborough College Winter Rally, Wymeswold Aerodrome. R/G/P and Combat. Full details next month.

"There's nothing like doing things in style." Members of the Hinkley club with their mobile headquarters - cum - workshop (plus members and models, of course!) at this year's Nationals.



Eric had only to make a token flight to claim first place.

Elton Drew of Glevum has had the misfortune to lose his rubber model on its first flight each time he has attended the Devon rallies and he has been to all four!

Glider was a straight win for I. Godfrey of Bournemouth, so with Peter Manville's Power win this made a "double" for Bournemouth. Combat soon became a tussle between the S. Bristol boys and the Weston Control-liners, with Weston coming out on top.

The R/C contest was organised by the S.W. R/C M.F.S., and there were 11 entries in all, including one multi-channel. The standard of flying was high all round, and only a few points separated fourth to seventh places. Winner was Ken Sturdy (South Chard) with 60 from a maximum of 75. Ken only joined the society at last year's Devon rally as a raw beginner some progress! Second place went to Roy Dunstan (Salcombe) with 54 points (and 52 on his first round). Roy's flying was the most consistent of the day. Third place (45 points) was gained by the only multi entrant, Harry Stillings (Exeter), who gained maximum points for his nominated loop, Immelman and spiral dive, using "Tritone" 3-reed equipment to operate rudder, elevator and motor escapements. Close behind came M. Woods (Tavistock), Courtney Gill and Hugh Price (Paignton), all with 42, and Ed Johnson (Larkhill) 39. Judge was Norman Butcher, editor of MODEL AIRCRAFT, to whom the society are sincerely grateful.

#### RESULTS

<b>Power</b>			
1. P. Manville ..	Bournemouth	9 : 00	
2. P. Buskell ..	Surbiton	8 : 56	
3. A. Young ..	Surbiton	8 : 55	
<b>Rubber</b>			
1. E. Barnacle ..	Leamington	9 : 00   2.06	
2. G. Fuller ..	St. Albans	9 : 00	
3. N. Elliott ..	Men of Kent	8 : 55	
<b>Glider</b>			
1. I. Godfrey ..	Bournemouth	8 : 10	
2. K. Hickman ..	Glevum	7 : 41	
3. D. Billings ..	Leamington	7 : 36	
<b>Radio Control</b>			
1. K. Sturdy ..		60 points	
2. R. Dunstan ..		54	
3. H. Stillings ..	Exeter	43	
<b>Combat</b>			
1. P. Heeley ..	Weston-super-Mare.		
2. R. Burgess ..	Weston-super-Mare.		

#### WALLASEY M.A.C.

A party from the club recently attended an excellent club meeting of the Hestwall club; this exchange at club meetings is getting quite regular. There is a lot to be learned listening to others.

A group from the club (the Rich Ones) journeyed to the Scottish P.A.A. festival and returned laden crockery wise! John Hannay won P.A.A. Jetex and John Done came third in this event and second in P.A.A. America class. Well done, lads.

#### NORTH KENT NOMADS

The Rotarian glider competition was again won this year by Ivor Bittle with his glider, and Bill Hubbard, our secretary won the Ball Tail-less Trophy with his own design rubber powered tail-less model. Some domestic strife was

created when Mrs. Bittle, flying her own glider, beat her husband by some 36 sec. in the Rotarian Cup, but unfortunately could not have her flights counted as she was not a club member!

#### NEW CLUBS

FELTHAM & D.M.A.C. Secretary: H.E. Martin, 72, Hanover Avenue, Feltham, Middx.  
 CHANGE OF SECRETARY  
 NORTH KENT NOMADS. Secretary: B. Hubbard, 161, Hook Lane, Welling, Kent.  
 WEST MIDDLESEX M.F.C. Secretary: A. J. Starky, 2, Princes Avenue, Greenford, Middx.



## Recent Results

#### SOUTH MIDLAND AREA RALLY

<b>Radio—Multi</b>			
1. Riall, C. ..	W. Essex.		
2. Olsen, C. ..	CM.		
<b>Radio—Single Channel</b>			
1. Roger ..	High Wycombe.		
2. Allen ..	W. Essex.		
<b>Power</b>			
1. Smith, T. ..	E. Electric	7.44	
2. Buskell ..	Surbiton	6.02	
3. Fuller ..	St. Albans	5.40	
<b>Glider</b>			
1. Cummins ..	Bristol	3.47	
2. White ..	Boston	3.12	
3. Baguley ..	Hayes	2.34	
(Second fly-off after dead heat third place.)			
<b>Rubber</b>			
1. Dixon ..	Leamington	6.13	
2. Lennox ..	Birmingham	5.47	
3. Greaves ..	Leamington	5.45	
<b>Combat</b>			
1. Kendrick ..	West Bromwich.		
2. Gibbard ..	Derby.		
<b>Team Race—Class A</b>			
1. Hall ..	Belfairs	5.19	
2. Allen ..	Mill Hill	6.02	
3. Place ..	Wharfedale	6.04	
<b>Team Race—Class B</b>			
1. Whitbread ..	West Essex.		
2. Gibbs ..	Hornchurch.		
3. McNess ..	West Essex.		
3. Chastell ..	Hackney.		

#### Chuck Glider (best 2 of 5 chucks)

1. Wells ..	Hornchurch	165 sec.
2. Pask ..	St. Albans	98 sec.
3. Edwards ..	St. Albans	91 sec.

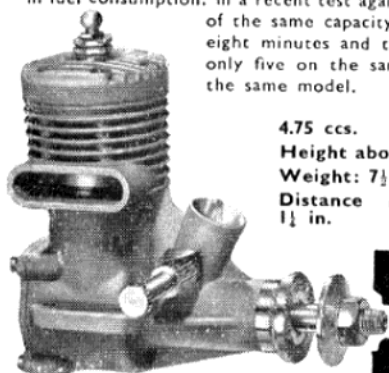
Note: The Rubber/Glider/Power times are for the fly-off.

# MERCO

## BRITAIN'S GLOW-MOTOR

### Supreme

This is the engine that every keen stunt man must have for its ease of handling, easy starting, even running, and above all its capacity for flying the latest stunt schedule right through every manoeuvre without any power loss. The efficient carburation of the Merco engines ensures an even motor run in every flying attitude as well as terrific economy in fuel consumption. In a recent test against a popular motor of the same capacity the Merco ran for eight minutes and the other motor for only five on the same capacity tank in the same model.



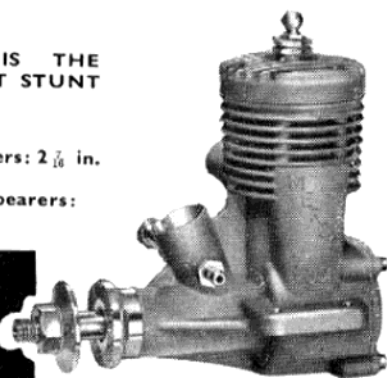
4.75 ccs.  
Height above bearers:  $2\frac{1}{16}$  in.  
Weight:  $7\frac{1}{2}$  oz.  
Distance between bearers:  $1\frac{1}{2}$  in.

**29**  
**£5.19.6<sup>d</sup>**  
including P.T.

Please note: These motors are supplied without glow-plug.

THE MERCO IS THE WORLD'S FINEST STUNT MOTOR.

5.75 ccs.  
Height above bearers:  $2\frac{1}{16}$  in.  
Weight:  $7\frac{1}{2}$  oz.  
Distance between bearers:  $1\frac{1}{2}$  in.

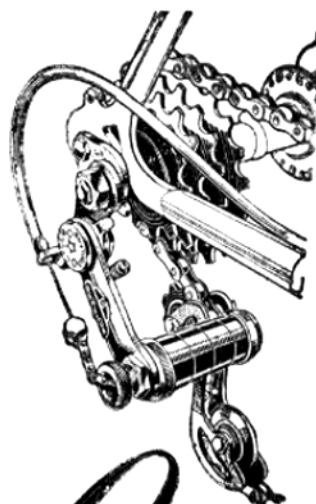


**35**  
**£5.19.6<sup>d</sup>**  
including P.T.

ASK TO SEE THE  
MERCO AT YOUR  
LOCAL STOCKIST

Manufactured by:  
**MODEL ENGINE RESEARCH CO. LTD.,**  
1A BALFOUR MEWS, EDMONTON, N.8

Sole Distributors:  
**HENRY J. NICHOLLS LTD.,**  
308 HOLLOWAY ROAD, LONDON, N.7. Tel: NORTH 4272



If you use a bike  
you need a  
**BENELUX MK 7 GEAR**

The Benelux Mk.7 is the latest and most efficient gear produced by Cyclo—the world's leading derailleur gear manufacturer. It's a must on your new machine—and can be easily fitted to your existing model. The Benelux Mk. 7 is available in 3, 4 or 5 speeds and even up to 10 speeds with a double chain wheel.

The coupon below will bring full details.

## Cyclo Benelux

**POST THIS  
COUPON  
TODAY**

To: Dept. MA, CYCLO GEAR CO. LTD., Aston, B'ham 6  
Please send me a Mk.7 leaflet  
Name.....  
Address.....



*How-to-do-it*  
*Magazine of U.S.*  
*Modeldom*

Read FLYING MODELS, the only American magazine devoted exclusively to model aviation! Every issue includes how-to-build data on new model aeroplanes of various types (with full-size plans wherever possible) . . . worth-while hints . . . photographs . . . how-to-do-it information . . . and features for sport a-plenty!

**Now published every month**

Annual subscription (12 copies) £1 9 6  
Including Postage

Mail your order and remittance today to:  
**ATLAS PUBLISHING & DISTRIBUTING CO. LTD.**

(Dept. A)

18 Bride Lane, Fleet Street, London, E.C.4

## THE SMALLEST ACCUMULATOR IN THE WORLD!

This special high capacity miniature lightweight accumulator is made by one of Britain's leading accumulator manufacturers. The silver oxide zinc plates are enclosed in a light but sturdy plastic case. The nominal capacity is 1.5 amp-hrs. and weight only 1½ oz. when filled. Overall Height: 2 in., Base: 1.112 in. x 0.617 in. Offered well below list price at

Only 17/6



**BE SURE TO VISIT  
BRITAIN'S GREATEST WALK-ROUND  
SCIENTIFIC, OPTICAL & MECHANICAL  
CENTRE—"The Model Makers' Paradise."**

Come and browse through the constantly changing stocks of over a **THOUSAND ITEMS** at  
**UNITED TECHNICAL SUPPLIES LTD.**

Dept. MA 29, TOTTENHAM Court Road, W.I. LAN 1116

Branches:

3 Harrow Road, W.2. (Opposite Edgware Road Tube Stn.) PAD 1133  
8, Queens Road, High St., Watford. WATFORD 28168.

Your guarantee for a High Grade Finish

# Celspray

## HIGH EFFICIENCY SPRAY GUNS



No. 2  
GUN



No. 3 GUN  
(Hand Bulb  
operated)  
9/6 Post 9d.  
Spare 2 oz. con-  
tainers, 9d.  
Rubber Tubing and Pump  
Connection to convert  
for tyre pump operation  
2/6 post free.

**IDEAL FOR ANY CELLULOSE,  
LACQUER, PAINT, DOPE, ETC.**

**ALL GUNS INTER-CONVERTIBLE**  
**The only SPRAY UNIT with the 5-YEAR**  
**GUARANTEE**

Obtainable through all Halford's branches,  
Hobbies and model stores, or direct.

Write for particulars of Complete Spray Kits  
and all spraying materials.

## CELSPRAY LTD

(T.1) Beechwood Rise Nth., Watford, Herts. - Tel.: Watford 6284

FOR OPERATION  
WITH CAR TYRE PUMP

**No. 2 GUN**  
(with 4-oz. spraying  
bottle). 8/6, post 1/-.  
Spare containers, 1/-.

**No. 6 GUN**  
(with 6-oz. wide neck  
spraying jar) 9/3, post 1/-.  
Spare containers, 1/9.

**No. 8 GUN**  
(with 8-oz. wide neck  
spraying jar) 9/9, post  
1/3. Spare container, 1/9.



No. 6  
GUN

When you ask for a  
knife - say **X-acto**



...they're made to  
**develop your skill!**

A man knows that X-acto is *right* the moment he picks up one of these superb knives. X-acto have three different weights of perfectly balanced handle, 25 interchangeable blades, gouges, routers and punches—all in razor-sharp surgical steel.

X-acto's a precise tool. And an all-round tool—right for delicate modelling, right for handyman work around the house. When you ask for a knife—say X-acto.

From Hobby shops & Ironmongers

And ask to see all the other tools  
in the X-acto range



**DUFAY (B'HAM) LIMITED, X-acto Division,**  
**308 SUMMER LANE, BIRMINGHAM, 19**



## RIVERS 3·5

The most powerful 3.5 c.c. diesel in the world! Bore 0.647 in. Stroke 0.647 in. Smooth running, easy starting and consistent performance throughout. Ideal for combat, etc.

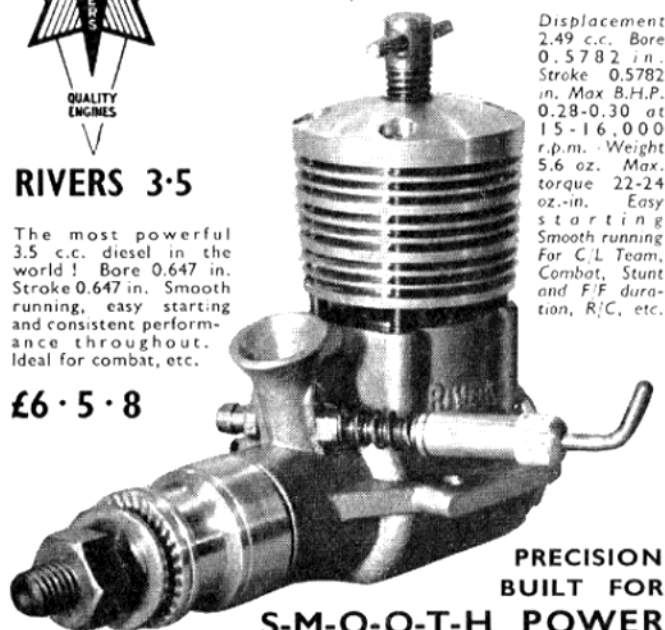
£6·5·8

## SILVER STREAK . . . £6·5·8

Built to the highest engineering standards, patented roller-race main bearing, high speed porting. Consistent performance. Tops in quality.

**TUNED** Individually works tuned and **£7·15·0**  
**VERSION** motor power boosted.

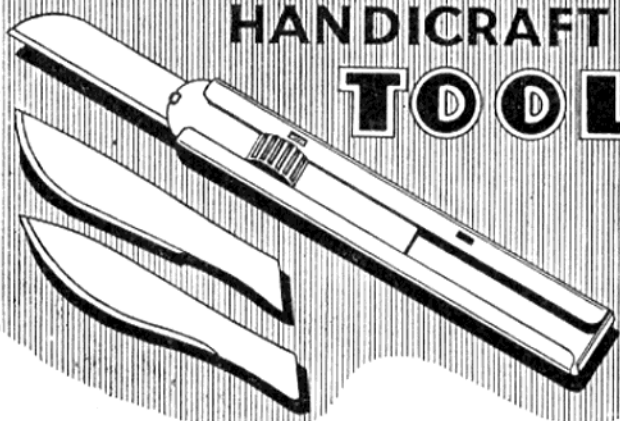
Displacement 2.49 c.c. Bore 0.5782 in. Stroke 0.5782 in. Max B.H.P. 0.28-0.30 at 15-16,000 r.p.m. Weight 5.6 oz. Max. torque 22-24 oz.-in. Easy starting Smooth running For C.L. Team, Combat, Stunt and F/F duration, R/C, etc.



PRECISION  
BUILT FOR  
S-M-O-O-T-H POWER

**A.E. RIVERS** (SALES) LTD, 15 MASWELL PARK ROAD, HOUNSLOW MIDDLESEX, ENGLAND. TELEPHONE HOUNSLOW 5116

# RAGG HANDICRAFT TOOL



## IDEAL FOR MODELLING

etc., and quite safe when not in use

**3/9** Complete with three blades of different shapes  
SPARE BLADES 6d. each.

Order from your usual suppliers and not the sole makers—  
**John & Wm. Ragg Ltd.** NURSERY WORKS Little London Rd., Sheffield 8.



## USE HMG FUEL PROOFER

Users of HMG Fuel Proofer agree it is the best obtainable. Due to the extremely high gloss which it imparts, HMG Fuel Proofer is extensively used as a finishing coat. The high gloss reduces drag, thereby increasing flying speed. No hardener or other addition required. Obtainable from all Leading Model Wholesale and Retail firms.

RETAIL PRICE per 2 oz. jar, 2/-.

Suppliers to the Trade.

**B. Relf & Co. 129 Eastbank Street, Southport, Lancs.**

### CEMENTS AND DOPES

HMG Heat and Water Proof Adhesive per tube 1/3  
HMG All Purpose Clear Adhesive per tube 1/9  
HMG Polystyrene Cement per tube 6d.  
Pukka Balsa Cement Three sizes, tubes 7d., 1/- & 1/6  
Finishing dopes, clear and coloured—Supplied in standard sizes and popular colours.

## England's Only Aviation Bookshop

The books, plans, photos you want on Aviation are here—we stock nothing else!

We BUY, SELL or EXCHANGE

Thousands of magazines and books always in stock  
Open All Day Saturday Only

or send 4d. for our 14-page catalogue

**Beaumont Aviation Literature**  
**2a Ridge Avenue, London, N.21**

(Trolley bus 629 and 641, or Greenline bus 715 pass the door. Nearest Tube—Wood Green)

## READ POPULAR FLYING

The monthly magazine of the Popular Flying Association, the founding and representative body in the United Kingdom of amateur constructors and operators of ultra light and group operated aircraft. Subscription £2, magazine £1 per annum. Specimen copy 1s. 6d. from The Popular Flying Association, 19 Park Lane, W.1.



# "AIR ACES OF THE 1914-1918 WAR"

OVER 2,500 COPIES  
ALREADY SOLD!  
AMPLE SUPPLIES  
NOW AVAILABLE.

**45/-**

COPIES CAN BE ORDERED FROM ANY OF  
W. H. SMITH'S BOOKSHOPS, OR OTHER BOOK-  
SELLERS, OR DIRECT FROM THE PUBLISHERS,  
POST FREE.

**HARLEYFORD PUBLICATIONS LTD.**

DEP. M/A/ACE, LETCHWORTH, HERTS.



# YOU'LL GET RESULTS

with our

# CLASSIFIEDS

To : Classified Advertisement Department, Model Aircraft, 19-20 Noel Street, London, W.1

from: .....

★ Private rate 3d. a word.

I enclose remittance value.....

★ Trade rate 6d. a word.

to cover.....insertions (name and

★ Minimum 12 words.

address, if to appear, must be paid for).

★ Box Number 2/6 extra.

★ Three private rate insertions for the price of two.

BLOCK LETTERS PLEASE


# YOUR BEST MODEL SHOPS



## Readers

YOU CAN DEAL WITH  
THESE MODEL SHOPS  
WITH COMPLETE  
CONFIDENCE

## Retailers

ADVERTISE ON THESE  
PAGES TO REACH THE  
LIVE MODELLERS IN  
YOUR TOWN

### BIRMINGHAM

Tel.: Midland 0972

#### *Hornton's*

32, STEPHENSON STREET, BIRMINGHAM, 2  
(Facing stage door Theatre Royal) and  
1, NAVIGATION STREET, BIRMINGHAM, 2  
(Adjoining Queens Hotel)  
Stockists of Model Aircraft, Railways and Ships

### CARDIFF

Tel.: 52906

#### *Bud Morgan*

THE MODEL AIRCRAFT SPECIALIST  
22/22a, CASTLE ARCADE  
SEND 4d. IN STAMPS FOR MY 1959 PRICE-LIST

### BIRMINGHAM

Tel.: Northern 5569

#### *The Model Mecca*

204-206, WITTON ROAD, 6

A 100% Modelling Shop. Aircraft Kits, etc.  
Trix "OO" L.M.S. Co. "O" gauge. 5 and 5a buses pass door  
WRITE, PHONE or CALL

### COVENTRY

Tel.: 40707

#### *The "Enterprise" Variety Stores*

19, FAR GOSFORD STREET  
21, BRIXHAM DRIVE, WYKEN

If it's advertised within it's obtainable from Coventry's No. 1 Hobby  
shops. . . . Full mail order service by return. S.A.E. for free lists. . . .  
"Plastics" our speciality. Also at 59, Long Street, Wigston, Leics.

### BRIGHTON

Tel.: Brighton 27693

#### *Arthur Mullett Ltd.*

16, MEETING HOUSE LANE, BRIGHTON

Agent for all leading Model Manufacturers  
World wide Mail Order Service

### DARTFORD

#### *Modern Models*

49-51, LOWFIELD STREET, DARTFORD, KENT

Whether you call or whether you post, we claim we've got more stock  
than most

### BRISTOL

Tel.: 23744

#### *Hobbies Ltd.*

65, FAIRFAX STREET

A branch of the firm which is known to Modellers throughout the  
world. Ask our Mr. W. Manning for advice

### GLASGOW

Tel.: Central 5630

#### *Caledonia Model Co.*

5, PITT STREET, C.2

THE engine repair specialists. EVERYTHING for the enthusiast,  
with personal attention from GEORGE LEASK, A.M.I.B.E.

### BRISTOL

#### *The Model Airport*

51, COLSTON STREET

Get your supplies from the leading M.A. shop in the town

### HARROW

Tel.: HAR 0387

#### *The Model Shop*

9, PINNER ROAD, HARROW, MIDD.X.

Stockists of many foreign engines and specialists in mail order. Wide  
range of kits always in stock

**HOUNSLOW**

Tel.: Hounslow 0041

***Poulton's Model Shop***

79, HIGH STREET  
HOUNSLOW, MIDDX.

Model aircraft, boats and trains. No charge for technical advice,  
engine runs or radio checks

**LONDON, N.W.1**

Tel.: GULLiver 1818

***Ripmax Limited***

39, PARKWAY, CAMDEN TOWN, N.W.1  
**THE RADIO CONTROL SPECIALISTS**

All Requirements stocked PLUS Personal Mail Order Service

**GRIMSBY**

Tel.: 4186

***Hobbies Ltd.***

88, VICTORIA STREET

A branch of the firm which is known to Modellers throughout the  
world. Ask our Mr. W. M. Livingstone for advice

**LONDON, N.W.7**

Tel.: MIL 2877

***H. A. Blunt & Sons Ltd.***

133, THE BROADWAY, MILL HILL, N.W.7

A complete range of flying and plastic Model Aircraft Kits and  
accessories.

**IPSWICH**

Tel.: 51195

***East Anglian Model Supplies***

37, UPPER ORWELL STREET, IPSWICH

Keilkraft, Veron, Mercury, Frog, Skyleada, Plastics, Boats, Engines,  
Solarbo, etc. Full postal service—Home or Abroad

**LONDON, S.E.1**

Tel.: Hop 3482

***Model Aircraft Supplies Ltd.***

171, NEW KENT ROAD, S.E.1

The oldest established model aircraft shop in London.  
Personal service with satisfaction

**LEEDS**

Tel.: 28639

***Hobbies Ltd.***

10, QUEEN VICTORIA STREET

A branch of the firm which is known to Modellers throughout the  
world. Ask our Mr. L. Kennard for advice

**LONDON, S.E.4**

Tel.: Tideway 6292

***Model Supplies***

328, BROCKLEY ROAD, S.E.4

Agents for Revell, Airfix, Keilkraft, Mercury

**LEEDS**

Tel.: 27891

***The Model Shop***

58, MERRION STREET  
(Nr. Tower Cinema)

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

**LONDON, S.W.2**

Tel.: Tulse Hill 8796

***Hobbies Ltd.***

81, STREATHAM HILL, S.W.2

A branch of the firm which is known to Modellers throughout the  
world. Ask our Mr. F. C. Reeves for advice

**LONDON, E.C.2**

Tel.: London Wall 4375

***Hobbies Ltd.***

87, OLD BROAD STREET, E.C.2

A branch of the firm which is known to Modellers throughout the  
world. Ask our Mr. D. Browning for advice

**LONDON, S.W.20**

Tel.: LIB 3062

***Model & Tool Supplies***

604, KINGSTON ROAD, RAYNES PARK,  
LONDON, S.W.20

Fine range of aircraft, boats, trains and accessories

**LONDON, N.7**

Tel.: North 4272

***Henry J. Nicholls Ltd.***

308, HOLLOWAY ROAD, N.7

M.A. enthusiasts' complete stockist. Britain's No. 1 Model Shop.  
H.J.N. will be pleased to see you

**EVERYWHERE**

Tel.: Gerrard 8811

***Model Aircraft***

19-20, NOEL STREET, LONDON, W.1

This advertising space is available to all good retail  
Model Shops. Rates may be had on application

**LONDON, W.2**

Tel.: 8827-8-9

THE COMPLETE MODEL SHOP

*Burleigh's*

303, EDGWARE ROAD, W.2

All your wants supplied by return  
BURLEIGH, OF EDGWARE ROAD, LTD.

**SOUTH AFRICA**

*Greenacres*

WEST STREET, DURBAN

You can obtain all your Model Aircraft requirements from Natal's  
Hobby Centre

**LONDON, W.4**

Tel.: Chiswick 0858

*Jones Bros. of Chiswick*

56, TURNHAM GREEN TERRACE, W.4

1 min. Turnham Green Station (Dist. Line)

THE SHOP WITH THE STOCK  
OPEN SATURDAYS 9 a.m.-6.30 p.m.

**SOUTHAMPTON**

Tel.: Southampton 25947

*Hobbies Ltd.*

134, HIGH STREET (Below Bar)

**MANCHESTER**

Tel.: Blackfriars 3972

*The Model Shop*

13, BOOTLE STREET, DEANS GATE

We have **EVERYTHING** in stock for the aeromodeller: Kits,  
Engines and Accessories

**STAINES**

Tel.: Staines 4613

*Staines Model Shop*

53, THAMES STREET

West of London's Leading Model Shop

**NEWCASTLE UPON TYNE**

Tel.: 2-1465

*Hobbies Ltd.*

42, DEAN STREET

(Continuation of Grey Street)

The firm known to Modellers throughout the world. Ask our  
Mr. D. White for advice

**ST. HELENS**

Tel.: St. Helens 3972

*George Webster (St. Helens) Ltd.*

THE MODELLERS' RENDEZVOUS, CORPORATION  
STREET, ST. HELENS

All leading makes of kits, engines, etc., in stock. Mail order by return.  
Aircraft List 6d., post free

**NEWCASTLE**

ESTABLISHED 1924

*The Model Shop*

(NEWCASTLE UPON TYNE) LTD.  
18 BLENHEIM STREET, Tel.: 22016  
NEWCASTLE UPON TYNE, ENGLAND  
Pioneers of modelling with 33 years' experience...  
Our Expert Staff are at your Service

**SUTTON**

Tel.: Vigilant 8292

*E. L. S. Model Supplies*

272, HIGH STREET, SUTTON, SURREY

Surrey's Hobby Centre. By return Postal Service  
Complete stock of all M.A. requirements

**OXFORD**

Tel.: 2407

*Howes Model Shop*

LARGEST STOCK IN THE MIDLANDS

CALL, WRITE OR PHONE

9-10, BROAD STREET

Mail service by return

**WATFORD**

Tel.: Watford 3522

*H. G. Cramer Ltd.*

172a, HIGH STREET, WATFORD

The leading stockist in the area



# CLASSIFIED ADVERTISEMENTS

Advertisements, with remittance, should be sent to Classified Advertisement Department, **Model Aircraft**, 19/20 Noel Street, London, W1, at the latest by the 25th of the month preceding publication date.

Private 3d. per word, Trade 6d. per word; minimum 12 words. Use of Box No. 2s. 6d. extra.

Displayed Classified Advertisements (including Situations Vacant): 35s. per single column inch (column width 2½ in.).

## FOR SALE

Ex-Services Stop Watches (wrist and pocket), Split Action Stop Watches, Time-of-Trip Clocks, Wrist Chronometers and Watches, etc. All with 12 months' guarantee. From 52s. 6d. Binoculars, Telescopes. Send S.A.E. for list.—UNITED TECHNICAL SUPPLIES LTD., Dept. M.A., 3, Harrow Road, London, W.2.

Transparent Acetate Sheets (tinted blue), various sizes, free sample, send 6d. postage, trade enquiries invited.—BCM/EVANCO, London, W.C.1.

For Equipment you wish to buy or sell, why not take space in these Classified columns? Then you will be approaching each reader of **MODEL AIRCRAFT**. For details see the head of this column.

Elfin 149, unused, 40s. o.n.o.—D. T. MILLETT, 12, Chelsworth Drive, Plumstead, London, S.E.18.

Special Pirelli—made expressly for aeromodelling. Genuine top quality ¼ in. in 17 oz. hank direct from Italy. Remit I.M.O. value 22s.—EDGARGO SADORIN, Via A. Caretto 3, Milano 508, Italy.

E.D. Bee, 25s. E.D. Baby, 30s.—EDGE, 18, Heathfield Avenue, Wallisdown, Parkstone, Dorset.

Jobs—if you have a Vacancy you can be sure that an announcement in **MODEL AIRCRAFT** will be reaching a lively, youthful readership. For rates see the head of this column.

**T**rucut  
PRECISION AIRSCREWS

## MAIL ORDER MODELS

THE MODELS BY POST SPECIALISTS  
BRYANT AVENUE, GALLOWAY CORNER, ROMFORD, ESSEX

Our stock lines include all Keil krait and Mercury, plastic of all kinds and makes, radio control equipment, boat kits and accessories. Engines by Mercury Allen, E.D., Davies Charlton, Aero and Marine, Enya and O.S. MAX., Gloplug motors and multi-speed. SEND FOR FULL FREE LISTS

New Aerial Mills 0.75, with hydroplane, £3. Separate engine, £2 5s., hydroplane, 15s.—GREEN, 23, Kettlehills Crescent, Aberdeen.

A.M. 35, 50s.; E.D. 2.46, 40s.; Tigre Glo 0.074, 35s.—CORWELL, 2, David Road, Glasnevin, Dublin, Ireland.

Enya 150 2.5 Diesel, hardly used, 70s.—M. TAYLOR, "Green Trees," Dry Street, Langdon Hills, Essex.

## WANTED

Wanted, Pulse Jet in good working order. State price.—CLIPSTONE, 41 Taunton Way, Stanmore, Middlesex.

Radio Control Equipment for sale? Try advertising in the Classifieds when you will be read by all the **MODEL AIRCRAFT** readers. For rates see the head of this column.

## PUBLICATIONS

World's Largest Stock of old Aviation Books (over 15,000). Catalogue free. Top prices paid for Jane's, any year. World War I and other aviation books.—STUART, Fairlight Hall, Hastings.

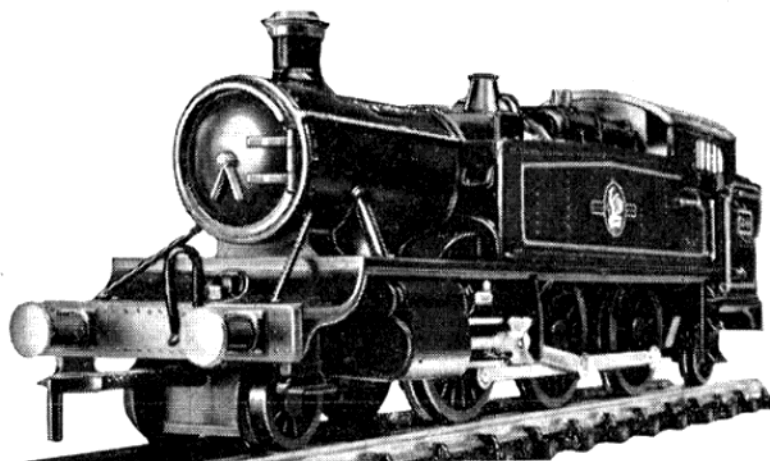
"Sailplane & Gliding"—the only British magazine devoted to the sport of gliding. Published every other month. Send stamped addressed envelope for descriptive leaflet; or 2s. 10d. for current copy; or 17s. for a year's subscription to—BRITISH GLIDING ASSOCIATION, Dept. M.A., 19, Park Lane, London, W.1.

Magazines, Books. If you wish to sell or acquire old or out of print issues, try **MODEL AIRCRAFT** classifieds. Rates are given at the head of this column.

Model Airplane News. America's leading monthly. Year's subscription, 35s. 6d., specimen 4s.—HOBSON, 344, Topsham Road, Exeter.



# LOOK! the latest Kitmaster model



**ROSEBUD**  
**Kitmaster**  
**PLASTIC SCALE MODELS**  
**ROSEBUD KITMASTER LIMITED**

## No. 7 Prairie Tank 6/6

Start to build it right away! No. 7 in the fascinating series of 'KITMASTER' plastic model railway kits is an authentic scale model of the London Suburban area's 'PRAIRIE TANK' engine—for use on your OO and HO gauge tracks and with moving parts. Good model and toy shops have it now. Check up and see you've collected all the 'KITMASTER' models to date!

KMC4

## GAMAGES

### for the LATEST KITS FROM AMERICA

A new importation in the Plastic Hobby Field, and this month the word "field" is very appropriate.

### LIFE SIZE BIRD KITS

Not only are they easy to build—but to make sure that you too can make a perfect model, they are supplied ready to paint by numbers.

Each kit contains life-size bird, two-position log and branch, complete paint set, brush, easy to follow plan and full paint by number instructions. Exclusive snap fit construction.

Usual price 11/8.

**GAMAGES**  
**PRICE 5/11**



Kits include:—  
**BALTIMORE ORIOLE**  
**GOLD FINCH**  
**BLUEBIRD**  
**SCARLET Tanager**

Post 1/-.



Also Adam's latest kit:—

"Around the World in 80 Days" Balloon, 11/8.

**GAMAGES • HOLBORN • LONDON • E.C.1 • HOL 8484**

## The MODEL CRAFT CENTRE

for all  
**AIRCRAFT KITS**  
**DIESEL ENGINES**  
**MODEL RACING CARS**



**King Charles Sports Centre**  
18 King Charles Street  
(Side Schofield's)

Leeds 1

Tel: 26611



## Radio Controls

Equipment which will enable the user to operate, independently, more than one control, is now demanded by most enthusiasts.

The reliability and ease of control of the Tuned Reed System, pioneered by E.D., has, after long and exhaustive experiments and tests, been amply demonstrated and proved by continual successes in open competition.

E.D. now produce six models, which will adequately meet the demands of most enthusiasts. Three of these are illustrated and the others are:—

### The "BOOMERANG"

A Hard Valve Receiving Set, completely wired and ready for use. Includes Transmitter, Receiver, Escapement. Range approx. 500 yd. Price complete £12 4s. 6d.

### E.D. Mk. IV RADIO CONTROL UNIT

Tuned Reed—three channels, for the multiple control of all models. Price complete £21 9s. 9d.

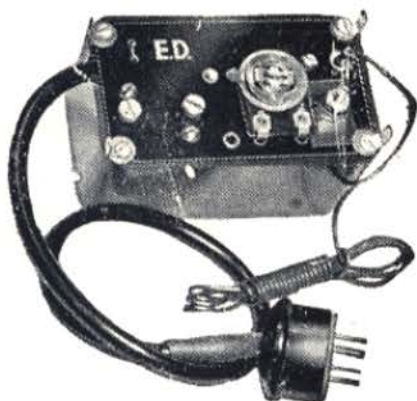
### P.C.I TRANSMITTER

A high powered, super compact, lightweight, portable Radio Control Transmitter. Price (less batteries) £5 18s. 0d.

Ask for and insist on E.D.

**the finest  
Equipment  
for the  
Model Maker**

A comprehensive range of Radio Control, Mechanisms, Spare Parts, Accessories is also available. Full details are given in our illustrated lists—free on request.



H.T. Supply—22½ volt battery.  
Idling current—0.6 ma.  
Current change—0.6 ma.  
L.T. consumption—25 ma.  
Hard Valve—no quench coils.



TRANSMITTER and RECEIVER with 8 ft. sectional Aerial. Fitted with Standard Hard Valves and six standard relays. Price complete £29 10s. 3d. (sold separately)

### The "TRANSITROL" THE FIRST COMMERCIAL TRANSISTOR RECEIVER

E.D., of course, were again first to introduce this new technique. Its advantages in size, weight, current capacity and quality in reception will appeal to all Radio Control enthusiasts. This valve transistor Receiver combines all the advantages of multi-valve modulated Receivers, together with simplicity and very low Receiver Battery size and weight. RECEIVER. Size 2½" x 1½" x 1½". Weight 2½ oz. Price—Receiver, Transmitter and Escapement, £12 19s. 9d.



### NOW AVAILABLE

for Radio Control Enthusiasts

5 ft. CHROMIUM PLATED TELESCOPIC AERIALS 24/- each

27 mc/s CRYSTALS 30/- each

All prices include P. Tax

### The "AIRTROL"

HARD VALVE RECEIVER

### The smallest Receiver in the World . . .

Size 2½" x 1½" x 1½" and weighs only 2½ oz. The latest addition to the E.D. range of Remote Control Receivers, specially developed to meet the great demand for a transistor hard valve receiver with a specification producing the ultimate in Radio Control.

Simple tuning.

Two transistors for output and economy.

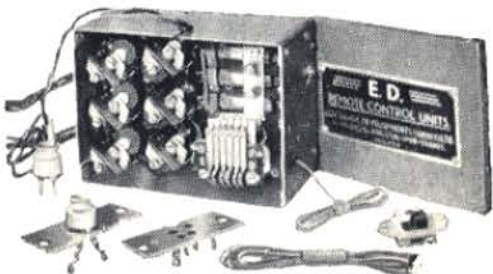
Valve life—4,000 hours.

Price £14 5s. 1d.

### The Mk. V "EVEREST"

TUNED REED 6 CHANNELS

MULTIPLE RADIO CONTROL UNIT. Includes CONTROL BOX, size 6" x 5½" x 2½" giving up to six controls.

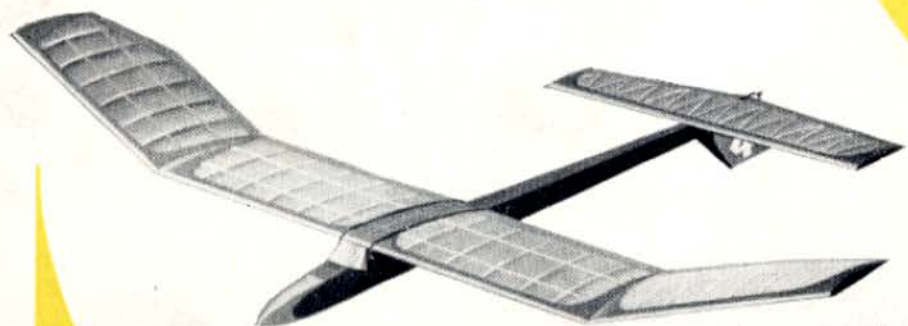


**E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD**  
DEVELOPMENT ENGINEERS  
ISLAND FARM RD. WEST MOLESEY, SURREY, ENGLAND.



# NOW! TWO MORE NEW

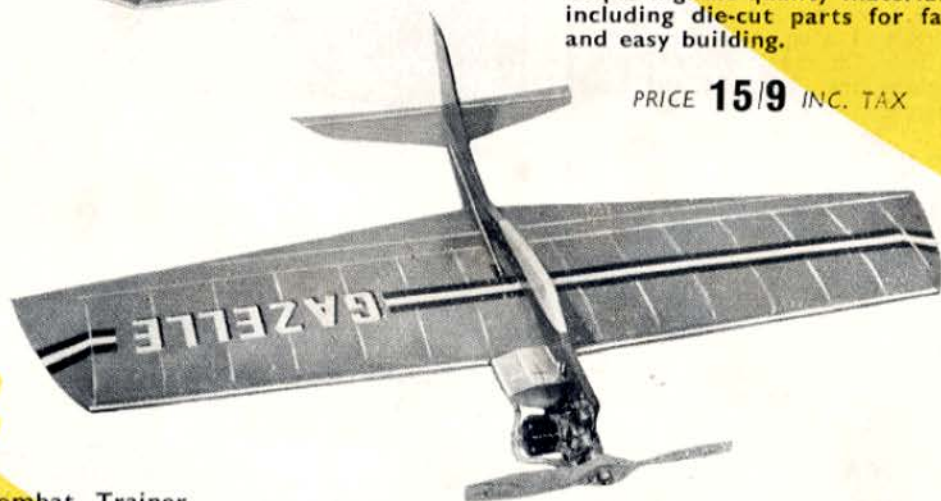
## KEILKRAFT KITS!



### Caprice

The beautifully clean-cut lines of this 51-inch span contest sailplane will appeal to all glider enthusiasts. The kit contains ample highest quality materials, including die-cut parts for fast and easy building.

PRICE 15/9 INC. TAX



### Gazelle

A 28-inch span Stunt and Combat Trainer that is simple and quick to build. A very tough and fully aerobatic model for 1 to 1.5 c.c. motors. Kit includes metal stunt tank, die-cut parts, steel control horn, Paxolin bellcrank, nuts, bolts and washers, etc.

PRICE 19/10 INC. TAX

BUY KEILKRAFT AT YOUR LOCAL MODEL SHOP

# KEILKRAFT

THE GREATEST NAME IN MODEL KITS

E. KEIL & CO. LTD., WICKFORD, ESSEX

(WHOLESALE ONLY)

FOR SUPER  
PERFORMANCE  
WITH YOUR GAZELLE  
USE KEILKRAFT FUELS

