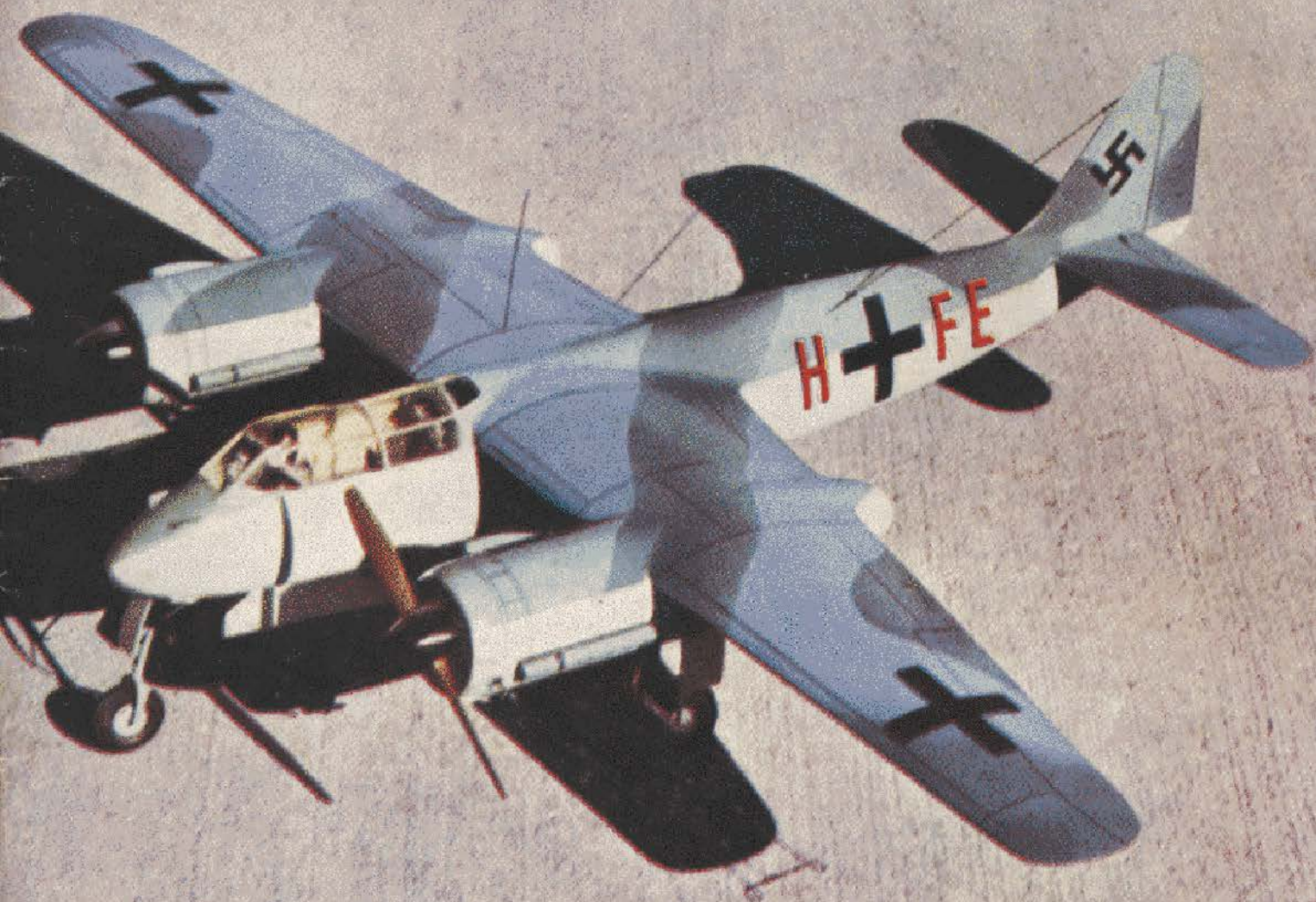


**MODEL**

*aircraft*

DECEMBER 1959

1'6



**Christmas  
Issue**

**Build this Ta 154 MOSKITO  
- feature article inside**



# KEILKRAFT

*For all your Modelling Needs!*



## KEILKRAFT CEMENT

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

## KEILKRAFT DOPE

Flows on smoothly and gives brilliant one-coat coverage. Quick drying. Available in all popular colours.

1/2 oz. clear	8d.	1/2 oz. coloured	8d.
1 oz. "	10 1/2 d.	1 oz. "	10 1/2 d.
2 oz. "	1/3	2 oz. "	1/6
1/2 pint "	4/3	1/2 pint "	4/3



Give your models a superior finish with these high quality KeilKraft products.

KK FUEL PROOFER	2/-	KK DOPE POLISH	9d
KK SANDING SEALER	1/3	KK PLASTIC WOOD	1/-
KK GRAIN FILLER	1/6		

## TRANSFERS

1/2" Alphabet (Red, White or Black)	...	...	3d.
3/4" Alphabet (Red, White or Black)	...	...	3d.
1" Alphabet (Red, White or Black)	...	...	6d.



## MODELLING PINS

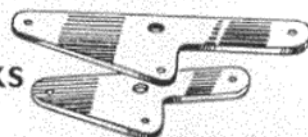
In the attractive KeilKraft Bubble Pack  
Per pack ... 1/-

## KK CONTROL LINE WIRE

30 or 33 s.w.g.  
150 ft. on card.  
2/6  
Terylene Thread  
100 ft. on card  
7 1/2 d.

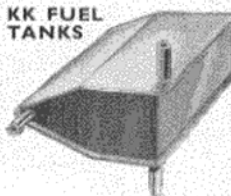


## KK BELLCRANKS



"Ranger" type (aluminium)	3 1/2 d.	Small plastic type	3 1/2 d.
"Stunt Queen" "	3 1/2 d.	Medium "	3 1/2 d.
		Large "	3 1/2 d.

## KK FUEL TANKS



1/2 A stunt	...	2/11
Small stunt	...	3/6
Large stunt	...	6/5
7 1/2 c.c. team race	...	3/2
10 c.c. "	...	3/2
15 c.c. "	...	3/2
30 c.c. "	...	3/6
15 c.c. pressurised	...	3/6
30 c.c. "	...	3/6

## KEILKRAFT FUELS

Blended with BP Energol oil for clean running and super performance.

KK Nitrated Diesel, 1/2 pt.	...	3/-
KK Nitrated Diesel, 1 pt.	...	5/-
KK Record Powerplus, 1/2 pt.	...	3/6
KK Methanex Glow, 1/2 pt.	...	3/3
KK Methanex Glow, 1 pt.	...	6/-
KK Nitrex 15 Glow, 1/2 pt.	...	4/3
KK Super Nitrex Glow, 1/2 pt.	...	6/6



Try some at your next flying session

## KEILKRAFT PROPELLERS

For rubber powered free flight duration models

6" diameter	...	1/9
7" "	...	1/10
8" "	...	1/10
9" "	...	2/0
10" "	...	2/0
11" "	...	2/3
12" "	...	2/7 1/2
13" "	...	2/11
14" "	...	3/5
7" diameter pusher	...	3/3

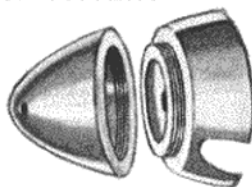


## KEILKRAFT S - A - N - D - E - D Balsa

(You can tell it blindfolded!)

The only SANDED balsa produced in Britain. Your models will look far better if built with this super smooth wood, yet it costs no more than ordinary balsa. Ask for it at your model shop.

## KK "SCREW-ON" SPINNERS



1 1/2" dia. standard (plastic)	...	2/7 1/2
1 1/2" " " "	...	2/11
1 1/2" " " "	...	2/11
2" " " "	...	3/4
1 1/2" dia. supersonic (plastic)	...	2/11
1 1/2" " " "	...	3/4
1 1/2" " " "	...	3/4
2" " " "	...	3/11
1 1/2" dia. (aluminium)	...	5/10
1 1/2" " " "	...	7/10 1/2

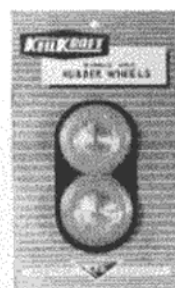
## KEILKRAFT AIRWHEELS

Fully pneumatic  
2" dia. ... 14/- 2 1/2" dia. ... 21/-  
3" dia. ... 25/4 3 1/2" dia. ... 28/-  
4" dia. ... 29/2



## KEILKRAFT SPONGE RUBBER WHEELS

Either streamlined or balloon section  
1 1/2" diameter 3/1  
2" diameter 4/3



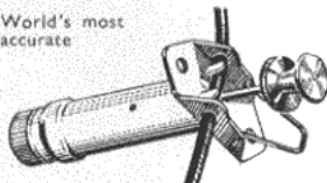
## WHEEL COLLETS



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

## 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



Positive action  
KK FUEL FILTER ... 2/6

## PLASTIC ENGINE COWLS



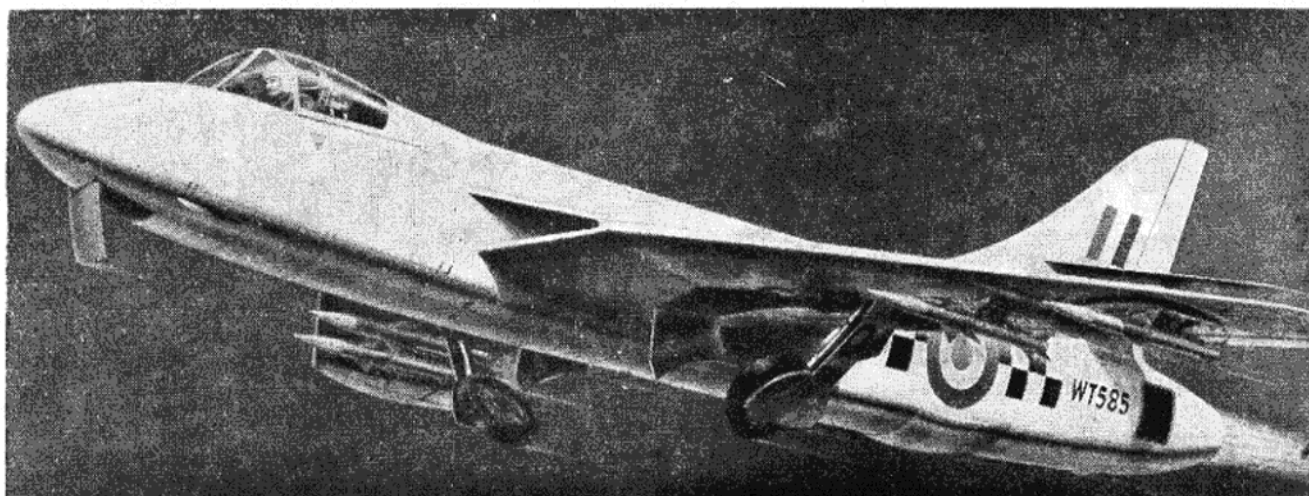
3 different types  
Suitable for models of 36"-48" span  
1/2 each.

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

**The World Famous  
Manufacturers of**



**ANNOUNCE  
THEIR WINTER  
PROGRAMME!**



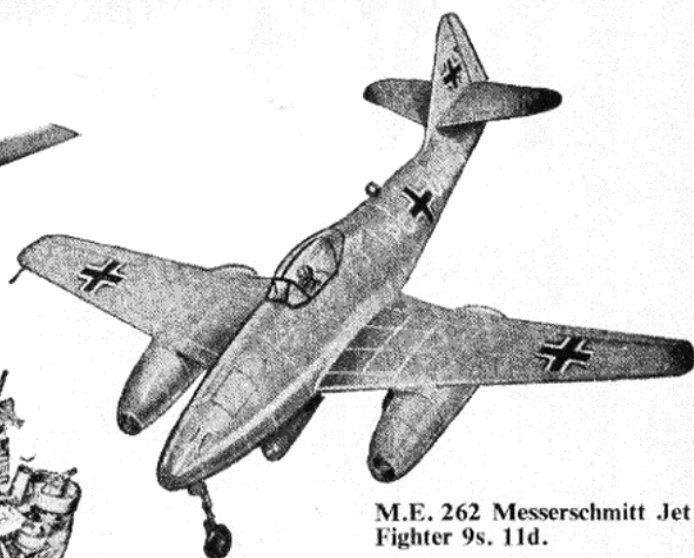
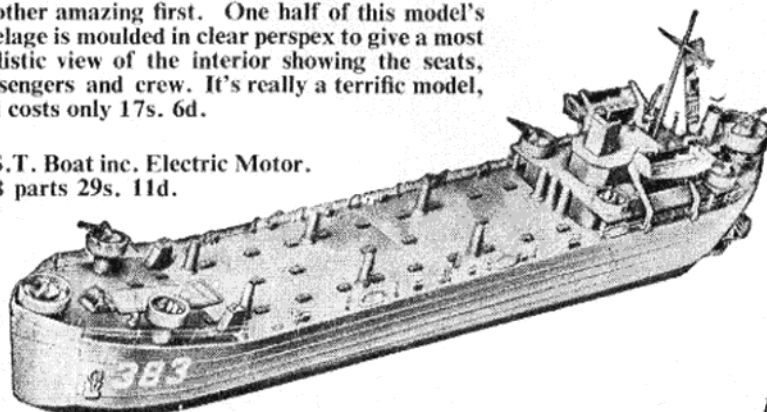
**HAWKER HUNTER** 89 parts 14s. 6d. Including towing tractor and driver. Retractable landing gear movable controls



**THE FRENCH CARAVELLE  
JET AIRLINER**

Another amazing first. One half of this model's fuselage is moulded in clear perspex to give a most realistic view of the interior showing the seats, passengers and crew. It's really a terrific model, and costs only 17s. 6d.

**L.S.T. Boat inc. Electric Motor.**  
208 parts 29s. 11d.



**M.E. 262 Messerschmitt Jet  
Fighter** 9s. 11d.

*Also:*

L.C.V.P. Navy landing craft including Electric Motor.

Junkers J.U.88 German Fighter Bomber. 95 parts.

Plus a host of others.

*Be sure to get these wonderful kits.*

*Manufactured under licence by*

**MODEL TOYS LTD.**

**275 KENSAL ROAD, LONDON, W.10  
LADbroke 5301**

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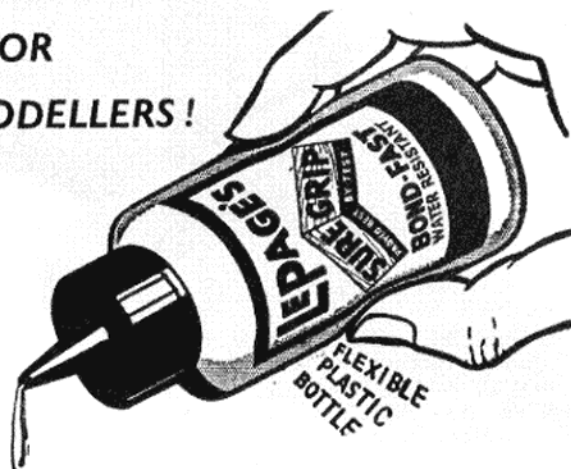
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27 WATFORD WAY · LONDON N.W. 4



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**LEPAGE'S** Bond-Fast P.V.A. White Glue is being used successfully by Model Enthusiasts throughout all England! Its tremendous joint strength of 3,000 lbs. per sq. in. is due to its deep penetration into all types of wood. It is equally effective on Balsa Wood, Plywood and Hardwoods. It is extremely clean in use; does not stick to fingers; does not string. Being slightly slower drying than cellulose cements it enables difficult building operations, such as sheet covering, to be carried out more easily. Its water-resistant properties make it ideal for model boat building. The plastic squeeze bottle makes it convenient and economical to use.

Why not buy a bottle now from your local Model Shop?



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| No. 23  | 8 oz. Plastic Bottle | 5/6  |
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| No. 124 | 1 gal. Refill Can    | 55/- |

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**HAPPY CHRISTMAS**

CEMENT

THAT'S A SHORT LETTER TOO

**SOLARBO LTD · COMMERCE WAY · LANCING · SUSSEX**  
 Telephone: LANCING 2866-7  
 Telegrams: SOLARBO WORTHING

I am going to make this just about the shortest letter on record. I wish you all a Happy Christmas and a Happy and Busy New Year—making models. Don't bother to wish me a Happy and Prosperous New Year. Just make plenty of models and that will make me prosperous! You see, we are vain enough to believe—"Plenty models, plenty Solarbo."

*John Paterson*

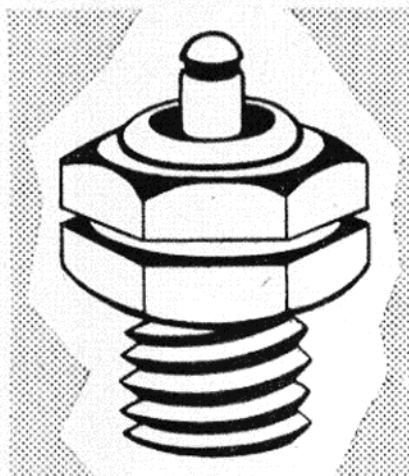
**NEW YEAR RESOLUTIONS**  
**BUILD:—**  
 2 POWER JOBS  
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 AND USE  
**SOLARBO Balsa**

**YOU CAN RELY ON SOLARBO—IT WILL NEVER LET YOU DOWN**

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# AT LAST! *A RELIABLE GLOW-PLUG* *AT AN ECONOMICAL PRICE!!*



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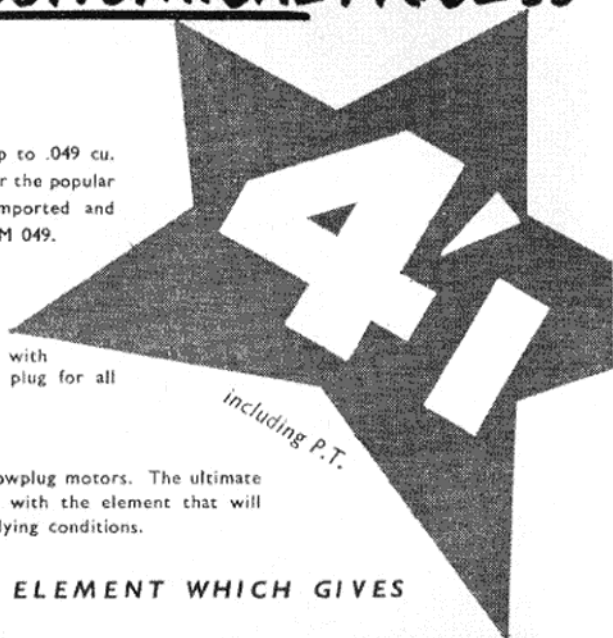
1.5 volt glowplug for small engines up to .049 cu. in. (0.8 c.c.) capacity. The ideal plug for the popular small American motors now being imported and especially recommended for the new AM 049.

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2 volt short reach plug for all glow motors from 2.5 c.c. to 10 c.c. capacity. Characteristics are long life with easy starting. The ideal "standard" plug for all short reach motors.

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2 volt long reach plug for the larger glowplug motors. The ultimate choice for all racing glowplug motors with the element that will really stand up to the most rigorous flying conditions.



ALL AM GLOWPLUGS HAVE THE EXCLUSIVE AM ELEMENT WHICH GIVES REALLY EASY STARTING WITH LONG LIFE.

**D. J. ALLEN ENGINEERING LTD.**

28, ANGEL FACTORY COLONY, ANGEL RD., N.18.  
Phone : EDMONTON 6466

# JETEX

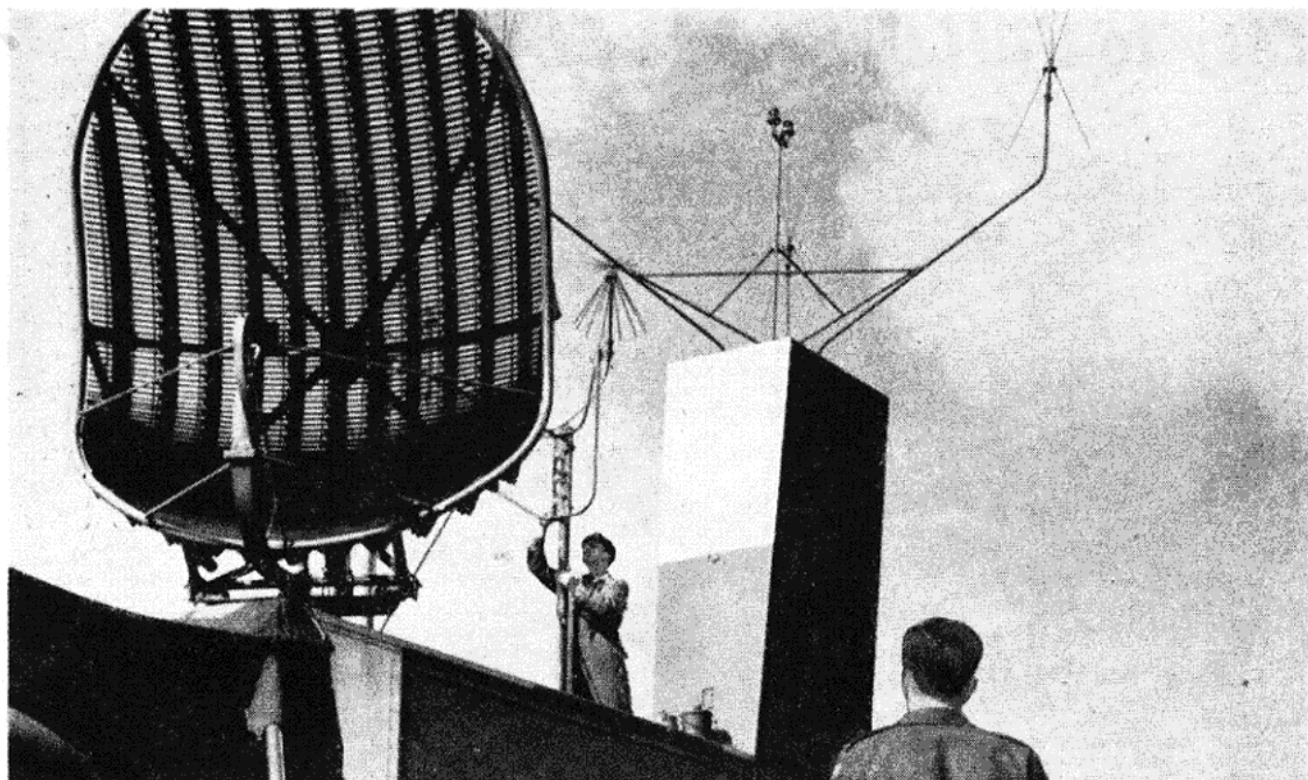
## POWER MAKES THE MODEL

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.





*Ex-Apprentice fitters working on airfield radar equipment*

## How high are you aiming?

You're 15-17 and keen to get the most out of the world. All round you, you see it's the men with technical training who get the best jobs today. Good training means an apprenticeship. And a Royal Air Force Apprenticeship is the finest of all.

**You'll go further in the Royal Air Force.** A young man picked for an R.A.F. Apprenticeship is assured of getting the world's finest training for his chosen trade. He's paid while he learns, too—up to £6 a week, *all found*. And then? He'll join the closely-knit team of experts who maintain the air power of Great

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**What's your line?** There are two main classes of R.A.F. Apprenticeships. *Aircraft Apprentices* learn advanced radio, electrical and mechanical engineering. *Administrative Apprentices* are the future experts on the organisation side.

These Apprenticeships are not handed out to anybody. Competition is keen. To be considered, you must have done well at school, and be really eager to get on. There are vacancies in the trades listed on the coupon. Send it now for further details.

**Post before 31st December 1959**

To R.A.F. Central Recruiting Office (MAC 39)  
Victory House, Kingsway, London, W.C.2.

Please send me full details of R.A.F. Apprenticeships. I am particularly interested in:

Accountancy/Clerical ☐

Supply Organisation ☐

Aircraft Engineering ☐

Electrical & Instrument ☐

Armament Engineering ☐

Engineering ☐

Radio Engineering ☐

NAME

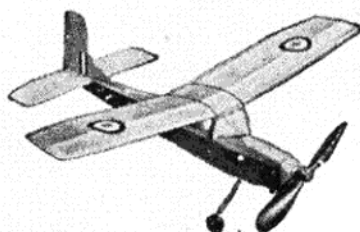
ADDRESS

DATE OF BIRTH



*All Apprentices are urged to gain air experience. This Apprentice is off for a passenger flight in a Chipmunk.*

# 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" diesel. 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

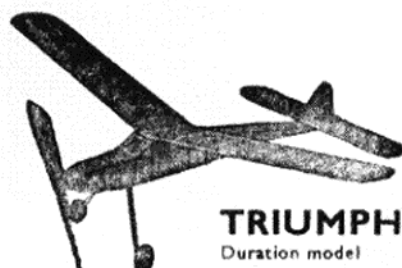


### TROJAN

Control line model

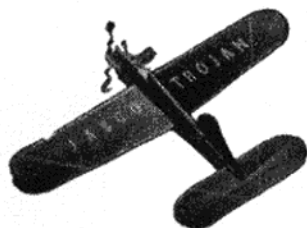
### TROJAN

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**



## 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**

Ask your nearest stockist or write direct:

## JUNIOR AIRCRAFT SUPPLY CO. LTD.

129 EASTBANK STREET · SOUTHPORT

# 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/-**  
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 "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/-**  
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### A Full Range of Accessories

R.E.P. 1/2-oz. Relay ... **24/-** Telescopic aerials, switches.  
 3-Reed unit ... **35/-** condensers, resistors, valves.  
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### ★ 27 Mcs 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**  
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"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/-**

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Complete with Circuits and Component Values for "Carrier" and "Tone" Transmitters **40/-**

## 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.
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- ★ "Pretuned", no adjustments or tuning required.

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

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Telephone: PROspect 9375



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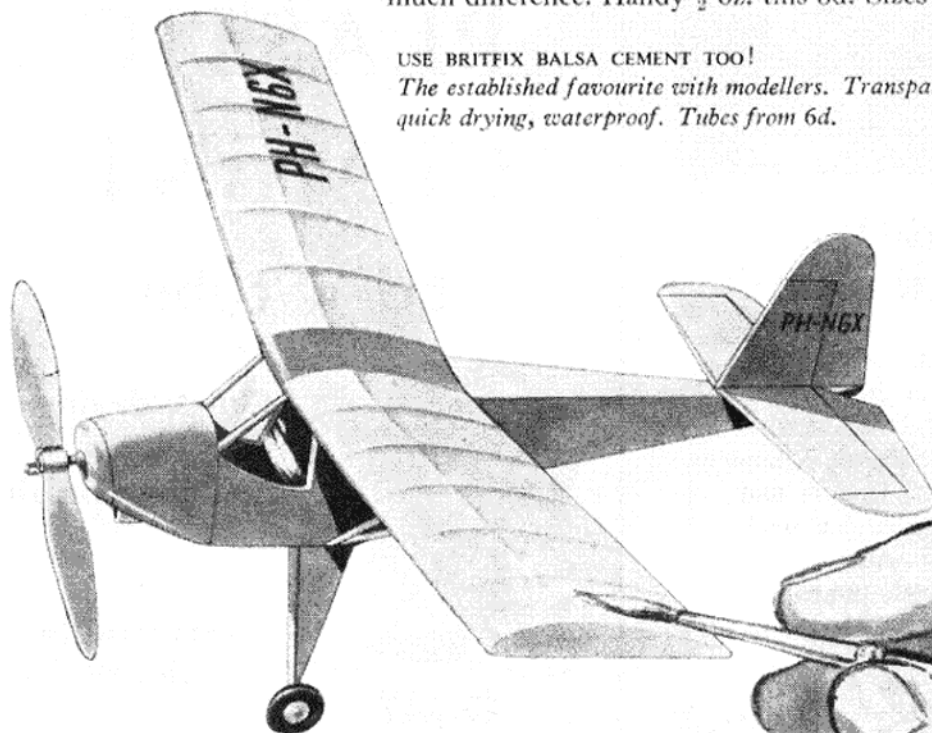
## WITH THE HUMBROL TOUCH!

Humbrol Gloss Enamel—in 34 matching shades—gives an added touch of realism to *all* flying models. But that's not the only advantage! Precise Laboratory tests have proved that Humbrol Gloss Enamel is 29% *lighter* than ordinary colour dope. And Gloss Humbrol (excepting metallic colours) is proof against diesel fuels—no need for an additional coat of fuel proofer.

Humbrol is dry in 1 hour, and flows on easily without brushmarks. It is now being accepted more and more by discriminating modellers as today's replacement for colour dope, the professional finish that makes so much difference. Handy  $\frac{1}{2}$  oz. tins 8d. Sizes up to  $\frac{1}{2}$  pint.

USE BRITFIX BALSA CEMENT TOO!

*The established favourite with modellers. Transparent, quick drying, waterproof. Tubes from 6d.*

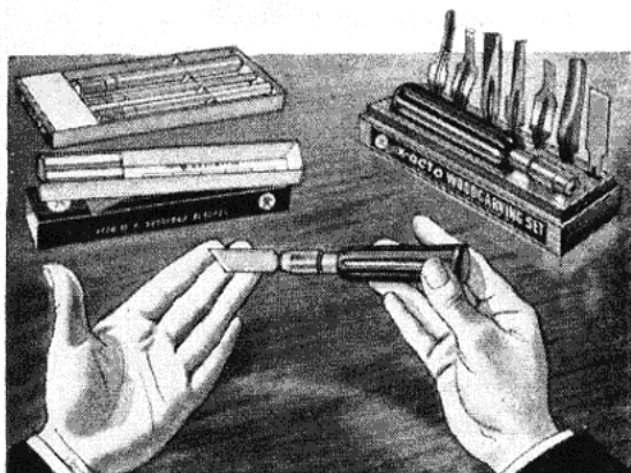


# HUMBROL

*The Art Enamel that turns Models into Masterpieces*

THE HUMBER OIL CO. LTD. (PAINTS DIVISION) MARFLEET HULL

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



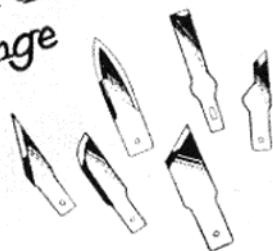
...they're made to  
develop your skill!

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.

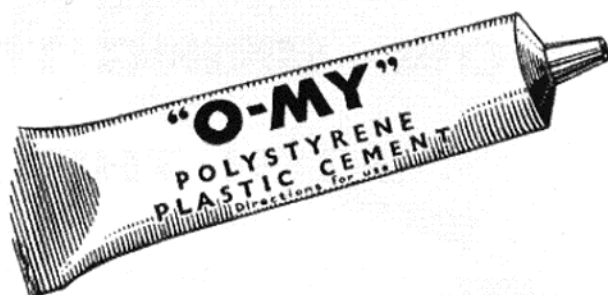
X-acto's a precise tool. And an all-round tool—right for delicate modelling, right for handyman work around the house. When you ask for a knife—say X-acto.

From Hobby shops  
and Ironmongers

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



**DUFAY (B'HAM) LIMITED**, *X-acto Division*,  
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**"O-MY"**

**POLYSTYRENE**

**PLASTIC  
CEMENT**

**6d a tube**

**ALSO**

**Quick drying**

**High gloss finish**

**28  
intermixable  
colours**

**CADET SIZE**

**4½d**

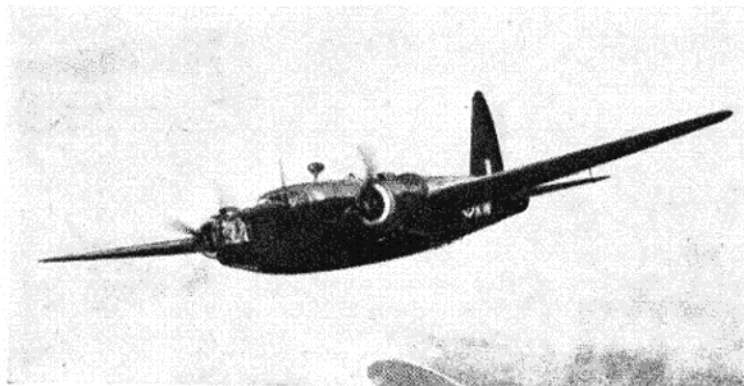


Actual size

**A large range of colours, glossy and matt**

**CELESTOR Manufacturing Co.**  
55, DARTMOUTH ROAD, LONDON, S.E.23  
Tel.: FORest Hill 2752





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## Just like the real thing!

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

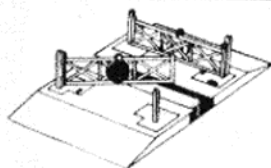
There are models galore in the Airfix range! Aircraft from fighters to bombers (all to the same 1/72nd scale), 00 gauge railway accessories, vintage cars, historical ships. Airfix value is unbeatable — ask your dealer for the latest list.

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

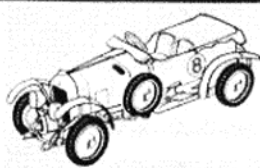
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THE WORLD'S GREATEST VALUE  
IN CONSTRUCTION KITS

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



**TRACKSIDE SERIES**  
Level Crossing 2/-



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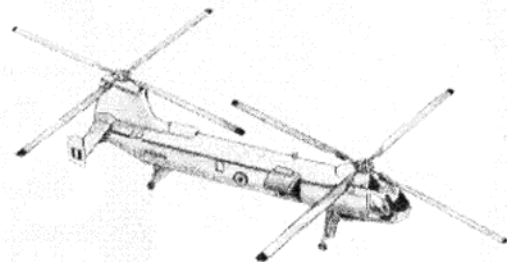
**HISTORICAL SHIPS**  
H.M.S. Victory 2/-



Airfix  
Wellington  
Bomber. 6/-

## STOP PRESS!

Latest Airfix Production



### BRISTOL 192 HELICOPTER

Realistic 1/72nd scale model of the new twin-rotor transport. Fuselage length 9 in.; 8 in. diameter moving rotors. Kit contains R.A.F. marking transfers and choice of cargo or winch door. 4/6.

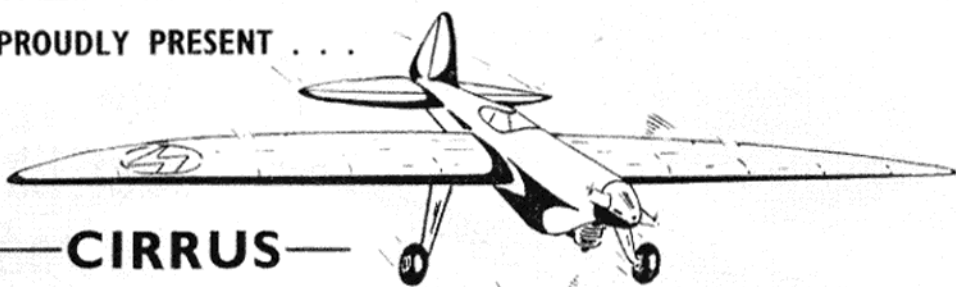
**Also new:** 1/72nd scale Typhoon (2/-) and 00 gauge crane (3/-).

[A359]

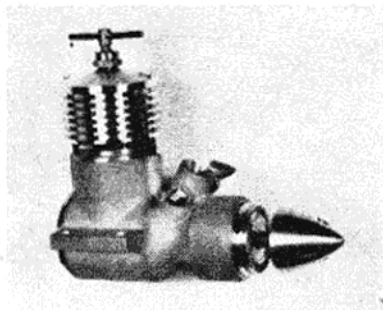


PROUDLY PRESENT . . .

—CIRRUS—



32 in. span advanced stunt model for 1-1½ c.c. engines. Features coupled elevators and flaps. Will execute the new S.M.A.E. stunt schedule with ease. Kit contains only the very best materials. Price including P.T. 21/6.



D.A. DRABANT 2.5 c.c. B.R. £6.7.2

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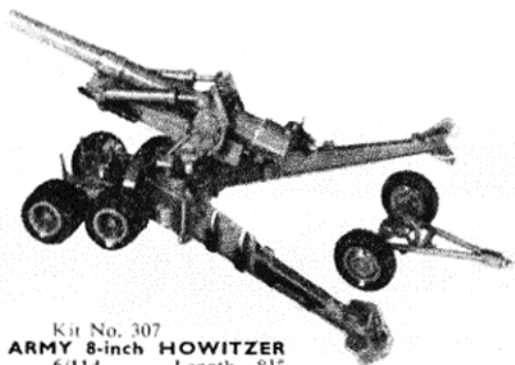
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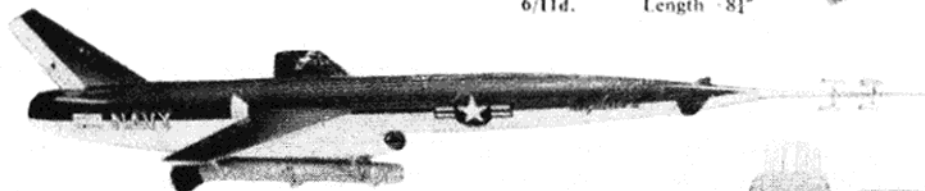
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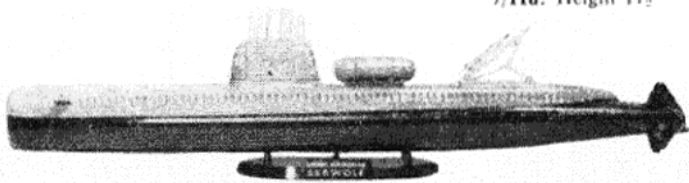
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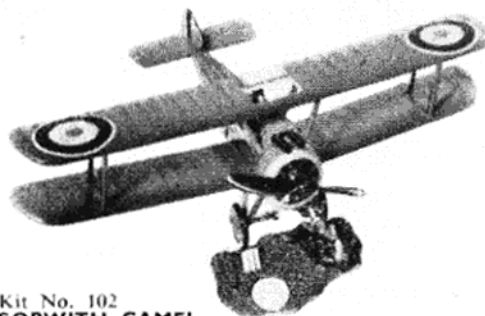
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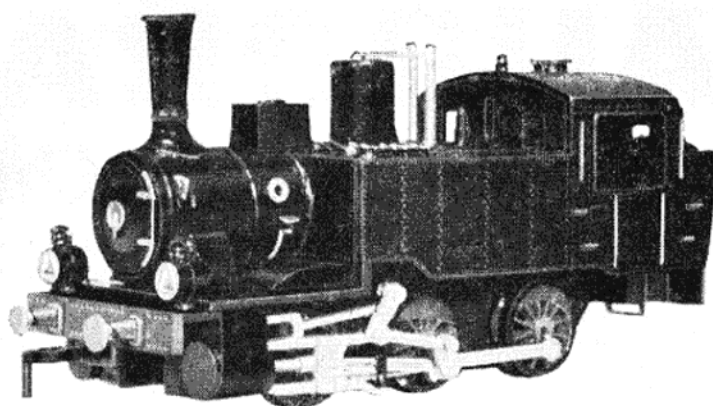
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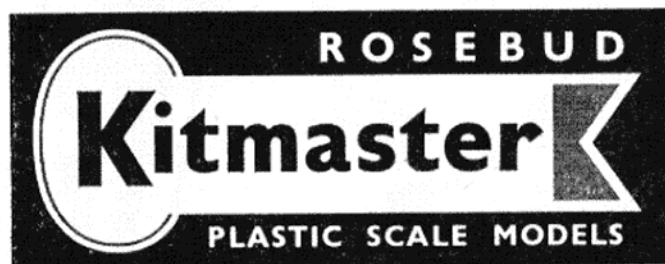
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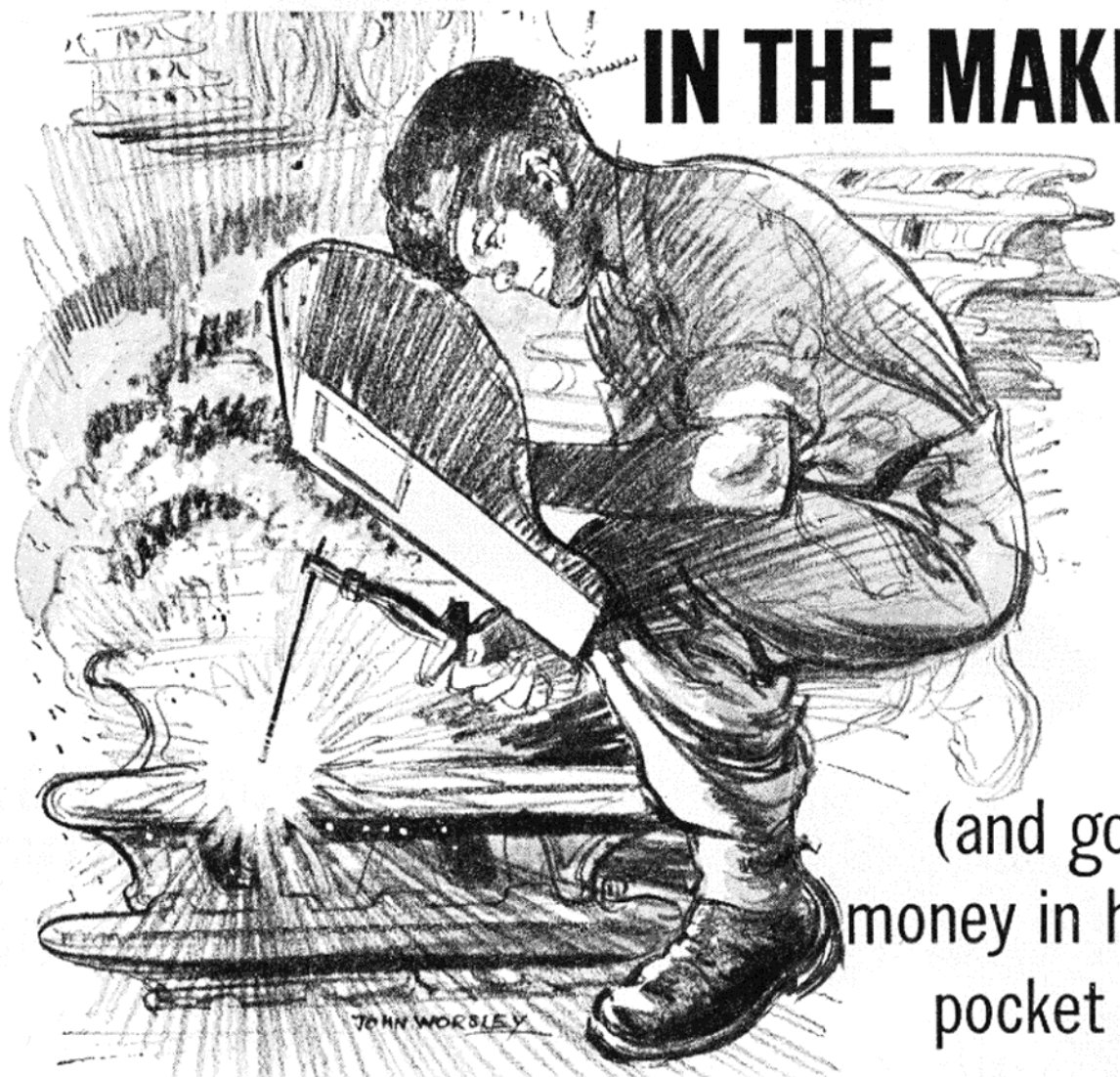
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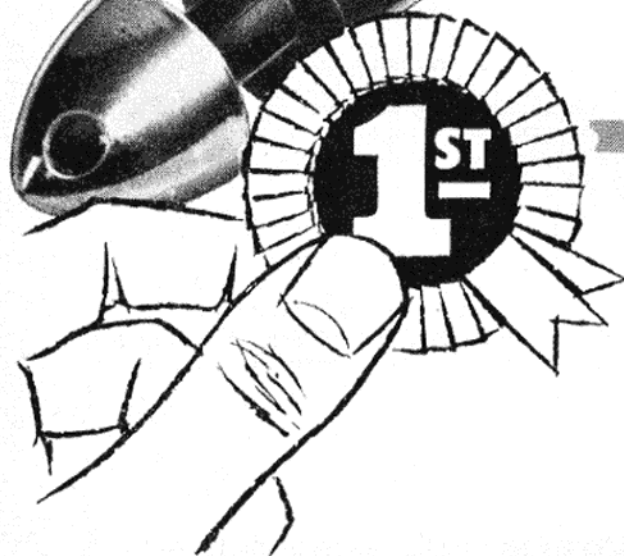
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## Here and There

### Places to Fly

THERE has been considerable space, in both the national and local press recently, devoted to councils attempting to ban C/L flying. This is, of course, nothing new, except that in both the cases reported, the councils have been approached sensibly and have accordingly viewed the situation sympathetically.

At Cambridge, the City Council Commons Committee instructed the Town Clerk to prepare a bye-law banning the flying of all powered aircraft, because of the possibility of accidents. Fortunately, the president of the Cambridge M.A.C., Capt. A. C. Taylor, is also an alderman, and he was able to persuade the council to think again before passing the bye-law.

This will allow the club to demon-

strate to the council that there is little to fear on this score, which is as well, because when the matter was discussed, the chairman of the Commons Committee was under the impression that C/L models were not under control when they landed!

Under the heading "No Place to Fly," the *Esher (Surrey) News* stated that there was as much chance of starting a model club in Esher as there was of starting a swimming club in the Gobi Desert. This is because the only place where models may be flown is a very rough field.

However, through the active intervention of local enthusiast E. G. Cotton, the council considered the possibility of laying a circular track à la Etterbeek where this year's Criterium d'Europe was held. Initially the cost would seem to be too high—estimates of the cost vary between £100 and £400—but there

*Season's Greetings  
to our readers*

is a possibility that outside financial assistance might be forthcoming.

Should a permanent circuit materialise it would be the first one in this country, which is poor when it is considered that Belgium has no less than three permanent C/L areas. However, it would be a start, and, as such, more than welcome.

Mr. Cotton is to be congratulated on his initiative and we hope that his example will be followed elsewhere. In the meantime we are keeping our fingers crossed.

### You've never had it so good(?)

WE are not entering into politics, but with the Government returned on its record of achievements, it would seem, from the monotonous regularity with which retiring S.M.A.E. officers are returned, usually unopposed, that modellers are satisfied with their governing body. That this is not universally the case, is borne out by correspondence we receive from readers complaining about the S.M.A.E.

We have little sympathy with such complaints, and usually tell the writers to do something constructive by volunteering their services at club or area level. Now, with the election of S.M.A.E. officers for next year imminent, there is the opportunity for all clubs to do something, either

by proposing suitable candidates for the posts to be filled, or, at the very least, by voting.

Voting support is usually very poor, although not as poor as the response to nominations for the vacant posts. (Not every post is vacant, an officer is elected for two years, half retiring alternate years to avoid the theoretical possibility of the council being completely composed of new members).

So now is every member's opportunity to effect any change he thinks necessary—if retiring officers are returned unopposed, or voting support, where there is a contest, is poor, then we can only conclude that members are certain that they have "never had it so good!"

### Keeping Up

BY tradition, the model aircraft hobby is a modern, progressive one; keeping pace with the newest developments in the world of full size aviation, while at the same time retaining its own unique character. Performance and variety of models have increased over the years, there being few, if any, types of aircraft which have not been flown in model form, from the early monoplane to the latest jet. And, in that form of flying, which has developed strictly within the hobby, and of which the F/F contest model is a notable example, there has been a complete breakaway from full size imitation

into new and interesting fields of low speed aeronautics.

We are now moving into an age of the rocket and supersonic flight, in which the challenge to the model world to reflect the modern trend becomes more intense, and it will be interesting to see what form the response will take. Undoubtedly there will be a stepping up on the technical side of things, with R/C playing a predominant role. Engine units may undergo conversion from airscrew into jet propulsion, although this may be looking some way into the distant future. Nevertheless, a safe, moderately powered unit would be a desirable asset to the hobby, as a continued, almost complete, dependancy on the obsolescent airscrew might eventually give our hobby a historic rather than a contemporary look.

As far as the contest model is concerned there is not the same sense of urgency, and it is more likely to be the subject of progressive refinement, than revolutionary change. If, however, we are to take recent World Championships as any indication, some increase in technical complication may well be part of the process. But, it is hoped that the improvements to the breed will not take the international contest model outside of the limited resources of the average modeller.

Altogether the outlook for modelling is one of greater diversity, giving wider opportunity for modellers of varying interests to apply their skill and ingenuity.

### Cover Story

ONE of the most eye-catching models in the C/L scale event at this year's Nationals, was Peter Wheldon's Focke Wulf TA 154. In line with our policy of bringing to our readers the best models available, we are, this month, featuring detailed drawings and instructions to enable you to produce an accurate replica of his design, which is shown in yet another view in the photo below.

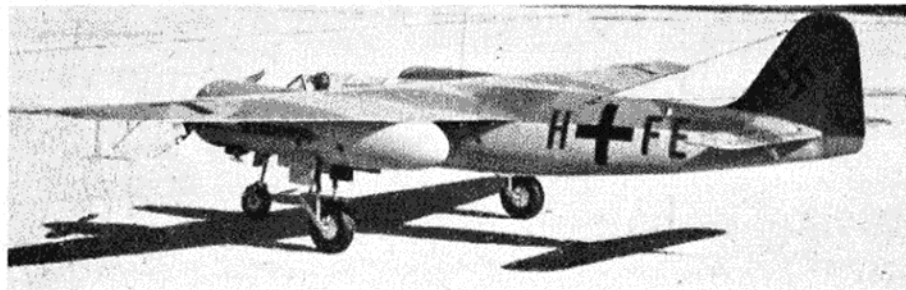
For the first time we have a full colour cover showing, appropriately enough, Peter's TA 154 as it appeared at Scampton. This is, in fact, a double first—a colour photograph of a model has never before been used on the cover of any British aeromodelling magazine. We know from past plans sales how popular twin engined C/L models are with our readers, and we anticipate a bumper response to this out-of-the-rut masterpiece.

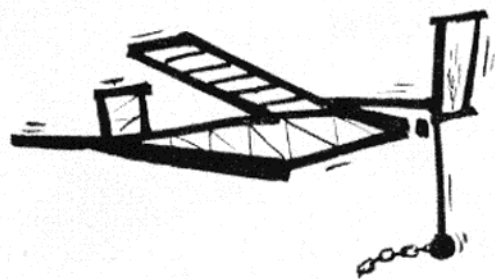
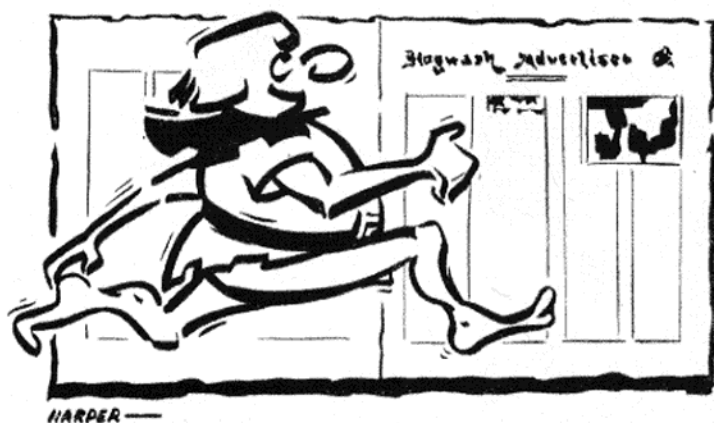
### National Models Exhibition

THERE is still time to send in your entries for the National Models Exhibition, which will be held at the New Horticultural Hall, Westminster, from December 31st to January 9th.

Nine different competition classes are listed in the Model Aircraft section alone, and full details are contained on the entry form which can be obtained from the Exhibition Manager, 19/20, Noel Street, London, W.1.

In addition to individual classes for rubber, glider, F/F power, C/L, solids, R/C, and scale (F/F or C/L) models, there is also a section for Juniors (under 16 on December 31st) and a Club Team Championship, open to clubs with three or more entries in any class(es).





# ALL HOGWASH

By Len Ranson

IT was a black and moonless night in Hogwash Hallow. On such a night, it is said, strange spirits move abroad, and unearthly sounds, unfit for human ears, pierce the thick, night air. Inside the old, black barn, some of the stranger spirits which haunted the Hallow were huddled around the flickering light of a smoke-blackened lantern, while above, the wind howled and fretted in the decaying rafters, as if waiting for some horrible climax. Suddenly, a grisly wailing echoed through the gloom, and a voice screamed out in anguish:

"Cut out that so-and-so engine. How do you expect us to hold a meeting with that row going on?"

The gloom-bound figure blowing his top was Ted Scriven, Secretary of the Lower Hogwash M.A.C., and the deafening silence which answered his cry was just coincidence—the engine had done likewise.

Ted, and a few of the other murky meeters, were trying to discuss, between revs, the cross channel air race, which was currently making the news. They were mostly bemoaning the fact that the full size stuff got all the glory.

"Ought to have given us the chance," complained Little Willie Wilkes. "Something worth commemorating must have happened in the model world fifty years ago, if it was only the first east-west crossing of Muggleton Bog."

"Might be worth looking it up in the Domesday Book, or something," suggested another of the nebulous figures. "Perhaps we'd find old Jeb here made the first paper aeroplane out of the *Hogwash Advertiser*."

Before Jeb Mahoon could think of a suitably crushing reply, the door of the barn flew open, and in from the black night staggered Crummy Crummers.

Crummy was the ace reporter of the *Hogwash Advertiser*. He was equally office boy, bottle washer and general dogbody of that exalted weekly. But, you couldn't deny that Crummy had a nose for news; a virtue which compen-

sated somewhat for the architectural shortcomings of that probing proboscis. If the Council threatened to close the flying field, as they often did, Crummy knew about it before the Council met. If a new rule change was being smuggled around the globe, Crummy would be sure to unearth it in some obscure foreign journal. And, when news was in short supply, Crummy could be relied on to remedy the deficiency from his fertile imagination.

"Did I hear someone mention the old rag?" he gasped, after the completion of the short ceremony to which every visitor was honoured—pushing out Daisy the cow, and hanging the door back on the six-inch nail.

"Only in the crudest terms," answered Ted. "Still, now you're here, perhaps you might ferret around in that back copy mind of yours, and tell us what happened in the model world fifty years ago."

Crummy didn't hesitate. He shot back the answer:

"A gang of dimwits sat around in the old barn talking bilge."

"Wise guy, eh?" snapped Salty Andrews, the Combat fiend. "But there may be something in what you say," he added as an afterthought. "Nothing much could happen in this rusticated backwater in fifty years. Why, the last historic event was old Jeb joining the club, and that must have been at least five hundred years ago."

At that, Crummy's extensive nasal equipment quivered. Somewhere, somehow, it had scented news.

"Five hundred years. That's funny," he murmured, half to himself. "Excuse me, chaps. Urgent business. Ten Four."

Saying no more he crashed out into the night, leaving the club members, Daisy the cow, and the doorway, gaping after him.

"Wonder what journalistic skulduggery he's up to now?" queried Ted, getting his shoulder to Daisy's rump.

He was not kept very long in suspense.

A few days later the front page of the *Advertiser* splashed the story of the momentous discovery of a sensational manuscript in the vaults of Hogwash Castle. This told of the derring do and ultimate fate of one Erasmus Crummers, serf of the Bad Baron Prospeck, Lord and Ruler of Hogwash Castle in the year 1459. The *Advertiser* was enthusiastic in acclaiming the obscure serf as the first model flyer in history. It also printed an extract from the manuscript:

"Erasmus the Serf didde buildde a quere macheen in ye shap of a birde, ye boddie of wich was wraught of stickes of pulpe woode, and ye winges of thinne parchment wich didde smel of ye peregrip."

"Wun daye wen ye Baron hadde lefte to mak sacke of a rebellious villeg, Erasmus climed to ye battlements withe his strang macheen. On ye frunt of ye macheen he fix a bigge paddel, wich he holded on by ye Baron's favrit thumbe-screw. This he hooked to muche gutte strande of ye wilde pirelli, and wounded it tille his finger grewed sore and hurted himme muche. He thenn flungeth ye macheen ouer ye battlements lyke as he wereth in angwish. Wheruponne it didde flote on ye airre in the manner of ye birde, but withe muche angree noise and wurringe."

"Full strait it flewed ouer ye moatte, and makked for ye river of ye Sludge, wher it was mette by ye Baron's favrit falconne. Wich birdde didde fall upon it with eville intente. But ye falconne didde falle fowle of ye dredfall paddel, and beinge mortly smoat, dropped to the grounde and suspiresd."

"Meentime Erasmus the Serf Pursyewed of his macheen withe gratte haste, untill the wounded gutte was spente, and ye macheen decteed onto ye Baron's favrit mangelwurzel croppe, wich didde burne exceedingly."

"Wen ye Baron returned and sawed wot mischief hadde bene wrought bye his serf, he wos muche angered of it, and didde have Erasmus flunge into his

Continued on page 328





## This beautiful replica of an infrequently modelled prototype, designed for two 1.5 c.c. motors, won second place in the scale control-line event at this year's Nationals for designer **PETER WHELDON**

**A**LTHOUGH never actually entering service, the Ta 154 *Moskito* was a unique product of the German aircraft industry. Designed in 1942 by Kurt Tank, the *Moskito* was the answer to the R.A.F. night bomber raids that were, at that time, devastating Germany. Built of wood—in the same manner as the D.H. *Mosquito*—and carrying (for its day) advanced night fighting aids, it would, indeed, have proved a menace to any night intruder over its homeland. However, of the few machines built, the majority crashed due to failures associated with the wooden construction of which neither Tank nor the Focke-Wulf concern had any previous experience.

The selection of the Ta 154 as a scale C/L model was the result of an extensive search for a prototype with tricycle undercarriage, simple attractive lines, and a nice colour scheme, but steering clear of the "usual" C/L twins. It was felt that although the full-size machine was a failure, the Ta 154 was of historical interest as being the German counterpart of the famed British *Mosquito*.

The model is of quite straightforward construction, but is not a project for a few evenings' hurried work. Patience and care are required and, as the photographs show, the result is well worthwhile. Powered by two A.M.15s, the original weighs approximately 34 oz. and flies on 52 ft. 6 in. lines. Single engine performance is quite safe, the model showing no tendency to come in.

### Construction

This falls into three distinct parts:—  
1. Completion of the fuselage and nose wheel assembly. 2. The completion of the wings. 3. Completion of the engine nacelles and main undercarriage. These three units are linked by the two master formers, O and E, which must be very carefully made before any other work on the model is commenced. The plan is very explicit and therefore the building instructions have been kept brief, merely outlining the sequence of assembly.

### Fuselage

Cut out all parts for formers D and E and carefully assemble these. The remaining fuselage formers are then cut out, followed by the top and bottom longerons and front side crutches. Form the main undercarriage legs and bind to former D with linen carpet thread, then cement D and E in position, on the bottom longeron, holding true by temporarily inserting the engine bearers in their respective positions.

When dry, add the remaining formers, top longeron, and front side crutches, etc. Build up the tail assembly and install the control assembly in the fuselage—hook up to elevators, and cement the tail unit in place. After installing the 18 S.W.G. lead-out wires, the fuselage may be planked with 3/32 in. hard sheet. Before completing planking, build up the nose wheel assembly, bind onto the 3/16 in. ply plate, and install in

the nose wheel well. The planking can now be completed, nose block added, and the whole fuselage, finished and sanded smooth.

### Wings

Cut all the ribs from 1/8 in. medium sheet, assemble the leading edge, cement ribs on spars and add leading edge. (Note—leading edge is simply pushed through the fuselage planking and well cemented in place.) Sand the top of the leading edge to conform with the wing section, and cover the entire surface of the wing—top and bottom, including areas that will be inside nacelles—with hard 1/16 in. sheet. Do not forget the ballast weight in the starboard tip. Add wing tips and sand completed wing to proper shape and section.

### Nacelles

Cement the engine bearers in position, ensuring that there is no inset on them. Cement the bottom nacelle longerons in place and all nacelle formers, together with fuel tanks. Check that all is true. Add the 1/8 in. sheet exhaust groove backing pieces and the nacelles are ready for planking with hard 3/32 in. sheet. When this is complete, add the cowlings rings and fairing blocks of soft balsa, then sand the completed nacelles to the correct shape. Bore holes through the port nacelle and insert paper tubes for the control wires to pass through.

### Finishing

Cement silk patches over all the wing to fuselage and the tail to fuselage joints—these patches add considerable strength, so be liberal with the cement. Give the whole model a coat of thick clear dope and when dry sand down with fine garnet paper. This is followed by a good coat of sanding sealer (talc/dope mixture) again sanded down when dry. Fill up any bumps or crevices with sealer and apply lightweight tissue over the whole assembly, then apply a further coat of thick dope. Add the cockpit canopy formers, cockpit details, and then glaze the canopy. Now apply further coats of sealer, sanding between each coat until a satisfactory surface is obtained.

When satisfied, colour the whole model a pale French grey using thinned down dope. Give several coats, using wet and dry paper between each one until satisfied with the finish. Now colour all upper surfaces with a medium shade of grey dope, repeating the finishing process as before. Apply shadow shading using a darker green-grey shade by means of a spray gun. Then add insignia and final trim.

Finally, add the undercarriage doors and exhaust tubes, give the whole model one coat of thinned down fuel proof varnish (engine bays require unthinned varnish) and your Ta 154 is finished. Check the balance point with engines installed and see that there is no inset on them. Test fly on 40 ft. lines, but first ensure that all control line clips, etc., are secure, as the pull of this model is quite something. The best of luck.





# The Cessna 210

ON the ground, the Cessna 210 looks little different from the company's well-established range of all-metal high-wing monoplane business aircraft, such as the Models 175, 182 and Skylane. In fact, it may prove to be the first of an entirely new family of high-performance four-seaters.

The most noticeable innovations are the fully-retractable tricycle undercarriage and the swept fin and rudder. A closer look will show that the 210 has something else in common with America's latest supersonic military

aircraft in the form of conical-camber wingtips to improve spiral stability. They help to make the flying qualities so good that Cessna foresee no difficulty for the private-owner who steps straight into the 199 m.p.h. Model 210 from slower fixed-undercarriage 'planes.

In general, the layout is conventional. The wing is a two-spar structure, braced each side by a single lift-strut which is faired into wing and fuselage by fillets to minimise drag. Cessna's famous "Para-Lift" flaps help to give first-class take-off and landing performance with slow, easy approaches; and trim-tabs are fitted to the elevator and rudder to ensure smooth relaxed flying under all conditions.

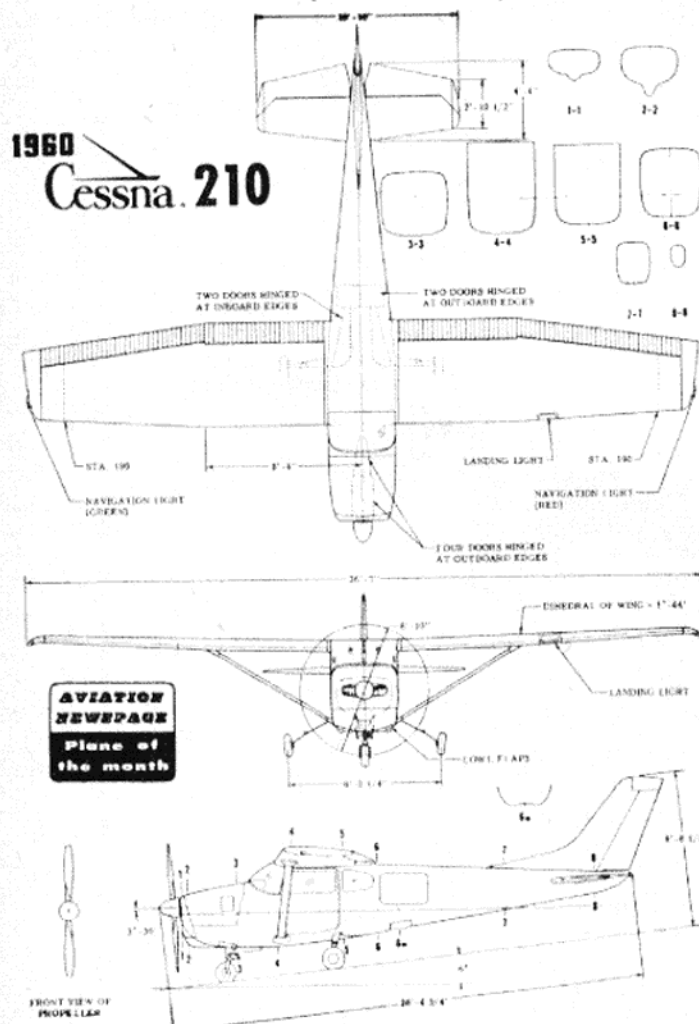
Technically, one of the most interesting features is the "Land-O-Matic" undercarriage, the main units of which retract rear-ward and inward in a unique way, to lie horizontally in the underside of the fuselage. Retraction is hydraulic, and the wheel doors close automatically when the wheels are either up or down.

Power plant of the Model 210 is Continental's highly-efficient new 260 h.p. IO-470-E six-cylinder horizontally-opposed engine, which features direct fuel injection and drives a two-blade constant-speed propeller.

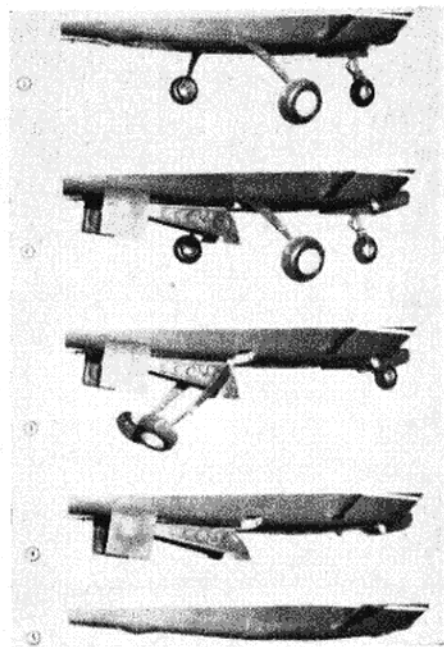
Comfort-wise, the new aircraft is in the best tradition of U.S. business-planes. The cabin floor is low enough to step inside straight

from the ground and there is a wide car-type door each side. All seats are adjustable, with leather upholstery; the floor is covered with deep-pile carpeting, and standard equipment includes such items as sun visors, cigarette lighters, coat hooks, heater, windscreen de-froster and map pockets. Normal instrumentation can be supplemented by two full-size radio installations and blind-flying equipment to make the 210 a truly all-weather aircraft. Data: Span 36 ft. 7 in.; length 26 ft. 4½ in.; height 8 ft. 8½ in.; weight empty 1,735 lb., loaded 2,900 lb.; max. speed 199 m.p.h.; max. recommended cruising speed 190 m.p.h. at 7,000 ft.; rate of climb 1,300 ft./min.; ceiling 20,700 ft.; take-off run 740 ft.; landing run 520 ft.; max. range 1,100 miles at 137 m.p.h.

Colour Schemes: Cinnabar red with deep mahogany, cadet blue with shadow blue, cedar with light orange, bamboo with shadow blue, cedar with deep mahogany, bamboo with Trinidad gold, cinnabar red with festival red, and bud green with leaf green—all with pearl white as a common colour. Wings are striped to simulate sweep-back.



The undercarriage operation sequence right. Drawing left is to 1/144th scale







**MENTOR MANIPULATION** by Fuji has reached its peak in the KM-1 general-purpose lightplane (below). It was back in 1953 that Fuji first acquired the licence to build Beech T-34A Mentor trainers in Japan and they have since produced 140 for their own national Air Self-Defence Force, plus 36 for the Philippine Air Force. After a time, they designed a new centre-fuselage section roomy enough to seat four persons in pairs, instead of the usual two seats in tandem, and the result was the LM-1 *Nikko*, of which 27 were supplied to the Ground Self-Defence Force as liaison aircraft.

Now, Fuji have fitted a 340 h.p. Lycoming GSO-480 engine in the basic LM-1 airframe, in place of the usual 225 h.p. Continental O-470, plus full instrumentation and navigation equipment for blind-flying, to produce the KM-1. As in the LM-1, there is a door in the starboard side, a roof hatch for loading bulky freight and provision for a fifth seat between the normal front and rear pairs for carrying an extra small passenger. Range is 640 miles at 186 m.p.h.

**SUPER SERVICE FOR SKY PILOTS** seems to be indicated by a recent press release from a U.S. manufacturer, which stated that the latest version of the company's jet airliner was "designed to accommodate 140 parsons."

**FIRST BEECHCRAFT TRAVEL AIR** on the British Civil Register, and typical of the fine new executive-type aircraft to be seen in the U.K. following

a relaxation of import restrictions is G-APUB illustrated below. In view of its registration, it would be nice to add that it is owned by a brewery! In fact, it is used by Woods of Colchester, an engineering firm.

Powered by two 180 h.p. Lycoming O-360s, the *Travel Air* is an immaculate four-seater which cruises at 200 m.p.h. and has a maximum range of 1,410 miles. It perpetuates a name that was carried by all the early aircraft designed by the late Walter Beech.

**FATHER CHRISTMAS** would be well advised to file a flight plan with North American Air Defense Command (NORAD) if he plans to approach the United States by reindeer sledge from his traditional Arctic HQ this month. The picture below, newly-released by the U.S.A.F., shows the kind of reception awaiting unidentified over-the-Pole fliers now that the Douglas Genie nuclear-warhead air-to-air rocket is operational.

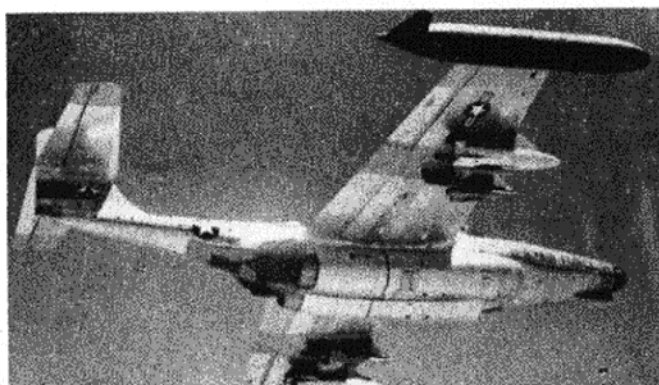
The aircraft is a Northrop F-89J *Scorpion* two-seat twin-jet all-weather fighter, squadrons of which spearhead America's outer defences in Greenland and Alaska. Two Allison J35-A-35 turbojets (each producing 7,200 lb. s.t. with reheat) give the F-89J a maximum speed of 630 m.p.h., which is not exactly fast by present-day standards. But

many air force leaders believe that high-speed interceptors are outmoded, because all necessary performance can now be built into the missiles rather than the launching aircraft.

Under each wing of the F-89J are two Hughes GAR-2A Falcon infra-red homing missiles, which can chase after the hot exhaust of an enemy raider at a speed greater than Mach 2 over a five-mile range, plus a Genie which, although unguided, could probably knock down anything within a half-mile range of its exploding 1.5 kiloton warhead by blast alone.

**FROM MIGHT TO MITE**—more precisely, Mooney's little Mark 20A lightplane (above). Spanning only 35 ft. and weighing 2,450 lb. fully loaded, this is one of the smallest and neatest four-seaters in the air, but it is no toy. A 180 h.p. Lycoming O-360 flat-four engine gives it a speed of 190 m.p.h. and *Spitfire*-like manoeuvrability; and its sturdy reliability was shown when an intrepid U.S. birdman flew one round the world not so long ago. Afterwards he said he wouldn't choose to do it again, preferring something bigger; but the Mark 20A is a fine little machine for private flying of a less ambitious kind, and is complete even to details like curtains at the cabin windows.

Heading photo shows the Mooney Mk. 20A. Right: The Beechcraft Travel Air. Below, left: Northrop Scorpion with Genie rockets. Below, right: Three Fuji Beech Mentors.



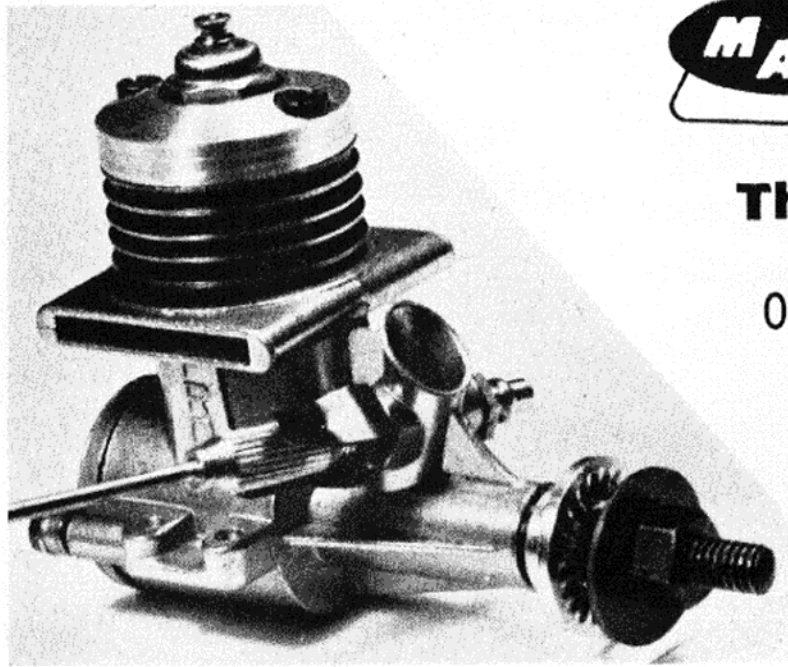


## ENGINE TESTS

# The FROG 049

0.8 c.c. Glo-plug motor

"...first of the new British  
"baby" glo-plug engines to  
reach the market."



**T**HE Frog 049 is the first of the new British-made glowplug engines to the popular American "Half-A" size (maximum swept displacement volume 0.05 cu. in.) to reach the market.

This new model closely resembles the well-known Frog 80 diesel model (introduced nearly three years ago) and retains the 80's bore and stroke—0.400 in. × 0.392 in.—which give a swept volume of 0.0493 cu. in. or 0.807 c.c. Many of the 80 components are, in fact, identical with those of the 049 and the two engines are only outwardly different above the exhaust ducts.

The neat crankcase casting of the 80, with its integral main bearing and twin exhaust ducts, is used for the 049, as is the rear cover, crankshaft, conrod, prop drive assembly and needle-valve assembly. That the same crankshaft should be used is, perhaps, a little surprising, since it is more usual to employ a somewhat larger valve port with glow engines. Compared with the original 80, as tested in M.A. in March 1957, the 049 crankshaft valve port is, in fact, a trifle smaller—i.e.  $\frac{1}{8}$  in. dia. instead of  $\frac{9}{64}$  in.

A reverse-flow scavenged cylinder, featuring twin-opposed exhaust ports with fore and aft transfers, is retained. However, port design and timing are somewhat modified by comparison with the 80. Instead of slot type transfer ports, placed entirely below the level of the exhausts, dual, inclined, drilled ports are now used, which enter the combustion chamber between the exhaust ports. The exhaust ports are much larger than on the 80, being both deeper and wider, while the piston has an appreciably higher crown as well as a very slightly longer skirt. The effect of these changes on port timing is to very slightly reduce the exhaust period while

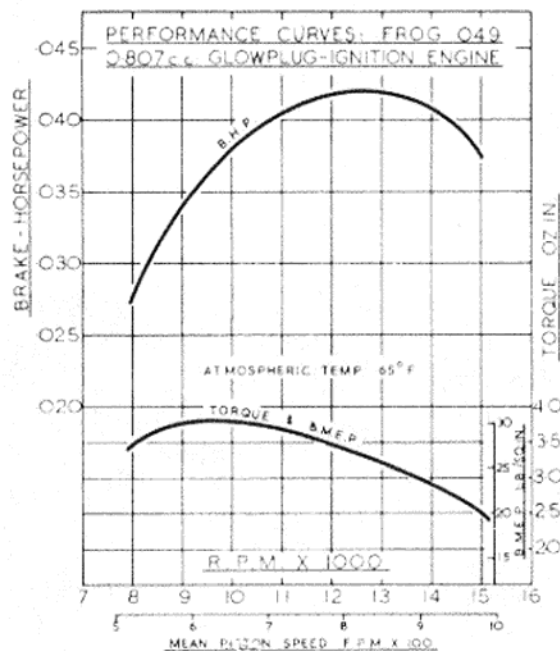
very slightly increasing the transfer period.

The cylinder of the 049 is somewhat lighter than that of the 80, having a reduced wall thickness, shorter skirt length and fewer and thinner cooling fins. Incidentally, both the main steel components—cylinder and shaft—have (evidently as a safeguard against the possible corrosive effects of some glow fuels) a blued finish instead of the plain case-hardened finish of the 80 parts.

An increasing number of small engines—especially glowplug types—are now being supplied with starting devices as a means of simplifying starting procedure for the beginner. These range from simple coil springs, which are hooked around the prop blade, to elaborate, enclosed "automatic" units with built-in clutch devices. On the Frog, the starting is of the simple pull-cord type and comprises a machined, pulley type spinner-nut (which can be fitted in place of the regular hexagon prop-nut and washer) and around which a braided cord is wound.

Pulley and cord starting on some earlier types of engines—particularly diesels—was not always encouraging. Often the starter pulleys were too small in diameter and too narrow, and cords would bind or slip or threaten to pull the engine clean out of the model. No such criticism can be levelled against the Frog 049, however. A wide, knurled section is provided for the cord and up to ten turns can be accommodated. A smart pull of the cord spins the motor over easily and with no undue strain on its mounting.

Overall dimensions of the 049 are the same as those for the 80, except for a slightly reduced cylinder height. With the standard prop nut and washer, it is also very slightly lighter



than the 80. General finish throughout is good and appearance pleasing.

### Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged two-stroke cycle, glowplug ignition. Shaft-type rotary-valve induction.

Bore: 0.400 in. Stroke: 0.392 in.

Swept Volume: 0.0493 cu. in. = 0.807 c.c.

Stroke/Bore Ratio: 0.98 : 1.

Weight: 1.9 oz.

### General Structural Data

Tumbled pressure diecast LAC.112A aluminium alloy crankcase and unbushed main bearing with integral intake, exhaust ducts, etc. Non-counterbalanced disc-web crankshaft with  $\frac{1}{4}$  in. dia. journal,  $\frac{9}{64}$  in. dia. crankpin and splined prop driver fitting. Lapped, cast-iron, flat crown piston with full-floating  $\frac{1}{8}$  in. dia. gudgeon-pin and forged duralumin connecting-rod. One-piece steel cylinder with integral cooling fins. Machined alloy cylinder head. Paper gaskets used to make cylinder-head and cylinder-to-crankcase joints. Entire cylinder assembly secured by two long screws from cylinder head to crankcase. Brass spraybar type needle valve assembly, inclined backward and upward. Beam mounting lugs. Provision for bulkhead mounting via two backplate screws. Dural prop drive hub. Steel hexagon prop retaining nut and washer or dural spinner type starting pulley.

### Test Engine Data

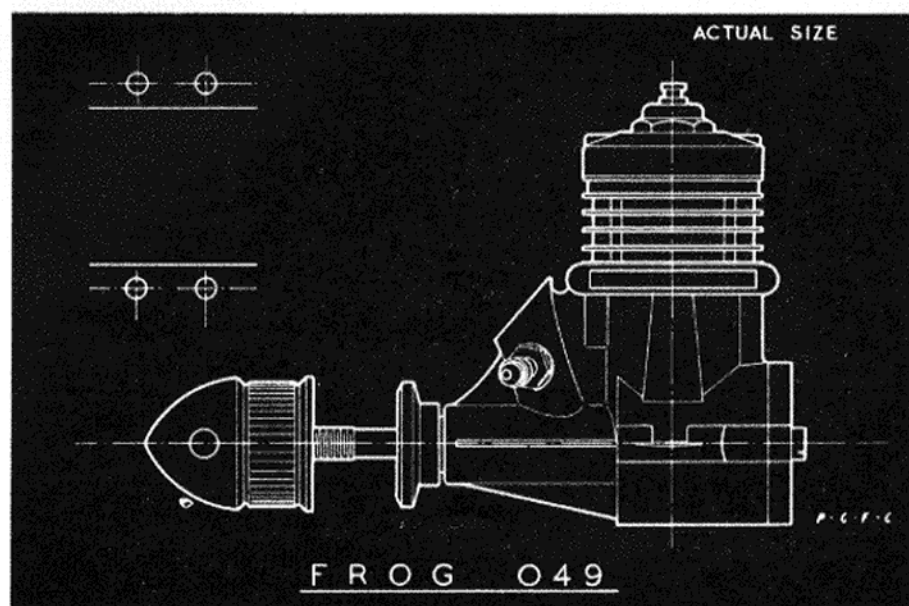
Running time prior to test:  $1\frac{1}{2}$  hours.

Fuel used: Shell Red-Glow Plus.

Glowplug used: K.L.G. Miniglow-X short reach.

### Performance

Starting the Frog 049 was easy, if



not particularly rapid. After priming, an initial start from cold usually required half-a-minute or so of prop flicking, using heavy duty  $1\frac{1}{2}$ -volt cells. With a 2-volt accumulator (and a suitable lead length) to give a slightly brighter glow at the plug, starting appeared to be a little quicker. This, incidentally, is where the starting pulley may be of help to the beginner. Four or five pulls of the cord were usually enough to get the motor going.

Docile behaviour is clearly one of the most essential characteristics in a beginner's engine. An engine which, when the prop is flicked, rewards its owner with a cut finger, is unlikely to endear itself to the younger enthusiast. In this respect, the 049's character is blameless. Even on the smallest available commercial prop ( $5 \times 3$ ) no viciousness was encountered and attempts to provoke this condition, by deliberate clueless handling, left the 049 quite unruffled.

Although, in small engines, the shaft-valve layout usually brings the needle-valve control uncomfortably close to the prop, this is not the case with the Frog. The spraybar is raked backward at a

fairly sharp angle and this, aided by a fairly long control stream keeps one's fingers at a safe distance from the prop disc. The needle-valve itself was non-critical in operation.

Most beginner type glow 0.049's develop rather less power than diesels of equivalent cylinder capacity and the Frog was no exception to this rule, the maximum power output being 0.042 b.h.p. Bearing in mind the reservation that the performance of the average production Frog 049 may differ slightly from that obtained with a single test example, this is a little more than 30 per cent. less than for the 80 diesel, although peak revolutions were slightly higher.

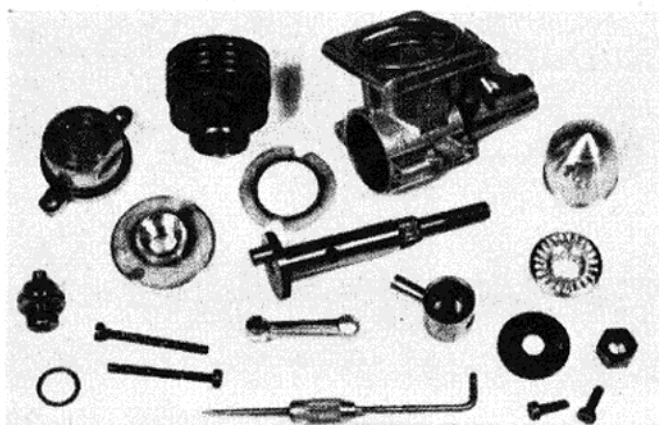
The level of vibration seemed to be somewhat higher than one would normally expect of a small glow engine, but, otherwise, the motor ran evenly and consistently. At no time was there any tendency for the engine to get excessively hot. There was no loss of performance as the 049 warmed up: on the contrary, as is usually the case with a well-fitted glow motor, after adequate running-in, there was, on the lighter loads, a noticeable build-up of power, during the first 10 or 15 seconds or so after a start from cold.

The Frog  $6 \times 4$  (nylon or plastic) prop, which is the maker's recommended airscrew, seems to be well suited to the 049. This, or a Trucut  $6 \times 3$ , should allow revs to build up to within 1,000 r.p.m. of the peak in the air.

Power/Weight Ratio (as tested): 0.35 b.h.p./lb.

Specific Output (as tested): 52 b.h.p./litre.

The "bits and pieces" of the Frog 049







**DOUG McHARD** was commissioned to build a solid scale model of H.R.H. The Duke of Edinburgh's Draine "Turbulent" King's Cup Air Race entry. We are pleased to feature not only plans of this original model, but also Doug's **FULL SIZE** working drawings, and photo illustrated instructions, for building a Bambi powered free-flight replica of the same machine

**T**HIS year, H.R.H. The Duke of Edinburgh, entered an aircraft in the King's Cup air race for the first time. The type chosen was the little Draine *Turbulent*, a French design built in Britain by Rollasons' of Croydon. The Duke of Edinburgh's Equerry, Sqdn. Ldr. S. de Milt Severne, A.F.C., piloted the machine and placed very well in the qualifying rounds, only to be defeated by high winds, which favoured the more highly powered aircraft, during the actual race.

Before the news of the Royal entry was made public I was commissioned to produce a 1/36th scale replica of the *Turbulent* which was presented to His Royal Highness, and from which the racing colour scheme was selected. 1/48th scale plans and photographs of this model appear on page 320.

Eagle eyed readers will spot one or two differences between the model's original decoration and the colour scheme eventually employed. The most obvious of these is the racing number disc which was subsequently enlarged.

After producing this little solid job, I thought how effective a F/F flying model would look and shortly afterwards built one around a D.C. Bambi.

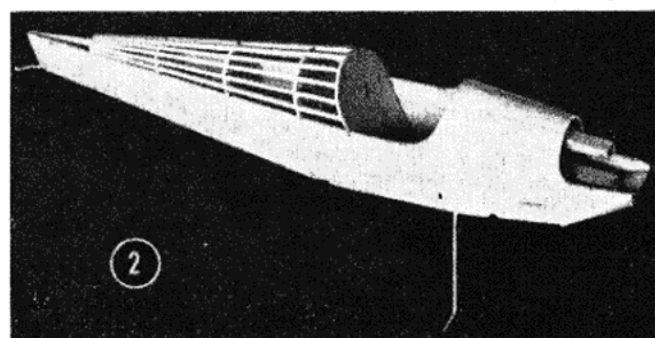
Full size plans are presented overleaf, and, together with the accompanying constructional photographs, should enable any modeller of modest experience to produce his own King's Cup entry in miniature.

#### Construction

Build the fuselage first and start by cutting out all the formers,  $\frac{1}{8}$  in. square crosspieces, both fuselage sides and engine bearers, from the material indicated on the plan. Before assembly

is started bend the undercarriage from 18 S.W.G. piano wire and sandwich it, with plenty of cement, between formers 4 and 6 using former sections 5 as locating and packing pieces. Allow to dry.

Cut the hardwood engine bearers accurately to the length indicated on the side view and note which is top and which is bottom. Drill the  $\frac{1}{16}$  in. holes for the 8-B.A. engine mounting bolts and elongate them forward with a round "Abrafile" to enable thrustline



adjustments to be carried out later. The square engine bearer holes in formers 3 and 4 are intentionally off centre and the front face should be carefully noted. When the bearers are in position they will be offset to the right to give 3 deg. engine side-thrust and bring the propeller to the centre line of the cowl.

Thread the bearers through these formers and don't spare the cement!

Mark on each fuselage side the positions of formers 4 and 7. Cement the rear ends of the fuselage sides together, sandwiching between them the 18 S.W.G. tailskid, and hold with a rubber band.

Now cement former 7 in place and draw the two sides together at the nose, fixing formers 3 and 4 in position. Use rubber bands to prevent the sides from springing apart. Check the down-thrust angle of the engine bearers carefully on the side view before the cement dries.

If the wood has been carefully selected, the fuselage assembly should be quite straightforward, but

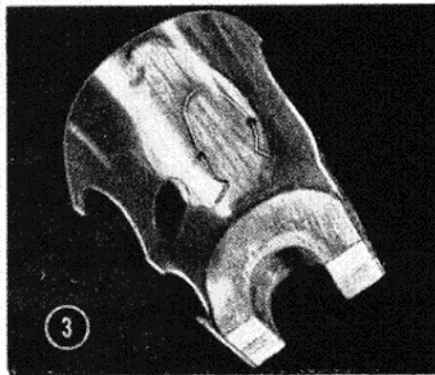
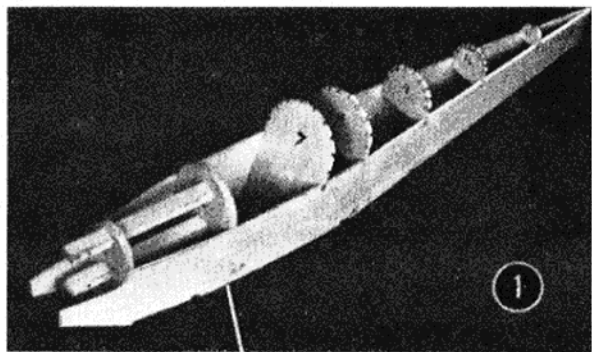
should the side panels be rather difficult to bring together, they can be pre-bent by rolling a pencil along the inner side faces at former 4 position and between formers 7 and 8. Sight along the fuselage to make certain it is "square," insert formers 8 to 11, together with the lower  $\frac{1}{8}$  in. square crosspieces and pin former 2 in position. This stage is shown in photo 1.

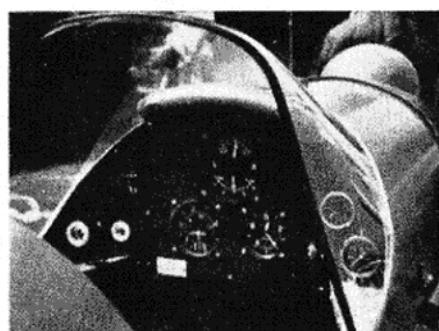
To complete the fuselage add the  $\frac{1}{16}$  in. square hard balsa stringers to the rear decking and bend the upper nose decking to fit over formers 3 and 4. (see photo 2). Moistening the outside of the sheet will assist this operation.

The most intricate part to make is the removable engine cowl. Cut out two of former 1, cement together, cross-grained, and sand slightly to conform to the nose

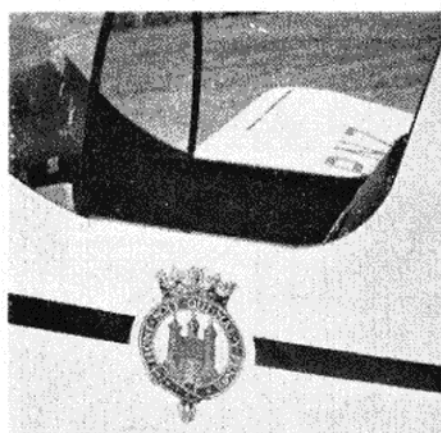
taper. Cut out the cowl from thin acetate sheet to the pattern shown, heat it and bend over a broom handle to the approximate section. Temporarily fit the engine and adjust the cowl openings to allow everything to "seat" nicely. Cement formers 1 to the acetate cowl, adjust the 18 S.W.G. cowl clip to grip the top engine bearer firmly and securely cement the scrap balsa fairing over it. (See photos 3 and 4.)

Now make the fuel tank (which represents the dummy starboard cylinder) from thin acetate. Heat a  $\frac{1}{8}$  in. wide strip and bend it around a piece





Above: Instrument panel and modified windscreen of G-APBZ. Left: Position of Tiger Club badge on starboard fuselage side (G-APNZ). Right: The Royal Crest on port fuselage side below cockpit (G-APNZ).



of  $\frac{3}{8}$  in. dowel to form a tube. Overlap the edges by about  $\frac{3}{16}$  in. and cement thoroughly. Drill two  $\frac{1}{8}$  in. holes for filling and fuel tube entry. Cut a  $\frac{7}{16}$  in. diameter disc from acetate and cement over one end. Over the other end, cement a stouter piece of acetate  $\frac{3}{4} \times \frac{7}{16}$  in. to form a mounting flange. (See drawing.)

Use plenty of cement and when thoroughly dry place the tank in position, and drill a hole in the flange for the engine mounting bolt. See photo 4.

The worst is now over! Construction of the wings is quite conventional. Pin the leading and trailing edges to the plan remembering to pin each side of the wood, not through it. Cement the wing ribs in position then the wing tip. When dry, cement the spar in the rib slots and add the  $\frac{1}{32}$  in. sheet to the upper leading edge, holding in position with pins until the cement dries. Don't forget to tilt the root rib to allow for 1 in. dihedral at the top.

The tailplane is cut from  $\frac{3}{32}$  in. sheet sanded to section and assembled to the rudder with the  $\frac{1}{8}$  in. sheet fairing. (See photo 6 for completed framework details).

Cover all parts (except the fuselage underside) with lightweight tissue before assembly, and when this is completed the wings should be firmly cemented to the fuselage sides. The front face of the wing spar being securely cemented to the rear of former 6. Cut the leading

edge level with the fuselage underside and brace across the joint with a piece of  $\frac{1}{8}$  in. square hard balsa. Make certain that the wing tips are packed up 1 in. at each side before the cement sets. When dry, cover the fuselage underside. Give one coat of clear dope and a thin spray of white dope over all. Fuel proof the front end of the fuselage at least, paying particular attention to the inside of the engine bay. Cement the windscreen in position and apply decoration.

If necessary add weights to the completed model until it balances level when supported at the wing spar. Attach the tailplane temporarily with a rubber band until glide trimming is completed.

Test glide, and adjust tailplane until a straight gentle descent is obtained. Now pin and cement the tailplane securely before power flying!

Fly first with low power over the longest grass you can find and cure any stalling tendency by tilting the engine down slightly. Cure turn by applying slight opposite rudder. The model should be trimmed to fly in left-hand circles under power, and glide to the right. The Bambi has lots of power for this model, particularly if the prop pitch is slightly increased over that recommended by the manufacturers, so treat it gently!

It's lots of fun to fly this model tethered round the pole in the clubroom too. Use at least a 4-ft. line attached to the right wing tip, which will need slight reinforcing, just behind the main-spar and use left rudder to ensure that the line keeps tight. If you want to fly the model in the opposite direction then the left wing tip must be reinforced and right rudder used.

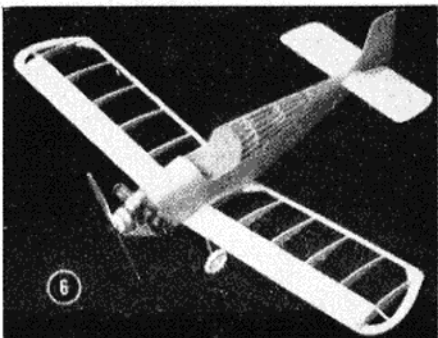
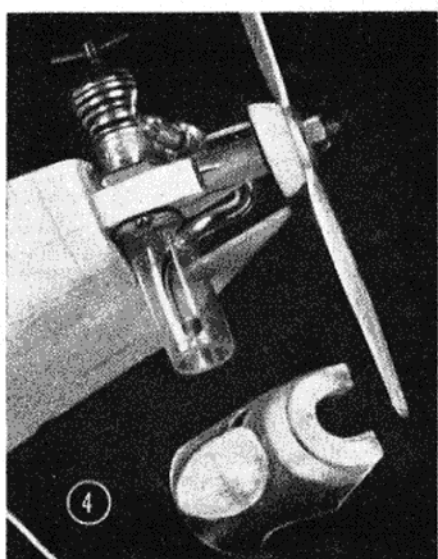
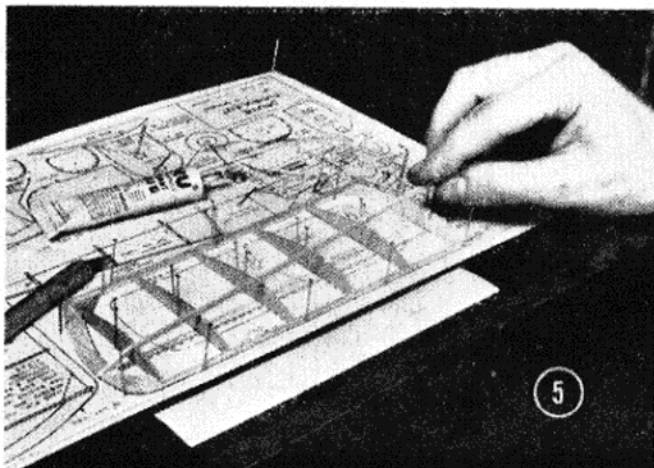
Why not run a club winter competition by building several *Turbulents* and running your

own King's Cup race? The models can be timed over say ten circuits each, or by limiting fuel capacity see who can get the most circuits from one tank.

Don't forget to open at least one window when running your indoor races; even a Bambi can produce a mighty anaesthetic atmosphere in a surprisingly short time!

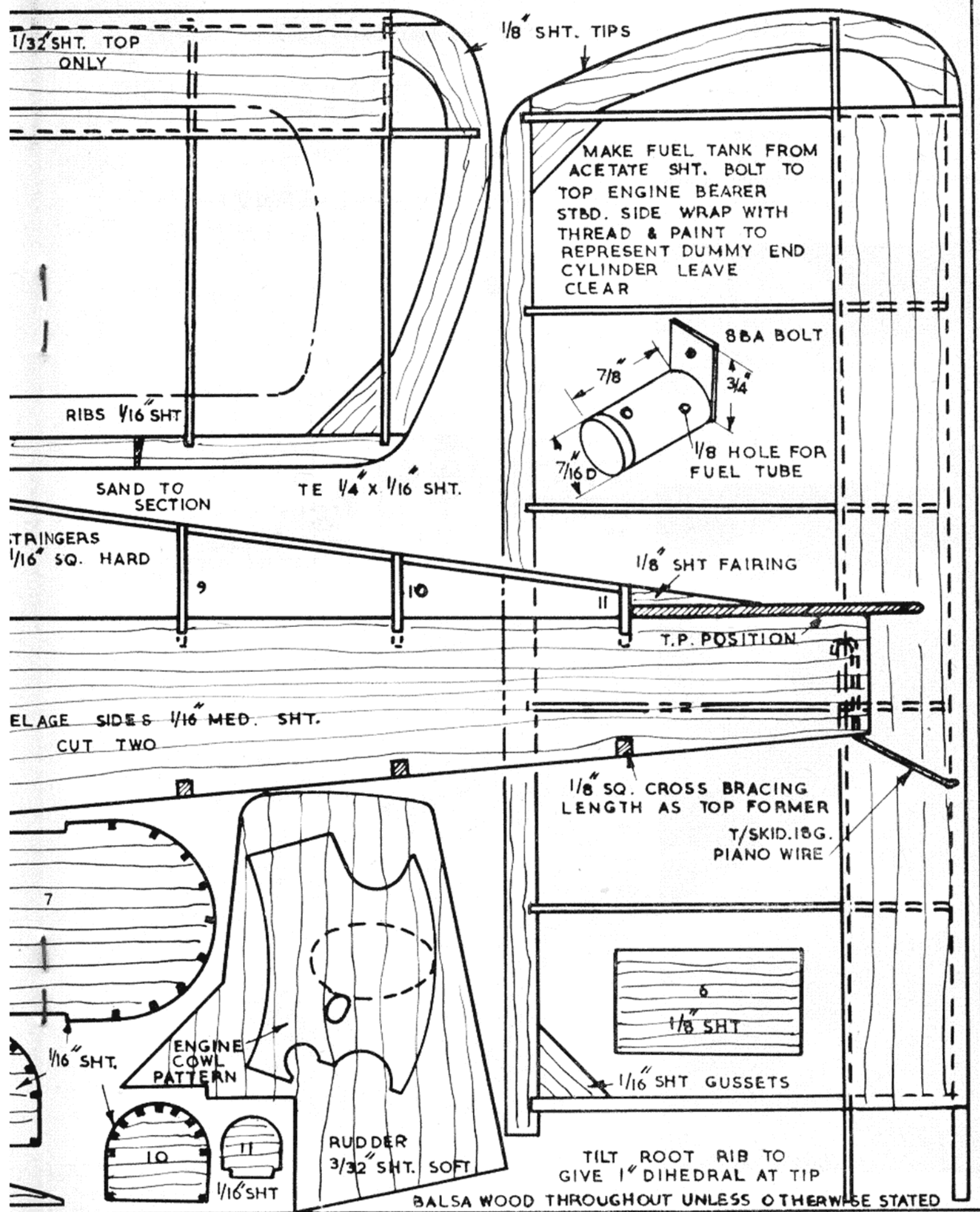
By the way, you can see the original model on the M.A. stand at the National Models Exhibition where we shall be pleased to see you and answer your queries.

Full size 'flying' plans overleaf —  $\frac{1}{48}$ th 'solid' plans and photos on page 320



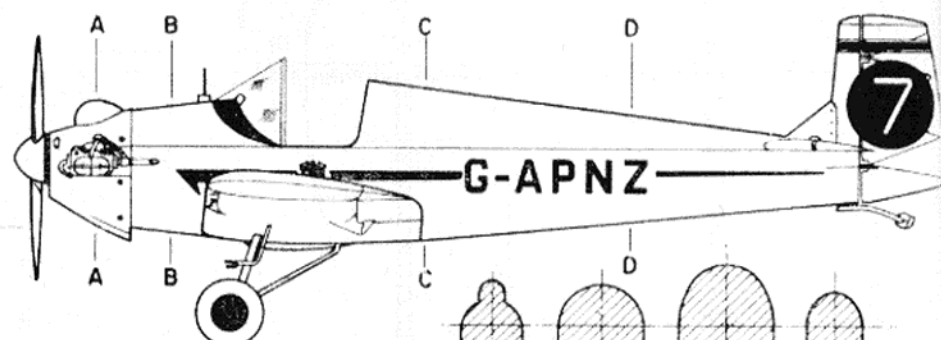
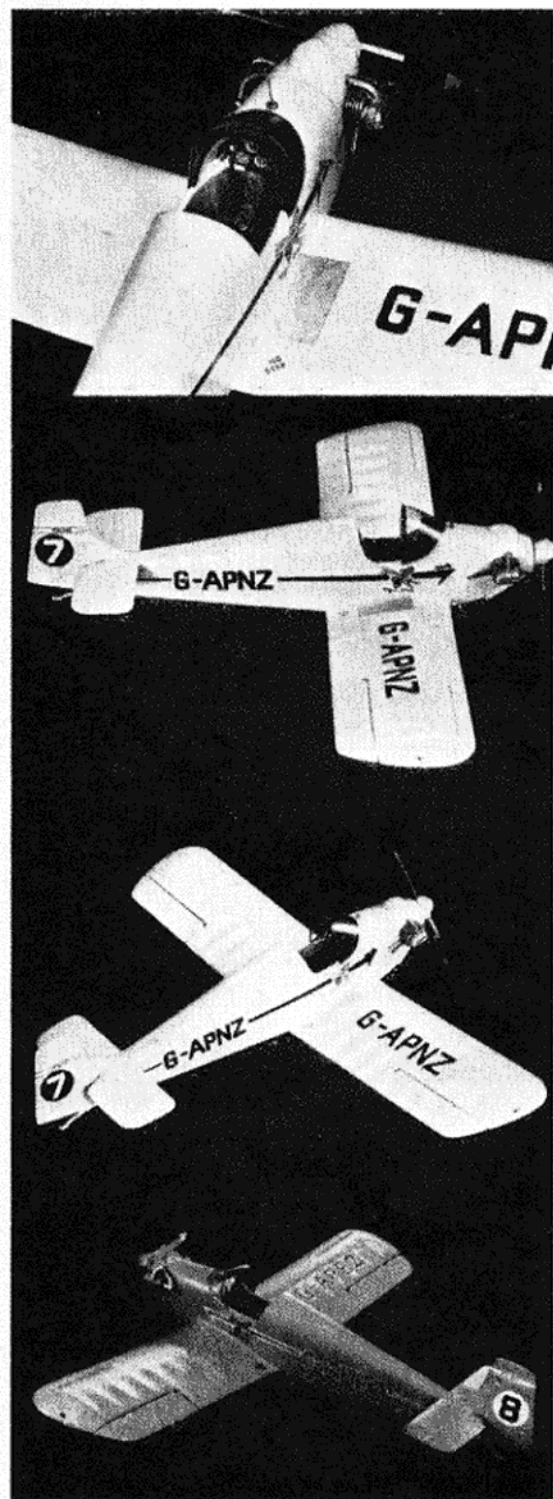






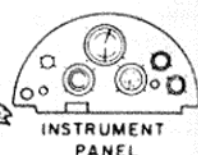
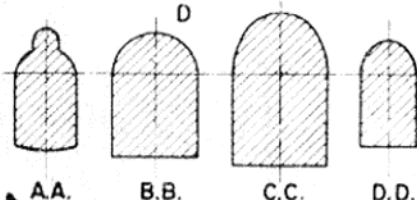
# and now build your own 'solid' of the Royal Turbulent . . .

these accurate 1/48th scale plans, and detail photos of the original model, will give you all the necessary information, plus an alternative colour scheme shown in the bottom photo.



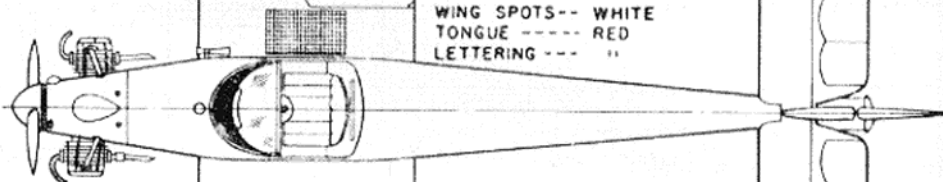
## G-APNZ COLOUR SCHEME

All white.  
Lettering and trim—dark green.  
Cockpit interior—light green.  
Racing numbers—white on black disc.



## TIGER CLUB BADGE ST'BD FUSELAGE SIDE.

TIGER ----- YELLOW  
STRIPES ----- BLACK  
WINGS ----- "  
WING SPOTS -- WHITE  
TONGUE ----- RED  
LETTERING --- "

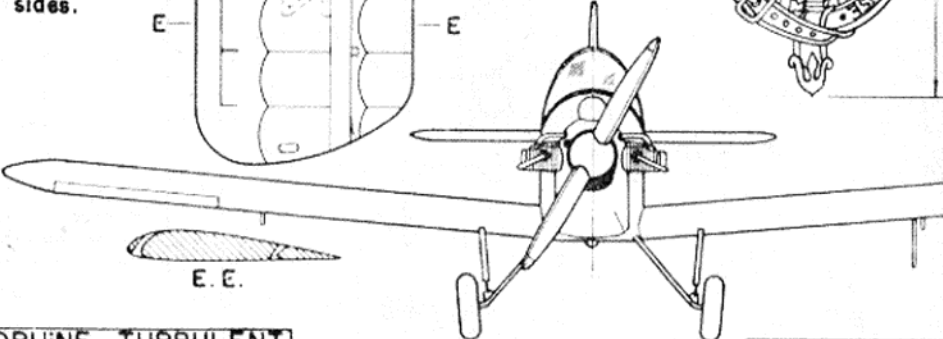


## G-APBZ COLOUR SCHEME

All light blue.  
Lettering and trim—red with thin white outline.  
Racing numbers—black on white disc.  
"Tiger Club" badge on both fuselage sides.

## H.R.H. THE DUKE OF EDINBURGH'S CREST PORT FUSELAGE SIDE.

CASTLE --- BLACK  
WINDOWS --- RED  
BELT --- PURPLE,  
GOLD OUTLINE.  
CROWN --- GOLD  
LETTERING --- "



DRUINE TURBULENT

A 1/36th scale reproduction of these drawings, plan no. S.M.A. 90 is obtainable from our plans department, price 1s. 3d. post free.

# CLOCKWORK DETHERMALISERS

*A reliable system developed  
by DAVE POSNER*



**A**FTER two eliminators were flown in the rain I equipped all my power models with D/T timers and the system illustrated has now had all the bugs ironed out of it.

Care must be taken when installing a timer in a power model due to the fact that the tailplane must be held down rigidly, and that entails the use of tight bands. This system allows the tightest bands to be used but relieves most of the force from the timer. To date it has been used on models having a fin behind the tailplane but different fin positions would not appear to necessitate any drastic alteration of the method employed.

If the timer used is a Tatone D/T Tick-Off, then start by soldering a piece of wire to the operating wire on the timer as shown at "A" so as to give better leverage and to prevent the wire loop from slipping down and round the pivot, for if this should happen nothing on earth will make the D/T work. Guide tubes can be bound with cotton to aid cementing to the fuselage but the rear tube takes a certain amount of strain and should be well secured in position with bandage. Care should be taken to see that this tube protrudes in front of the tailplane mount so that the retaining bands do not foul the C/L wire. The front tube should be a sufficient distance from the timer to allow the front loop to move back farther than the rear loop, as the rear fixing swivels right round when operating.

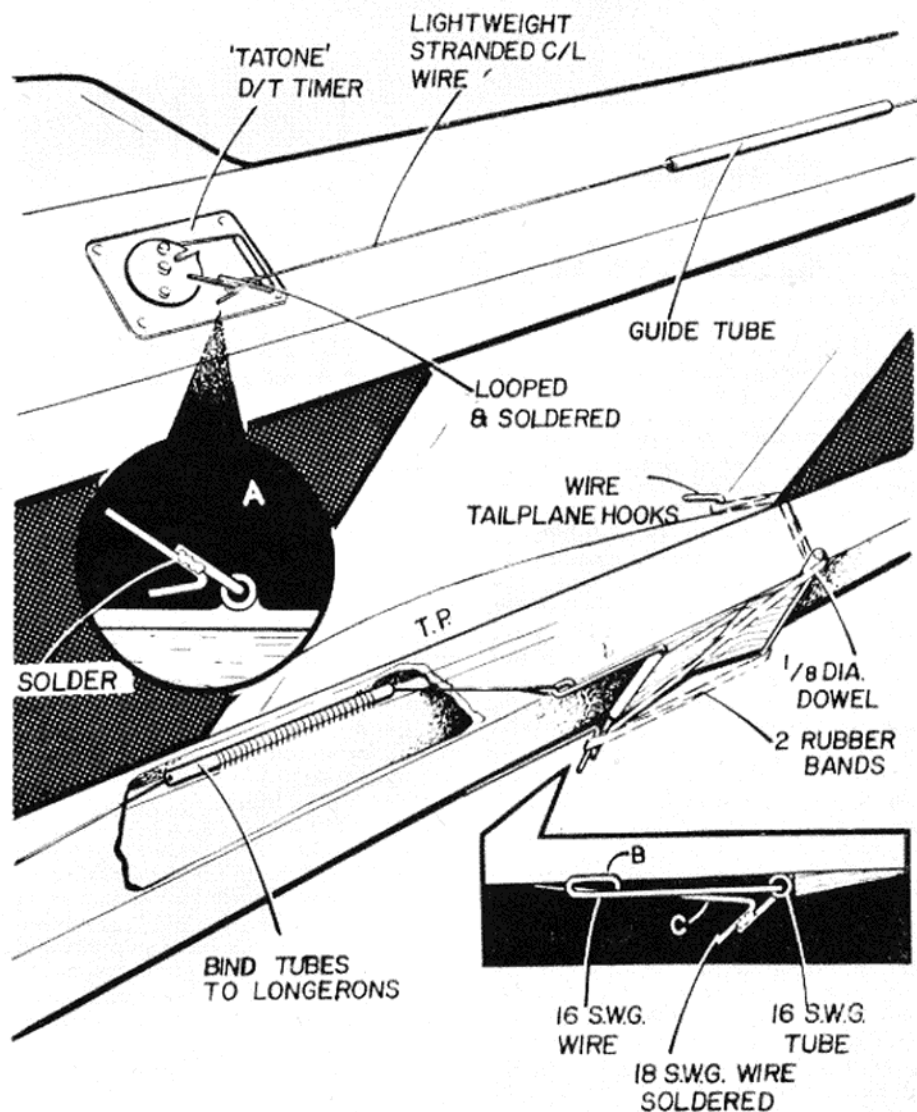
The rear fixing is formed of 16 G wire and tubing, the tubing being cut to length and then slipped on to the wire "B," which is then bent so that the longer arm is parallel to the fuselage and the shorter one at an angle of 45 deg. to it. The tubing should be securely fixed to the fuselage with a block behind it to take the strain. The wire "C"

should be soldered to the short arm of "B" to give leverage and should be left fairly long otherwise one tends to slip the retaining bands underneath it—I speak from experience!

The tailplane is fitted with a wire saddle both back and front. The D/T bands should pass only between the rear fixing and the rear saddle and

never, for obvious reasons, from one side of the saddle, round the rear fixing and back to the other side!

The present system would appear to be foolproof, and provided the timer is cleaned and oiled regularly you should have a D/T which operates when you want it to and not when a piece of fuse feels like it!







**Peter  
Chinn's**

## Latest Engine News

SOME months ago, we received the first examples of the new Max-III engines from the O.S. factory in Japan. Permission has now been obtained to release full details of these interesting motors. Manufactured in standard 29 and 35 and Multispeed 35 types, this latest series is an entirely revised design based on the manufacturer's five years' experience with the well-known Max-I and Max-II models.

The O.S. Max engines have, over the past few years, built up an enviable reputation, throughout the world, for performance and durability. Some Max-II owners will probably be wondering why the makers should have bothered to bring out a new model at this stage, with the big-shaft type Max-II barely a year old. One user, on being told of the existence of the Max-III commented "What's the matter with these people? Are they never satisfied?"

To this we can only answer with our own impressions of the Max-III and to remark that, if we were asked to select a 35 class engine, we would find it difficult to name any 35 of greater all-round merit than this latest model O.S. Max.

The "Silver Arrow" is the name that has been given to this, the production version of the Rivers 3.5 c.c. roller-bearing diesel.

From the first sight of the motor, one cannot help but be favourably impressed by it. In our opinion, it is quite the best looking engine of this type in current production. Its proportions are admirable: clean cut and purposeful. The external finish, aided by top-class die-casting and without colour treatment, is immaculate. The overall effect is of a soundly engineered engine which makes some other engines look gaudy by comparison.

The latest Max is roughly  $\frac{1}{2}$  oz. heavier than the previous model. In return for this, one gets a really robust crankcase and main bearing unit which should survive more than its fair share of crash punishment. The mounting lugs have been further strengthened and the opportunity has been taken to increase the size of the transfer passage, exhaust duct and carburettor. A new, very rigid, bushed con-rod is used and to compensate for its increased weight, extra counterbalancing is machined into the crankshaft. The shaft remains the

biggest of any 29 or 35 at 13 mm. dia.

Greater cooling fin area is provided on both the cylinder and head. This should be particularly valuable during the running-in period and when it is desired to use hotter fuels. The Max-III, nevertheless, retains the qualities of the earlier models in its ability to provide ample power on lower-priced "mild" fuels, and flexibility appears to have improved. Another improvement is the use of an aluminium head-gasket which is blow-out proof and offers more efficient heat transference. The new cylinder head has the plug offset to the transfer side.

Provision is now made for a pressurised fuel system where this is desired. To tap crankcase pressure for this, a special nipple is available, which screws in place of the left-hand upper backplate screw, or, alternatively, into a lug provided in the recessed backplate.

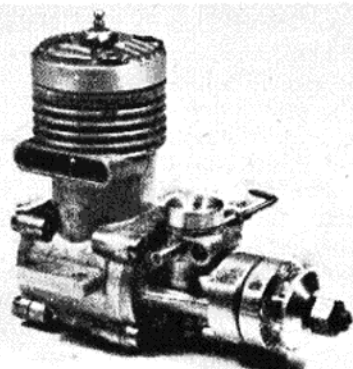
The R/C version of the Max-III Multispeed 35, has a completely redesigned throttle system. This retains the coupled system, of a semi-rotary exhaust valve plus carburettor throttle, but the latter is now an all-machined unit, very precise in operation, with a separate air-bleed screw slow-running adjustment. On this engine a special cylinder-head is also used with revised internal contours and a bar type plug, further offset to the transfer side.

In the U.S.A., incidentally, the Max-III models have been introduced by the American distributors as the "Custom-X" series, to distinguish them more clearly from the Max-II series. They are priced approximately 14s. 6d. higher than the Max-II.

Super-Tigres, made at Signor Jaures Garofali's "Micromeccanica Saturno" in Bologna, have always been good engines and the recent impressive win by a special works-prepared Super-Tigre G.20V in the Criterium d'Europe speed event, against strong opposition, has once again focused attention on the products of this Italian company.

The G.20, which is now made in two sizes, "15" (2.47 c.c.) and "19" (3.22 c.c.) has, somewhat unheralded, undergone a complete redesign during

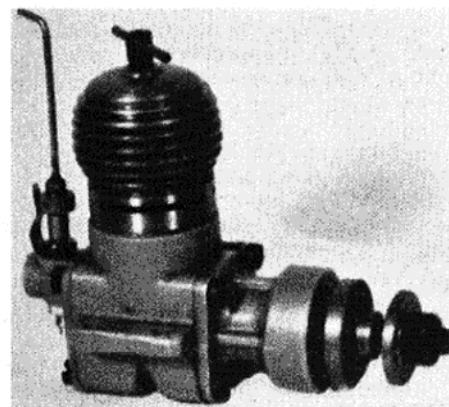
The Super-Tigre G.20V/19 of 3.22 c.c. This is a bored and stroked version of the V series 2.47 c.c. G.20 that has done so well in speed events.



the past year or two and now differs appreciably from the last G.20 which had been developed from a design originally introduced many years ago. Recently, through the kind co-operation of Cliff Petty of Birmingham, who is an avid enthusiast for all the latest and hottest machinery, we were able to examine one of the latest G.20V. 19s.

Externally, the "V" series is easily distinguishable. All new pressure die-castings are used. The combined crankcase and cylinder barrel is bigger all round, with an enlarged transfer passage and heavier mounting lugs and is open at both ends, the back end being sealed by the usual type of diecast cover secured with four screws. The front bearing housing is stronger, with a bigger carburettor, and contains 9 mm. i.d. inner, and 5 mm. i.d. outer, ball journal bearings with a bushing between.

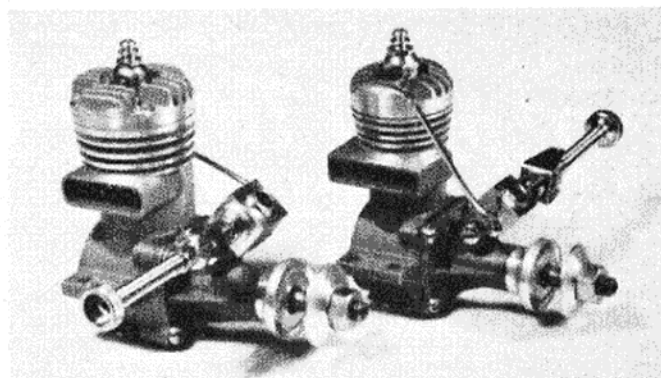
Development is evident in the design



The Russian MK-12B international class diesel. This is an exact copy of the West German Webra Mach-1.

of the shaft and induction porting. The crankshaft is heavily counter-balanced, balancing all rotating mass plus part of the reciprocating weight—i.e. approximately the weight of the connecting-rod and gudgeon-pin. The valve port is long (12 mm.) and is matched by an elongated valve aperture in the bearing (straight sides and semicircular ends) in accordance with the latest trends in high-performance glow engine design. The induction period is about 190 deg. —40 deg. ABDC to 50 deg. ATDC. The carburettor intake is very large and, for normal use, the choke area is reduced by means of a machined venturi insert and a spraybar type needle-valve assembly. For maximum high-speed performance, for racing purposes, however, an alternative venturi of some 9 mm. bore is supplied. This seals off the holes for the standard central spraybar position and the spraybar is relocated through a special bushing cast in the front of the carburettor, so that only a small central segment of the spraybar (at the jet hole) restricts the venturi throat. With this, of course, there is insufficient suction for normal tanking arrangements and the engine must be used with a pressurised fuel system. A pen-bladder can be employed,

R/C versions of the Enya 09 and 15-18. The carburettor throttle is the barrel type, operating independently from the needle-valve.



but the engine is also equipped to utilise crankcase pressure and this would appear to be the preferred method. The system is of the high-pressure type, the pressure take-off being via the crankshaft rotary valve, from a point below the main bearing, so that it is opened only during the crankcase compression period of the cycle.

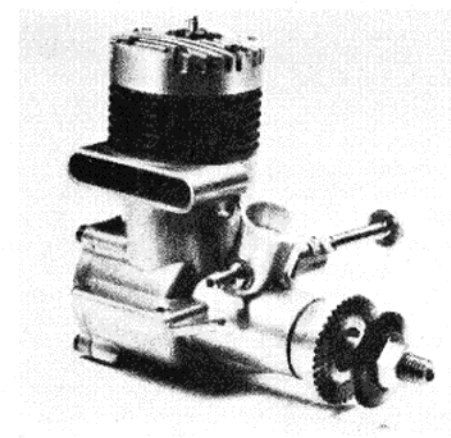
Construction is to the usual high Super-Tigre standards. Externally, no special attention is given to the otherwise well-executed castings and appearance is somewhat spoilt by unremoved flash—particularly between the fins. Inside, however, it is a different story, where fits and finishes are top quality.

The G.20V/19 has a square bore and stroke of 16 x 16 mm., giving a swept volume of 3.216 c.c. or 0.196 cu. in. The manufacturer claims a maximum output of 0.40 b.h.p. at 18,000 r.p.m.

Now in production at the Enya factory is a new diesel, the 06-D. This, as can be seen from the photograph, is similar in appearance to the 0.06 beginner's glow engine, but has a sturdier crankshaft, a steel con-rod and delivers higher torque and power.

A new model Enya 09 (to be known as the 09-2) will also be available early next year. This has a revised porting which is said to improve on the already high level of performance of the current

The entirely new O.S. Max-III .35 for 1960. Appearance, finish, strength, performance and handling are all improved in the latest version of this popular imported make.

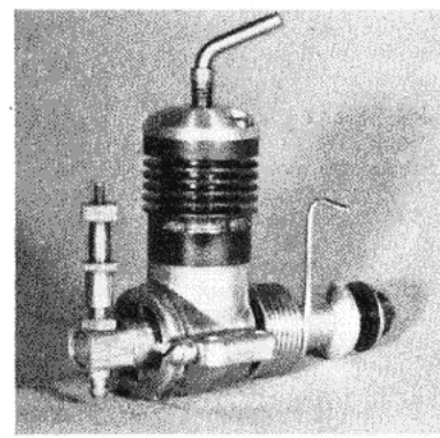


09 and will sell at a more competitive price.

The Rivers 3.5 has been officially named Silver-Arrow. Production models (after some delay with the new gravity cast crankcases) should be on sale by the time this issue of M.A. appears. Messrs. Rivers, incidentally, are also working on a speed control device mounted on a boss on the backplate. This consists of a plunger valve which varies crankcase compression and is said to work very well. As an alternative to this fitment, provision is being made to substitute a nipple for tank pressurisation and an additional accessory is a special double-action ball-valve filler. This latter will allow the tank to be filled and air displaced at the same time, creating a positive seal immediately the fuel bottle is withdrawn.

ODDMENTS . . . E.D.'s Fury 1.46, easy starter but only average as regards power, will appear in new, hotted-up Super-Fury version for 1960, with disc-valve instead of reed induction, plus other mods. . . . Despite arrival of Cox Olympic 15 and successes by O.S. Max 15 glow engines, American F.A.I. F/F enthusiasts seem to be getting more diesel conscious, with Oliver and Enya 15-D as leading diesel powerplants. . . . In contrast, Czech experts are now trying MVVS racing glow engines in F.A.I. F/F.

Enya's latest. A pre-production example of the new 06-D. As befits a diesel, it has a heavier shaft and stronger con-rod than the 06 glow model.



# Topical Twists

by PYLONIUS

## Rather Cut Up

Our Eastern friends might know from first-hand that the moon, unlike beginners' balsa, is not made of cheese, but, from all reports, they seem to have steam age ideas on family modelling material. Admittedly, we still think of rockets in terms of wooden sticks and milk bottles, but our telly-side fun is made of 100 per cent., labour saving plastic. All that cardboard cutting-out drudgery, which our Polish comrades seem to revel in, went out with model flying. Even our cornflakes have gone plastic, or, rather, the cornflake models have, and we have to go a goodish way back into history to the day of the cardboard model.

Long as I am in my remaining tooth, I can only just remember the period. What I cut first, my baby tooth or a cardboard model, I can't recall. All I know is that my two left hands, though chubbier, were more dexterous in those days, and I used to nip round those little gum tabs like nobody's business. The worst aspect was the intense concentration. By some miracle of diminution, the cut-out designers managed to squeeze the whole of von Richthofen's circus on a piece of board six inches square, and, for good measure, throw in a working model of the great man himself, complete with spiked helmet and workable trigger finger.

But having cut out all the little gum tabs I could say that this is where I came unstuck, for, to be truthful, I could never get them stuck down. The nearest I came to success was a Puss Moth with a very advanced system of tiny landing flaps.

We can only hope the Polish designers are more generous with the raw material. Getting the T.U. 110 on to a six-inch square of cardboard might be equal in merit to jumping over the moon, but it's going to ruin the comrades' eyes for telly viewing.

## Hi Flung

Moving further east to another sort of circus, we hear of an Hungarian C/L team doing a demonstration tour of China (only for a stunt, of course). Unlike our own modest fete displays, where the model flying competes with the Hoopla stall for the half dozen unclaimed spectators, the Hungarian handle wavers attracted huge chunks of clamouring Chinese populace. So great was the enthusiasm that the surplus masses had to be turned away amid loud oriental type lamentation, leaving the fortunate volunteers to enjoy the dubious delights of combat flying as a respite from part-time dam building.

Flying stunt in China requires careful plotting of the schedule. Velly inscrutable fate awaits honorable western gentlemen who make offensive hieroglyphics in the sky. What a figure eight, two bunts and a four-leaf clover means in Chinese might be anything from chop suey to a velly dishonorable insult. When you start dickering with square loops and that sort of thing you might well finish up in a Chink clink.

## Flying Off

There's a lot of agitation going on about fly-offs these days. In fact, the way competition is hotting up in the F/F field, it won't be long before they're holding fly-offs for the fly-offs. Only a short while ago we had too few experts chasing too many pots, but now the position seems to have reversed itself, with the contest area simply crawling with expert types, all clocking max's with contemptuous ease, while conserving those extra thousand rubber turns for the inevitable ten-man fly-off.

In these overcrowded circumstances the super expert finds it tough going to lift even the occasional pot. Instead of the glory of the dramatic winning flight he has to partake of the

day-long drudgery of max making. During his routine excursions he must ruefully recall the glamour of his pot-lifting heyday, when the rank and file joined in just for the fun of it, or a second or third prize at best.

We should also spare a pang of sympathy for the good lady who dishes out the hardware. Gaily she flits up to the prize-giving rostrum, all winning smiles and condescending benevolence, only to find the clever little boys are not forthcoming. She, poor dear, fears the old charm isn't what it used to be. She wouldn't know the clever little chaps are still out looking for their fly-off models or that the Team Race and Combat kids are fighting on gamely until dusk. She can be excused if she is a bit offhand in her manner to the chuck glider winner.

One way of cutting out the fly-off fiasco is to raise the max limit to ten minutes, use more short-sighted timekeepers, and handicap the experts one minute per pot on the sideboard.

## Armchair Flying

The latest news from the fireside front is that all you ex-modelling telly viewers will be seeing flashes of your erstwhile slavery on the commercials. You might say that the one-eyed monster has come to gloat over its victims, but the hobby has suffered setbacks in the past. Not quite as bad as this, admittedly, but we are confident we will survive it.

What surprises me is the telly people accepting this form of advertising. Modern youth, whose most strenuous form of activity is looking at an open air western, might be jolted out of its telly hypnotic state by the sight of a 6 ft. span, radio controlled model of the Comet IV, reputed to have been built by a six-year-old from a 3s. 6d. kit, or by the success story of the boy who is twice the man on Splotch's Super Dope. In no time at all he'll be bitten by the model bug, and instead of watching the posse chasing the outlaws across the prairie, he'll be hoofing it across Chobham after his *Bandit*.

## Bring 'Em Back Alive

A club report refers to "the retrieving skill of the wife of a prominent Leamington member."

On the face of it this statement seems to hold something of a contradiction, as it is always the less prominent club members who have the best retrieving wives. Such wives have an unerring accuracy in locating and dragging home the model breadwinner; unearthing him from flying field or meeting place with all the precision and sixth sense of an O'Donnell in search of his model.

It may be that the prominence of this well retrieved member is one of size rather than eminence in club affairs. This might account for the ease with which he is spotted.

## Thirst of the Phew

Having perspired (or sweated, according to one's flying field dignity) through the sort of cloudless summer usually confined to seaside railway posters, we modellers have to admit there's something to be said for a dose of good old fashioned British weather. A touch of tropical heatwave is welcome enough if you are sitting it out on some bikini strewn beach, but if you're waltzing it over the airfield then you're liable to finish up like a wilting wallflower.

Even eating an ice lolly becomes an effort, and, with the naked type sun boring a hot hole in your moulted cranium, the trek across the baking airfield assumes epic proportions. As you stagger along, desert film hero fashion, you yearn for the refreshing splash of the customary puddle beneath your blistered feet instead of the dry, monotonous crunch of expended ice cream cartons. And as you become momentarily airborne on a lurking coke bottle you wish for a spot of yielding dampness to break your fall.

Worse is to follow. Drippingly you reach your model, and find what was once your pride and joy of symmetrical perfection has been roasted into an undulating mass of twists and warps. As you plod desperately back, you console yourself with the thought that at least you did a max., only to realise that a dry D/T burns faster than a damp one.

All you can do is to flop out, close your eyes, and as the twanging music of the heat bursting rubber motors floats across the airfield, dream of soft Hawaiian beaches, or, more refreshing still, Chobham in a typical snow storm.





**JIM BAGULEY**

*writes about*

# POWER DURATION MODELS

I DO not claim to be a top line power modeller, but, by writing this article, I hope to stir up some thoughts about power duration model design, especially if it results in the topic becoming controversial!

I have restricted myself mainly to the most interesting type of contest power model—that using as much power as can safely be trimmed. Although I have devoted most of my remarks to the design and trim problems of the model, it must be emphasised that the most important factor in competition flying is the way in which the model is flown. This is largely a matter of experience. No matter how good a model is, it will not be able to achieve consistent results if handled badly.

Where there are inaccuracies in my descriptions of other models' characteristics, I apologise. It is impossible to be 100 per cent. accurate where ideas and impressions are largely a matter of opinion. It also takes some courage to "stick one's neck out" when writing about something no one else has been outspoken about in print for five years, but someone has got to do it, so here goes! J.B.

## The Pylon Model

*The wash-in and tail tilt trim with same turn direction for power and glide:—*

This is the trim which seems to be the most popular at the present time, and it has shown itself to be capable of handling very high power. It is usually a right-right trim and with this flight pattern, the pre-flight adjustments are as follows:—

Some differential wing warp is built-in to roll the model against turn, i.e. left, and this is usually—when using polyhedral—in the form of wash-in on the starboard inner panel, and possibly slight wash-out on the port inner panel. The extreme tips of both wings are washed-out to prevent tip stalling and

thus help the rate of roll and pull out. Thus is achieved our desirable left rolling moment (explained later).

On the glide the wash-in on the starboard wing may produce a turn to the right, as the drag may be greater than the increased lift, but in any case, the turn will be insufficient. Slight right turn may also be useful under power, and a way in which to achieve this, and give glide turn, is to employ tail tilt (starboard side tilted up). The effect of this under power, as compared with the effect during the glide, will depend upon the model layout and the c.g./incidence situation which is explained later. Suffice to say for now that as the c.g. is moved aft, and the

longitudinal dihedral reduced, the less the effect will be under power compared with that during the glide.

The reasons for the applied left roll due to the wing warps may be explained as follows:—

It is assumed that whatever the angle of climb it will be safest if it is of helical form (i.e. spiral climb). This applies irrespective of whether the model is climbing at 45 deg. with a "roly-poly" trim, or a wide 60 deg. sweep with maybe only  $1\frac{1}{2}$  turns in 15 sec., or a near vertical climb, with little turn but rolling about a longitudinal axis. The theory being that if the model is in any way deflected from its helical natural flight pattern, it will momentarily assume one which is still helical, but may have different helix diameter, helix angle, helix inclination, etc., before returning to the original pattern. The helical climb can, therefore, cope with any sudden gusts.

For those who find it difficult to visualise that a right spiralling model is rolling left to some degree, imagine a model climbing at say 45 deg. in a normal circling right-hand spiral. Now gradually (in your imagination) steepen

the climb angle and lessen the turn, while maintaining a spiral or helix, and keep going until the model is climbing almost vertically with little turn. It will be seen that the model is virtually climbing vertically and rolling left about its longitudinal axis.

The left roll is therefore necessary for a safe spiral climb and if the left roll due to torque is insufficient, and there is no rolling moment, a spiral climb may be

tricky with high power, resulting either in loops, or a spiral dive. A spiral climb is, in any case, merely a loop deflected into a spiral by means of applied roll and turn.

Overdoing the left roll can be interesting, especially if the model was trimmed to climb at about 75 deg., as the left roll gradually takes over (usually after 200 ft.) and the model then goes to horizontal left rolls, and then vertical left rolls but vertically downwards! Should the model survive this manoeuvre the cure is either to lessen the warps, or increase the turn by means of the trim tab.

If the longitudinal stability of the model is rather borderline, instead of a smooth transition to the glide it may do left rolls vertically downwards. The solutions here are to retrim with the c.g. further forward, to increase the power so that the model rides over the top of the climb into the glide, or to retrim for a shallower spiral.

The symptoms of maladjustment under power may be summarised:—

**PART I**

- Insufficient left roll—spiral in or loop.
- Too much left roll—left roll (but not in upward spiral).
- Insufficient turn—loop.
- Too much turn—shallow climb or spiral dive.
- C.G. too far forward with too much longitudinal dihedral—loop.
- C.G. too far back with too little longitudinal dihedral—right spiral dive, or lack of pull-out, or inconsistency of helix angle.

The above list is a basic guide, the only way to be sure of a diagnosis is by flying experience as other factors may enter the picture, e.g. model proportions (discussed later), engine offsets, etc.

The effect of precession (gyroscopics) has been ignored, as if the model is trimmed to climb steeply, as it should be, then the effect of precession is not worth worrying about, especially if the model is launched in its climbing attitude. The effect of precession is, however, to provide a nose-up moment to a left climbing model and the reverse to a right climbing model.

Should this wash-in, tail tilt trim be used on a model with a left-left flight pattern, it should be remembered that a right rolling moment is required to be induced, and this will require greater warping as the left rolling moment, due to torque, will have to be cancelled. This may mean excessive warping which may cause trouble, and for this reason a left-left climb with this trim is not recommended.

The effect of tail tilt should now be explained as it will be useful for further trimming. The turning effect given by tail tilt is caused by the tail lift acting at an angle to the vertical axis of the model, this will give a sideways lifting force as the lift may be resolved into two vectors—one horizontal, one vertical. This is shown in Fig. 1 where "L" is

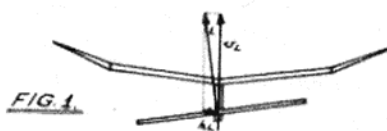


FIG. 1

the tail lift, "vL" is the vertical component, and "hL" is the horizontal or turning component. In glide conditions when the tail lift is a predominant factor compared with the fin (and other side area effects), a definite turn will be caused by the resultant "hL."

On the climb the whole model will be moving much faster, but although the tail will still have lift, as will the wing, the side areas (fin, etc.) will have come into their own and any turning effect, or otherwise, which they may have, will far outweigh the effect of the tail tilt.

The effect of tilt on the glide (before it reaches a ridiculous magnitude such as will noticeably affect the power) is dependent upon what proportion of the total lift is borne by the tail plane. If the model has a short moment arm,

e.g. well forward, and a considerable longitudinal dihedral, it is obvious that tilting the tail will have comparatively little effect, as this component is bearing only a small proportion of the total lift. If, on the other hand, the model has a long moment arm, e.g. well back and little longitudinal dihedral, then the opposite will apply.

The foregoing trim has been described in detail as it is very widely used. There are many other types and variations, so many that it is not possible to consider them all. I will, however, sum up a few in general terms, and also include some trimming gadgets.

#### Thrust offset and rudder trim

This, apart from the "let go and hope" trim is the oldest, as it is the most obvious. The basic idea is, using low power, to trim for the glide by varying wing and/or tail incidence and rudder setting and then to trim the power by using thrust offset.

The pattern may be left-right, right-left, straight-right, etc., but the success

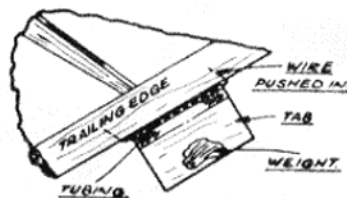


FIG. 2 DRAG TAB

of this trim will depend upon the design and it is not recommended for highly-powered models.

An obvious disadvantage is that if the turn under power, and glide, is in the same direction, should the model bank in the direction of rudder offsets, this offset will be turning the model downwards. The effect of thrust offset may also be complicated by the effect on side areas. The characteristic climb pattern of a model of normal proportions with this trim is a "roly-poly" spiral which, while it may be very safe, is rather inefficient.

#### Straight climb trim

This trim is achieved in several ways, usually the aim being to produce a straight 70 deg. climb into wind with a flick out at the end into the glide. The glide circle being obtained by a trim tab, auto rudder, tail tilt, or drag tab. In the latter three cases the effect of the glide turn on the power pattern being negligible or nil.

The "in the groove" characteristics needed for this trim may be achieved either by the layout of the model, or by downthrust. The layout requirements include a long moment arm, combined with a large tailplane and small longitudinal dihedral with rearward c.g. unless downthrust is to be resorted to. This trim tends to be dangerous as, if downthrust is used, and the model is at some time subject to under-elevated

conditions (gusts, etc.) it may stay that way! Also with this layout the transition to glide may be dangerous especially if the climb is steep, unless flicked into the glide by auto rudder.

#### General trim

The first type of trim mentioned is recommended for general use with highly powered models, but it is not claimed to be the ultimate. A trim with different circling directions on climb and glide is generally to be avoided, as it usually means a bad pull-out or excessive climb trim to cancel the glide trim.

#### Drag tab

This is normally situated on the wing trailing edge some way out. It is usually a hinged tab which is weighted so that it hangs freely. On a steep climb it may be "blown" straight, thus producing little effect. It will hang down on the glide, causing the model to turn to the side on which it is attached by increasing the drag on that side. See Fig. 2.

#### Auto rudder

This is similar to those used on gliders, but instead of being actuated by the tow-hook, is actuated by a timer, usually at the same time as, or immediately before, the motor cuts. It is normally straight on climb and turned for the glide (Fig. 3).

#### Other gadgetry

The system used by Bond Baker on his long moment arm F.A.I. power model, was a cam arrangement on one side of the tailplane which raised it at that side under power, removing the tail tilt and, at the same time, increasing the tailplane incidence. This method proved most effective on Baker's model, giving it a near vertical, almost straight climb, but a side wind launch during the '58 Championships nearly caused a crash before the model built up sufficient airspeed to climb.

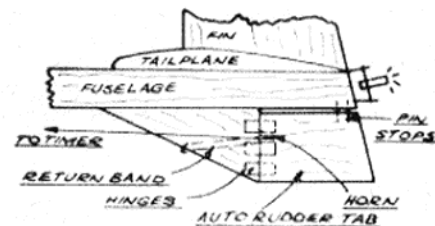
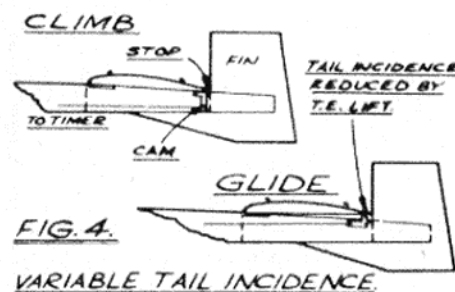


FIG. 3. AUTO RUDDER.

This system, in common with the more usual systems of just increasing tailplane incidence or decreasing wing incidence under power, enables a model to be flown with the c.g. further forward, which may give a safer pull out and a more consistent glide if operated at the correct moment. Dave Posner has recently been experimenting with the decreased wing incidence method with promising results, and this should be recommended enough. A cam arrangement is shown in Fig. 4.

It is better for the wing or tail to be lowered by the cam operation, as this requires less effort on the part of the timer, but this means, in the case of the tailplane, that the leading edge must be actuated, which may mean a double cam, as the leading edge is used more for location than the trailing edge.

In the arrangement shown in Fig. 4 the tailplane trailing edge is raised by the cam, but part of the tailplane only may be made to alter in incidence, i.e. a trailing edge flap. A pendulum



actuated tailplane trailing edge flap was used by Max Byrd as early as 1932, and even now this would seem to be a good idea provided the system is well designed and the pendulum suspended at the c.g. of the model.

There are many other trim gadgets in addition to those mentioned here, but this is a representative selection applicable to pylon models.

### The High Thrust Line Model

#### The Bethwaite trim

Bethwaite's own explanation of this trim (see Fig. 5) is interpreted thus:—

The basic idea is to allow the model to loop, but to also apply a roll which is in phase with the loop, thus producing a spiral. A left hand turn is used, and as the climb is relatively shallow there is a powerful precession nose-up moment. The lower part of the rotating slipstream from the airscrew impinges upon the low side area and the wing, thus producing a left turning and right rolling moment, this being at a maximum when the model is moving slowly, i.e. at release.

The precession moment is also at a maximum at release. The net effect of this is to rapidly roll, turn and lift the model until it reaches say 50 deg. to 60 deg. then the spiral opens out and becomes more shallow. If the speed at any time becomes excessive the model straightens and loops, thus lessening the likelihood of a spiral dive. His design seems to require a remarkable amount of downthrust, but the main objection to this trim is that with a very highly powered model, a 45 deg. or so spiral does not usually provide the greatest altitude.

#### Early Stan Hill trim (Amazon)

The original Amazon (Fig. 6) seemed to be trimmed to climb vertically with no roll or turn.

I believe the model was warp free, had close wing and tail rigging angles, with rearward c.g., sharp leading edged airfoil and little downthrust.

This would give a loop of vast diameter, the motor cutting when near vertical, from a horizontal take off, with long run. Any glide turn presumably is set by the rudder, with sidethrust compensation on the climb. The objection to this trim is that if the model was at any time in difficulty it would have comparatively little chance of recovery. Other examples of this design, and the later version of Amazon seen in action, have had a safe left spiral at a shallow angle which gains them a respectable height, but it is on the glide that the model really scores.

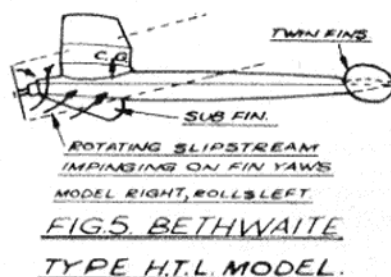
It has been said of this type of layout that as the centre of the area in the slipstream is behind and below the c.g., the rotating slipstream will roll and draw the model right, thus making a left climb safer. I would agree with the right roll, but am doubtful if the side area beyond a limited distance back would be affected by the rotating slipstream, especially an upper fin, which would be directly behind the wings and fuselage. This has no effect on the validity of the theory behind the Bethwaite design (see Fig. 6).

#### Natural downthrust trim

This trim, if highly powered, generally results in a loop, made safe with down and sidethrust, although it has proved safe with low powered models such as the earlier Belgian International Class designs.

#### Excessive low drag

Another method of killing the looping tendency of a high thrust layout due to the wing but not the tailplane being in the airscrew slipstream was to have the



motor mounted at the top of a pylon, in front of, and above, the wing. The moments of wing and fuselage/tail drag about the motor were then roughly equal, and if the tailplane had sufficient power the loop diameter was very large.

#### The new Stan Hill type of model

This trim or layout can be seen in Fig. 7. The idea is to do away with excessive downthrust, either of the built in or added variety, and to maintain a safe climb; using greater longitudinal dihedral for a better pull out and a more consistent glide. The latter should be

fulfilled, even with the high c.g. if sufficient dihedral is maintained.

The nose down moment due to the high thrust line, would probably admirably replace the normal nose down moment on a pylon model due to the slipstream impinging on the tailplane and downwards, even though there is greater longitudinal dihedral. Only the motor mount fin, and possibly the rear fin, are in the airscrew slipstream giving better usage of power.

The rotation of the slipstream affecting the forward fin will turn the model left, but if the fin is carried above the thrust line this may be cancelled. The action of the slipstream on the rear fin may also give left turn, provided the slipstream

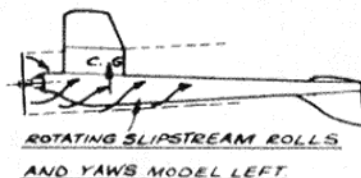


FIG. 6. EARLIER HILL TYPE H.T.L. MODEL.

is still rotating when reaching this point. (It may be assumed that this is so, as the slipstream path is relatively unhindered.) This, together with the left roll due to motor torque reaction alone, and the large diameter loop, will give a steep very slowly rolling right climb, but Stan Hill prefers to use slight left or straight climb. The design uses tail tilt for right glide turn, a large tail moment and a forward c.g.

This layout would seem to be well worth trying, although it is noted that the Hammerhead itself is a very large model for a 2.5 and I wonder what trimming problems there would be if the model were more highly powered; anyway, well done Stan Hill for getting out of the rut, with an original layout!

#### Further trimming techniques

Many layouts which are basically unsound may be perfectly safe if the model proportions suit them; just as conversely a basically safe layout may be unsafe if the model proportions do not suit it. General design considerations will be discussed after several well known models and their trims have been analysed. It is hoped that the owners may forgive any discrepancies as it is impossible for anyone to know everything about another person's trimming or reasons for any model's peculiarities.

The majority of the Surbiton club seem to use the wash-in and tail tilt on pylon models; indeed, certain members of that club would seem to be the originators of this trim (or Tom Smith with friend Trittler or maybe Brian

Continued overleaf



Eggleston of *Creep* fame, or Marcus's *Eureka*, certainly it was the Surbiton club who showed me the way.

Dave Posner's earlier models had the true, near vertical, spiral, but of late the spiral seems to have opened out slightly to more nearly approach Gaster or Jays' trim in which the model climbs at 60 deg. plus, with little turn or roll, and a very large loop diameter giving perhaps four turns in 15 sec. The man who has blazed a long trail of success with this wash-in/tail tilt trim has been George Fuller who, I would say, uses it to his best advantage on his very small model.

The Buskell trim is one on its own, being a high rate of roll and a pull out with no loss of height; the detail trimming of *Slick Stick* is a mystery to me and I have yet to see anyone else produce the same results with a this model. In

fact it appears to be a one man model, as one proxy flier found out!

The fastest climbing models I have ever seen were those Tom Smith flew at the '58 Nationals, where he seemed to have made his usual layout slightly more conventional. The trim would seem to have been an 80 deg. spiral of negligible roll and turn (in effect straight up at 80 deg.!) but it was not consistent even in the calm weather, one of the models "flew over the hump" to pass from steep climb to horizontal and then steep dive!

The models themselves were very advanced, being exceptionally lightly constructed and although having normal areas, had very thin airfoil sections and used an auto rudder. The propellers were also a lesson, being very wide bladed and making efficient use of the engine power, this in contrast to the

narrow-bladed Surbiton type propellers.

Ron Draper's models seem to use a "straight up" trim with slight down-

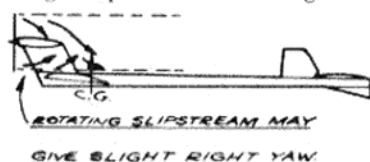


FIG. 7. NEW HILL TYPE

H.T.L. MODEL

thrust and long moment arm, there being no tail tilt, etc. The glide circle is obtained by auto rudder and drag tab. The use of wash-in on the port tip is mystifying however. These models usually seem safe, especially those built by John Bickerstaff.

To be continued next month

## ALL HOGWASH

Continued from page 309

favrit dungenne, where ye hapless serf, didde suspire."

"Well, what d'you think," enquired Ted of the dazed members, "Genuine, or a Crummy forgery?"

Salty answered by asserting that if that piece of history wasn't bunk, then the Black Prince defeated the Armada with a combat model.

One or two of the members remained unconvinced, in spite of both the obscure serf and Crummy bearing the same blot on their respective escutcheons; the name Crummers.

"Well, of all the wet lot," cried Ted, "Use a bit of common, for Chob-ham's sake. Every character who comes to a sticky end in the old ruin does his nightly stint in the unmentionable tower. And, while I've heard of all sorts of ghosts up there, headless and otherwise, I've never heard of a model flying one."

Salty had a bright idea.

"Just to make sure, why not get Little Willie to do a spot of ghost watching. Armed with a copy of Hector Plassem's Guide to Hogwash Ghosts, he could check 'em off as they come on duty."

Willie jibbed at this.

"No fear," he wailed, "I had enough of it when we held that indoor meeting in the Banqueting Hall. Me microfilm job got stuck on the balcony. So I climbs up after it. Bit dark up there, and I sees something flimsy, which I takes to be me model. Makes a grab, and gets hit on the head with a ball and chain."

"That's the excuse all the village idiots make," remarked Salty.

"At least when I saw the ghost of Sir Ould Foulkes, with his head tucked under his arm, I didn't offer him a tube of cement," retorted Willie.

The idea of the ghost hunt was abandoned when, a week later, the *Advertiser* came out with a yet more sensational stroke. It announced the holding of a special competition to commemorate the 500th anniversary of the first model plane crossing of the Sludge. Local luminaries had chipped in generously towards the prize money, with the exception of Farmer Glossop, who regarded Baron Prospeck's treatment of modellers as a shining example.

The prize was to go to the owner of the model making the most novel and spectacular crossing of the Sludge.

"Now we can see the light," exclaimed Ted. "But I think I know how we can put paid to Crummy's little game. Now, chaps, this is what we do. . ."

On the day of the contest the whole of Hogwash turned out in force, partly out of curiosity, but mostly to keep the horde of visitors off the hollyhock beds. News of the unique contest had spread far and wide. The fact that it was to commemorate the first model flight touched the National Pride. No doubt the Russkis were already digging furiously into their history books, but five hundred years had given the old country a flying start.

The cattle track to the Sludge embankment was jammed solid with cars, coaches and vehicles of all descriptions, as Ted and his clubmates made their picturesque way to the contest site. Each was tricked up in the manner of a medieval serf, which was odd, and each carried a medieval looking model, which was not so odd. They were given a resounding cheer by the coach parties, and jollied on their way with a discordant rendering of "Robin Hood."

When they reached the river bank there was Crummy, dressed medieval-

wise, as Ted had expected. But far from having his already disjointed nose put further out of joint by the sudden appearance of a dozen similarly clad medievalists, he seemed quite unperturbed.

"Let's just ignore him," suggested Ted, rather disconcerted at Crummy's lack of response. He and the others then turned their attention to the frenzied activity along the riverbank.

Many were the quaint and enterprising means by which the prize-happy contestants were hoping to negotiate the murky waters of the Sludge. Most impressive was a radio controlled Serf model, while at the other end of the scale, Little Willie Wilkes's even more diminutive brother was preparing to tow across a rotor kite while swimming under water with a snorkel.

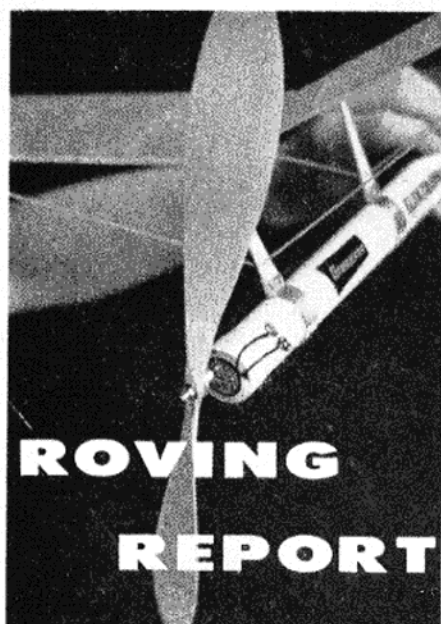
One of the first machines away was an ingenious magno control effort. A large hand-cranked electro magnet, stacked in a rowing boat, provided the attraction. Unfortunately, a slight technical hitch—the sudden immersion of the boat—caused the model to veer off course. It was later found affectionately nudging a distant gasholder.

Another plucky assault by rowing boat was made by a combat character, doing his circulating from a platform in the boat. All went well until he caught a foot in one of the rowlocks. Undismayed by this mishap the model carried on in ever decreasing circles, until the combat character was bound head to toe with such fiendish thoroughness that it would have won the approval of the Baron himself.

The Hogwash boys fared little better. The only splash they made was the watery one of models plopping one by one into the green depths. Only one medieval type model flew the course, landing bang on the mangelwurzel target. The judges were enthusiastic.

"Looks like old Crummy pulled it off after all," remarked Ted, dejectedly.

Continued on page 337



## Brings you up to date with the latest world model news

**E**VER since the earliest days of flying, the application of electric power, as a means of motive power for aircraft, full size or model, has been dismissed as impracticable, due to the poor power-to-weight ratio obtainable with electric motors and batteries, as compared with an i.c. engine or rubber motor.

Modern developments in motor and battery design, however, are now giving us second thoughts about this—at least as far as models are concerned.

Two years ago, Lt.-Col. H. J. Taplin flew a converted *Radio Queen* R/C model, using, in place of the original E.D. 2½ c.c. diesel, a 24-volt ex-aircraft motor and a battery of twenty Venner H105 silver-zinc miniature accumulators. The flights then made were, so far as is known, the first ever to be made with an electrically powered aircraft.

Apart from this successful initial demonstration, experiments had begun (notably in Japan and Germany) with small models powered by miniature high-speed motors suitably geared to drive "rubber sized" props and capable of giving sufficient thrust for lightweight models on pen cell or miniature accumulator power.

One of the most active experimenters in this field has been Fred Militky, designer to the well-known Johannes Graupner model firm of Kirchheim-Teck, Württemberg, Germany. These experiments culminated, recently, in a long flight, lasting 23 minutes and 10 seconds, for which a Jodel-Club light aircraft was employed to follow the model.

Militky's models have been designed around a 3-volt geared motor now being marketed by Graupner under the name Mikromax. This weighs 9/10ths of an ounce, has a diameter of 20 mm., is 22 mm. long and turns up to 20,000 r.p.m. on 3 volts. A choice of three reduction gear ratios is available: 3.9 : 1, 15 : 1 and 59 : 1, the middle ratio being the one chosen for model power, while the low ratio makes the unit applicable to R/C actuator use. The motor does, in fact, also form the basis of a new type Graupner actuator lately put on the market.

FM.248, the model Fred Militky used for his 23-minute flight, is a slim fuselage, high-wing, cabin model of 780 mm. (30.7 in.) span. All-up weight of the model is 130 grammes (4.58 oz.) of which approximately 2½ oz. is accounted for by the motor and battery.

By the time these words appear, news of the first of the Japanese units should be released in the United States. The motor will be available there via one of the bigger distributors and will, apparently, be a complete "power package" comprising motor, battery case and cut-out, selling at \$2.95—about 21s. The Japanese also have at least one kit model ready.

We shall be giving some more detailed information on these new developments in due course.

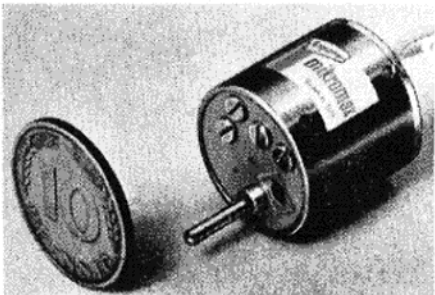
Many a good engine has been wrecked in team racing and one of the most dismal stories of which we have heard for a long time is that illustrated in one of our photos on page 335. At the 1959 Chrysler-Plymouth sponsored contest in Helsinki, Jouni Valo crashed his very fast model in the first eliminating heat and, as you can see, the engine fared worst of all, being a complete write-off. An unusual choice for a team racer, the motor was a Fox 29R, converted to run on a normal metal tank, with a reduced bore venturi and standard spraybar needle-valve assembly.

The fastest of all Finnish team racers, the model had been clocked at 190 km./hr. (118 m.p.h.) doing 35 laps per tank on

Our heading photo shows the front view detail of one of Fred Militky's experimental lightweight electric models. Motor is geared down 15 : 1 to drive big prop.

Below: the Graupner "Mikromax" internally-geared miniature electric motor for F/F models. Similar motors are being made in Japan.

Right: Fred Militky's electric FM.248 cabin model which recently flew for over 23 min.



15.92 metre lines, and had recorded a best time, for the 10 kilometres, of 4 min. 16 sec.

### Oddments from the U.S. Nats . . .

Radio events get bigger and better every year. This year there were six separate classes, namely: multi, intermediate, scale, pylon-race and rudder-only for two age groups. Bob Dunham, winner of the multi event for the third year running, again used an Astro-Hog and, naturally (since he makes it) Orbit radio equipment. Motor was a K & B 45-RC. Three Astro-Hogs—or modifications thereof—placed in the first four.

The R/C scale winner used, believe it



Neat, Super-Tigre powered, multi-channel R/C model from Italy. It was built by Giotto Mazzolini of Rome.

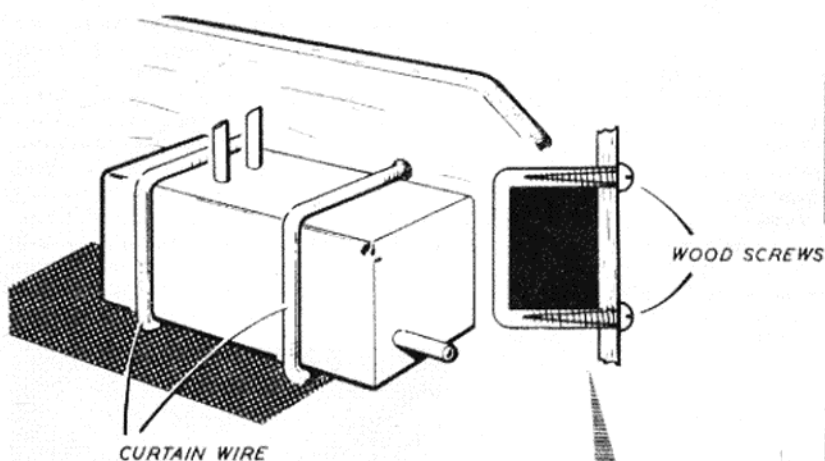
or not, an Orbit equipped F-51 Mustang, Fox 0.59 powered. Sounds like a hot combination . . . second was a Luscombe Sedan and third a Fairchild PT-19. Fourth, in wonderful contrast to the F-51, was 10 lb. of Fokker D.7 also Fox 59 powered and with Orbit 8-channel.

The pylon racing jobs were faster than ever this year. First and second place winners both exceeded 40 m.p.h. average speed over the five-laps-to-the-mile course. Incidentally, winner W. S. Deans flew a K & B 19 powered *Nova* designed by second place man Jerry Nelson and—a coincidence—a similar

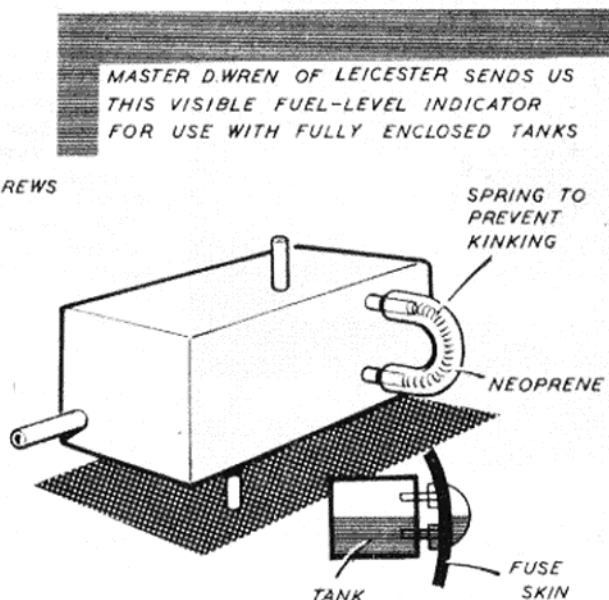
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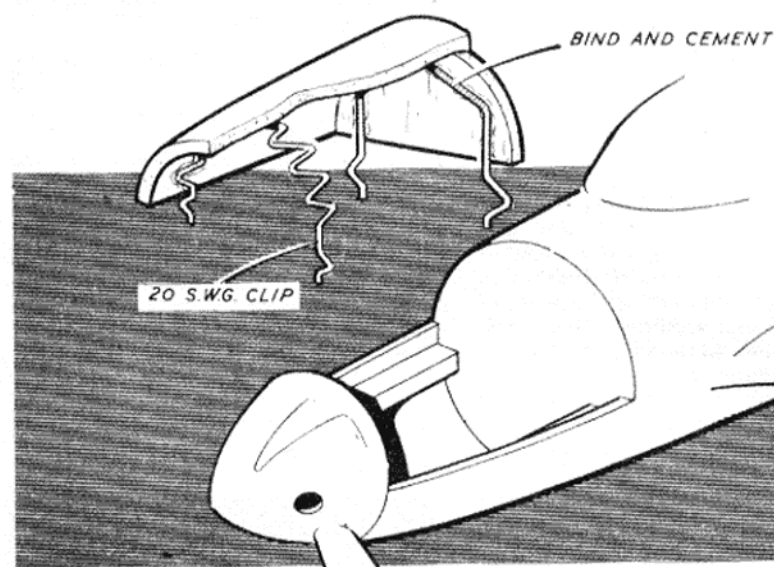
# Readers' Hints and Tips . . .



RICHARD HOWARD OF EDINBOROUGH USES THIS INGENIOUS TANK FIXING ON HIS PROFILE MODEL

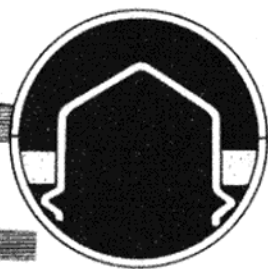


MASTER D.WREN OF LEICESTER SENDS US THIS VISIBLE FUEL-LEVEL INDICATOR FOR USE WITH FULLY ENCLOSED TANKS

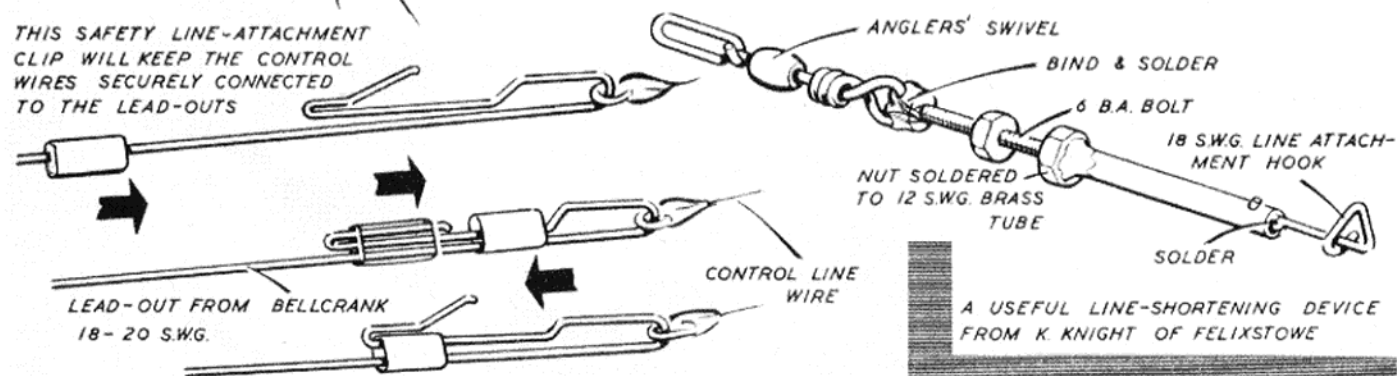


HERE IS AN EFFICIENT COWL-FIXING CLIP FROM A WHITEHOUSE OF BIRMINGHAM-

SECTION SHOWING COWLING IN POSITION



THIS SAFETY LINE-ATTACHMENT CLIP WILL KEEP THE CONTROL WIRES SECURELY CONNECTED TO THE LEAD-OUTS



SAYS B.J. BIDDLES OF LEICESTER

A USEFUL LINE-SHORTENING DEVICE FROM K. KNIGHT OF FELIXSTOWE

The neat safety control-line attachment idea of B. J. Biddles wins him this month's Tool Chest.



# OVER THE COUNTER

## Under 2s. 6d.

From Frog this month we have a long awaited addition to their 2s. 6d. World War II Fighters series in the shape of the *Spitfire* Mk. 2. Moulded in light-blue plastic to 1/72nd scale, this attractively boxed kit makes up into an accurate reproduction of one of the priciest marks of *Spit*.

All modellers use a knife at some stage and a cheap yet efficient product is the X-Acto 1001 general purpose knife costing 2s. 4d. The detachable blade is reversible and the handle contains a spare. Extra blades are available in packets of three for 1s. 4d.

## Under 5s.

Some of the less hackneyed prototypes are now being investigated by the plastics manufacturers. One result of this is the production of the Handley Page *Hampden* now available from Frog at 3s. 6d. This price includes cement, and brown and green camouflage paint. Its companion model, at the same price, is the Vickers-Armstrong *Wellington*. The moulding in both these kits are well up to the high I.M.A. standard and they go together very well. It is unfortunate that these two otherwise excellent models are marred by not being to an accepted scale. The *Wellington* is 1/116th scale and the *Hampden* 1/100th.

The transparent bag type of packing for plastics undoubtedly cuts production costs. Against this, less protection is given to the more delicately moulded parts and it is wise to examine the contents as closely as the transparent bag will allow, before purchasing. More and more manufacturers are using this packing for their products, the latest being Aurora, whose 1/48th scale Nicuport IIC-1 now retails for only 3s. When carefully assembled this is a very impressive model, complete with pilot, mechanic and eight "Le Prieur" incendiary rockets with which these W.W.I. scouts were armed. Other models in this series will be the Albatross D-3, Sopwith *Camel*, Fokker *Triplane*, S.E.-5A, and Fokker D.7.

The long established Warnford company have come up with something revolutionary in the way of modelling material. An expanded foam plastic, it is to be known as Warnford Modellite and moulded as wing panels 20 in. x 4 in. to Clark Y section, each panel costing about 2s. 11d. A 2 in. square x 3 ft. block will also be available at about 4s.

The wing panels weigh between 1/2 and 3/4 oz. each and are quite strong enough to be used without additional spar stiffening. The lightest balsa one would normally use for modelling weighs around 5 lb. per cu. ft. and this is very

## Special Christmas shopping guide to some new and recent products

soft indeed. Modellite weighs only 1 lb. per cu. ft. and is much stronger! There are snags of course! If dope or any cellulose finish is used on it, it will dissolve into a gooey mess! The new Humbrol gloss enamel finishes are, however, quite suitable, and also fuel proof. This is important as diesel fuel will attack Modellite very rapidly! For cementing use P.V.A. cement, don't use polystyrene or balsa cement under any circumstances.

We are at present carrying out tests with Modellite and will report more fully when these are completed. There are many fascinating possibilities here, and we would like to hear from any

are easy to build, realistic, durable and they fly! Models are about 16 in. span and cost between 7s. 3d. and 8s. 9d. At present available are a Ryan S.T.M., *Spirit of St. Louis*, *Cessna Bird Dog* and Piper *Pacer*.

Books are always popular presents, and any modeller will be everlastingly grateful for a copy of Peter Chinn's book "All about Model Aircraft." Hundreds of "how-to-do-it" photographs pack its 112 MODEL AIRCRAFT size pages. Articles cover nearly every type of modelling including the elements of radio control, C/L flying and engine running. This best seller costs only 6s. from your model shop or direct from Percival

Marshall & Co. Ltd., 19-20, Noel Street, London, W.1.

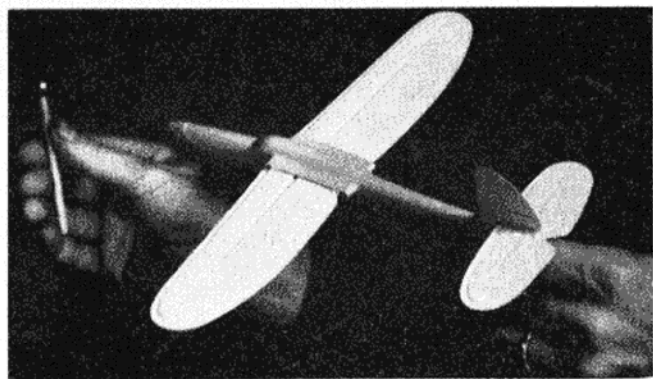
Those who build flying models will appreciate the X-Acto balsa stripper which is used in conjunction with the X-Acto Nos. 1 or 2 knives. Priced at 5s. 9d., this little device will save its cost many times over in the course of its life. It also enables the modeller to cut strips of any width to suit the job in hand. Consistency

is achieved by cutting all strips from one selected sheet, thereby tremendously simplifying and improving model construction.

## Under 1s.

Although not the first to feature a completely equipped passenger cabin, the Aurora kit of the *Caravelle* is, we understand, the first to have one complete fuselage side moulded in transparent plastic. This enables the built-up interior to be clearly seen, rather like those beautiful models we have envied in the travel agents' windows. Price is 17s. 6d.

Another new Aurora kit is the Hawker *Hunter*—8 1/2 in. span, costing 14s. 6d. It features a retracting undercarriage, removable rear fuselage, dummy engine and towing tractor with driver! Alternative national markings are supplied giving plenty of scope for those wishing to produce "something different." In time for Christmas there will be a



The Jetex Swallow shown above is a completely pre-formed plastic catapult glider with an excellent performance. Wingspan is 11 in. and it is very crash-resistant. Price 2s. 6d.

modellers who have experimented with this new material.

The first plastic model of the twin rotor Bristol 192 is now in the shops. Airfix are responsible for this original choice and, as is usual from this manufacturer, the scale is 1/72nd. All who saw this impressive machine at Farnborough will want to build this model especially as the price is so reasonable at 4s. 6d.

Other interesting plastic news is that Aurora have a Messerschmitt M.E. 262 kit available at 9s. 11d. This kit features retracting undercarriage, opening canopy and hatches.

## Under 10s.

Youngsters like their models to look like full size aircraft, but scale models are difficult to build, vulnerable and comparatively unsatisfactory as practical flying models. Strombecker rubber-powered plastic flying scale models overcome most of these snags. They

Junkers 88, also from Aurora, fully detailed this will cost 12s.

An aircraft in the news at the present time is the Fairey Rotodyne, and Frog have a 1/72nd scale plastic kit of this fascinating machine. The mouldings are neat, the front door opens, and the rotor hub is well detailed. When mounted on the stand, included with the

examining some of Ray's new products and we can report that we were impressed by their obvious high quality. Two motors are to be produced, a 2.5 c.c. diesel and a 2.5 c.c. glow. The glow plug engine is available now, delivery at present being about one month. The diesel will be available as soon as production of the glow engine gets well under way.

Made entirely by hand, in strictly limited quantities, each motor has an exhaustive test before delivery. Rear disc (Tufnol) induction is employed and the crankshaft runs in special ball races. Piston and cylinder liner are cast iron. The black crackle-enamelled crankcase is most attractive as our accompanying photographs show. Price of the glow plug engine is

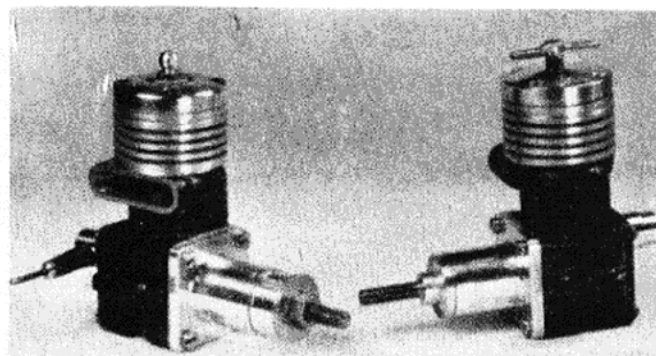
The new trio of small British glow plug engines are causing a great deal of interest and although deliveries do not yet meet the demand, they should have caught up in time for the Christmas rush. The smallest of the three is the 0.046 c.c. Davies Charlton *Bantam*, costing 34s. 10d., including the "Quick-start" spring starting device. For the first time on a small British engine a replaceable propeller fixing bolt is employed. This will go a long way towards reducing the number of expensive crankshaft breakages.

The Allen-Mercury 0.049 comes next in the price scale at 39s. 6d. and the built-in spring starter is fully enclosed and self engaging. This motor is primarily designed for bulkhead mounting, but provision is made for an efficient beam mounting as an alternative.

Third example is, of course, the Frog 0.49, subject of this month's Engine Test, which has been in the shops for some weeks now, and is being very well received. Many of the well-tried Frog 80 components are employed in its construction. Price of the bare motor is 49s. 6d., and a presentation set comprising engine, tommy bar, tank and prop in a transparent topped box costs 57s. 6d.

One of the finest gifts for any modeller is the magnificent Burlington Hobby Chest from X-Acto. Contained in the fitted case are almost the entire range of X-Acto tools including gouges, cutters, plane, spokeshave and stripper. Costing £5 3s. these tools will last a lifetime.

Due to the enormous number of new products continuously appearing on the market. We are unable to include everything, so for any specific information please refer to previous "Over the Counter" features.



Here are the prototypes of the two new Gibbs engines. The glow plug motor on the left is now in production and the diesel will follow shortly. Note the black crackle stove enamelled crankcases.

kit, this makes an impressive model with a rotor diameter of almost 15 in. price is 12s. 6d.

Plastics from Airfix get more ambitious every time. Now they have a Mark III *Sunderland*—no less—with a wing span of 19 in. We look forward to examining one of these kits especially as the price is so reasonable at 10s. 6d.

#### Over £1

A new name in the engine manufacturing field is a well-known one on the contest field—no less than Ray Gibbs, in fact! We recently had the pleasure of

£6 15s. and all enquiries should be addressed to Raymond Gibbs (Model Engineers), 197, Ardleigh Green Road, Hornchurch, Essex.

Latest news from the Merco stable is that several minor improvements are now incorporated in the new 1960 models. These engines, now better than ever, should be well in evidence among next season's contest winners. Several eagle-eyed readers have pointed out the unfortunate transposition of the Merco 35 and the Fox Combat 35 pictures in our November issue, for which error we apologise.

## A Microfilm Covering Frame—described by LEN RANSON

MICROFILM covering can be greatly facilitated by the use of an open ended frame, where one edge of the film is left unobstructed for negotiating diaphragm breaks, prop hubs and other joints. A simple frame of this type can be made up quite easily in a matter of minutes.

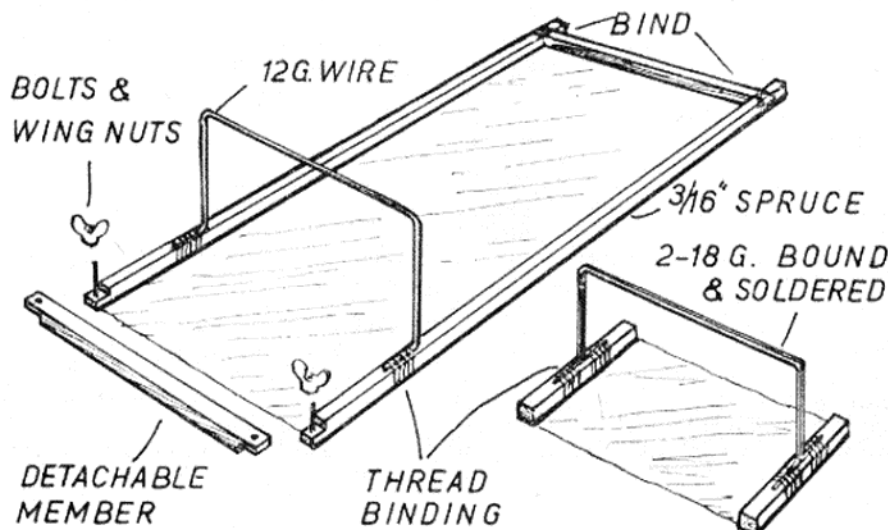
Constructed of  $\frac{3}{16}$  in. square spruce or similar material, one end member is made detachable, with a bridge or U-piece of stiff wire to support the side members. Twelve gauge piano wire is adequate for small frames, but for large frames a thicker gauge is recommended, or, for ease of working, two smaller gauge wires bound together. The removable end can be secured with small bolts and wing nuts, or, possibly, some simple clip arrangement.

After the film is lifted and left to dry and "weather," it can be cut away from the removable member by means of the usual hot iron wire.

An extension of the open frame

principle is the small patching frame, which consists only of a bridge and two side members. The patches are transferred from a larger frame, then cut to appropriate width and applied

across damaged areas of film. This avoids the necessity of stripping the whole surface in which the damage is located; a decided advantage in "field" repairs.





Following our recent series of articles, 'And so to Radio,' which explained the first steps in R/C, we now present the same writer's own approach to the more advanced multi-channel flying

**A**FTER some seven years of specialisation in single-channel radio control I have at last taken the plunge into the mysteries and delights of multi-control. I had been toying with the idea for at least a couple of years, but one tends to keep putting off the first move, and tries to find plausible excuses for "sticking to the devil one knows." As there must be many s/c flyers similarly placed, I thought it might be interesting and helpful to recount my own personal experiences of the change-over, and this two-part series is the result. Its purpose is to introduce the reader to the subject and help him to break into the new medium as painlessly as possible.

I had some experience of elevator control on s/c, using the system described in the July, 1959 issue of *MODEL AIRCRAFT*, but I fully realised that this was, at best, only a substitute for the real thing, and having decided that further progress in single-channel was virtually impossible, realised that the time had come for positive action.

The first thing to do was to decide what system to adopt. Remember that I was (like you) a rudder-only enthusiast with little or no knowledge of multi, and had to rely on what I had heard and read at various times. Furthermore, there was the all-important question of cost. Multi equipment *can* run away with a lot of money, and this is a commodity I never seem to have enough of! I pondered the relative virtues of reeds and pulse systems, and for a time wondered whether a s/c system such as the *Galloping Ghost* might not be the answer. But in the end I plumped for

reeds. I liked the principle of each button or lever on the control-box having its own individual reed responding in the airborne model, thus keeping each control separate and distinct. To my mind this was nearest to the basic principle of single-channel, with which I was fully familiar, when a press on the button has a definite and immediate result—even if it may not always be exactly what was intended!

The next thing was to decide how many reeds I would use. At first I felt I would need 5 or 6, two for rudder, two for elevator and one for motor control, the sixth (if there was one) being held in reserve for any further control later desired. I thought that by buying the equipment in kit form and making it up myself I could save quite a bit, and sat down to work out the cost. I found that, for 6-channel, and using my old carrier-wave TX suitably modulated, the cost would be about £25. This was more than I felt like laying out, and I was not too keen on adding all the radio work involved to the task of building a new model (I felt that neither of my rudder-only jobs was suitable for conversion, and wanted an entirely fresh model for the new venture).

This meant that if I wanted as much of the equipment as possible ready-made (which would obviously cost even more), I would have to try a different approach. I looked up all the gear I could find in "Over the Counter" and adverts, and eventually decided to go for the "Tritone" 3-channel tone receiver (Radio & Electronic Products) at £11 6s., factory tuned and tested, and ready to

install. From the same source I could get a modulator kit for 38s. 8d. to convert my old C/W transmitter, and a complete, ready-to-plug-in 3-channel control box for 53s. 6d. This made a total of £15 18s. 2d., a very considerable saving on the £25 "do-the-whole-lot-yourself" 6-channel proposition, and the only radio work would be the very simple modulator.

Clever me, I thought! I've cut the cost by nearly half, and it's practically all ready to use. All I have to do now is to work out how to get rudder, elevator and motor control from 3 channels. On closer examination this seemed a tall order, and first I asked George Honnest-Redlich (supplier of the equipment) whether there were any objections to using self-neutralising actuators with reeds. "No," said George, "but the handling and memorising of three sequence actuators will need some practice, I feel." Well, I thought, I don't mind doing a bit of overtime practising with the outfit, on the bench at first if necessary, as long as the idea is practicable. Incidentally, he also told me the time-delay using reed/relays is less than 1/6th of a second, which virtually means instantaneous operation.

Having thus cleared up lingering doubts, I then considered whether I could successfully handle three sequence actuators in the manner required. Well, I have used nothing but actuators for all my rudder-only flying, so I should be merely doing "what comes naturally" —for me, anyway! Therefore, I felt, one actuator would be perfectly acceptable for rudder control. Next, elevator



—my mind naturally turned to the s/c system already mentioned, which had been quite successful and caused no outside headaches—why not use the same idea, but this time with the unbelievable luxury of a separate control to bring in the elevator at will? So one actuator for elevator was approved and passed. Finally, motor control. This posed no problem, for all that is needed is a brief press-and-release to change from one neutral (giving high speed) to the other neutral (giving low speed) and vice-versa. This actuator could be mounted cross-wise in the cabin, only a few turns being needed on a very short rubber motor (engine-speed control being required at most only half-a-dozen times during an average flight). So, I said to myself, I'll do it!

I sent off the order, and when the equipment arrived I carefully studied the receiver, reeds being a new form of control to me. To my surprise, the whole RX was smaller and lighter than the 2-valve s/c receiver I had been using for rudder-only. The reed unit comprises a coil and permanent magnet, above which are suspended three tiny spring-steel reeds of graduated lengths, coated with "Rhodium," a corrosion-resisting plating. Each reed has its own natural frequency, and when a modulated signal of that frequency is transmitted the reed vibrates in sympathy, emitting a definite

musical note like a tiny tuning-fork. As it vibrates it touches (several hundred times per second) a silver-wire contact placed about 3-thousandths of an inch from it—these rapid pulses are conveyed to a suitable condenser which smooths them out into current which is accepted by the appropriate relay as a steady flow, so pulling in the armature and "making" the actuator circuit, exactly as the single relay does in a carrier-wave receiver. Thus we achieve the purpose of being able to select any one of several relay-actuator circuits at will, according to which control is manipulated on the box.

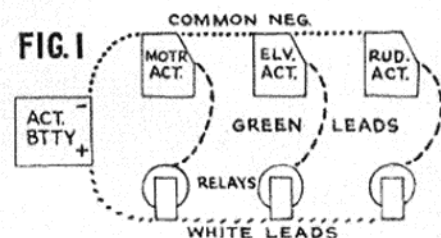
I made up the modulator (a very simple job, this) and fitted it into my existing TX case. If a 0-30 M/A meter is connected as per directions, this shows about 25-30 M/As when the TX is switched on (the old button socket being permanently shorted out by a 2-pin plug with pins connected). This indicates that the carrier-wave signal is radiating, and, unlike single-channel, where the signal is transmitted only when the button is pressed, the carrier remains on all the time; H.T. battery drain is therefore appreciably higher and more frequent replacement will be needed. Also, as two valves now have to be fed, L.T. consumption will also be increased, but the additional cost is relatively small when taken over a period; the important thing is that you should realise that your batteries are subject to heavier drain, and therefore, to ensure reliability, you will need to keep a closer watch on their condition.

When one of the controls on the box is manipulated the meter reading drops slightly, according to whether the potentiometer is turned in (lower note) or out (higher note). Thus, when the three pots. have been correctly adjusted to the three different reed frequencies, the meter will show, say, 22, 23, 24 M/As respectively. Although this is jumping ahead a bit, I might mention here that it is a good idea to make a mental note of each reading so that, should one of the pots. be accidentally moved, the reading can be checked and adjusted actually during flight if necessary.

The next step was to test TX and RX together. Having connected up the HT and LT batteries to the receiver (temporarily mounted in a bench test-bed) I switched on and operated one control. I could hear a faint note from one of the reeds, and by careful adjustment of the appropriate potentiometer the note became more distinct, and one of the relays pulled in. On releasing the

control the relay dropped out. I now made an optimum adjustment by gently rotating the pot. while I pressed and released, as it is not the loudest tone which necessarily gives the best relay response, and a very small movement can make a lot of difference. I then did likewise with the other two controls, and finally tried each in turn. Response was immediate and positive in each case; so far, so good.

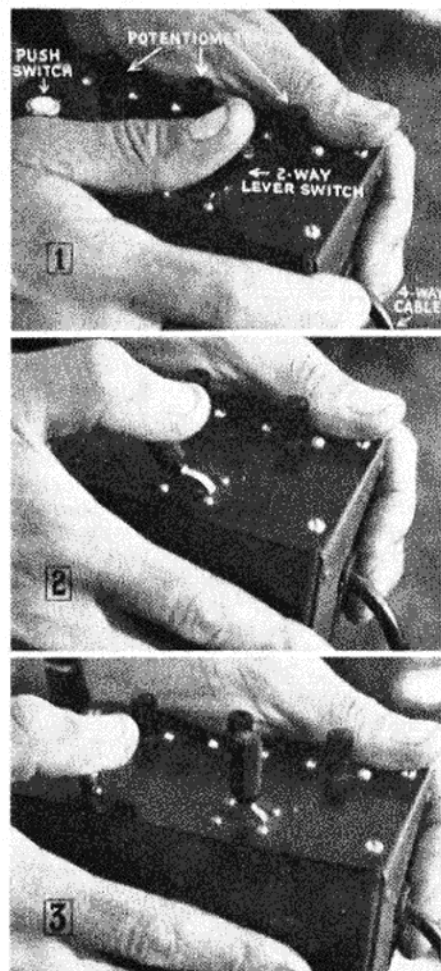
I now had to decide which reed to use for which purpose. I decided to use the shortest reed (highest tone) for rudder, the longest (lowest tone) for elevator, and the middle one for motor. It is possible, with faulty adjustment, to



get some interaction between adjacent reeds, and I obviously wished to have the widest possible separation between the two flying-surface controls, motor control not being so critical. Each potentiometer on the control-box can, of course, be tuned to any of the reeds, and the type of box usually supplied for 3-channel operation has one two-way lever switch and one push-switch. I decided to use the lever switch for rudder and elevator, leaving the push-switch for motor speed.

To minimise the possibility of accidentally confusing rudder and elevator operation I use the thumb ONLY to operate the lever-switch, keeping the fingers religiously at the side of the box. For rudder control the thumb is placed at the "back" of the lever, which is then operated in the same way as the push-button in rudder-only flying. When I want elevator control I have to make a deliberate and conscious manual movement to bring the thumb to the front of the lever so that it can then only be moved backward. Motor control presents no problem, as the whole hand is moved back so that the thumb can press the push-switch. The photographs illustrate the technique, and provided this is rigidly followed there is virtually no possibility of confusion in use, in fact the technique very quickly becomes automatic. I have to date boomed only once, and that on my very first multi flight.

Each relay of the "Tritone" has three leads for wiring up to the relative servo circuits, white (armature), blue (back contact) and green ("make" contact). For some servo systems all three would be used, but in the case of self-neutralising actuators only the white and green leads are required, the blue being neatly twisted and tied away safely, for possible use at a later date if desired. Wiring-up is simple, as per

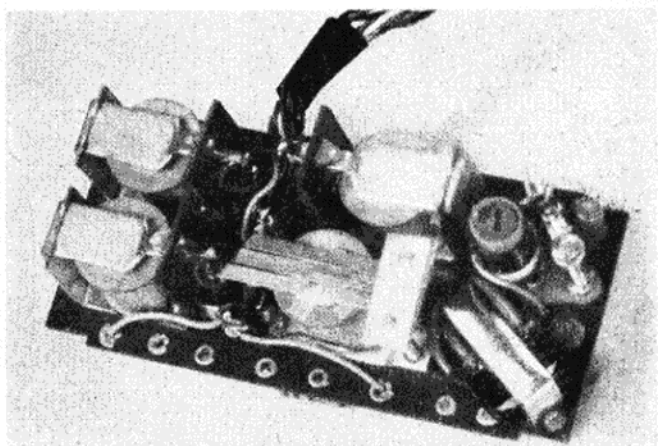


"Safety" technique when using three-channel control box to operate three sequence actuators—(1) Rudder control, using lever in the same way as push-button is used in "rudder-only," i.e., with thumb only, so that lever cannot be unintentionally pulled backward. (2) Elevator control, with thumb moved to front of lever for similar reasons. (3) Whole hand moved backward, thumb moving to push-switch for engine control.

Fig. 1. The three white leads are cabled together and connected to one side of the actuator battery (it is immaterial whether this is positive or negative). A single wire connects one terminal of each actuator, from the rudder actuator at the tail to the elevator actuator at the rear of the cabin, then to the motor actuator at the front, and finally to the other side of the battery. Each of the three green leads is then connected separately to the second actuator terminals. If you wish to identify each pair of relay leads (white and green) in order to select particular reed/relay circuits for specific controls (as I have done in taking the lowest tone for elevator, highest for rudder and middle for engine-speed), you will have to place a flashlamp bulb temporarily in series with each white/green pair to ascertain which is which. If you have no such preference this simple test is not necessary, and you can connect any of the green leads to any actuator.

Finally, let me offer a word of advice. Don't try to improve or modify the receiver with any pet brainwaves of your own unless you are a genuine, dyed-in-the-wool radio expert and know exactly what you are doing and what the results will be. The manufacturer must, in the very nature of things, know more about

The photograph on the right shows the R.E.P. Tritone receiver, mentioned in this article. The outer casing has been removed to show the very neat yet accessible layout of the chassis. All three relays and the reed unit are readily discernible.



it than rule-of-thumb characters like us, and if the "improvement" were necessary or even desirable it would have already been built in. I foolishly thought I'd "improve" my receiver by fitting (with great difficulty) adjustable screw contacts for the reeds in place of the fixed silver wire. As the silver wire is rigid and does not move about, and also ensures perfect electrical contact at all times, my modification was not only completely pointless but actually less

efficient. When this was pointed out to me I at least had the sense to remove the offending gadget and replace the silver wire as originally supplied, but I should never have done it in the first place. If something is actually wrong, of course, that is a different matter and you should put it right if you can—if not, return the receiver to the manufacturer for expert attention.

To be concluded next month

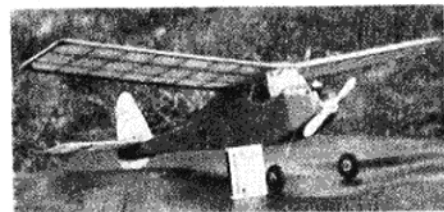
## ROVING REPORT

Continued from page 329

situation arose in the open rudder event where second place winner Milton Boone's very successful *Charger* design took 1st, 2nd and 4th places. "Rudder," by the way, does not mean just that: an engine throttle is also permitted, so *Charger* uses an O.S. Max Multispeed 0.15 engine, connected to a Varicomp escapement, for three engine speeds.

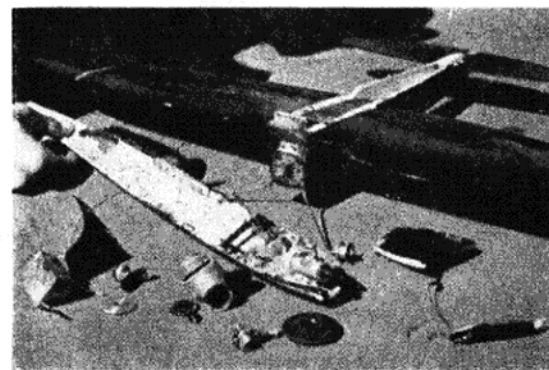
No one could claim that American R/C is in a rut... Howard Bonner flew a remarkable pylon racer highly unorthodox in both design and construction. A delta-pusher, it had a vacuum formed skin of butyrate plastic sheet, internally stiffened with expanded polystyrene. Another remarkable piece of work was a scaled down Astro-Hog complete with "scaled down" 8-channel gear, for an all-up weight of only 2½ lb. Motor was an O.S. Max Multispeed 15.

The 1959 American Nationals, the 28th to be held, were unique in that, for the first time, they included at least one contestant from every State in the Union. Under a scheme promoted by the Hobby Industry Association of America, one modeller was selected from each State (including Alaska and Hawaii, to make 50 in all) and had all his expenses paid for the round trip to the week-long meeting at the U.S. Naval Air Station, Los Alamitos, California. The lads (all under 21) seem to have justified their attendance: they took home no less than 70 awards between them.



All-India Rally. K. M. Khanna, joint winner of the concours d'elegance, with his Laurie Ellis designed "Javelin."

As usual, several of the larger engine manufacturers (notably Cox, Fox and K & B) provided free servicing for contestants' engines. Crash damaged or otherwise unserviceable motors were quickly dealt with to enable modellers to get back into the contest.



Above: Klaus Wegewitz of Berlin, an employee of the Webra engine concern, built this tiny Pee-Wee powered R/C model. Less than 23 in. span and 6 oz. weight, it has two-channel radio.

Left: awful results of a high-speed team race crash, in the 1959 Chrysler-Plymouth contest at Helsinki, Finland. See text.

Right: impressive R/C glider by K. Ginalska, Poland, left. Z. Korsak is adjusting Russian-made RUM-1 radio.



# CLUB NEWS

## SOUTHERN COUNTIES R/C RALLY

A strong wind was a severe handicap to the flying at Middle Wallop on the occasion of our first all R/C rally, but this did little to impair the enthusiasm of the large entry. Greatest interest was centred on the multi entries; in fact, the single-channel and glider fliers were hard put to make any impression against the wind.

Olsen and Uwins put up a very good performance to finish first and second in multi, and they were closely followed by Ed Johnson, who also had a large part to do with running the meeting.

Although the flying was very good all day it was late in the evening that things got really exciting when Olsen and Uwins put on an R/C combat display.

Although no cuts were made there were many near misses—of models and ground. On one occasion Uwins actually clipped the ground with his wingtip and recovered! The session was brought to a rather premature close when Olsen lost control and his model crashed in the car park—fortunately with not too much damage.

### RESULTS

Multi	Single	Glider
1. Olsen	1. Wood	1. Cole
2. Uwins	2. Robinson	2. Hitchin
3. Johnson	3. Hales	3. Taylor
4. Riall	4. Sturdy	
5. Rogers	5. Thumpston	
	6. Sheldon	

## NORTHWOOD M.A.C.

Thanks to the Oliver-powered *Razor Blade*, we, with allies Kenton M.A.C., have gained five firsts, one second, and six semi-final placings so far this season, making us top combat club for the second year running.

Combat flyers Pete Perry, Dick Pratt and "Tib" Tribe proved that this trio can be all-rounders by placing one, two, three in the club championship.

## FORESTERS M.F.C.

The Foresters M.F.C. took a stand at the Nottingham Ideal Homes Exhibition. A great deal of interest was shown by old and young alike; in fact, so great was the interest that it resulted in there being literally hundreds of spectators at our last two meetings at the local airfield. The models at the exhibition included an *Astro Hog* by G. Pike, a *Rattler* by B. Tozer, a *Sopwith Scout* by T. Woodward and numerous other flying models.

There were also on show about 50 plastic models, a collection of engines mounted on a frame ranging from 1947 to 1959 and including every interesting engine made during that time.

An unusual exhibit was an uncovered *Shock Wave* designed by G. Pike which is an 8 ft. 6 in. low wing R/C model with ailerons, retracting undercarriage, etc., which he intends to fit with 10-channel simultaneous equipment of American design.

Members do not seem very competition minded, although the turnout for pleasure flying on Sunday afternoons is excellent. A good 80 per cent. of the membership turn up regularly. Many non-members are taking advantage of our excellent facilities without the responsibility involved. We have a working arrangement with

the Sherwood Flying Club at Nottingham who use the same airfield (with full-size aircraft, of course), whereby we keep out of their way so as to keep well clear of the runways in use. The non-members are abusing this agreement which could very likely lose us the use of the airfield.

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

Strange happenings dept.—One combat-weary type, for want of something better to fly, recently turned up with a two-year-old A/2 which, d/t-less, and in perfect conditions, promptly turned in a 14 min. flight, yet came down no more than a mile away. A fortnight later, suitably imbued with free-flightitis, said model was entered in the D/C C.M.A. Cup and somehow turned in 7:32.

## STEVENAGE M.F.C.

With the continued lack of a suitable local field for flying, most of our activity seems to centre around the keen contest types. However, Monty Welch continues to orbit models rapidly in the team race practices at the Barclay school playground most Sunday mornings. We did 4:40 for class "A" last week, not sure how this compares with other people's times—never seem to see any.

Earlier in the season Mavis and Pete Giggie seemed to have suffered from the Stevenage jinx before Mavis placed third in glider at the Surbiton gala. We had a disastrous day at Cranfield for the team events; not only were six models pranged or lost but the comp. sec. also set fire to his trousers with the d/t fuse. However, we made amends at the area picnic, for Geoff Dallimer won the rubber event, with Alan Payne third, and Johnny Brookes was only beaten into second place in glider by about the last flight of the day. We are still unravelling towlines after the mass glider launch!

## SHIREBROOK M.A.C.

The Shimaks really went to town with a static exhibition arranged in a local dance hall. With something like 100 models to set up it was quite a performance, everything from 7 ft. *Radio Queens* down to the smallest plastic. Some 30 models were shown by Riddley Fidler (Bolsover); although not a club member he is a keen plastic enthusiast.

The club's Concours d'Elegance (building and finishing) contest was judged by Mr. Frank Kirk—Senior Air Traffic Controller, Rolls-Royce, top marks going to Barry Pepperday with his H.P. *Hadrian*, with Fred Richards and his *Tiger Moth* a very close second.

The flying side of the Concours was won by R. Foley with his C/L *Mosquito*. The judging of the flight pattern was carried out by Bill Cox, Air Traffic Controller, Rolls-Royce, who pooled his results with Mr. Kirk and so decided the outright winner.

A competition was flown for the Mrs. Pepperday Trophy (F/F power), this being won for the third year in succession by Albert Duncan. His plane was his own design powered by a Frog 2.49 modified, and for his success (and cheek) the club has bought him a small trophy to keep as his own.

## CROYDON & D.M.A.C.

Den Partridge won the South Coast Gala glider event for us with his pair of now ageing *Nebulae* in quite breezy conditions at Tangmere; Ken Smith and Jack North both had off-days and bent models for no apparent reason. Ken in addition had a three-mile trot to West Hampnett to collect his Frog 3.49 model from the care of a cow who fortunately wasn't partial to balsa.

Next week, when the lads arrived at Chobham around 10 a.m. they found that the handy types had already scored seven treble maximums in the Frog Senior; John Blount saved the day by

At the Southern Counties R/C Rally, C. Riall, who can do anything with his "Gallop-ing Ghost" model except make it talk, spoilt his chance of winning by attempting a touch and go landing, which was in the middle of the schedule. What with the high wind and rather rough grass it was the prop that touched and the engine no go!

topping the London Area results with 8:29 in the C.M.A. event.

There was an excellent turnout at Chobham Common for our rally this year, and although it was rather windy there was the almost inevitable fly-off in rubber and glider. Panic stations were called when some handy soul set fire to a gorse bush by over enthusiastic pumping of a primus stove, but concerted fire-fighting action averted a widespread fire.

### RESULTS

Rubber	
1. J. O'Donnell	Whitefield 9.00 + 4.42
2. E. Thorpe	Derby 9.00 + 3.10
Glider	
1. R. Monks	Birmingham 9.00 + 3.10
2. J. O'Donnell	Whitefield 9.00 + 1.28
Power	
1. J. Wisner	Surbiton 7.50
2. P. Mullen	Surbiton 7.14
Slope Soaring	
1. J. Baguley	Hayes 2.11
2. G. Fuller	St. Albans 1.15

## SIDCUP A.S.

At the A.G.M. it was unanimously decided that the club known as Sidcup Model Society be dissolved and a new club, to be known as Sidcup Aeronautical Society, formed. Meetings are held at the Prince of Wales public house, Mottingham.

We are staging an exhibition in aid of the Sidcup Handicapped Scouts on December 12th in the Woolwich Baptist Hall, when we hope to attract many of the Christmas shoppers. One inspired club member has built a Hovercraft and we hope to develop this idea further. If possible, we would like to hold a C/L rally some time next year—we have several good cups to be won.

## BRIERLEY HILL AERONAUTS

We are now busy analysing the results of the competition season and one thing is very obvious. With more and more 4 min. max's being used to eliminate those horrible fly-offs, club recovery teams win contests, but it does need considerable sacrifice on the part of the team. They have to give up all hope of flying on the day of the competition and be prepared to do a lot of hanging around "in the country." In the recent Keil Trophy team power "do," the club's Johns (Smith and Marshall) never missed a model and but for a bug in treasurer Mick Wilkinson's model, we should have beaten our big neighbours Birmingham and Coventry.

## UNITED SOUTHERN AEROMODELLING CLUBS

The association held its first flying meeting recently, which was attended by Lancing, Worthing, East Grinstead, Horsham and Chichester M.A.C.s. This meeting took place on Goodwood motor circuit which is Chichester's flying ground.

The F/F went off well, with many models disappearing into the blue without d/t's. The C/L events, however, were very much damped by rain, which claimed more streamers than the contestants did themselves.

### RESULTS

Sailplane	
1st G. Richardson	Horsham
2nd Mrs. Giggie	Stevenage
3rd M. Smith	East Grinstead
Power	
1st R. Godwin	Horsham
2nd N. Elliott	Men of Kent
3rd M. Russell	Horsham
Rubber	
1st N. Elliott	Men of Kent
2nd D. Later	Men of Kent
3rd J. Potter	Chichester
Stunt	
1st J. Bashford	Worthing
Combat	

Rain stopped play.

Anyone wishing to join the association may obtain details from R. Elliott, 6, Orchard Avenue, Lancing, Sussex.

## GOATSHED KNIGHTS M.F.C.

We are now well into our second year of existence and several changes have taken place during that time. In recent weeks we have gained several new members and in an effort to make some of the members more competition-conscious we are now running a club comp. every two weeks. Competitions to date have been "A," T/R, "A" combat and combat. It is intended





to present a cup to the club champion in 12 months' time, which will be worked out on a points basis, simply by giving one point for entering a comp., three points for 1st, two points for 2nd, and one point for 3rd.

We are also corresponding with Glenelg Model Aero Club (Australia) and are exchanging news and ideas on aeromodelling. One of their ideas we have adopted ourselves: it is to divide the club into teams of three, and we are also incorporating this in the club championship.

Club meetings are now held every Monday and Friday evenings at the Parachute Association, 17-19, Leopold Street, Gateshead. Anyone interested will be most welcome.

#### WICKFORD MODEL AERO CLUB

We have now re-formed the club and hold meetings at Wickford Secondary School on Thursday evenings. Anyone interested in joining will be welcome.

#### ANGLIA M.A.C.

At the recent area club championships held at Deben we had quite a successful day—placing 1st and 2nd in senior glider, using an *Inch Worm* and a *Caprice*. H. Humphries placed 2nd in junior glider and honours also went to the C/L section of the club, who won senior combat and placed 2nd in junior. This was the first time that either of the juniors had entered a competition and should spark off new activity amongst the younger members.

#### HAYES M.A.C.

In the Farrow Shield we topped the London area results, but know of three clubs at least with higher times in other areas.

At Tangmere, Pete Hedgeman and Josh Marshall took 2nd and 3rd in tailless (out of four), and Jim Baguley at the Croydon gala, disgusted with poor glider times, hurled his toy aeroplane off the hillside to record one of his best times of the day, 2:11, to win the hand-launch slope soaring comp. for the third time.

#### SQUARES STUNT CLUB

This is a new club, devoted strictly to stunt C/L models, but modellers who have current membership in another club are not excluded from joining.

The club was formed with eight members and a large variety of good stunt models, motors, etc. We will be holding contests in the club every fourth week through the winter to improve our standard of building and flying. These contests will be thrown open to all comers to assist this purpose. Flying meetings are weekly, of course—Sundays at Wanstead Flats, an excellent flying ground for stunt models.

Anyone interested in our activities can see us flying as above, or contact M. Jewby, 7, Lawrence Road, Forest Gate, or telephone GRA 8138.

#### EAST LANCASHIRE M.A.C.

Our visit to the Northern Gala proved to be a good day for us, although not winning any of the events. E. Lord missed the third place in PAA load by 3 sec., and A. Garnett reached the fly-off in glider with an *Inch Worm*. A. Buchel

### RECENT RESULTS

#### KEIL TROPHY

1. Surbiton	48.00
2. East Lancs.	45.32
3. St. Albans	44.43
4. Ashton	40.34
5. Coventry	38.18
6. Wigan	36.03

31 clubs competed.

#### FARROW SHIELD

1. Coventry	44.32
2. Birmingham	43.25
3. Leamington	43.07
4. Hayes	41.07
5. Croydon	39.10
6. Surbiton	38.31

29 clubs competed.

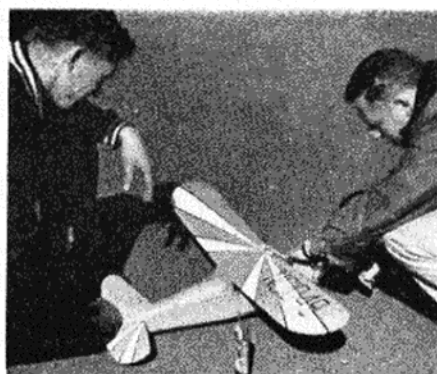
#### FROG JUNIOR TROPHY

1. A. Tossell	Port Talbot	8.07
2. C. Jackson	Chorlton	8.06
3. G. Moore	Port Talbot	6.46

20 entries.

#### PLUGGE TROPHY

1. Baildon	1344.243 pts.
2. Surbiton	1281.214
3. Coventry	1173.994



At the R.A.F.M.A.A. Championships prolific model builder "Brush" Johnson, above, of R.A.F. Manby flew a beautifully finished Mercury Stinson 105 to win the F/F concours event. Photo on the right shows winners of combat and 2nd in F.A.I. Team race, Scotsman L/A Robertson, and Australian, A/A Phinn, both of R.A.F. Locking.

dropped 45 sec. in power, he followed up this effort with 12 min. in the Keil Trophy.

We are busy making arrangements for our winter rally at Walton Spire on December 6th. Competitions will be held for U/R power, rubber and glider, combat S.M.A.E. and "A" combat for up to 2 c.c. R/C and chuck glider. Full details can be obtained from L. Clarkin, 19, Fair View Road, Burnley, on receipt of a stamped addressed envelope. Visitors will be able to purchase hot meals at a nearby cafe.

#### CAMBRIDGE M.A.C.

The R/C fliers kept the large crowd of spectators and competitors entertained all day with some very good flying at our slope soaring rally at Ivinghoe Beacon, but those with F/F models were reluctant to fly because of the strong wind which persisted nearly all day. Previous experience at their own Ivinghoe rallies seems to have paid off for the St. Albans boys, and D. Edwards' vane-steered model was certainly the thing for F/F soaring.

Though we feel that interest in slope soaring is fading a little, the rally was a success since most of those present had a good day's flying. We hope they enjoyed those brown bottles we gave them as prizes. It wasn't beer—it was Titanine 753—DOPE! (Anyone got themselves lined with cellulose?)

#### RESULTS

Radio-control	
1. G. Upson	Northwick Park
2. R. Godden	Cambridge
Free-flight	
1. D. Edwards	St. Albans
2. W. Cleghorn	St. Albans
3. J. Burrows	St. Albans

#### NOVOCASTRIA M.A.C.

It was a fine day—for the third year running—for the club annual Rush Trophy Gala, held on the Newcastle Town Moor. This trophy, which is awarded to the person who, on the gala day gains the greatest number of points, went to E. Black of Glasgow.

#### RESULTS

Glider	
1st Black	Glasgow
2nd Firth	Sheffield
3rd Meechan	Glasgow
Power	
1st Spurr	Teeside
2nd Firth	Sheffield
3rd Grey	Wakefield
Rubber	
1st Black	Glasgow
2nd O'Donnell	Whitefield
3rd Chambers	Teeside
Combat	
1st Farrar	Wakefield
2nd Laurie	Novocastria
Consolation—Smith	Stanley

#### WESTON CONTROLINERS

At the Western area R.A.F. championships, two of our members did well. "Red" Phinn



came first in combat and F.A.I. team race, second in stunt and third in "A" team race, and R. Robertson came second in combat.

At the Western area meeting at Blake Hill Farm, R. Johns won back the Weston cup, presented in 1949 by Mr. Evans of the model shop. The cup this year was for "A" team race due to poor entries in F.A.I. team race. C. Hunt came second in the "A" team race and Pete Heeley won the combat, R. Johns coming second. G. De Mellow won the stunt with a *Spectre* that he pranged earlier in the day but managed to repair it in time for the comp.

At home, as a result of the exceptional weather, N. Wilkins put up a flight of 14 min. 10 sec. on a 17 sec. engine run with his Merlin-powered K.K. Skylon.

#### NORTH KENT NOMADS

We are holding our annual dinner on November 28th in the Grove Tavern, Dulwich. Tickets will cost 17s. 6d. each and anyone interested in attending should immediately contact Bill Hubbard, 161, Hook Lane, Welling, Kent.

#### CHANGE OF SECRETARY

SIDCUP AERONAUTICAL SOCIETY. Michael Bassett, 209, Bexley Road, Eltham, S.E.9.

WICKFORD M.A.C. L. Warren, Bromfords Villa, Borwick Lane, Wickford, Essex.

GREENFORD M.A.C. R. A. Exall, The Conservative Club, Courthope Road, Greenford, Middx.

GIRLING A.C. B. Young, 11, Farn Lane, New Town Centre, Cwmbran, Mon.

EAST LANCASHIRE M.A.C. E. Lord, 3 Eaton Bank, Rough Lee Road, Accrington.

#### NEW CLUB

FOUR ASHES M.A.C. A. R. Owen, 75, Slater Road, Bentley Heath, Solihull, Warks.

## ALL HOG WASH

Continued from page 328

Salty nodded miserably.

"They're looking for him now," said he. "Seems to have disappeared for the nonce."

Just then Little Willie came bounding up, looking a bit white around the gills.

"Guess who I've just seen?" he gasped.

"A ghost?" hazarded Salty.

"Sort of," panted Willie, "I met Crummy's mother. She said she was sorry Crummy hadn't been to the club lately, but he's been in bed for the past few weeks with a chill. Something to do with rummaging about in a damp old vault."

"Then that—that wasn't Crummy?"

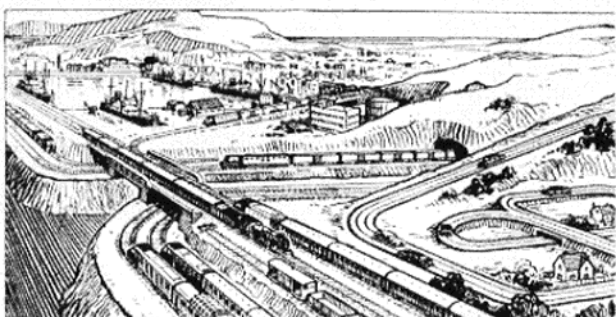
"Couldn't have been," replied a horrified Salty, "Must have been the boy himself, Erasmus."

"But how does a g-ghost collect the prize money?" asked Willie.

"Well, now," replied Ted, drawing a false nose from his pocket.

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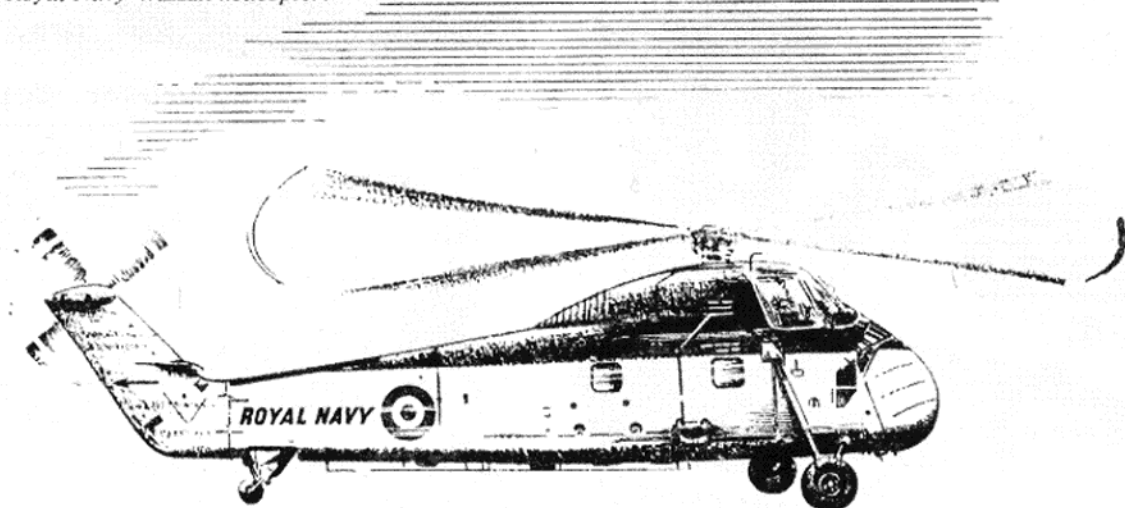
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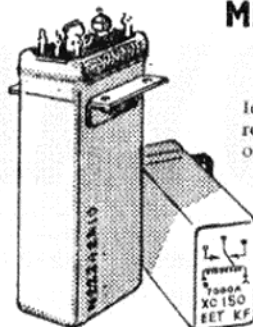
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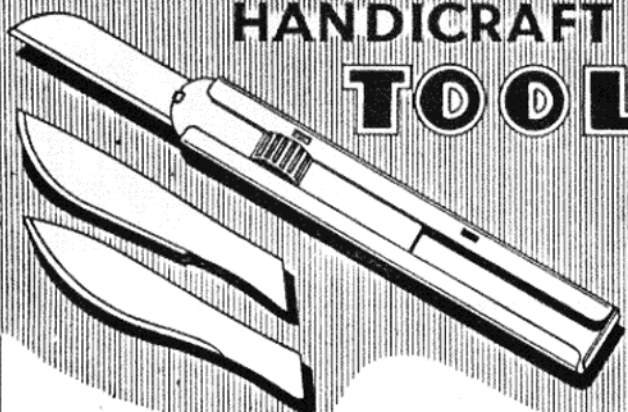
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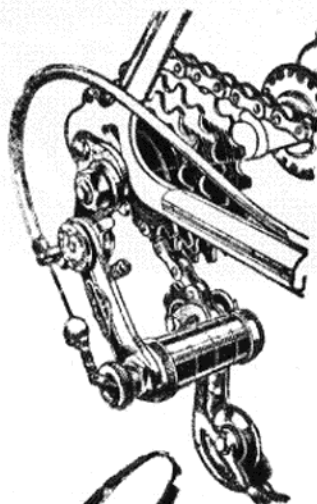


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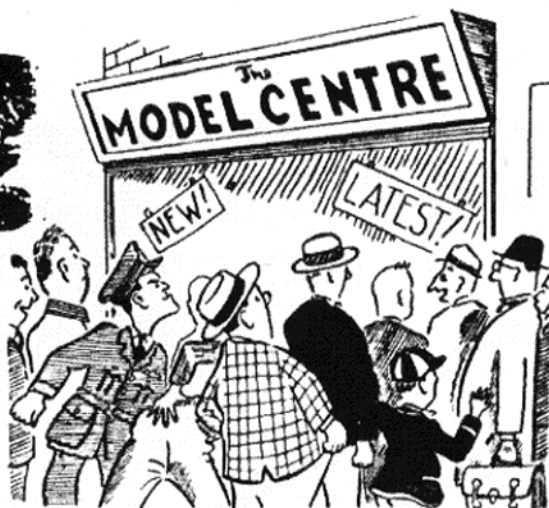
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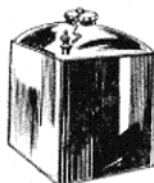
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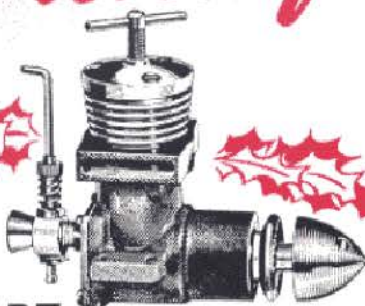
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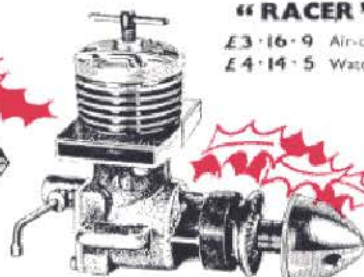


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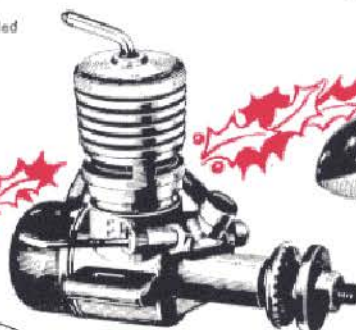


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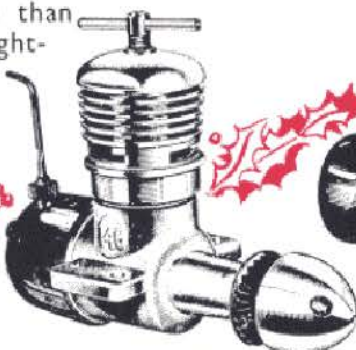


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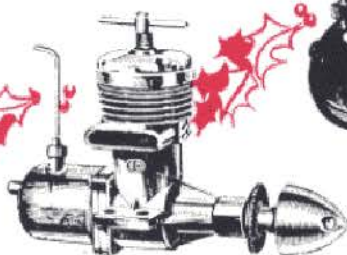


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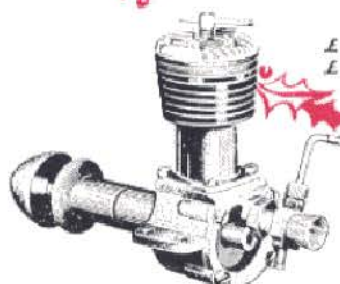


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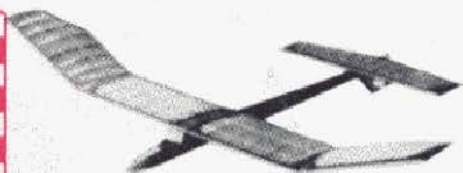
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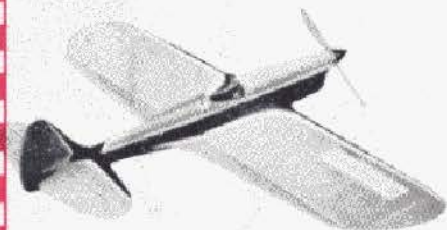
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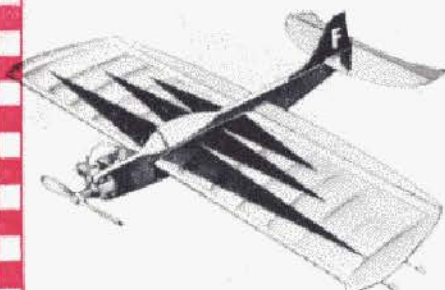
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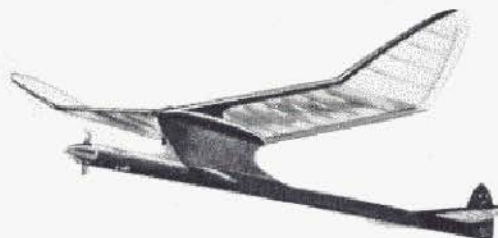
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