

MARCH 1960

1'6

# MODEL *aircraft*

*Model Aircraft  
Wings Club -*

Full details inside



**HOW I BUILD  
MODELS LIKE THIS -  
by scale expert -**

**Cesare Milani**

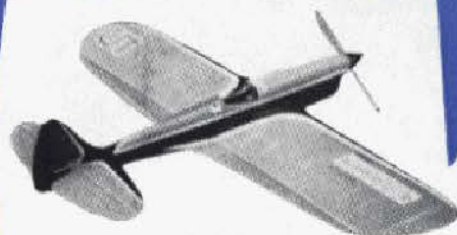


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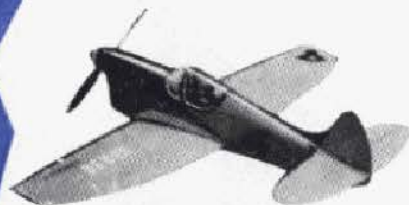
### SPECTRE

41" span stunt model for 2.5 to 3.5 c.c. motors. De Luxe kit. 37/6



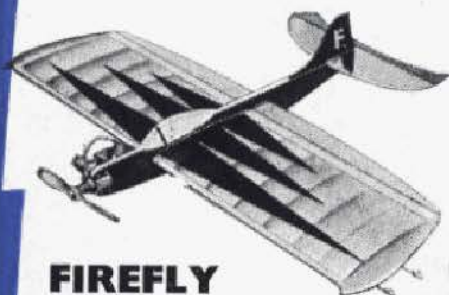
### GAZELLE

28" span stunt model for motors from 1 to 1.5 c.c. 19/10



### DEMON

30" span class 'A' team racer for motors from 1.5 to 2.5 c.c. 29/6



### FIREFLY

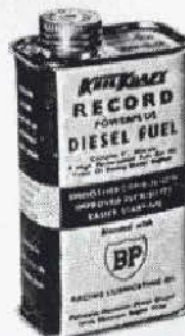
20" span stunt model for motors under 1 c.c. 15/9

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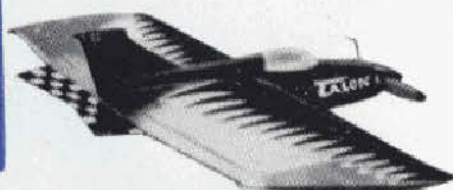
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### TALON

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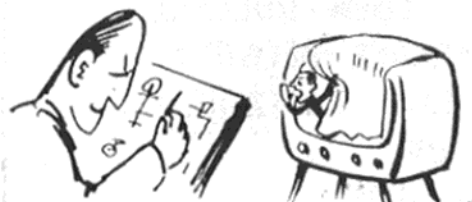
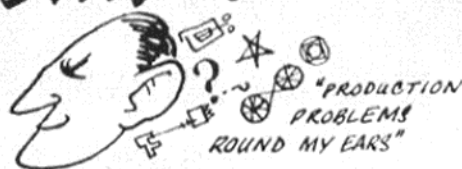
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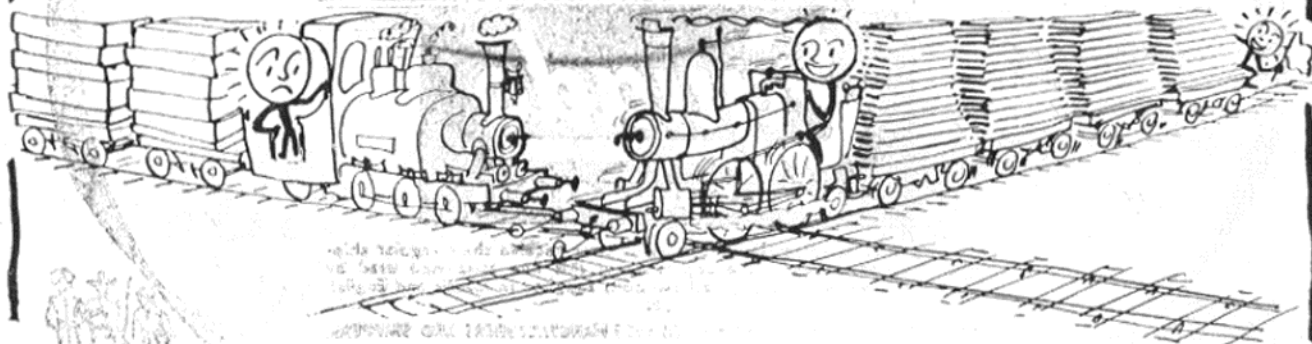
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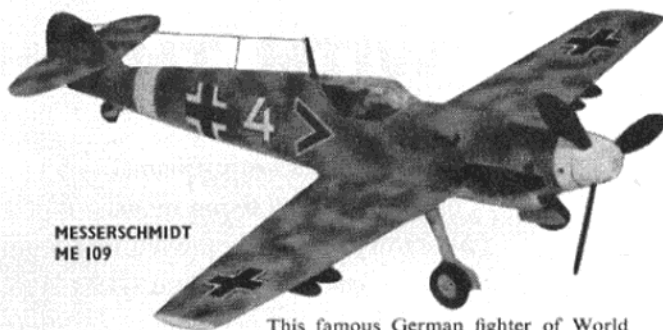
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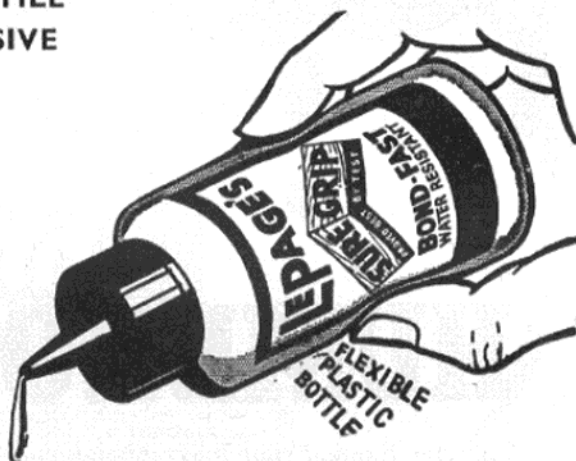
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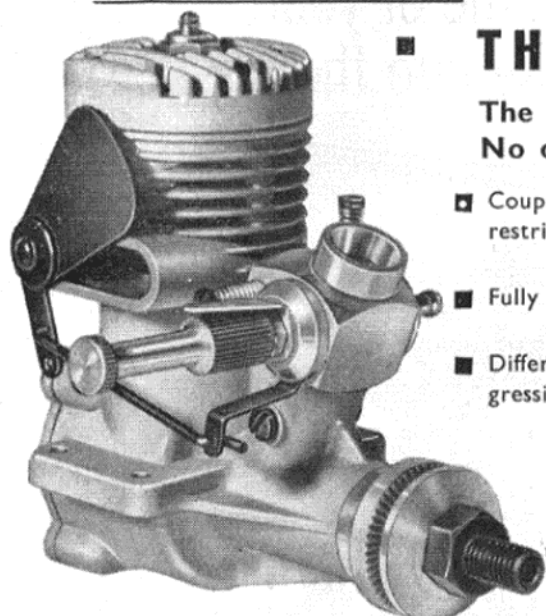
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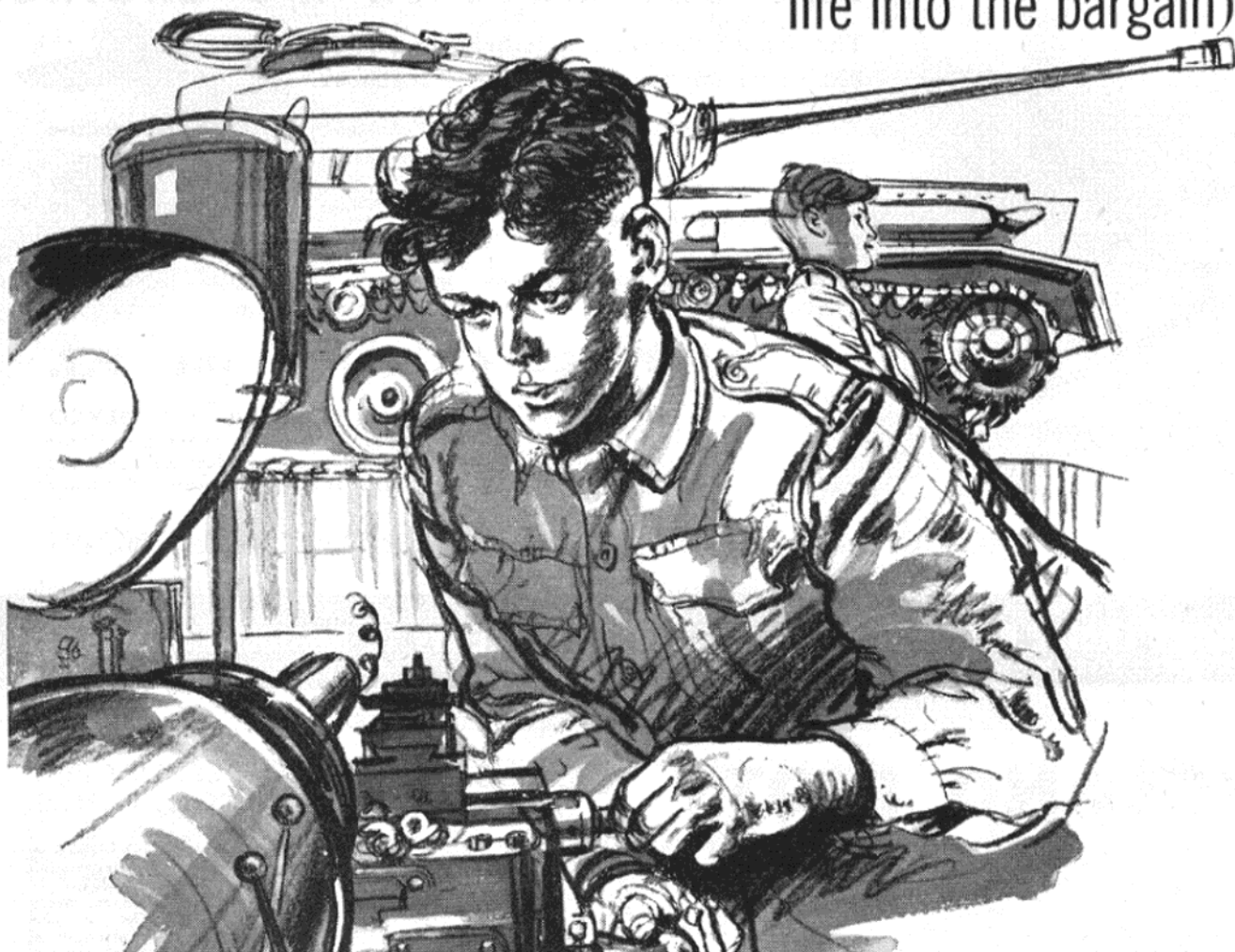
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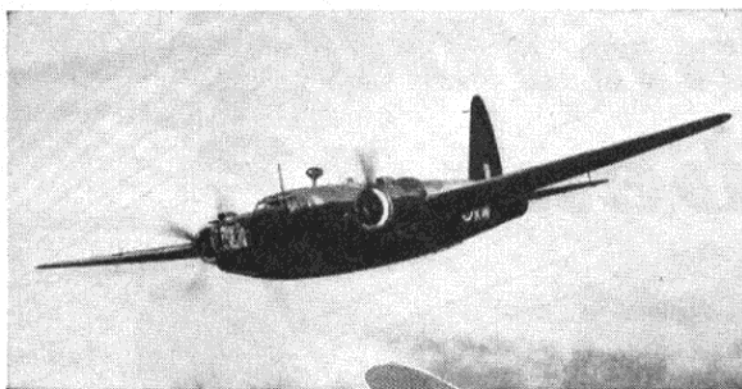
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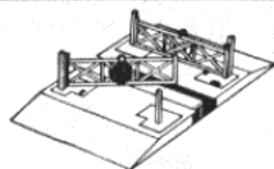
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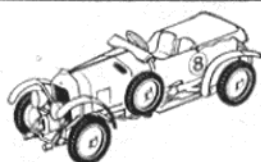
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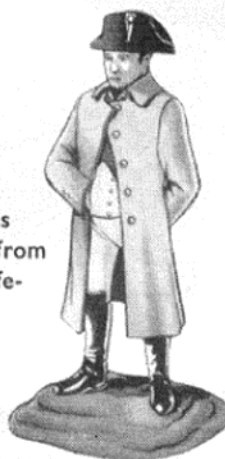
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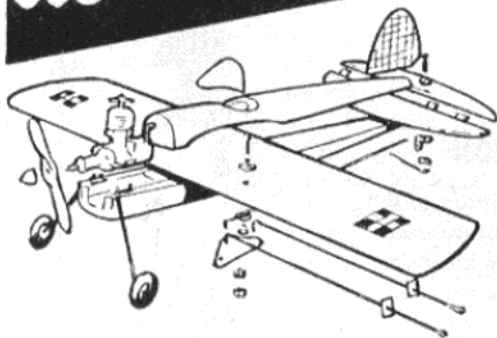
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MARCH 1960

No. 225

VOLUME 19

EXECUTIVE EDITOR: C. E. WALLER

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The official Journal of the  
SOCIETY OF MODEL  
AERONAUTICAL  
ENGINEERS

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

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

Telephone: GERrard 8811

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

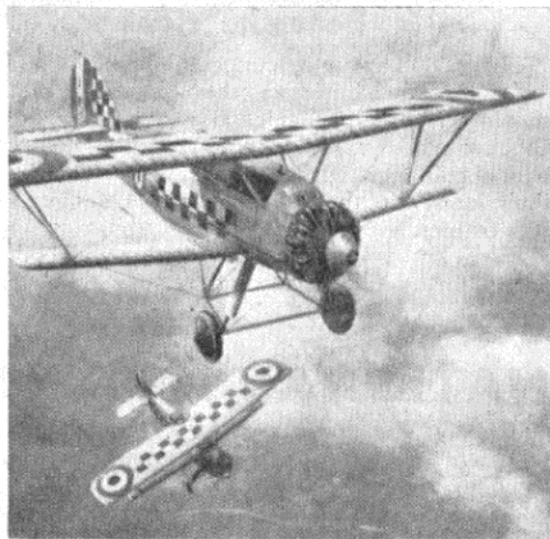
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## Here and There

FOUR years ago we produced a special "Vintage" issue of MODEL AIRCRAFT, and so popular was this that we still receive requests, from all over the world, for copies, although this issue was, in fact, sold out immediately on publication. Encouraged by this demand, and the many letters we have received, we have decided to make our next issue another vintage one.

A reproduction of the cover, which will be in full colour, is shown below. It is from a painting by well-known modeller P. E. Norman, and shows two Siskin IIIa's of No. 43 Squadron, R.A.F., while featured inside will be P.E.'s detailed plans for building a F/F replica of this aircraft, which can also be adapted for R/C.

Of particular general interest is an article by Major C. Draper, D.S.C., in which he gives his impressions on many W.W.I and other early aircraft which he has flown. Illustrating this article are photographs, many of which have never before been published, from Major Draper's history packed personal albums. These are but a few of the interest-packed features which will appear in the April issue of MODEL AIRCRAFT, there is not space here to tell of everything we have in store. Regular and "non-vintage" readers have not been forgotten of course, and many other popular features will be included. Don't forget to look for the colourful cover at your shop on the 20th of next month, or, better still, place a firm order now, because they are bound to sell out quickly!



### Scale scoop!

CAPTAIN CESARE MILANI'S happy smile on this month's cover was well justified, for he had just won the Championship Cup at our National Models Exhibition with the 1/4th scale Bristol F.2.B, which he is proudly holding.

Cesare's fascinating approach to his model building is revealed in his very interesting article which starts

on page 81 of this issue. It will be seen that his interest is not only in building but also in flying these beautiful scale models. Cesare intends to fly his Bristol fighter in the scale event at this year's Nationals at Scampton and this should be one of the highlights of the meeting.

It will be recalled that he won the Nats. in 1958 with his Ansaldo SVA, and in 1959 with the Fokker DVII. Naturally he's trying for the hat trick. The latest project is a 1/8th scale *Fury* and, perhaps, we'll have the pleasure of seeing it flying before the end of the year.

Although Cesare Milani's scale model work is internationally known, a rather surprising fact is that he did not start modelling seriously until 1946.

On this subject another enthusiast who only began modelling as a "senior" but met with considerable contest success, was J. L. Pitcher. Mr. Pitcher, a well-known member of the Croydon Club, started building Wakefields at retiring age, and went on to win numerous open events, the Irish Nationals and also gained a place in the 1950 Wakefield team which visited Finland. So come on you youngsters, get dad interested—he might be a prospective World Champion!

### Beat the clock

VERONS are to be congratulated on the initiative they have shown with their novel "Beat The Clock" model building competition which coincides with the release of their latest kit, the 19 in. span C/L *Colt* trainer.

Each kit contains a competition entry form and the modeller is

invited to state how long it took him to assemble the kit up to the doping and engine installation stage. The competition is to run for four months and six E.D. diesel engines are to be awarded each month to the modellers who complete their *Colts* in the shortest time.

Veron have divided entries into three age groups, up to 13, 14 to 17, and 18 and over. To assist the juniors MODEL AIRCRAFT will present the *Colt* as an illustrated constructional feature in next month's Wings Club pages.

### De Havilland Lancaster ?

WHY oh why do reputable manufacturers, after spending considerable sums of money on accurate moulds for their plastic kits, continually include inaccurate or fictitious markings?

We seem to be getting over the spate of G-BOAC registrations on every other new airliner kit, but now Frog have perpetuated the crime with their otherwise excellent D.H.89 *Rapide* (see Over the Counter).

The transfers with this model read G-AGUK but this registration really belonged to *Lancaster* "Star Gold" (serial P.P.688) of B.S.A.A.

A most colourful authentic scheme for the *Rapide* would be that still used by the Automobile Association on their aircraft—yellow and black, with registration G-AHKV, or, of course, as B.E.A. still use *Rapides* on their Scilly Isles to Land's End run, the model could be finished in their livery.

### Prize error !

IN our photo report of the S.M.A.E. Dinner and Prizegiving we named

A. Tossell as the recipient of the Frog Junior Cup.

The cup was, in fact, the Heather Trophy for the Junior Champion and it was being received by P. C. McLean of Essex M.F.C.

In the illustrated feature on the National Models Exhibition last month, the model in Photo. 17 was described as a F/F B.E.2E, built by G. R. Quick. Actually this beautifully built model is radio controlled and was built by D. E. Thumpston of Sutton Coldfield—it received a commended certificate. To date the model has logged no less than fifteen flying hours in over 350 flights, a fine achievement.

We apologise to all concerned for these unfortunate errors.

### Wings Club airborne

THE Model Aircraft Wings Club, first announced at the National Models Exhibition, is off to a flying start and we have been greatly encouraged by the fine response to this venture.

The initial flood of entry forms was such that our organisation at this end was strained to the limit, and we are sorry if some of you did not receive your badges, etc., by return post.

There has also been extensive support from the trade and senior modellers who are fully aware of the fact that the expansion of our hobby depends upon a continuous intake of juniors. Many of the articles in the Wings Club pages are, of course, just as useful to non-members. For instance, this month's feature on tissue covering is of universal interest to all modellers.

## NATIONAL MODELS EXHIBITION—aircraft section results

FREE-FLIGHT POWER-DRIVEN AIRCRAFT	
Silver Medal	M. A. Shepherd (semi-scale supersonic airliner)
Bronze Medal	N. Barker (semi-scale sports model)
Very Highly Commended	C. E. Read (delta wing model)
Highly Commended	C. E. Read (freelance experimental autogyro)

CONTROL-LINE MODELS	
Bronze Medal	J. Wylie (semi-scale stunt model <i>Meanstreak</i> )
Very Highly Commended	D. J. Day ( <i>Iroquois</i> 53 in. stunt model)
Highly Commended	Flt.-Lt. N. Falconer ( <i>Gaisgeach Fada</i> semi-scale stunt model)
The MODEL AIRCRAFT Prize	M. A. A. Beckett (semi-scale stunt model)

GLIDERS	
No awards made.	
NON-FLYING AIRCRAFT	
Silver Medal	P. G. Cooksley (Bristol <i>Bloodhound</i> guided missile and Bristol <i>Box-kite</i> )
Very Highly Commended	M. Freestone ( <i>Canberra</i> B Mk. 2)
	H. J. Randall (Bristol <i>Military Box-kite</i> )

Highly Commended	H. J. Randall ( <i>Sopwith Triplane</i> )
	H. J. Randall ( <i>Albatross</i> C.111)

SCALE FREE-FLIGHT OR CONTROL-LINE MODELS	
Championship Cup and The "Bristol" Challenge Cup	Capt. C. Milani (Bristol F.2b <i>Fighter</i> C/L model)
Bronze Medal	N. Barker (F/F <i>Cessna</i> 172)
Very Highly Commended	A. J. Symonds (four-engined C/L <i>Vickers Viscount</i> )
Highly Commended	T. W. Kellard (F/F <i>Spitfire</i> )
Commended	A. F. Clements (F/F <i>Sopwith Camel</i> )
	A. F. Clements (F/F <i>Fokker E.IV</i> )
	J. H. Wilcox (F/F rubber <i>Bleriot Military Monoplane</i> )

RADIO-CONTROLLED AIRCRAFT	
Commended	C. W. Bladgen (R-6-B)
	D. E. Thumpston (B.E.2e)

JUNIOR SECTION	
Silver Medal	J. D. Mitchie (R/C <i>Auster</i> A.O.P.9)
Very Highly Commended	J. Day (F/F <i>Hawker Hind</i> )
	D. W. Gladwin (C/L <i>scale Provost</i> )
Commended	S. Blay (C/L <i>Veron Panther</i> )



# POWER DURATION MODELS

by  
*Jim Baguley*

## Fuselage

It may be said that the purpose of this component is to keep wing, tail and motor rigidly in their correct positions, with provision for adjustment. It must also contain the timer, cut out, etc., and provide the necessary side area in the correct places.

The usual basic fuselage constructions are (a) sheet box, (b) longeron and spacer, (c) longeron, spacer, and sheeting, (d) crutch and former with or without sheeting, (e) planked (usually near circular).

The planked fuselage is probably the best, strength weight and shape considerations taken overall, but is not the easiest to construct. The usual method of building is shown in Fig. 20.

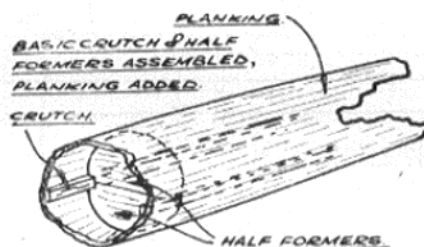
The sheet box construction (Fig. 21) is by far the easiest to make, whether it has sides of equal thickness (Fig. 21a) or top and bottom of large section strip of constant width, with sheet sides (Fig. 21b). It usually has the disadvantage, if built light, of disintegrating fairly easily on impact, but against this it is also easy to repair.

The longeron, spacer and tissue-covered construction (Fig. 22) is light and strong, but its resistance to twisting is largely dependent upon the tightness and strength of the tissue covering if no triangulation is used. The longeron, spacer, and sheet covered construction (Fig. 23) provides an excellent compromise, being fairly light, strong and rigid, and seems to stay in one piece better than the sheet box.

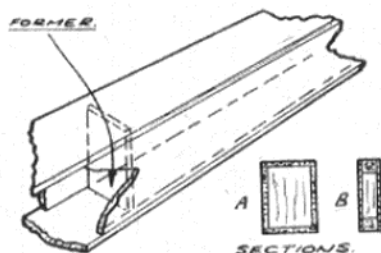
The actual fuselage section is also a compromise, the most rigid shapes being near circular or triangular, with rectangular the easiest to construct; although the elliptical or circular shape may be built up from a basic rectangle or square as shown in Fig. 24.

It must be emphasised that while

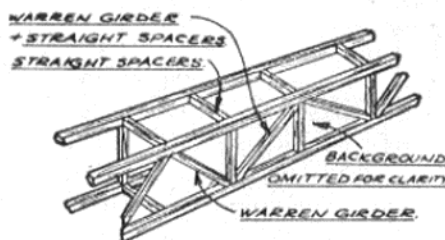
rigidity is not a good thing for promoting crack-proof structures, the fuselage needs to be very rigid in flight to allow minimum distortion due to flight



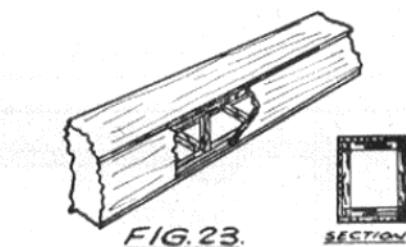
**FIG. 20. PLANKED CONSTRUCTION.**



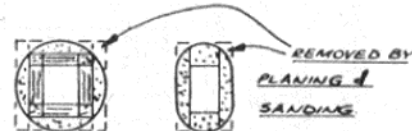
**FIG. 21. BOX FUSELAGE CONSTRUCTION.**



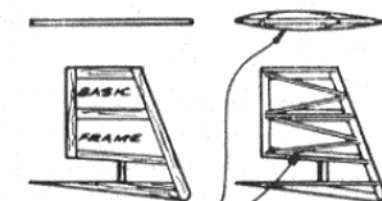
**FIG. 22. LONGERON SPACER CONSTRUCTION.**



**LONGERON & SHEET CONSTRUCTION.**



**FIG. 24. CIRCULAR & ELLIPTIC SECTIONS FROM SQUARE & RECTANGULAR SECTIONS.**



**FIG. 25. BASIC FIN (& PYLON) CONSTRUCTION.**

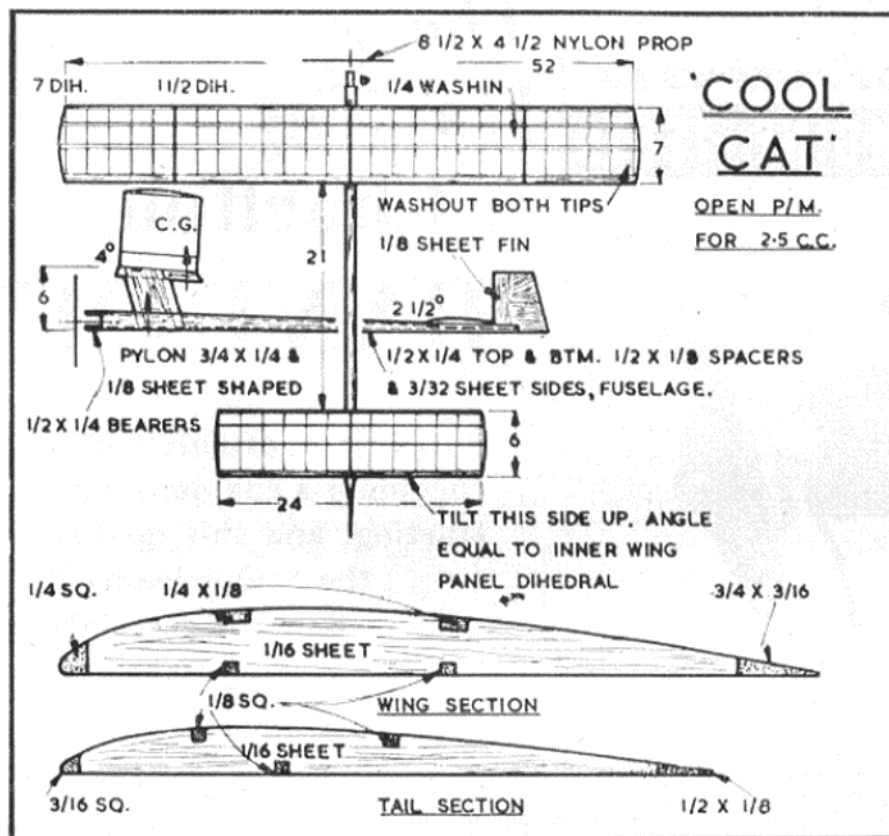
loads. If a pylon is used this again should be fairly rigid and also, to prevent stalling, be of a fairly streamlined section. Fig. 25 shows fin and pylon constructions which have been found satisfactory. The pylon should extend into the fuselage structure, and be sheeted.

The motor mounting should be rigid, but the strength will depend upon which one would prefer to go first in the event of a crash, the fuselage or the motor. For this reason, my engine bearers are usually only extended an inch or so inside the fuselage but the motor fits right up against the front former and small (10 or 8 B.A.) bolts are used.

There are endless variations to the types of fuselage construction so there is little point in going further in describing them in detail especially as the only trouble a fuselage usually causes is in the fitting of components, but a few general notes may not come amiss.

A sheeted fuselage should always be covered in fabric or tissue to prevent grainwise splitting. Wing and tail mounts should be of generous proportions as there is little point in making a rigid fuselage if these components can move! All end grain sheet joints should be pre-cemented. Highly stressed points or points subject to wear, e.g.





fuselage front and wing and tail mounting should be covered with linen soaked in cement.

The grain of the sheet covering of a fuselage should generally run lengthwise but can sometimes be changed locally to good effect to prevent grainwise splitting, e.g. at engine bearers. Cross grain diagonal sheeting is also very strong when allied to longeron-spacer construction.

### General

An important factor in the maintenance of a high strength/weight ratio in the construction, is the selection of wood, this, however, only comes from experience.

It is useless attempting to write only about power duration model construction as so much has already been written on construction in general. In any case, the only difference in the case of power models is the necessity to ensure freedom from warp change as a result of the high stresses incurred during the power run.

### Three Design Studies

### Coolcat

This was an attempt to produce a power model which was just about as simple as is reasonably possible, bearing in mind the necessity for performance. The characteristic climb was found to be, as was expected, a 60 deg. spiral with low rate of roll and turn, perhaps five turns in 15 sec.

It finally came to grief at the Devon Rally after a poor first flight when the Enya had finally become run in and was beginning to "give," the wings

proving unequal to what was demanded of them after 10 sec. of climb! This was due to lack of dihedral braces and poor pre-cementing at the central dihedral joint (lesson now learnt).

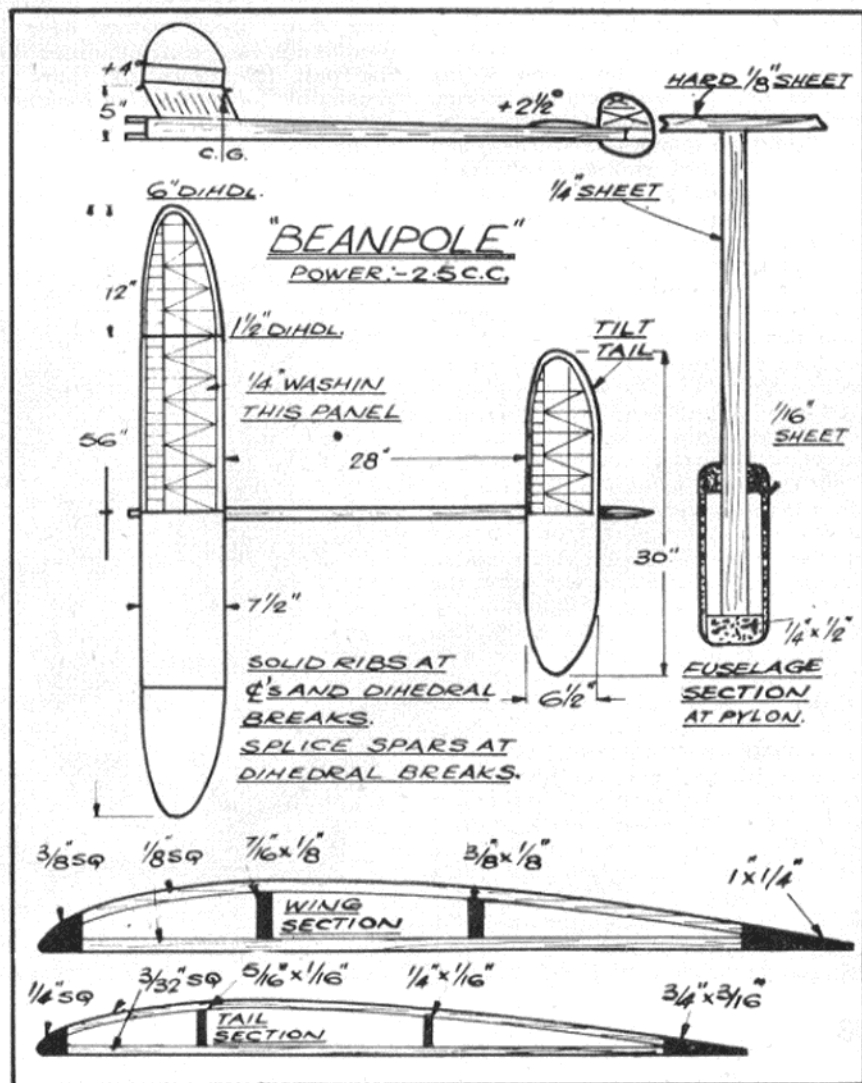
The flat plate fin section is compensated for by very large fin area and the pylon is of small area to lessen any possible slipstream effects. The wing construction would appear to have been balanced as it did not warp appreciably.

*Troglodyte* (name only refers to its cave dwelling instincts if wings fold)

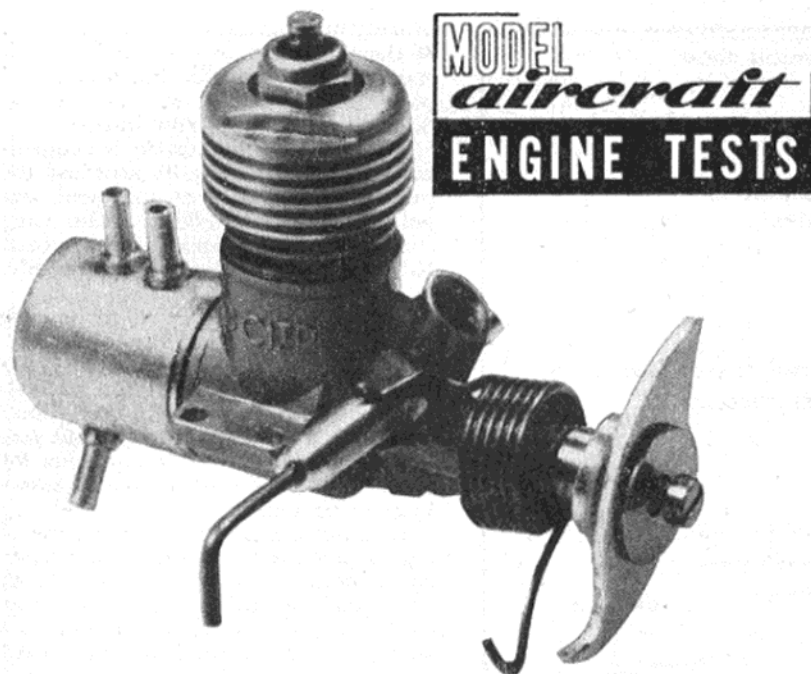
This represents the stage that my power model development has reached. It is an attempt to achieve good climb and glide from a small model, the size being about the trimable minimum for a modified Oliver with present knowledge of trimming technique.

In achieving the glide by the use of high aspect ratio the climb is not made easier by the lowering of the rate of roll, but the design usually trims out quite easily. It would probably be improved by increasing the wing and tail chord by  $\frac{1}{2}$  in. but for those who like something spectacular yet fairly easy to trim it should provide much entertainment. The main point to watch is that the wing spars selected are of *very* tough balsa, as mine usually fold at least once before being fully trimmed, although the

Continued on page 86







**MODEL  
aircraft  
ENGINE TESTS**

# The Davies- Charlton "BANTAM"

**"... first essential of a beginner's engine is easy starting, and this quality the "Quickstart" Bantam certainly possesses."**

**C**OSTING only 34s. 10d. inclusive of purchase-tax, the new Davies-Charlton Bantam is the cheapest model internal-combustion engine ever offered on the British market. For this remarkably low sum, the purchaser gets an easy-starting, soundly made engine, complete with fuel tank and spring starting device. Excellent accessories, in the shape of unbreakable nylon props, an all-purpose spanner-screwdriver, and a really practical glowplug connector, are also available, to make this an excellent proposition for the young newcomer to power model aircraft.

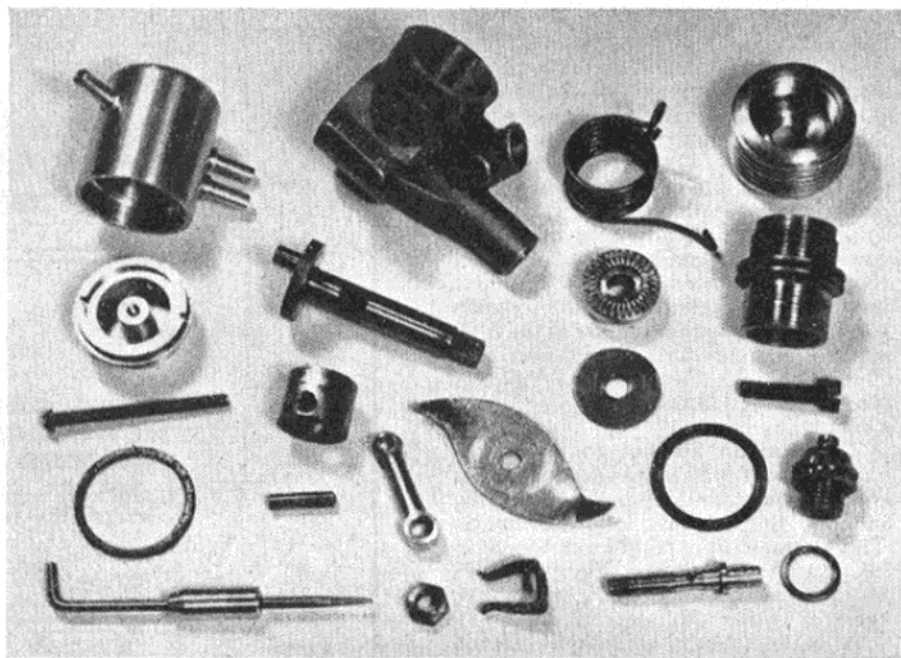
Weighing less than 1½ oz., complete with tank and starter unit, and having a capacity of 0.75 c.c., the compact little Bantam is also small enough for the least expensive power model kits at present available. In fact, for around £3 10s., it is possible to buy the engine, prop, dry battery, connector, an inexpensive kit and the dopes to make a completely finished model. For £4, the outfit could include the builder's choice of any suitable model, F/F or C/L, and still leave enough change for a can of fuel to fly it. Despite its low price, the manufacturers of the Bantam are evidently satisfied that the quality of its construction is adequate to cope with more than a fair share of normal use, for they guarantee the engine for a full 12 months. If the engine is damaged by mishandling, or when wear makes the replacement of parts necessary, the factory undertake servicing at a nominal charge of 5s., plus the cost of replacement parts, the prices of which are listed in the instruction leaflet issued with the engine.

The Bantam is a shaft valve, radially-ported glowplug engine of just under 0.05 cu. in. displacement and, as such,

comes within the American "Half-A" capacity group. Engines of this type are relatively new to British modellers, most of whom are accustomed only to diesels in the small sizes, but, in America, these baby glow engines have been produced in staggering quantities during the past few years and have been responsible for introducing innumerable modellers to the hobby of building and flying model aircraft. Properly designed, these engines are, we believe, better suited than diesels to the "raw beginner" market. There is no compression control

to worry about and if a starter device is provided, there is very little to learn about starting technique. The glow motor is less critical to prop size and is invariably more docile than an equivalent size diesel. Admittedly (with a few outstanding exceptions) the baby glow engine does not develop the power of a good diesel of equivalent swept volume, but, in any case, this is of little importance to the beginner.

In its general constructional design, the Bantam is reminiscent of the earlier, Allbon-designed, D-C engines. The



*This photo clearly shows the quantity, and quality of the Bantam parts—remarkable for only 34s. 10d.*

main casting is basically that of the D-C Allbon Dart 0.55 c.c. diesel and the stroke remains the same, the bore being enlarged by 0.058 in. to give the required increase in capacity.

Several changes are evident in the latest production Bantam, as compared with the first test sample received, which was described in our October, 1959, issue. The crankcase now has only one transfer passage instead of two, although the annular transfer chamber is enlarged. The copper gasket making the joint between the lower cylinder flange and the crankcase has been replaced by one of a composition material that has been found more satisfactory. The conrod is now machined instead of forged and the gudgeon pin is pressed into the piston instead of being fully-floating. More significant, the crankshaft porting has been considerably reduced: a small circular valve port replaces the large rectangular port of the pre-production engine and the gas passage through the shaft has been reduced in cross-sectional area by no less than 64 per cent.—i.e., from a diameter of 5/32 in. to 3/32 in. Finally, the alloy spraybar material has been changed to brass, a drawn alloy tank has replaced the earlier turned tank and the "Quickstart" cam is of heavier gauge metal.

#### Specification

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

**Bore:** 0.408 in. **Stroke:** 0.350 in.

**Swept volume:** 0.04576 cu. in. = 0.7499 c.c.

**Stroke/Bore Ratio:** 0.854 : 1.

**Weight:** 1.35 oz. (1.45 oz. with tank).

#### General Structural Data

Light alloy pressure-diecast crankcase unit and unbushed main bearing with integral carburettor intake. Non-counter-balanced disc-web, hardened crankshaft with splined end for prop driver and separate propeller retaining screw. Hardened, ground and honed steel piston with flat crown, pressed-in gudgeon pin and machined aluminium alloy connecting rod. Screw-in, steel cylinder with three exhaust, and three transfer, slot-type ports. Machined aluminium alloy finned cooling barrel and head, screwed onto cylinder. Six-coil starter-spring of 19 S.W.G. spring steel wire, anchored to brass spray-bar assembly. Starter cam of 17 S.W.G. alloy sheet. Beam mounting lugs. Detachable fuel tank—can be rotated for inverted or side mounted operation.

#### Test Engine Data

Running time prior to test: 1½ hours.

Fuel used: D-C "Quickstart" Glow-fuel.

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

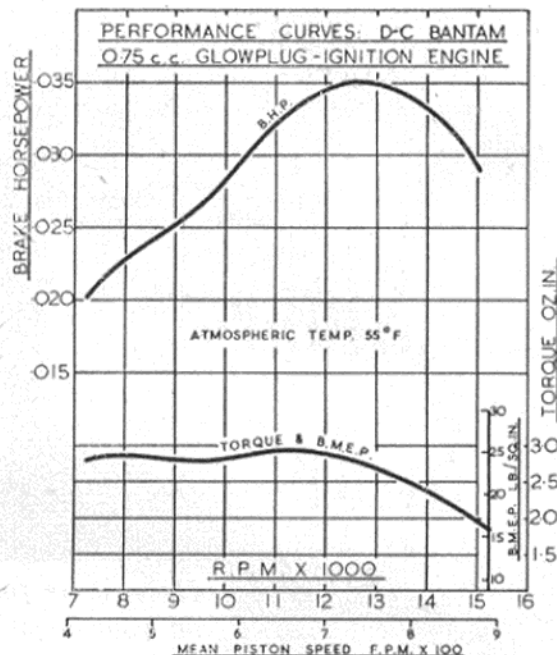
#### Performance

The first essential of a beginner's engine is easy starting and this quality

the "Quickstart" Bantam certainly possesses. A very complete instruction leaflet is issued with the engine and if this is followed, it is difficult to see how anyone can go wrong. However, we have one suggestion to make in regard to using the starting device and this is to grip the tip of the prop between the forefinger and thumb when rotating the prop backwards against the spring, pulling the hand sharply outwards as the prop is released. Using this procedure, there is less risk of the prop being released prematurely and it is easier on the fingers.

The "Cam-Quickstart" device fitted to the Bantam (in which the starter spring is hooked over a special pawl behind the prop, instead of direct onto the prop blade) works very well. Nevertheless, we are doubtful whether the spraybar is the best place to anchor the starter spring. After prolonged use, we found that the movement of the spring tended to loosen the spraybar locknut. This, in turn, allowed the spraybar to rotate slightly, so that the jet became misaligned—indicated by a sudden loss of a couple of thousand r.p.m. Some improvement was effected by inserting a washer between the spring and the needle-valve tensioner, however, and it must be admitted that it is difficult to envisage a neat, alternative anchorage, for the spring, with the existing crankcase design.

The Bantam was also easily hand-started on a wide variety of airscrews ranging from a 6 × 4 wood (7,300 r.p.m.) downwards in size and including the recommended D-C nylon 6 × 4 and 5½ × 3½ props. Best speeds obtained on these latter were 12,200 and 14,500



r.p.m. Torque tests indicated a maximum torque of 2.9 oz. in., equivalent to a modest b.m.e.p. of 25 lb./sq. in. which is normal for very small glow engines. Somewhat less common was the slight dip in the torque curve between 8,000 and 11,000 r.p.m. This, however, has no practical significance to the user, since the engine is obviously at its best when run at speeds above 12,000 r.p.m.

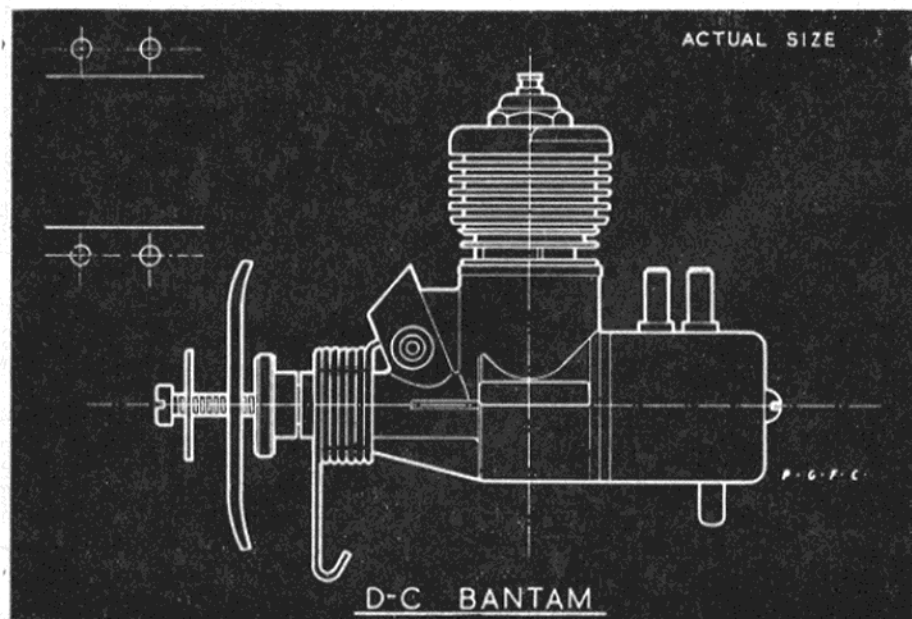
In all, our test Bantam was a pleasant handling little motor, well made, and of adequate performance. Unquestionably, it represents outstanding value.

#### Power/weight Ratio

(As tested) 0.41 b.h.p./lb.

#### Specific Output

(As tested) 47 b.h.p./litre.

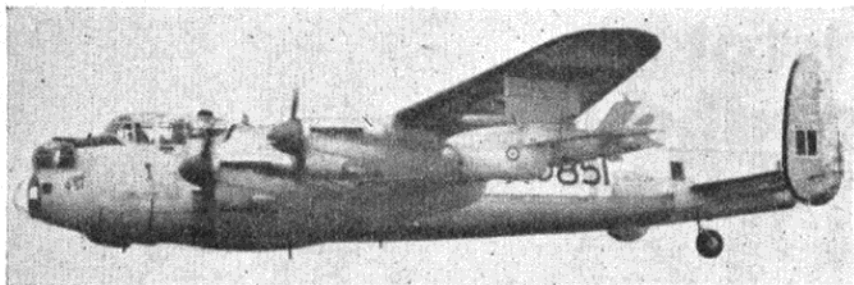






J. W. R. Taylor's

# AVIATION NEWSPAGE



This R.C.A.F. Lancaster Mk. 10DC is still flying.

**MOST NOSTALGIC PHOTO** to come our way for some time is reproduced above. It shows one of the R.C.A.F. Lancaster Mk. 10DC's which are still giving good service as launching aircraft for Ryan KDA-4 *Firebee* target drones, after modification in the Fairey Aviation Company of Canada plant at Eastern Passage, Nova Scotia.

As can be seen, the *Firebees* are carried on deep pylons under the wing-tips. Each drone spans 11 ft. 2 in., with a length of 17 ft. 6 in., and is powered by

**707 GOES SUPERSONIC**—or does it? The answer is probably "No," but PanAm's 707-320 Intercontinental *Flying Eagle* certainly hit a top ground speed of 775 m.p.h. during a recent Tokyo-Honolulu flight, carrying 103 passengers and a crew of 11. Maybe the tailwinds which were gusting up to 210 m.p.h. at the time had something to do with this.

**JUNIOR JET** that solves the travel problems of a bustling businessman is

ramps or steps. Dual controls and blind flying instrumentation are standard. The rear seats can be removed and the starboard front seat folded down flat to permit the carriage of high-priority cargo.

Apart from the cabin section, the only new components are the wingtip fuel tanks and the nacelles for the two latest-type Continental 356-9 turbo-jets, each of which gives 1,400lb. s.t. Weighing only 9,300 lb. fully-loaded, the Model 407 has a top speed of 487 m.p.h. and will cruise for more than 1,400 miles at 360 m.p.h. at 35,000 ft. Operating costs are hardly likely to be low, but it offers considerable versatility and economies as a trainer/utility aircraft for military use and it may be significant that the prototype is already flying in U.S.A.F. markings, although no order has been announced.

Another jet that has **DOUBLED ITS SEATING** recently is Sweden's Saab *Draken*. The latest J 35C version, illustrated below, has two seats in tandem for conversion training, but is otherwise identical with the single-seat J 35A interceptor. In fact, the front fuselage can be removed and replaced by a J 35A nose, with more complete fire-control radar and operational equipment.

The J 35C flew for the first time on December 30th, 1959, and is in production for the Royal Swedish Air Force. Its performance is said to differ little from that of the A, which has a max. speed of Mach 1.8.



This sleek Cessna 407 is a modified civilian version of the U.S.A.F. T-37.

a 1,000lb. s.t. Fairchild J44-R-20 turbo-jet, which gives it an operating speed of 575 m.p.h. Endurance is 53 min. at 40,000 ft., and it is possible to augment the target's radar reflectivity and infrared radiation to give the effect of a much larger fighter or bomber aircraft during missile firing practice.

**ANOTHER WORLD WAR II BOMBER** still going strong is Boeing PB-1G No. 77254, shown right in the insignia of the U.S. Coast Guard Service. It has been busy on high-altitude aerial mapping for the U.S. Coast and Geodetic Survey and is believed by Boeing to be the last of this version of the old *Fortress* family in service. A few B-17s are still engaged on missile work, both as drone targets and directors.

Top, right: Another veteran still flying is this U.S. Coast Guard P.B.-1G. Note the unusual position of the star insignia, on the fin.

Bottom, right: The two-seat Saab *Draken* J 35C. The nose section is interchangeable with the single-seat interceptor.



# The Bristol Bloodhound



**P**URISTS will probably object to seeing a missile oust the usual piloted aircraft from this page. So let us begin by saying that MODEL AIRCRAFT does not entirely share the preference of Messrs. Sandys and Krushchev for black boxes rather than human guidance systems: but *Bloodhound* is no ordinary missile.

As a start, the basic weapon has an aeroplane configuration, with monoplane wings and tailplane instead of cruciform surfaces of the kind found on *Thunderbird* and *Seaslug*. The wings are pivoted so that they can be moved either differentially or together to provide full "twist-and-steer" manoeuvrability without the need for movable tail surfaces. Bristol claim that this gives a higher rate of response than with the usual cruciform layout.

Despite its unique configuration, *Bloodhound* was developed remarkably quickly. When Bristol were asked to start work on it in 1949, two other British surface-to-air missiles had been under design for some time: yet it was the first to enter service in July, 1957, and by the end of 1958 Fighter Command's first *Bloodhound* station, at North Coates in Lincolnshire, was said to be capable of becoming operational overnight.

From the start, Bristol had as equal partners in the project the Ferranti company, who are responsible for the semi-active homing radar guidance

system. In addition, they were able to collaborate with Boeing in the design of the original 16-in. dia. ramjet engines, drawing on the U.S. company's experience to such good effect that the prototype BB-1 engines developed full thrust within only nine weeks of being built. From them have been evolved the current *Thor* ramjets which power the operational missile, and which run on normal kerosene fuel.

Many different designs were studied in the early days. One had cruciform wings of delta planform, with the homing head in the centre of an annular intake (like the nose of a *Lightning* fighter) and no tail surfaces. Another tailless design had straight wings with the engine air intakes in the leading-edges. These two designs featured integral ramjets: a third had cruciform wings and tail, with two ramjets mounted on opposite

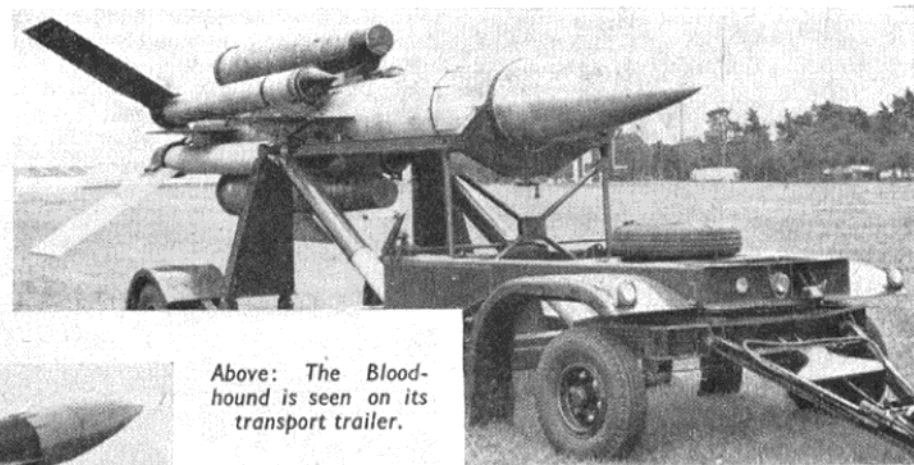
wingtips. After considerable development and many test vehicle firings, the current aeroplane layout was adopted, with the ramjets above and below the fuselage, and with four jettisonable solid-propellant boosters wrapped around the tail end.

The fuselage of *Bloodhound* has top and bottom keel members, bulkheads machined from magnesium castings and fairly thick skinning. The receiver antenna of the Ferranti guidance system is housed in the pointed dielectric nose-cone; then comes the very powerful high-explosive warhead, which is interchangeable with a nuclear type. The wings and tailplane also have thick light-alloy skins, over a plywood matrix.

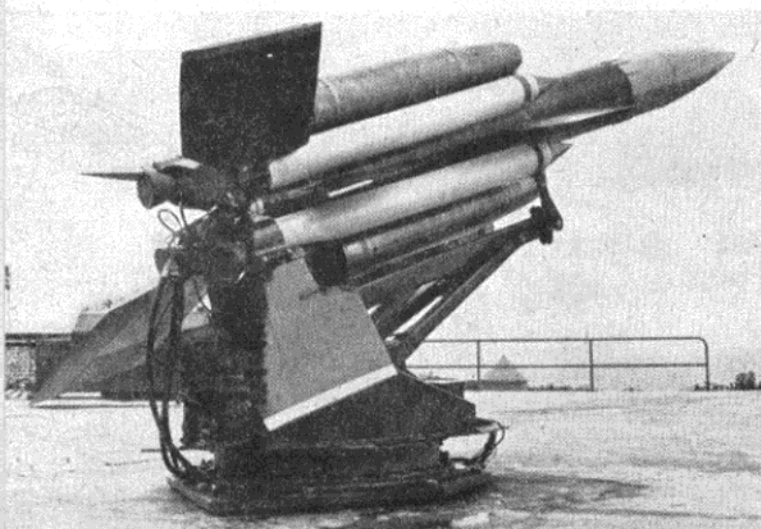
In operation, the firing sequence is as follows: Each *Bloodhound* wing has a very powerful Metropolitan-Vickers three-dimensional tactical radar which locates and tracks the incoming target. The latter is then passed to the B.T.H. *Sting Ray* target-illuminating radar of an individual fire-unit. The *Sting Ray* locks on to the target and keeps the missile and its ramp aimed towards it, following automatically the target's every move. When the enemy is within range, the button is pushed by the firing officer—almost the only manual operation required.

In flight, the receiver dish in the missile's nose picks up signals that have been transmitted by *Sting Ray* and have "bounced back" from the target, and uses these signals to home on the enemy aircraft. It is finally detonated by a proximity fuse.

An indication of the *Bloodhound's* effectiveness is that it has been chosen to defend Sweden and Australia as well as the United Kingdom, where it will



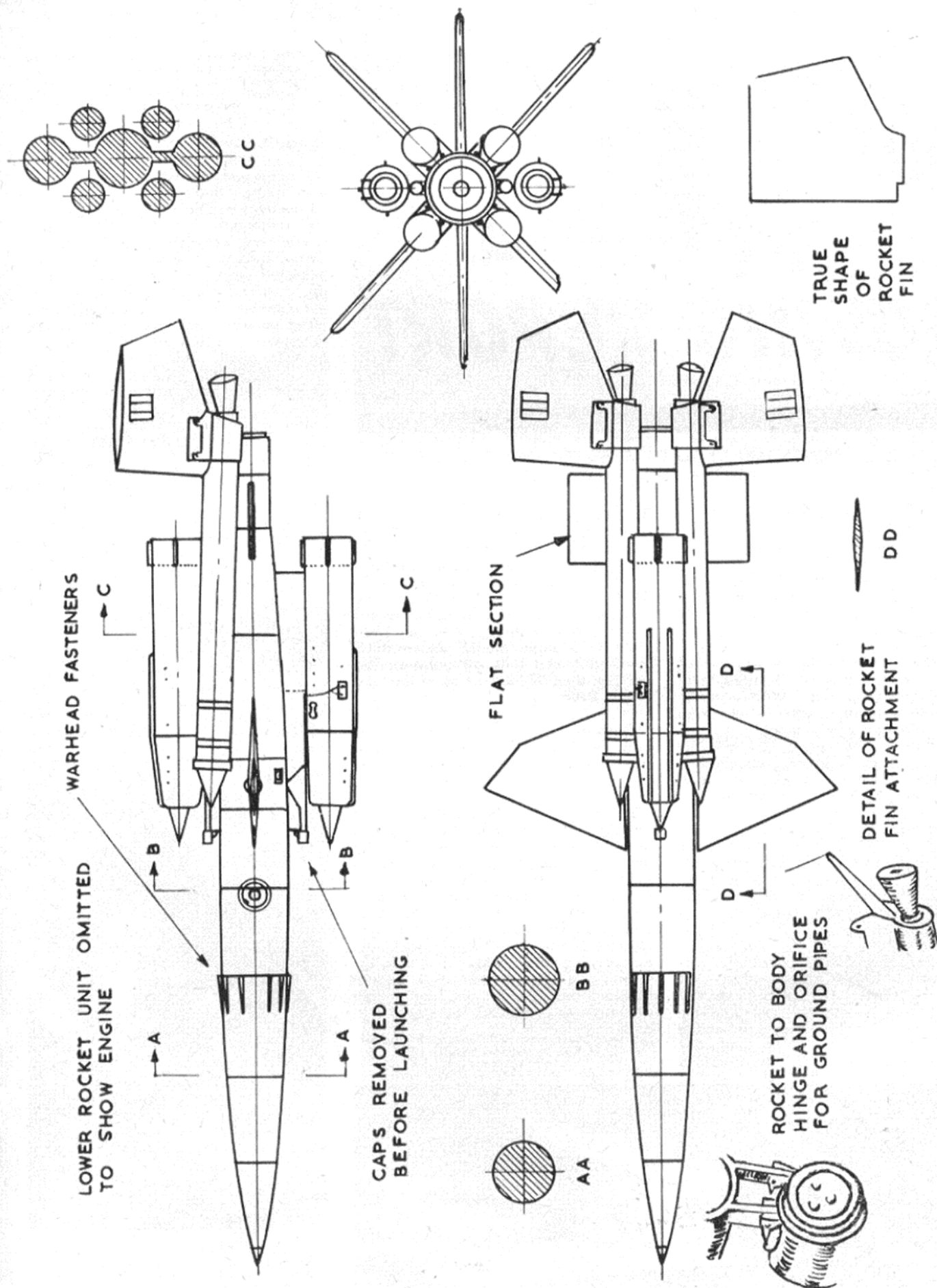
Above: The *Bloodhound* is seen on its transport trailer.



Left and heading photos show *Bloodhounds* mounted on their launching ramps, with firing leads connected and ready to go.

eventually take over completely from manned fighters. Advanced versions are under development, together with more powerful ramjets such as the 18-in. Bristol Siddeley BRJ.801, and it has been announced that they will include eventually an anti-missile missile.

**Data:** Length with boosters: 25 ft. 3 in.; without boosters, 22 ft. 2½ in.; wing span, 9 ft. 4½ in.; body diameter, 21½ in.; range: at least 60 miles; speed: over Mach 2.







BRINGS YOU UP TO DATE ON THE LATEST  
WORLD MODEL NEWS

AT the time of writing, the official F.A.I. World Speed Record for radio-controlled models stands at 90.1 m.p.h.—set up by the well-known Belgian modeller, Jean-Pierre Gobeaux at the close of last season. But over 100 m.p.h. has been officially clocked by several models in the U.S.A., and a new mark of over 110 m.p.h. is expected to be ratified. We would hate to hazard a guess at what the record might be in two or three years time. With currently available equipment, there would seem to be no reason why it should not reach double the present figure.

At least one British modeller is planning an attempt on the record and, from our old friend Joe Dale in New York, we have news of another experimenter who is getting excellent results with delta R/C speed jobs flown over water. These latter, however, are merely a stepping stone to a more ambitious project: a Dynajet powered version, which is expected to reach at least 200 m.p.h. . . .

Radio flying skill in the U.S., particularly in California, gets more and more remarkable. The place to see this demonstrated is the annual LARKS Circus, where the experts abandon starchy rules and really go mad. At the last event, Zel Ritchie took off and

then flew his multi through the entire stunt pattern *inverted*, Bill Williams jettisoned his wing in flight and brought his model down via parachute and, just for kicks, Chas Legon specialised in bombing runs—at the judges, using tomatoes. World R/C duration record holder Ken Willard flew a Veco *Brave* C/L stunt model under R/C: modified model took off tethered, did one lap, then Willard let go of line and flew it R/C . . .

Suggestion that the present contest rules for multi-channel models should be changed is made by the well-known U.S. expert, Harold deBolt, in the February issue of *Model Airplane News*. The object of the proposed change is twofold. Firstly, the flight pattern should be made more difficult; since far too many contestants in major American events are now producing "perfect" flights under the present rules and judges are finding it increasingly difficult to decide the winners. Secondly, the flight pattern should be more compact—i.e. as many manoeuvres as possible in the shortest possible time, to avoid situations in which days are just not long enough to cope with the size of the entry.

Superb scale-type sailplane with single-channel R/C by Gustav Scholz of Stuttgart.

The illustration shows a rare sight in Iceland . . . Bjorn Ingimarsson's German-designed "Zugvogel" glides in for a landing. Iceland has one club, the Reykjavik Model Club.

Briefly, deBolt proposes an 18-manoeuvre schedule designed to test, to the maximum, the capabilities of model and pilot, and to combine these manoeuvres so that each follows on with the minimum of delay. Consecutive manoeuvres are deleted, as are power dives and spiral dives: the former because modern powerful models can do, consecutively, anything which they are capable of performing singly; the latter because height lost in performing them results in time wasted in regaining altitude.

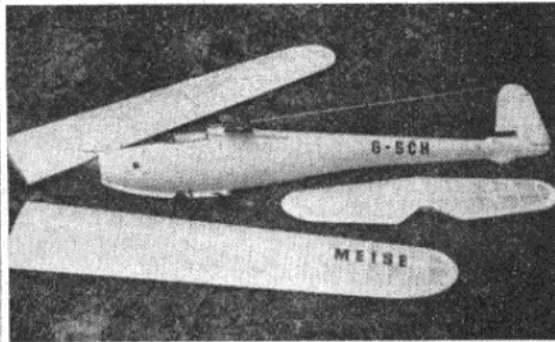
Harold deBolt, incidentally, is a member of the team selected to represent the U.S. at the first World R/C Championship in Switzerland this year. Other team members are Bob Dunham and Ed Kazmirski.

Describing the beautifully made scale type R/C sailplane illustrated, Karl-Heinz Denzin of the German magazine *Modell*, comments that constructor Gustav Scholz is one of the best three model builders he has met in 27 years of modelling. Scholz is a cabinet-maker by trade. The model has a span of 72 in. and is covered with heavyweight Perlon, which is said to be easier to apply than silk and nearly indestructible.

Germany first competed in the Wakefield Cup contest in 1937, when it was



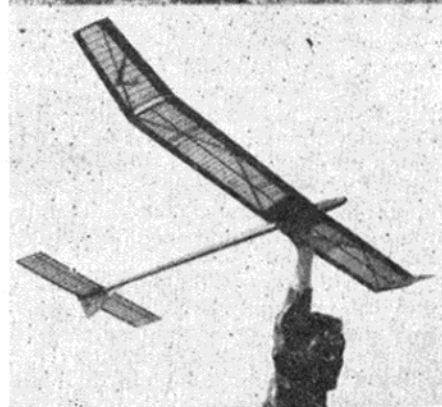
Czech C/L Championships. Jiri Trnka starts his McCoy 35 model for the stunt event, in which he came close to beating champion Gabris, but was eventually relegated to 3rd place after engine trouble.





Hungary. Norbert Roser and the A/2 with which he won the 1959 Peoples' Democracies glider championship at Leszno, Poland.

held at Guyancourt, France. One of the members of that first German team was Alfons Menzel. Today, Herr Menzel, now 65, still flies Wakefield's and puts up some performances which rate with the best. In the photograph,



Polish gliders. Top, B. Haase with his A/2, winner of the 1959 Polish Championships. Below, a study in wing structure—approximately 100 ribs—designed by Stanislaw Jurczeniak.

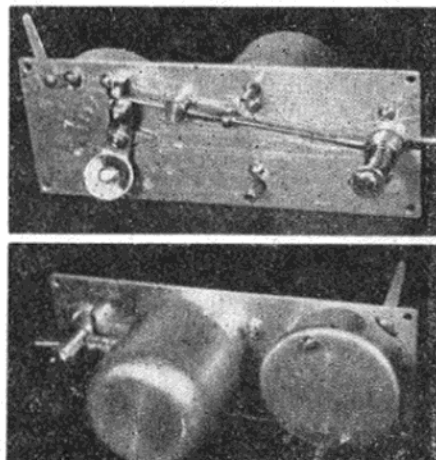
which we reproduce by permission of *Modell*, he is seen winding one of his recent Wakefields, single-handed, with the aid of a steel rod jack anchoring the model at the rear peg. Not an entirely new idea, but one that has been adopted by a number of other German modellers.

Last month we mentioned the new German slope-soaring R/C record, of 5 hours 3 min. 11 sec., that had been set up by Wolfgang Soergel with a



Pakistan. Rusi B. Mobed of Karachi with his Laurie Ellis designed "Agressor" F/F delta (Mercury kit) powered by an Amco 0.87.

Schuco-Hegi Kit model and Mecatron radio equipment. Soergel, who is also a C/L pilot of note and won the German Stunt championship in 1957, is in charge of Schuco Kit production. Schuco—the manufacturer of those world-famous and ingenious model cars of our youth—entered the model industry about four years ago with some simple ready-to-assemble C/L models designed around Webra engines. Activities have now been expanded to include a sizeable range of all types of kits, props, tanks, wheels, etc., plus the distribution of Metz-Mecatron R/C equipment, Webra and Jaguar engines and other lines. All these are contained



Switzerland. The Schenker tank and timer unit available from Swiss model shops. It comprises metal tank, clockwork timer and cut-out valve.

in a large new model catalogue issued by Schuco—their first.

That excellent Belgian model publication *Model Avia* (only two years old but a "model" of attractive presentation) for which editor Pierre Delfeld's avowed policy is to make it *the* model magazine for French-speaking modellers, now has an engine test series which deals with model motors from all over the world. Among engines recently tested were the tuned Rivers Silver Streak, which was credited with 0.308 b.h.p. at 16,200 r.p.m., the American Cox Olympic (0.312 at 15,700 r.p.m.) the Japanese O.S. Max-II 15 (0.282 at 15,300), and Max-II 35 (0.60 at 15,000) and the German Webra Bully 3.5 (0.31 at 11,500). The tests are conducted by editor Delfeld, who is himself a keen engine enthusiast and has a personal collection of over 100 different types.

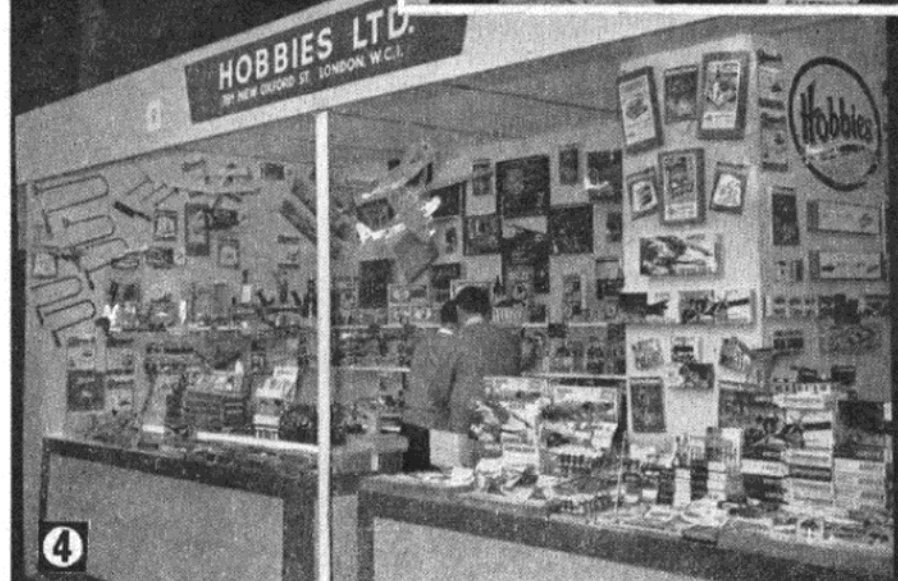
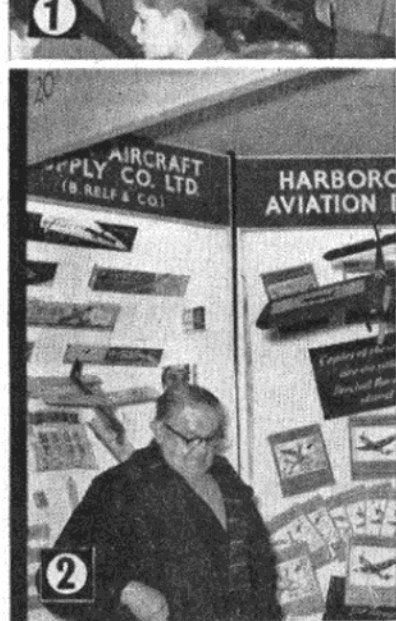
**ODDMENTS** . . . Latest U.S. manufacturer to enter the ready-made power model field is the Aurora Plastic Corporation with an 18 in. scale Thunderbolt and a 17 in. Cessna L.19, both said to use an entirely new engine of unorthodox design. . . . At home: Jim Baguley's latest open power job: 56 in., 21 oz., Enya 29-3 giving 16,000 r.p.m. on 9 x 4 prop! As Jim says, whichever direction it goes, it should be spectacular. . . . O.S. R/C type (idlebar) glow plugs are current team-race wear in Australia. Most entries in recent Australian Nationals events used these including winner (O.S. Max-III 29) who set new Australian record.



How to wind a Wakefield single-handed. Veteran German flier Alfons Menzel demonstrates his technique in this "Modell" photograph.

# OVER THE COUNTER—

## At the National Models Exhibition



IN photo number 2 Major Draper is seen on the stand shared by Davies Charlton, Harborough Publishing Co. and Jnr. Aircraft Supply Co. The complete range of D.C. engines was on display including the long-awaited Tornado twin. This engine is now in production and the 1960 season should see (and hear) increasing numbers of these interesting engines in use. The ingenious and colourful triangular engine boxes attracted much attention.

The popular Harborough series of aviation books were all available for inspection and copies were on sale at the Percival Marshall stand. Major Draper, being himself a World War 1 Sopwith Camel pilot found the Harborough books of great interest and his accounts of early exploits were most fascinating.

Jasco kits were prominently displayed and these ever-popular kits with their emphasis on the younger modeller found a ready sale on the Hobbies stand which as you can see in photo 4 was just brimming over with tempting goods.

Sheen Models had a very well stocked stand (photo 1) and modellers showed particular interest in the wide variety of engines which proprietor Bill Davis had on display. Buyers of glowplug engines were presented with a free accumulator and this chance of something for nothing was not overlooked by engine seekers.

Performance Kits could be bought at Sheen Models' stand and designer O. W. Fisher had a complete display of his products on his own stand where he was always available to answer queries concerning his popular designs.

Henry Nicholls' stand (photo 3) had a built up Mercury M.E.109 as its centre-piece, and right next door, the increasingly popular Merco engines were tastefully displayed to good advantage. Many were the complimentary remarks passed on the fine finish of these excellent British engines.

George Honnest-Redlich was kept busy by the many interested visitors who were attracted to his display of R.E.P. R/C equipment and R/C kits. George also demonstrated his R/C gear installed in a diesel-powered launch which he operated in the water tank. This, in many people's opinion, was the most impressive of all the demonstrations.

Leigh Models and Ed. Johnson shared the International R/C stand, where they had on show a complete range of the exciting new Continental R/C imports. Graupner and O.M.U. equipment was prominently displayed, and demonstrations of this equipment were constantly given. Possibly the best selling item here was the little Micromax electric motor for F/F models. These

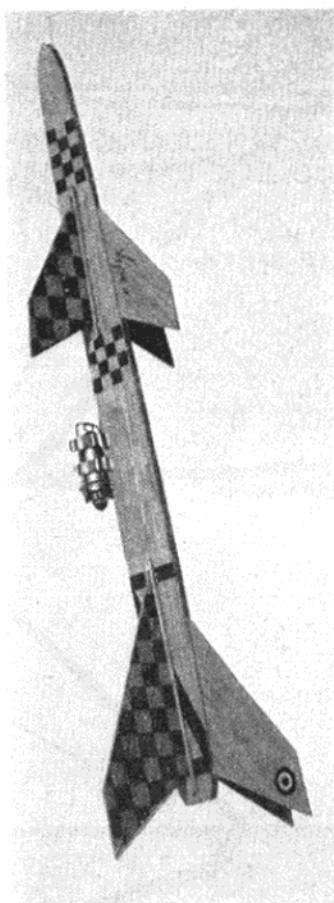


little power plants were selling as fast as they could be delivered!

Electronic Developments revealed some of their interesting new R/C equipment and it was also demonstrated very successfully, installed in a power boat operating in the water tank. Their constantly expanding range of diesel engines produced an impressive display, all sizes from 0.46 c.c. to 5 c.c. being on show, together with their water-cooled variants.

Solarbo balsa needs no introduction to modellers for most of the kit manufacturers use it. Their exhibit showed what great strides have been made in recent years in the art of die-cutting intricate balsa parts, a process for which Solarbo are deservedly famous.

## LATEST TRADE NEWS



The photo above shows the latest model to come from **Jetex**. Suitably named the *Viper*, it is a 17 in. long profile missile which employs a Jetex 50 c. for power. The kit is very fine value and complete with motor, cement, coloured die-cut parts and transfers, etc., costs only 6s. 11d.

The *Viper* is very easy to assemble and climbs to 200 ft. before gliding safely back to land. (We wonder if it will "home" onto contest models?)

An extremely useful little 52-page Model Diesel Handbook is now en-

closed with every new **Davies Charlton** diesel engine. It contains full specifications of D.C. diesels, an illustrated explanation of the operating cycle of a two-stroke diesel, and very complete starting and running instructions. There are many line drawings to supplement the text, and not unnaturally emphasis is placed on operating technique using the D.C. Quickstart spring starter. For those buying their first engine this little booklet will be of invaluable assistance.

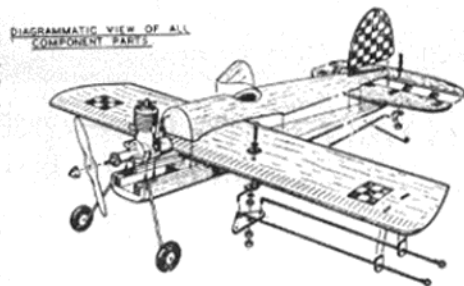
Received just in time for this feature are the latest kits from **I.M.A.** For only 3s. 6d. there is a beautiful kit for a 1/68 scale De Havilland 89 *Dragon Rapide*. This excellent and original choice builds up into one of the most delightful plastics we have seen for a long time. There is lots of scope for the ingenious modeller to add interior detail and, of course, there are many colour schemes from which to choose. (See Here & There page 64.)

The second plastic from Frog is the long-awaited 1/96th scale *Lancaster*. This is a fitting companion to the already popular V bomber range to the same scale. Moulded in black plastic and complete with paint this is a worthy addition to the Frog range. The price is only 6s. 6d. An interesting variation of the wartime *Lancaster* would be the Canadian Mk. 10c, still flying and featured in this month's Aviation News page.

For 32s. 6d. you can buy the 22 in. span Frog S.E.5a. This very complete, prefabricated C/L kit of the World War I

scout, although a biplane, is not difficult to build, thanks to the tremendous amount of care and thought put into the design and kitting by I.M.A. The plan is very clear and has several perspective drawings to help the builder. Specially sectioned balsa for wing leading edges and scale rubber tyres are but two of the special features of this fine kit.

The **Veron** *Colt* kit mentioned in Here and There is just about the ultimate in non-plastic prefabrication, even to the extent of having the sorbo tyred wheels already retained on the axles. We reproduce here an exploded



drawing taken from the stage by stage illustrated building instructions included with the kit. The *Colt* is fine value at 27s. 6d. and is suitable for 0.75 to 1.5 c.c. engines.

When we mentioned **Humbrol** gold enamel last month, we quoted the price as 8d. per tin; this should, of course, be 1s.

## MODEL aircraft R/C TESTS

### The RipMax Mactuator

Laboratory Tests by F. C. Judd. A.Inst.E.

THE Mactuator is a lightweight rubber driven self centring escapement of rather novel design and is intended mainly for use in radio controlled model aircraft. It is a single hole mounting type with an escapement to provide the required combination of movements for the neutral, left, neutral and right rudder sequence. Nominal operating voltage is 4.5 v. and it is supplied complete with a coupling unit and a comprehensive set of instructions. These instructions include a graph showing the current and voltage operating conditions and a table which shows the number of turns attainable on the motor for different lengths and sizes of rubber.

### Functional Tests

The unit was mounted and fitted with a rubber motor of  $\frac{1}{8}$  in.  $\times$  24 in. strip and wound up to over 600 turns. Tests showed that with a partly used battery giving 4 v. under load that 400 complete movements of the actuator were possible without slipping or interruption. The minimum safe operating voltage is 3 v. but a test was made down to 2.5 v. and so long as there is plenty of drive available the actuator will operate. The makers, however, recommend 3 v. as the limit.

Current consumption is average for these small actuators being approximately 400 mA at 4 v., so that for uninterrupted operation, as would be required for R/C, it may be safely operated from three pen cells. The unit is robustly made and should be able to withstand all but the hardest of crashes. It is recommended for its compactness and ease of fitting as well as for reliable operation and lightness in weight. The maker's specification is as follows:

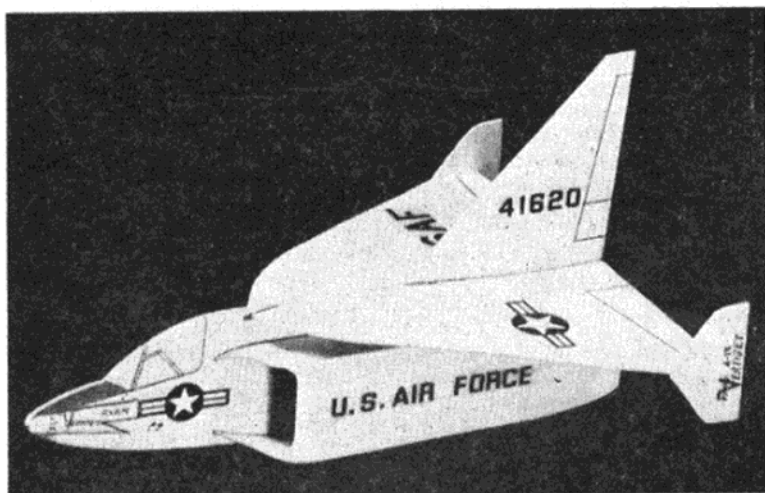
Weight: 1 oz.

Size:  $1\frac{1}{2}$  in.  $\times$   $\frac{3}{4}$  in.  $\times$   $1\frac{1}{4}$  in.

D.C. resistance: 9 ohms.

Current drain continuous: 400 mA at 4 v.

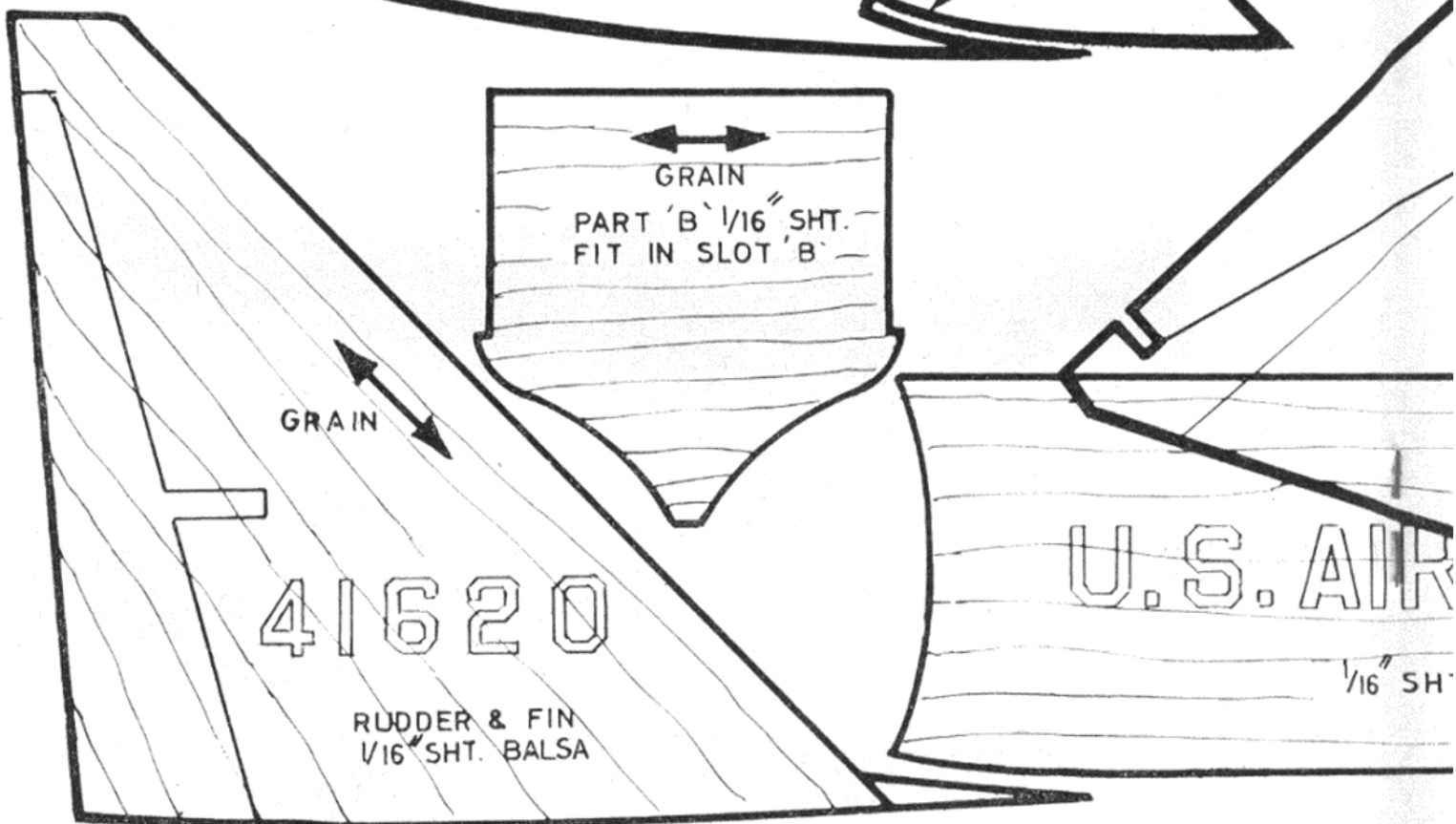
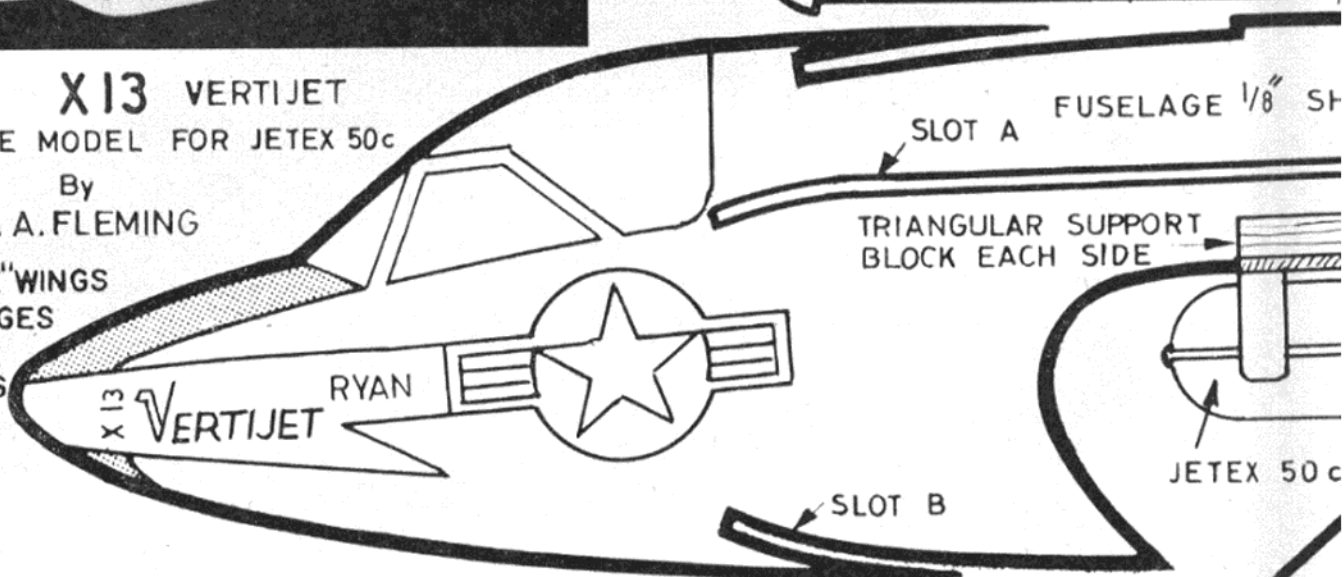
Makers: Ripmax Marine Accessories, Parkway, London, N.W.



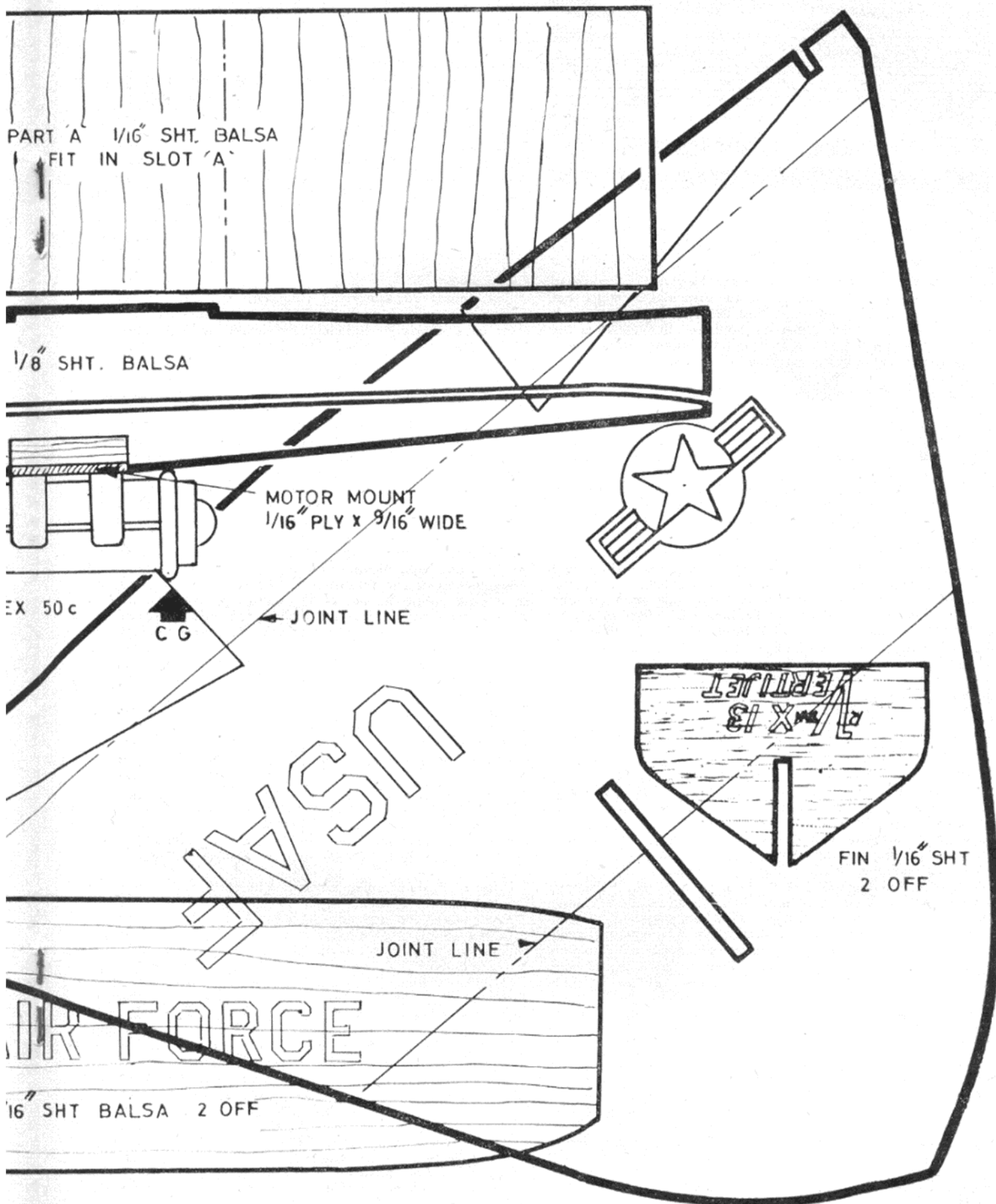
# **RYAN X13 VERTIJET** PROFILE MODEL FOR JETEX 50c

By  
J. A. FLEMING

SEE THE "WINGS  
CLUB" PAGES  
FOR THE  
BUILDING  
NOTES.



TURN TO PAGE 90 FOR ILLUSTR







## TOPICAL TWISTS

by pylonius

### Practice Flying

As a serious student of Emergency Ward 10 (I expect to pass out at the next operation) I am surprised to learn that the white coated workers can find time off from the nurses to take up other and less exciting hobbies. But, as far as the G.P.s are concerned, the modelling fever might explain those interminable vigils in the waiting room—takes time to set a rib properly.

Unhappily, the modelling medics remain, with few exceptions, strictly earthbound. This is a bitter pill to swallow. Most other professional types are not too proud to romp it over the local park, and we can often catch a glimpse of a flighty colonel or steamed up solicitor making for the max's with the best of 'em. Perhaps the fact that we only too seldom rope an M.D. into the M.A. fold is a matter of prestige. Imagine the astonishment of the other ladies-in-waiting-room if some old dear comes in all of a flutter with the news that she'd seen the Doctor flying a toy plane over the park. Her friends would be sympathetic, and suggest, although they have enjoyed her company in the waiting room, perhaps she would be more comfortable on the psychiatrist's couch.

Even so, I think our doctor friends should take aeromodelling more seriously. Just think of the beneficial effect of a prescribed course of building and flying to the fat and flatulent. Instead of trotting out loads of pep pills and tranquillisers, you get a kit on prescription with the slogan "build yourself up."

### Flying Colours

What colour is the best for a contest model? From the expert point of view it depends upon a number of factors; whether the model flies, whether it prefers trees to bushes, and whether the timekeeper is colourblind.

To be on the safe side you could throw in the whole spectrum, but, unless you're a leprechaun, you will not likely find any pots at the end of the rainbow. This becomes evident when you take a look at the sort of craft that lifts all the big time prizes, and you won't need dark glasses either. Mostly these weathered veterans have about as much colour as a blanched sausage, having acquired their bleached complexions from flying too close to the sun for too many seasons. Fuselages that might once have been sheathed in jet black skins are now grey and sagging with age, while wings that were red as the girl friend's lipstick have faded into a Brand X whiteness. This makes it rough going for any colour-conscious timekeeper, but the way they fly is a sight for sore eyes. And, while the slicked up rainbow jobs are limping around like sick butterflies, you can never say that the bleached out max getters are ever off colour.

### Ribby Ideas

One of the worst things that can happen to a modeller is to get an aerofoil complex. Most of us are prepared to face up to the facts of life, and accept, with a brave smile, that the old R.A.F. 32 is every bit as good as a Jokowson 999, but the aerofoil genius has more scientific ideas on the subject. He'll bash away at those rib outlines, plotting them to a thousandth of an inch, oblivious to the fact that, by the time he's got the covering on, the average section between sag and bulge will bear a close resemblance to a string bean.

All this occurred to me upon reading that someone's pet

aerofoil was a modification of a modified modification. However, critics seem to think it just a bit thick.

Brother, it sure is.

### All Your Own Work

In these labour-saving days the modeller would be a poor fish if he didn't cash in on the anti-drudgery stakes. Up to now he has been doing pretty well for himself, with wheels, props, cowls, spinners and what-have-you available at small expense over the ready-made counter. Even so, he still has to do a fair non-telly stint on the building board before he's ready to begin wrecking operations. But, ever resourceful, he's now reported to be scavenging around the fishing tackle market for the odd fuselage, exploiting every angle, as it were.

It looks as if, very soon, a shrewd shopping expedition will yield almost a complete model. And, to ensure maximum viewing time you can get the wife to do that.

### Out-voted

The recent electioneering campaign on the part of an S.M.A.E. candidate is unusual, but not without precedent. We refer, of course, to the celebrated case of the Little Umbrage M.A.C. hustings, in which Joe Bloggs canvassed with such vigour and enterprise for the coveted post of Asst. Comp. Secretary. The fact that there were no other candidates forthcoming in no way deterred him. Joe Bloggs was made of sterner stuff.

His first move in the campaign was to plaster the village with "Vote for Bloggs" posters bearing a huge photograph of the man himself. This met with a certain amount of objection from the villagers who wished to preserve the ancient beauty of their hamlet. Some were all for appealing to the Royal Humane Society, while others were aroused by the keen disappointment of the village children, who had naturally linked the posters with a circus event.

His personal tour of the village had certain repercussions, mostly from Mrs. Bloggs' rolling pin, on a purely technical disagreement on the definition of "baby." But, perhaps, the most outstanding feature of the campaign was the famous Bloggs' manifesto. This ran to some ten foolscap pages and contained more I's than a dud potato. It attacked everything and everybody, from the F.A.I. to the local fish and chip shop. Space will not permit us to publish this literary harangue in full, but here is a typical extract:

"Friends! Who was the only P.R.O. ever to write a report for the model press? Joe Bloggs. And who would have sent it in had the Treasurer provided a stamp? Joe Bloggs. Who was instrumental in obtaining the use of Farmer Muckrake's hayloft for a clubroom? Joe Bloggs. And when it burnt down, who was first on the scene with a bucket? Joe Bloggs. But how was he to know it contained Methanol?"

"Joe Bloggs is the man you can trust, the man of enterprise. It was he who organised the impromptu chuck glider comp at the club get-together. And, more than that, friends, he was the only one with sufficient foresight to bring along a chuck glider."

"Joe promises more such contests in the future. So, don't forget, 'Slog for Bloggs.'"

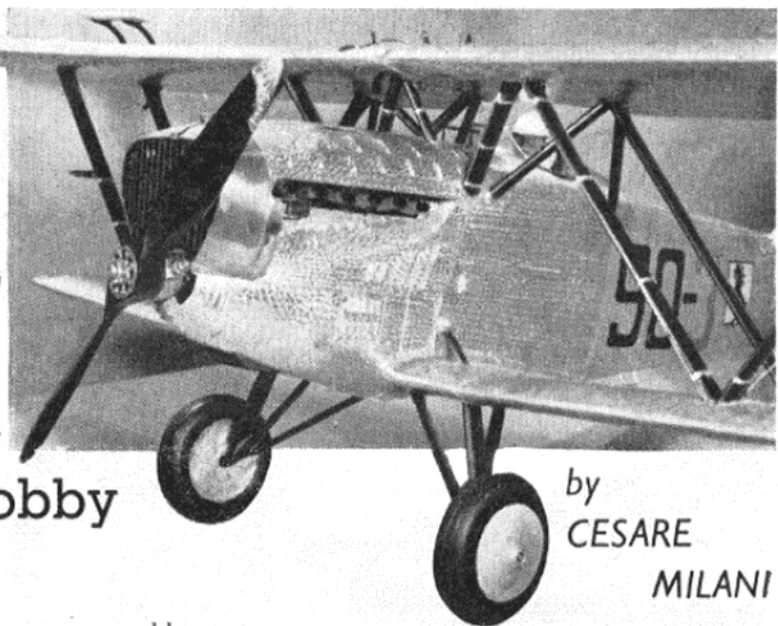
Sad to say, Joe was not elected. A few days before the A.G.M., he gave up modelling for rug making. Everyone conceded a striking victory to Mrs. Bloggs.

Of course, such electioneering campaigns are as rare as entries in a club comp. When the question of nomination of club officials comes up all the big noise critics wilt into shrinking violets. Unpaid drudgery might have its personal rewards in the upper echelons of the model movement, but it's a noble spirit who can unflinchingly face the prospect of putting the strong arm on impecunious juniors or of writing letters of appeasement to the Town Council and other offended bodies.

But, on the basis of one being born every minute, the members never give up hope. True, it's a hard struggle, with desperate appeals in the name of club tradition, public duty and the back rent of the clubroom, but it always ends up with some off-beat character taking up the portfolio. Marvellous thing, human nature.

# CREATIVE MODELLING

----- my approach  
to our hobby



by  
**CESARE  
MILANI**

I HAVE been building model aeroplanes for many years now and, since my very first model, my only aim has been to produce exact working miniature replicas of real aircraft. I agree that other forms of aero-modelling can be as fascinating as scale (R/C in particular), but to me scale is the only way to put in the air a machine which is a real aeroplane.

Now, what is a model? The dictionary definition is that it is "a reproduction in three dimensions of some project or existing structure showing the proportions and the arrangements of its parts." So, why spend time building something which

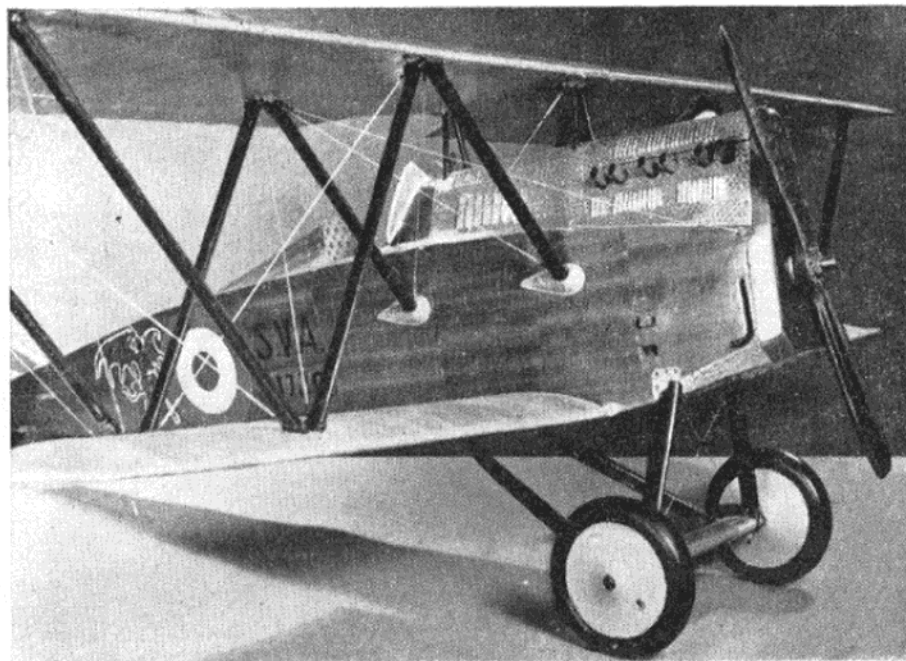
has only a vague resemblance to an aeroplane?

I must admit that research on Wakefield, speed and glider models has much more value, aeronautically speaking, than a mere reproduction of a real plane, but from the individual's point of view, creating a real aeroplane is far more satisfying. I like the feel of the controls; the model obeys my hand as a real aeroplane would and, as with real aeroplanes, every model has its own characteristics. When I throttle back and start the landing approach, there is very little difference from the way I react when I am sitting at the controls of a real aeroplane.

Judging the speed, the height, feeling the moment of stalling when it is time to pull the stick right back—all these are the same. This is something a F/F model cannot give you.

However, and I must emphasise this point, building a real scale model is no easy task. To begin with, not all aeroplanes make good scale models. For example, it is such a shame to see a good model irremediably spoilt by a protruding engine, but a monstrosity like this can be avoided by a careful and discriminating choice of prototype. Remember, in scale, proportion is the vital factor. I know that such famous and handsome machines as the *Spitfire* have a glorious past and tremendous romantic appeal, but a motor that could be contained in a model *Spitfire's* cowling has yet to be made. Moreover, an aeroplane of this type must have a retracting undercarriage; it would not fly with its wheels down all the time! I have experimented with several different retracting undercarriage mechanisms in my models and have reached the conclusion that the difficulties involved rule them out at the moment as a 100 per cent. reliable proposition.

This is one of my reasons for preferring the old timers. There are, of course, other reasons. They were the aeroplanes my father talked about when I was a child. In spite of his being a surgeon, he was a flyer during the first world war and the tales of his actions, and the descriptions of his long flights in search of the enemy fascinated me and left an indelible mark on my mind. To me, an old biplane looks



The Ohlsson 60 (petrol) powered Ansaldo S.V.A. 1958 Nats winner.

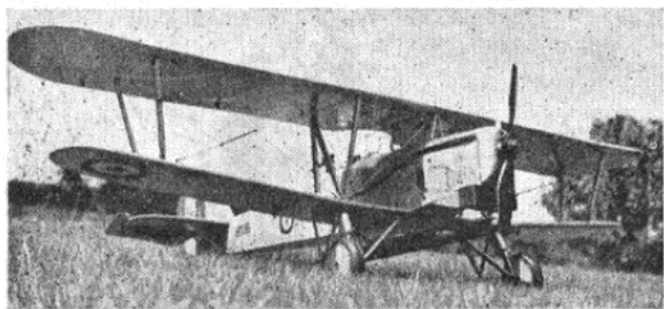
more of an aeroplane, if you will pardon the paradox, than the latest Mach 2 jet. It has wings, big ones; struts, wires, plenty of them; and squadron insignia and pilots' personal crests. My favourite model is an *Amsaldo S.V.A.*, an exact reproduction—serial numbers, insignia, etc.—of the plane my father flew. It flies beautifully and is for me a living souvenir.

I have tried to explain why I like C/L scale models. I will now go on to explain how I build them. As I

right place, so you must try to make them as unobtrusive as possible and hide them under removable hatches. Most important, if you want your model to fly properly, is the cooling of the motor; you must arrange the inside of the cowling in such a way that the air, entering through the front, is free to escape, after having passed round the cylinder head, without creating unnecessary turbulence. One can fit baffles round the engine and let the air escape through a removable hatch in the top cowling.

Build your fuselage exactly as it was built in the original; then you can be sure that all structural problems, strength, warps, etc., are already solved for you.

Wings are a delicate part of construction and a vital one, too. I find that the original airfoil of most first world war biplanes is quite good for a model. Actually, all my biplanes have this kind of airfoil and when the engine cuts out they stay in the air for three or four laps. They glide well and have a very low



These two photos are of the  $\frac{1}{4}$ th scale Hawker Horsley powered by the author's favourite Anderson Spitfire petrol engine.

have said before, one must carefully choose the aeroplane which is to be reproduced in scale. First of all, see that the motor and the controls can be concealed within the cowling; then see that the wing area and, even more, the tail area have good proportions. But technical reproduction is not merely a mechanical transformation of something big to something small. It is creative; it is something that you see slowly take shape under your hands. It is an art, and you must approach it with an artistic state of mind and eye.

When you have chosen the aeroplane you are going to build, you must obtain as much information as you possibly can. The Imperial War Museum and most aeronautical firms are extremely obliging and on several occasions I have had drawings, pictures and details sent to me. So first of all, original drawings and plenty of pictures. Then you can start your own drawings.

The scale proportion is immaterial, but my personal point of view is that 1 in. = 1 ft. is the minimum if you want your motor hidden. Actually I prefer  $1\frac{1}{2}$  in. = 1 ft. up to 2 in. = 1 ft. scale, but that depends also on the motor you are going to use. Here I prefer a good old 10 c.c. spark ignition engine. Heavy, I agree, but it is clean (i.e. the fuel does not attack the finish), has plenty of power and is easily throttle controlled. The exhaust stacks of your motor rarely come out exactly in the

In a biplane, where the pivot should be as near as possible to the central point between the wings, the bell crank can be fixed well away from the visible cockpit space, that is to say, beneath the instrument panel. The elevator push rod should be as unobtrusive as possible, running under the cockpit floor. If the full-size plane has the elevator controlled by wires outside the fuselage, have your control working in the same way. It is not too difficult to transform the horizontal movement of the bell crank in to a vertical one operating the elevator wires. In my models of this type, the wires are connected to the pivoting arm by two turnbuckles allowing an equal tension to be obtained on both.

stalling speed as a result. Balance in a C/L model is not critical but a little excess weight in the nose for the first few trial flights, is always a good safety precaution.

Struts are quite difficult but here again the best way to join them to the wings is to follow the original construction. I build the struts from aluminium tube, flattened and drilled at both ends to fit the wing attachment which is usually bolted to the spars. The struts are covered in balsa wood and cut to shape. The balsa wood can be stained and varnished to look like mahogany, birch or any other wood. (See Figs. 1, 2, 3 and 4.)

Bracing with wire must be approached with great care. In



Fitted with a Taplin Twin 7 c.c. diesel engine, this Fokker D.VII won the 1959 Nats!



models of old biplanes the scale wing section is very thin and the wings, consequently, are inclined to warp. Where wire cable was used on the real plane, stranded control line wire can be used on the model—single strand does not look realistic. It is not possible to find the correct scale section when streamlined wires were

wire is perfectly straight. For steel wire, the piece attached to the wing longerons, or to the end of the struts, is small section tube. It will eventually look like a turnbuckle. The wire, previously cut a fraction shorter than required, is then tinned and soldered on both ends to the attachment tubes using the same bending

just for appearances' sake. Make them work!

Quite often one can see a well-made model irremediably spoilt by its ailerons. Ailerons are part of the wing all right, but separate parts, nonetheless. So, never draw a black line to simulate this separation. It is easy enough to build them up and hinge them to the wing in the correct way, and to ensure complete authenticity take the trouble to see how the aileron control wires are attached to their horns.

For covering I generally use nylon, which is both strong and light, but one thing should be remembered: every part of the wooden frame that shows under the fabric, e.g. formers, ribs, leading edges, etc., should be carefully prepared with sanding sealer and smoothed down to a satin finish, otherwise the grain will show badly.



Cesare Milani's Fiat C.R.20.

used, so in these cases it is best to stick to normal round section steel wire. But check the diameter for head-on view effect!

Wires must be tight, for nothing is worse than seeing bracing wires sagging and out of line and I use two methods to get the correct tension. For stranded wire, I cut the wire slightly longer than required and fit two small lengths of tubing over both ends. The wire is then looped through a hole in a piece of metal attached to the wing spar, near or on both ends of the struts, and passed through the small tube which is then flattened to grip the wire securely. Repeat the operation on the other end (see Fig. 5). To get a good tension, gently bend the wing before fixing the second end of the wire. When you let it go, the



These two photographs and the one at the top of page 81 show the enormous amount of detail incorporated in the metal cowlings of this model.

technique to obtain the correct tension. (Fig. 6.)

With thin section wings, especially when the span is quite big, bracing wires are essential to the structural strength so do not put in your wires

The cowlings of all my models are made of metal. Aluminium and copper are easy to work. One just has to have the patience to beat them to the correct shape. There is a very simple way of making aluminium pliable. Wet one surface and smear it with common salt. Then heat it with a lamp or spirit burner. Copper just needs heating. If you take the trouble to go round shops and look for the right size of saucepan or cake mould, etc., you will eventually find a shape and size that is very near to your requirement. Actually the radiator rim of my Bristol Fighter is made out of a copper ball from a lavatory cistern!

Louvers are another black spot. If they are not regular and all of the same shape, they will spoil your model, so take your time. After having drawn lines in the exact position of the louvers on the metal panel, drill a small hole at one end



Another view of the Ansaldo S.V.A. This is an exact model of the plane the writer's father flew.

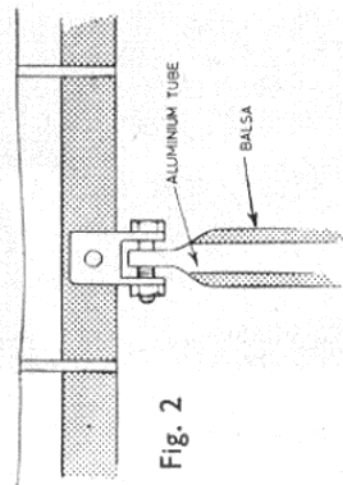
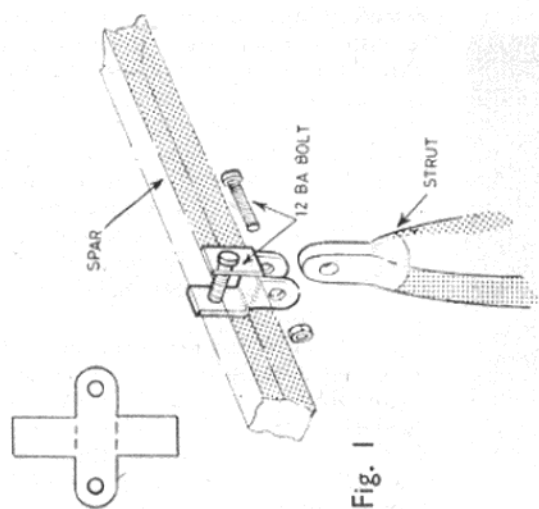


Fig. 3

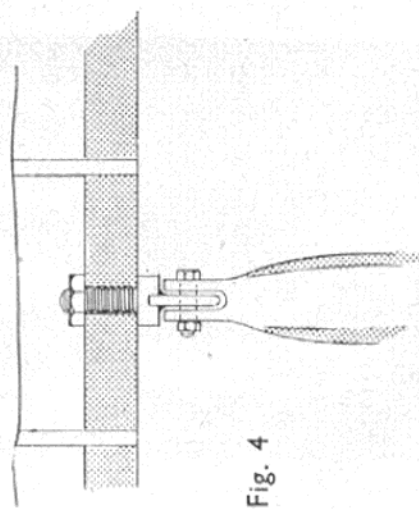
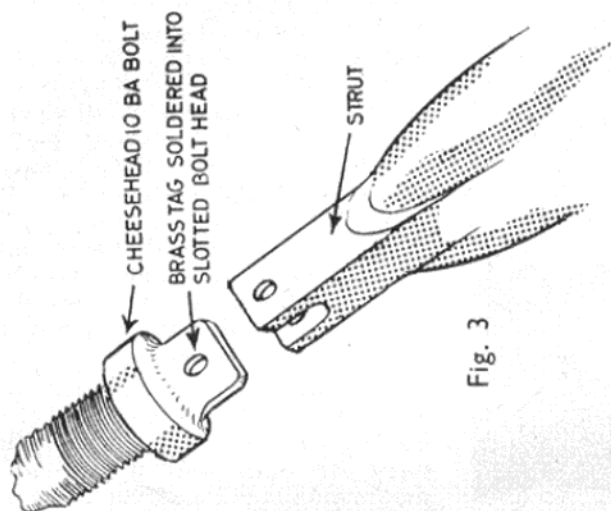


Fig. 5

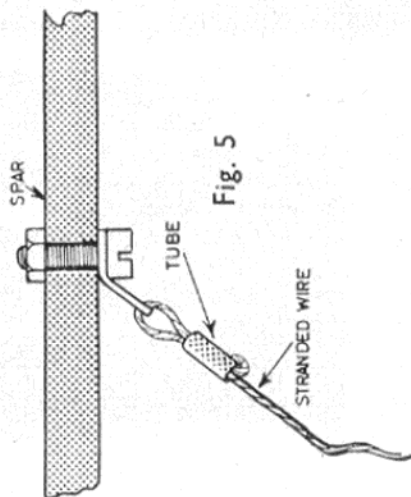


Fig. 6

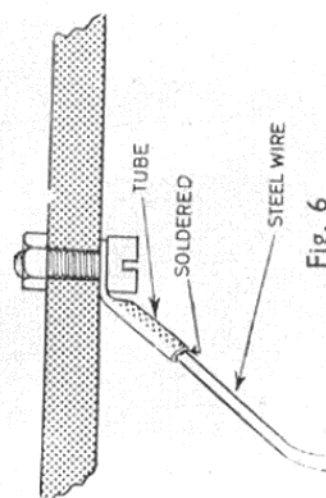
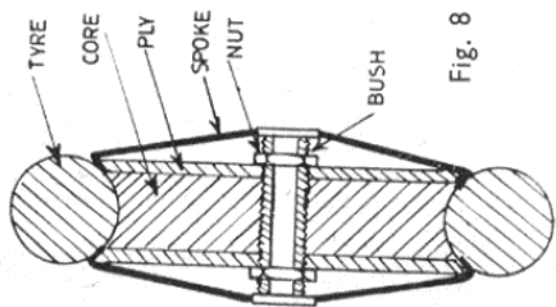
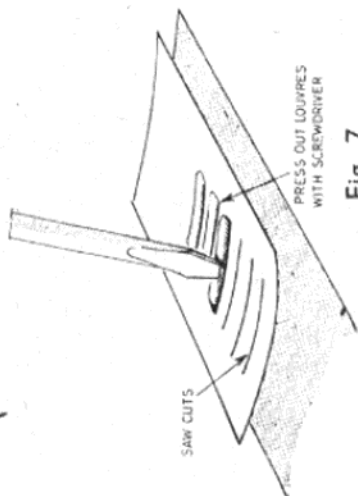


Fig. 7

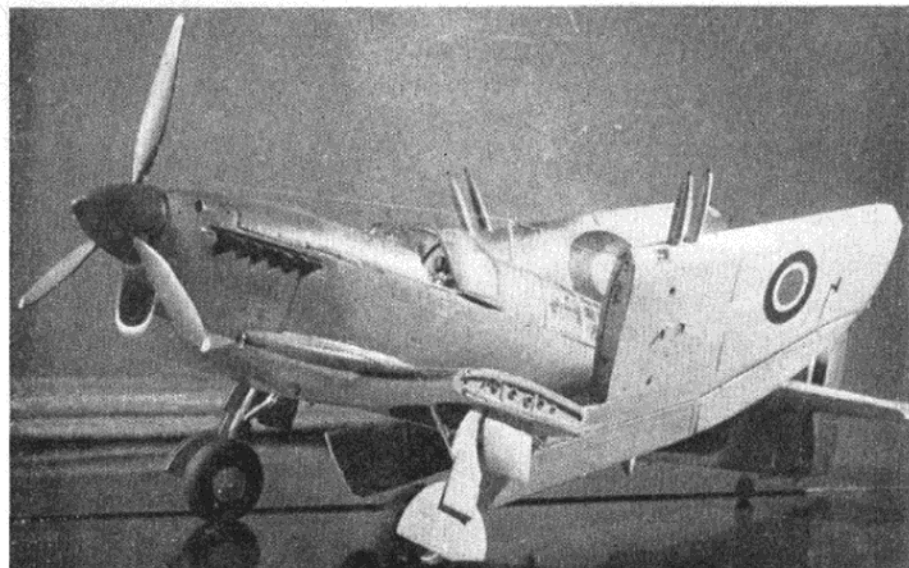


and saw up to the other end. Then, using quite a big screwdriver or some similar tool, push out one side of the cut from underneath. (Fig. 7.)

When you build the wheels, check the tyre section carefully. A tyre out of scale will spoil the whole effect of the model. I am against the use of commercial ready-made wheels. Work down to the right shape an existing rubber tyre (Meccano, model car tyre or similar). A core with the diameter of the inner part of the tyre, two plywood discs of the size of the actual rim joined together, and a good bush in the centre make a perfect wheel. To both ends of the bush, metal spokes can be soldered, the other end of the spokes being pushed through the plywood (see Fig. 8). To cover, cut a round piece of fabric, bigger than required, then, having smeared some clear dope between the tyre and plywood discs, tuck it in. The result is most realistic.

Cockpit details in a scale model are essential. Great care must be taken with the location of the various controls and instruments which must all be built to the right shape. Guns and bombs must also be built separately but remember that even balsa wood can look like metal if treated in the proper manner. So if you do not have a lathe to turn up metal parts (I have never had one and moreover would not know how to use one) do not despair, just use plenty of elbow grease!

Finishing and painting the model is most important. A wrong colour



*This 1/4th scale Fairey Firefly powered by a Fox 59 spark ignition engine had complete wing folding mechanism.*

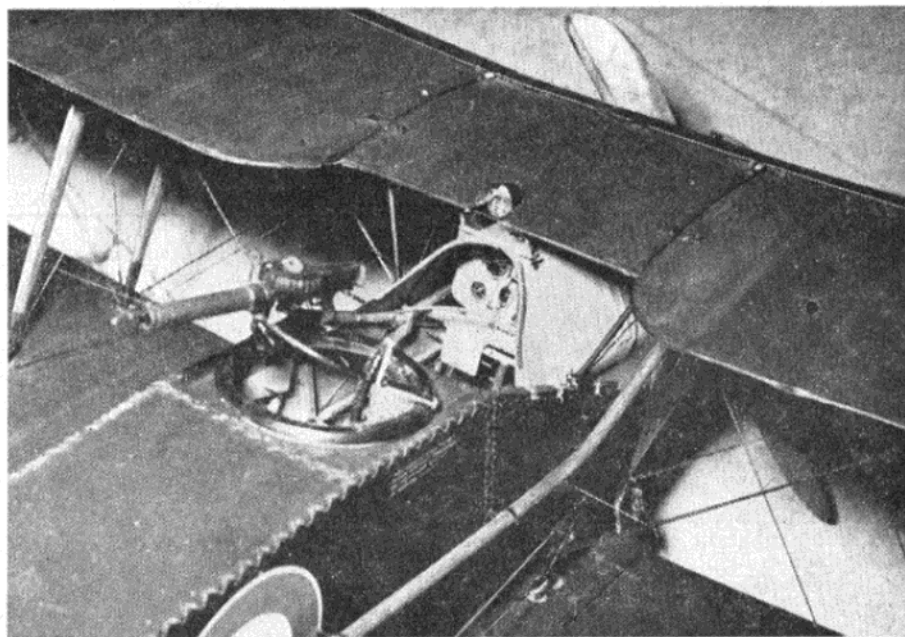
shade, a wrong size roundel, a non-existent serial number look silly and will lose points in a serious competition. Check all the information you can get about the true colour scheme, and if it is camouflaged, follow the original pattern of the various shades. Find a reliable source of information. Many books about camouflage are wrong. One of them gives the main colour of a French Spad XIII as silvery-grey. None of the French Spads has ever been painted grey. Their true colour was either yellow or a camouflage with not less than ten different shades of brown, khaki, green and even black. I use a foot

pump type spray gun for my colouring; it was cheap to buy and is very useful. Remember, if an aeroplane is finished in a matt colour, and most of them are, do not use a glossy dope. One sees all too often in scale concours events, beautiful models spoiled by this unnatural glossy surface. Matt plastic enamel can be used over a clear doped surface and it is quite effective as well as being petrol and diesel fuel proof.

When possible, roundels should be hand painted, but to make life easier I often use transfers repainted in the true shade with matt enamel. Serial numbers must be cut out of a transfer sheet, or, even better, hand painted. One seldom finds the right shape or size in commercial transfers.

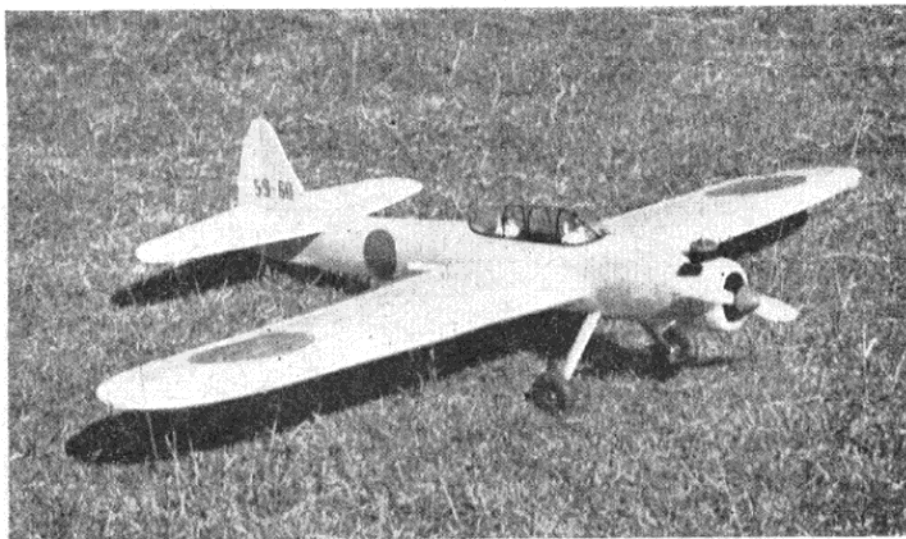
Well, I have tried to describe what I think is necessary in building a scale model but I would like to add that the reward for all the time spent, all the work, is not a cup or diploma; it is the inner satisfaction which comes from making something that surpasses the usual model plane, something that, when in the air, is a *real* aeroplane. Have you ever flown a real biplane with lots of struts and wires? When you throttle back and put the nose down you hear it whistling a music which only someone in love with flying can appreciate. Well, your scale model will whistle in the same way. You can hear it and feel yourself sitting in the cockpit you know so well because you have made it. You fly with it.

Is it only a dream? I don't know. But that is the feeling I get when I take up one of my scale models.



*Complete cockpit detail and fabric lacing of the Bristol Fighter are seen in this photo.*





## GEISHA GIRL

A 'do the book' .29 stunt model  
with attractive semi-scale appearance  
designed by . . . . . RAY BROWN

THE "Lee Bees Controliners" club needs no introduction to C/L stunt fliers, and one of their most prolific builders is Ray Brown, whose Zero inspired *Geisha Girl* we feature this month. Despite its scaly appearance the *Geisha* will easily perform the stunt schedule. To date Ray has won the stunt contests at the Beauleiu and Godalming rallies, come second at Enfield and only lost the Gold by 2½ points!

### Constructional Notes

Cut formers from ½ in. balsa as shown on the plan. Bolt the under-

carriage between the ply-formers. Select two sheets of pliable medium soft, 3/32 in. sheet for the sides and cut to a shape slightly wider than shown on plan. Fix the 1 mm. ply doublers with impact glue but do not cut out the wing slots at this stage. Bind the sides to the formers with Sellotape and cement well, allow to set hard before removing the Sellotape.

Add the motor mounts and tank at this stage. Fill in between the mounts and sides with scrap balsa. (Note: before cutting wing slots add silk or rayon to inside as shown

on plan.) The tail wheel assembly is now fixed between the sides before adding the bottom block.

Build the wing in two halves, and begin cutting out two sets of ribs sandwich fashion. Fix the ribs to the lower main spar and lower T.E. first, then add L.E., top main spar and ½ in. square along the T.E. before fixing the tip. T.E. can be assembled after removal from the plan. Cement the wings together and add 3/16 in. braces across the centre section—pin down the entire T.E. whilst setting. Add the ½ in. ply bellcrank platform and leadout wires then the 1/16 in. L.E. sheeting and cap strips, line guides, etc.

The wing can now be slid through the fuselage and fixed in position. Cut panels out of 1/16 in. centre section sheeting afterwards to allow control pushrod complete freedom. Flaps are added after assembly, but the horn-rod must be placed across the fuselage before the wing is fixed in place.

The tail is cut from medium-soft ½ in. sheet and the 1/16 in. ribs are sanded to the section shown on the plan. Connect up the control rods at this stage, making sure that everything centres properly before fixing the tail to the fuselage sides. The fin consists of medium-soft 3/16 in. sheet sanded to a symmetrical section.

Cut out the soft fuselage blocks to plan view and cement lightly to top and bottom. Carve to the section shown on the plan, remove and hollow out to 3/16 in. wall thickness, then fix permanently in position. Front cowl and top are fashioned from soft block and are fixed to the engine bearers with small woodscrews.

The model should balance on, or about, the main spar position for smooth flying.

## POWER DURATION MODELS

Continued from page 67

easiest construction (shown on the plan) took a lot of punishment before showing signs of failure, and seems to be capable of withstanding a d/t under power.

I do not claim to have ever seen any still air but the still air duration with everything just right, should exceed 5 min. from 15 sec., this with a 16 oz. example and a good 2.5.

### Beanpole

Future development will be on the lines of the long model described in the "designing for a flight pattern" section, a prototype of which is shown in the

accompanying diagram. Wing chord is increased ½ in., tail chord 1 in., tail span 2 in. and moment arm 2 in. The fuselage construction is greatly simplified and a flat pylon is used despite better judgment saying "no"! Flat bottom wing and tail sections enable a simpler wing and tail structure to be used.

A suspected snag with this layout is the pull out, which may have to be obtained by the use of an auto rudder.

Much Developed Version of Vic Jay's

1955-56 F.A.I. 2.5 c.c. Model

This model has only recently been

built and is, as yet, suffering from teething troubles. These are in the form of a fuel system which was not built in strongly enough and started disintegrating, and a pull-out which, although not a large dip, sometimes caused the model to carry on stalling indefinitely.

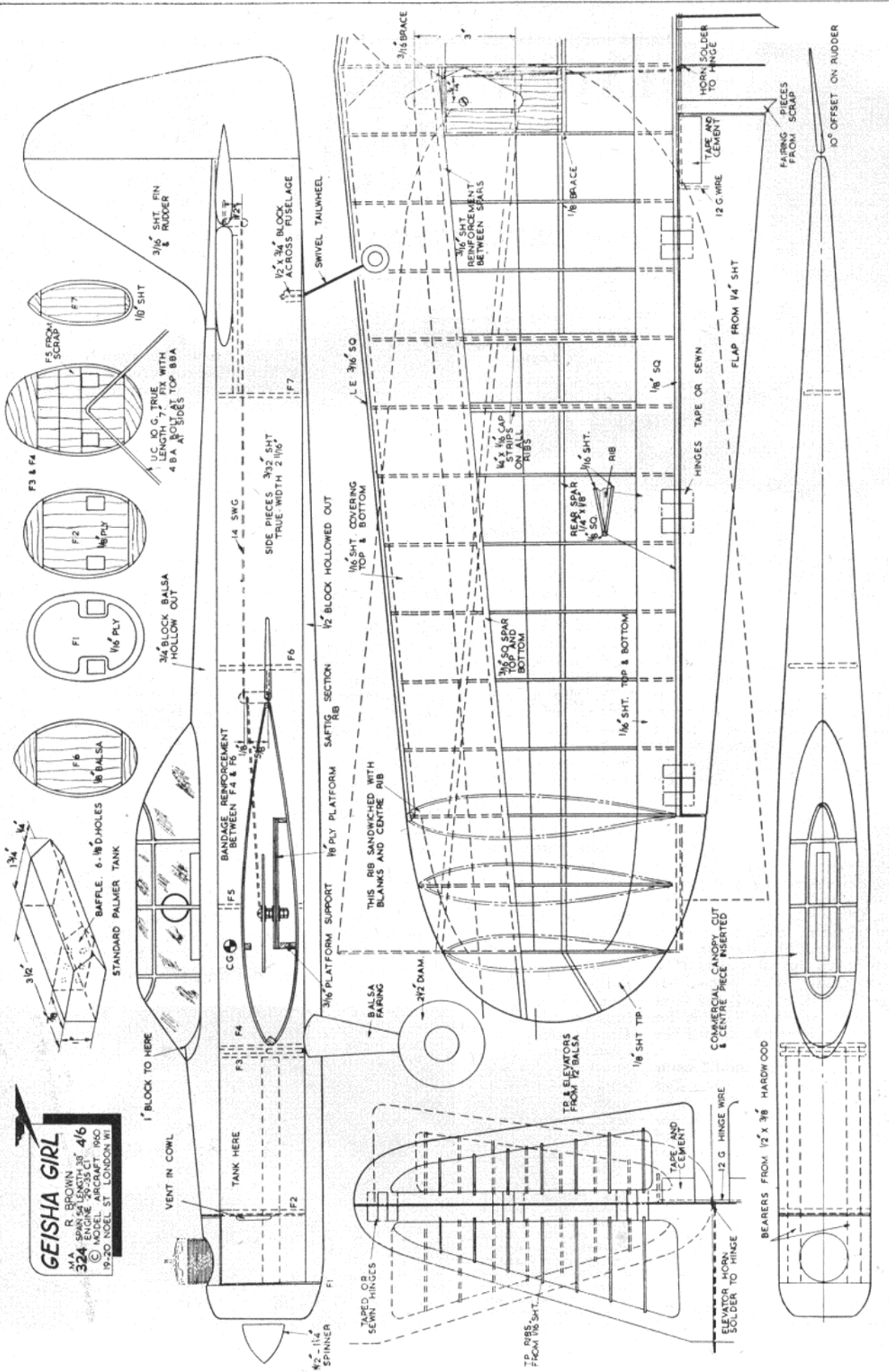
The former is being re-built in, while the latter is cured by making the climb shallower and faster.

The power this model has to control (size being that of a normal 2.5 c.c. model!) seems to be no problem but everything is built immovable and thoroughly keyed in place.

This design gives the wide sweeping type of climb rather than a vertical spiral rolling about the fuselage.

# GEISHA GIRL

M.A. R. BROWN  
324 SPAN 52 LENGTH 38 4/16  
ENGINE 29-35 C.T. 1860  
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## LATEST ENGINE NEWS

from **PETER CHINN**

The new Rebell 1 c.c. low-priced diesel, made for, and distributed by, the German firm of Alexander Engel.

**T**HE new R/C version of the Merco Stunt 35 looks very nice. Like present leading R/C engines—notably the K & B Torpedo 45RC and O.S. Max-III 35RC—it has both intake and exhaust throttles coupled together. The exhaust unit is a flat plate baffle, like the K & B, but pivoted at one end instead of the centre. The carburettor throttle is a barrel type and has a separate air-bleed idling adjustment—a refinement otherwise found only on the O.S. In keeping with the rest of the engine, the construction and finish of these new component parts are first class.

When the K & B 45 and 45RC were introduced last year, it was widely prophesied that other American manufacturers would quickly follow suit with 0.45 cu. in. (7½ c.c.) or similar size engines for R/C work. These, however, have been slow in coming forward, despite the fact that the 0.45 size was immediately taken up by leading U.S. radio modellers and to an extent that now makes the K & B 45RC the most widely favoured American engine, for large multi-channel models, among the top fliers.

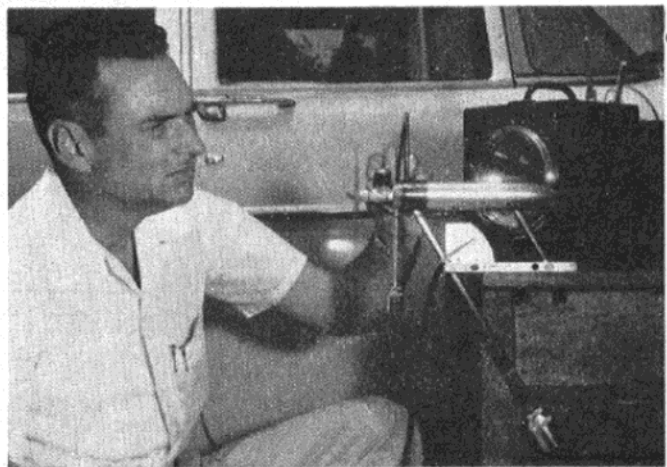
One more 45, however, should come on the market before the summer. This is an entirely new job, rather more heavily built than the K & B. It has a one-piece crankcase, cylinder barrel and main bearing unit, large-journal crankshaft and, in its R/C version, coupled throttles (semi-rotary type exhaust unit) and a special head. We have a prototype of this engine and hope to give more complete information as soon as permitted to do so by the manufacturer.

One of the surprising features of present day Japanese model engine

production is the willingness of leading manufacturers to make frequent improvements to their engines even at the expense of costly re-tooling. The majority of British and American manufacturers try to make crankcase dies, for example, last for several years' production. In contrast, the Japanese O.S. Max 29 and 35 have progressed, among many other changes, through four different crankcases in five years.

This policy is now also evident in the low-priced O.S. Pet 099 which, in its new 1960 version, has undergone several basic modifications, including a new crankcase unit with Desaxé cylinder layout. Although it is almost identical in appearance, the new casting is much "cleaner" (the finish, in fact, is now comparable with the very high standard of the Max-III models), has heavier mounting lugs and a larger diameter main bearing housing. Apart from this, the engine is easily distinguished from its predecessors by a new finned diecast cylinder-head in place of the plain machined head formerly used. The cylinder now has a blued anti-rust finish and has slightly modified porting to take advantage of

Bob Holland, well-known U.S. engine manufacturer, testing one of his latest Hornet 0.8 c.c. motors. The engine is fitted to a torque reaction mounting which also measures static thrust. The stroboscope is for measuring r.p.m.



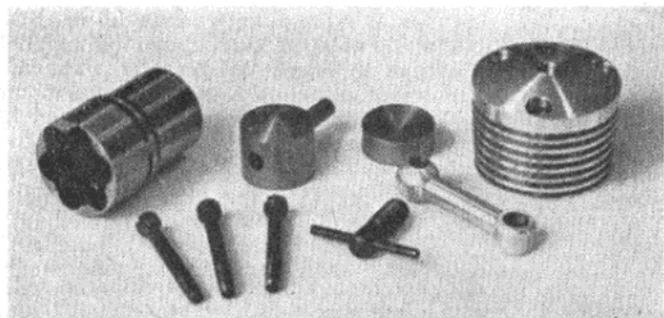
the offset positioning. So far as we are aware, the new 1.6 c.c. Pet is the smallest production engine ever to feature the Desaxé layout.

Just for the record, there is still no such thing as an Oliver Tiger Mk. 4. . . . Also, the short stroke Mk. 2 Oliver Tiger-Cub 1.5, first described in these columns a couple of years ago, is still not yet in production. Only two of these were built. The first one came to us for test and proved to be the most powerful 1.5 to date (0.18 b.h.p.). At present it is in America, equipped with a crankcase-pressurised float-chamber fuel system, and lifts a 6½ lb. R/C endurance model with ease, turning a 10 × 4 prop at 8,000 r.p.m. The second engine went to Mike Bassett, who has had a staggering 90 m.p.h. out of it in one of his team racers.

Again, just for the record, there is no such thing as a 2½ c.c. Holland Hornet. . . . Among American "Half-A" class engines the latest Holland Hornet 049 is unquestionably one of the most powerful. Over the past year or two it has been notably successful in this popular U.S. F/F class. So, when reports started coming in that the Holland Engineering Company were producing an equally hot "F.A.I." engine, we thought the time had come to ask Bob Holland about it. The story, it seems, stems from an error made at the 1959 U.S. Nationals, when Bill Hunter's winning r.o.w. *Satellite-600* was entered as having a "Hornet 15," whereas, in fact, it was fitted with an O.S. Max-II 15. In no time at all, word got around that the Max was a prototype Holland 15!

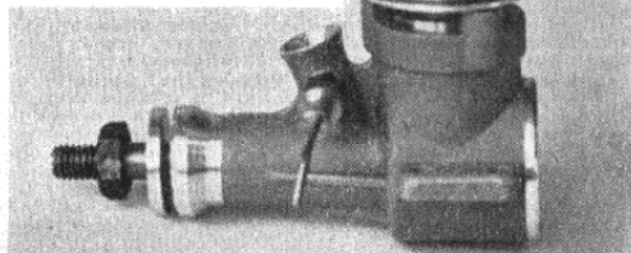
Now being produced in Hungary is a new 2.5 c.c. diesel, the Krizsma "Record," designed by the well-known Hungarian all-rounder Gyula Krizsma. The engine appears to be of better quality than the Hungarian quantity-built diesels that have been offered for export. Performance curves for this engine, published in Hungary, claim a maximum output of just over 0.27 b.h.p. at approximately 13,000 r.p.m. For





On left: Parts of the Krizsma Record diesel. Note transfer porting which is similar to that of the Webra Mach-1 and Schlosser 2.5 engines.

The new Hungarian Krizsma Record engine of 2.5 c.c.



From the old-established French Micron firm is the 1.5 c.c. glow-plug unit below right

although several new or revised models have made an appearance or have been in the offing since last summer,

among them the Fox 201 and Veco 29R. The latter has now been officially released and appears to be the 29 equivalent of the 35C, but with normal suction intake instead of pressure feed. Both engines have been developed from the existing "Series 100" 29 and 35 stunt engines. The 29R is intended for team-racing and combat and other applications where higher power at high revolutions is desirable.

Look out for a new "speed" version of the hot Enya 29-3. The manufacturers have recently been working on a 29-3 Special. To quote designer Saburo Enya: "This engine has one ball-bearing, a wider intake port and a new chrome-molybdenum steel crankshaft." The engine will be supplied with two

comparative purposes a curve for the Webra Mach-1 (a favoured engine among Hungarian F/F experts) is also given on the same graph showing a maximum of 0.285 b.h.p. at 15,500-16,000 r.p.m. but lower maximum torque and a lower output at speeds below about 13,400 r.p.m.

The engine is a straightforward, plain-bearing layout, with shaft intake and circumferential cylinder porting. The transfer system consists of six, deep, internal flutes similar to that used by the Mach-1 and Schlosser 2.5. The upper part of the cylinder liner is jacketed by a finned alloy cooling barrel, the entire assembly being secured by three long screws into lugs in the crankcase casting. The shaft is of the plain disc-web, non-counterbalanced type. Bore and stroke combination is the usual Continental  $15 \times 14$  mm.

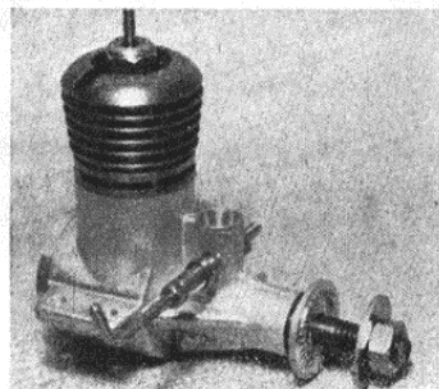
Other "Record" engines currently manufactured include a twin-shaft car unit, on the lines of the Oliver car engine, and a 5 c.c. shaft-valve loop-scavenged glowplug motor.

Due to be released about the time this appears are the first of a new series of low-priced diesels especially manufactured for the German model firm of Alexander Engel. To be known under the name of "Rebell," the first two engines are a 1 c.c. and a 1.5 c.c. (actually 0.96 and 1.47 c.c.). They are perfectly ordinary engines of the plain-bearing, shaft intake, radial port type and their main attraction will be their price, which is expected to substantially undercut existing levels. The heading photograph shows one of these engines.

Announcements of new American engines have been rather less frequent than usual over the past few months,

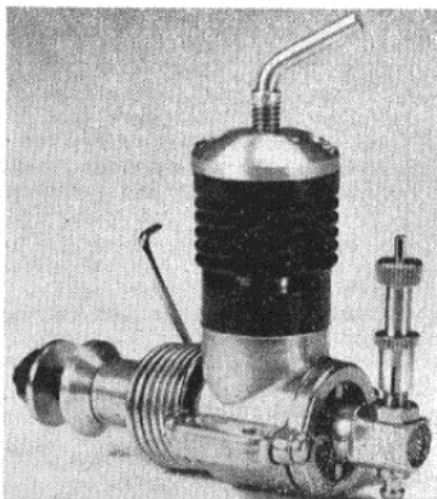
sizes of venturi inserts and is intended for team-racing and speed. With the standard 29-3 already capable of delivering up to 0.70 b.h.p., the performance of the Special should be interesting.

New on the French market are a couple of small shaft-valve, radial-port engines. One is the Micron glow 1.5 illustrated, made by Moteurs Micron of Paris 11, one of the oldest model engine manufacturers on this side of the Atlantic. The other is the Modelsport M.S.10, built by Monsieur Y. Drhouin,



at Agde in the South of France, and available in glow or diesel version. This latter is a 1 c.c. job ( $10.75 \times 10.65$  mm.) and looks very "AM-10-ish" around the crankcase. Performance claimed is also similar to the AM-10: 0.12 b.h.p. at 14,000 r.p.m.

We have a laudatory independent report from America on the experimental Super-Tigre loop-scavenged diesel 2.5 first mentioned in our November column. On an  $8 \times 6$  Top-Flite Nylon prop, the engine was 1,000 r.p.m. up on two Cox Olympics, 1,000-1,500 up on an Enya 15-D and two modified Olivers and 2,000 r.p.m. up on the Super-Tigre G.20V. While comparative prop/r.p.m. tests only give part of the story, due to varying power-curve shapes and peaking speeds, these figures are quite remarkable. However, it remains to be seen whether production models of the Super-Tigre are as good.



The production version of the new Enya 06-D 1 c.c. diesel. It has reed induction and a spring starter.

YOUR OWN . . .



. . . PAGES

If you were at the National Models Exhibition you will know that it attracted a great number of young people—the largest number, indeed, since the first exhibition 63 years ago. You will also be aware that all of them, whatever their special interests, enjoyed inspecting the model aircraft and watching the flying in the arena.

Hundreds of young modellers decided to join the Wings Club before another day was over. I had, of course, expected this. Obviously, a very high proportion of young enthusiasts would want to claim the opportunities and prestige which the club offered them. But what I did not expect—and I am still recovering from the surprise—was the similar eagerness of boys and youths who hitherto had given only a mild attention to the pleasures of building and flying aircraft models. They, too, wanted to join!

Some of these newcomers were attached to other hobbies, while others had no definite hobby at all. There comes a time in one's schooldays when an earlier interest—perhaps in some form of collecting—loses its appeal, either because one is older or because the pressure of homework and examinations creates a break. Once dropped, a hobby tends to be abandoned. The boy of 14 or 15 may even regard his earlier enthusiasm with amused scorn.

It is at this point in one's life that aircraft modelling often fills a need. Here is an interest which is clear-cut, adventurous, constantly expanding and thoroughly adult. One does not grow out of it; on the contrary, one grows into it ever more deeply. The boy's hobby becomes the man's.

Already our club is an assured success. But what delights me most is the work the club is doing for the whole model aircraft movement by bringing in the newcomers. I am sure that the actual modellers among the wingmen will welcome the recruits to modelling as eagerly as I welcome you all at the outset of 1960, a year of grace, we hope, for all of us.  
Alan Winterton.

## RYAN X-13—an ideal model for wingmen



Build this model and win £2!

This prize will be awarded to the Wings Club member who sends us the best photo of his completed X-13 by March 15th. We will publish the photo in our May issue. The plans and these instructions almost do the job for you!

THE full size plans in the centre pages of this issue are for a simple Jetex 50 powered profile model of the fascinating Ryan X-13 *Vertijet*. This experimental American vertical take-off aircraft first flew successfully in 1957, and even junior Wings Club members should find no difficulty in constructing our flying model of it.

In photo 1 all the parts are laid out and as you can see there are no difficult shapes to cut out. You will need a tube of cement and a 3 ft. sheet of softish

$\frac{1}{8}$  in.  $\times$  3 in. balsa wood, which costs about 1s, a piece of  $\frac{1}{8}$  in. sheet balsa, large enough for the fuselage, and, of course, a Jetex 50c. motor.

Start by tracing the outline of all the parts on to the balsa wood and cut them out with a sharp knife. The wing and

part "A" are each made up of three pieces of  $\frac{1}{8}$  in. sheet cemented together edge to edge. While these parts are drying, cement the small plywood motor mounting plate to the fuselage, and fit the two triangular blocks between its top side and the fuselage to support it firmly.

Slide parts "A" and "B" into the slots in the fuselage and hold them with pins until the cement dries. Make certain that the fuselage is exactly on the centre line of these two parts. The side pieces may now be cemented into position; one is shown fitted in photo 2.

Slide the leading edge of the wing into the fuselage slot just behind the cockpit, and cement the wing firmly to the fuselage making sure that it is in contact along its entire length. The rear end of the wing should curve up slightly; this is important and pins must be used to hold the wing until the cement dries.

Slot the tip fins on to the wings and then cement the centre fin in position as shown in photo 3. Be sure to get the fins exactly in line fore and aft and perfectly upright, sloping neither to left or right. The markings can now be applied using transfers; or a ball point pen may be used to draw them directly on to the wood.

When you fit the Jetex motor take care not to have it pointing to one side as this will make the model very difficult to fly. With an empty Jetex motor fitted, your X-13 should balance level when supported under the wings at the point marked "c.g." on the plan. Add plasticine to the nose or tail until the correct balance is achieved.

Glide the model with the empty motor fitted over soft ground and adjust the balance until a smooth descent is obtained. Load the Jetex motor according to the instructions and choose a calm day on which to fly the model for the first time.

If you have built the X-13 carefully and there are no warps, it should climb in an almost straight line. If it turns sharply to right or left correct it by bending the tip fin on the *outside* of the turn in the *opposite* direction.

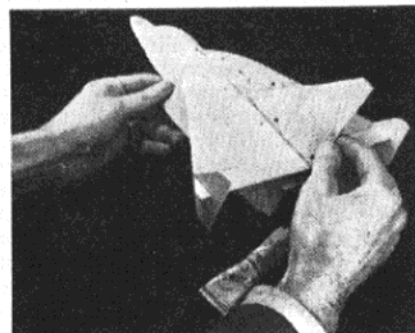


Fig. 3

Dear Alan Winterton,

I would like to become a member of the Model Aircraft Wings Club. With this coupon I enclose a postal order for 1/- to help cover the cost of the badge and membership book.

Name in full.....  
(Underline christian name normally used)

Address.....

..... Date of birth.....

School or College.....

Name of other club or clubs to which I belong (if any).....

Send to—MODEL AIRCRAFT WINGS CLUB, 19-20, NOEL STREET, LONDON, W.1.

## ON THE WINGS CLUB WORKBENCH — Tissue Covering

ONE of the jobs that the beginner finds most difficult to carry out successfully is that of covering the completed framework. Scale model fuselages with their many stringers are particularly tricky and should not be attempted until experience has been gained on a simple box fuselage model such as that of the *Frog Fawn*, which we are using for this month's feature.

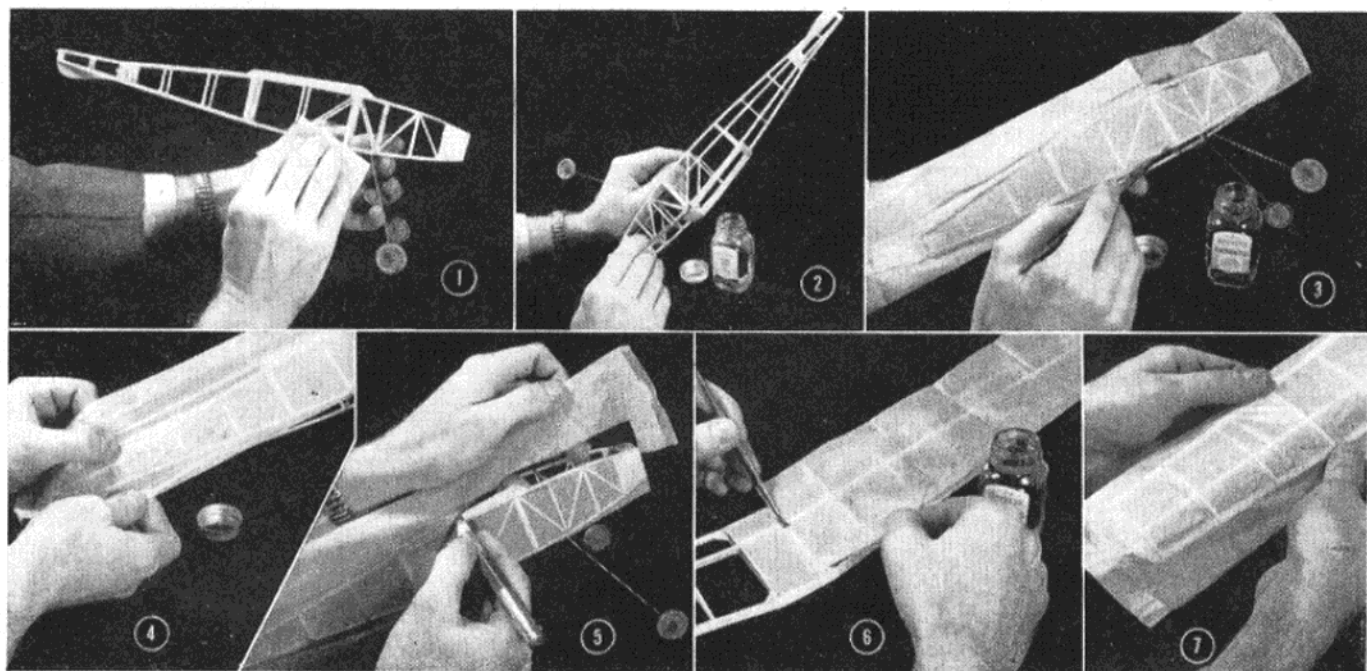
The tissue paper will be supplied with your kit, and in addition you will need, a small bottle of clear dope, a small

bottle of thinners will soften the dope sufficiently to allow corrections to be made. When dry, trim off the surplus tissue and repeat the operation on the remaining fuselage sides (Photo 5).

The wing and tail are covered in the same way but do not try to cover the wing in one piece of tissue. Use three pieces on the top surface, one for the centre section and one for each outer panel. In Photo 6 we are sticking the tissue to the root rib and when this is dry the rest of the tissue is attached

pull of the shrinking tissue will twist and warp the thin wood, destroying the model's flying performance.

Unlike clear dope, the coloured sort does not shrink tissue and, therefore, should only be used after a coat of clear shrinking dope has been applied. Colour dope is quite heavy and even one coat will cut down the flying performance, so if you wish to brighten up your model, paint only the nose, or wing tips, or perhaps the wing leading edges, in a contrasting colour.



bottle of thinners, a No. 5 artists' brush and a simple water spray (scent spray).

Before starting, the entire framework should be lightly smoothed with a piece of fine sandpaper, and any blobs of cement that stick up above the framework must be removed (Photo 1). This preparation of the model is very important if a smooth covering is to be achieved.

When you are satisfied that the framework is as smooth as possible, give all the outside surfaces a coat of clear dope (Photo 2). Now cut a piece of tissue a little larger than the fuselage side, lay it on the frame, and attach it to the nose of the model by brushing thinners liberally over the *outside* of the tissue. The thinners will soak through, and the dope on the frame will become tacky. Press the tissue on to the wood and in a few seconds it will be held firmly. When the tissue is stuck to the nose, work back along the frame with the thinners, pulling the tissue taut as you go (Photos 3 and 4). The important point is to ensure that the covering is *evenly* spread. It does not have to be stretched *tight*. If the tissue sticks before you have spread it evenly, the applica-

tion of more thinners will soften the dope sufficiently to allow corrections to be made. When dry, trim off the surplus tissue and repeat the operation on the remaining fuselage sides (Photo 5).

The whole model should now be sprayed very lightly with water. The tissue will slacken off and look very loose, but when the water dries it will tighten up and shrink to a drum-tight surface, free of wrinkles. Do not handle the tissue while it is wet as it is very weak indeed when in this condition.

You must not try to hasten the drying time by heating the tissue, as this will only make the covering slacken off again upon drying.

To strengthen the covering and help to make it waterproof, a coat of clear dope is now brushed all over the tissue.

Dope is very inflammable so do not use it near the fire. The coat of clear dope will shrink the tissue even more than the water and give your model a slightly glossy surface.

When the dope is no longer tacky, the wings and tail may be pinned down on a flat surface to prevent the frame twisting as the tissue shrinks. Do not give more than one coat of dope to such a small model as the *Fawn*, as the

Humbrol plastic enamel is much lighter than colour dope and is especially useful for decorating flying models, although it takes a little longer to dry. Like colour dope it has no shrinking properties and on tissue it must be used over a coat of clear shrinking dope.

The method of covering that we have described here is undoubtedly the lightest and neatest, but if you wish, instead of dope and thinners, tissue paste may be used to attach the tissue.

*Last month's*

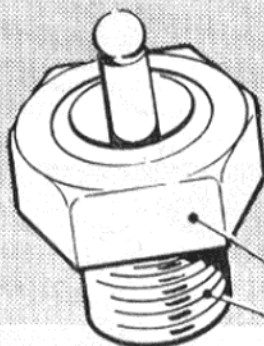
### QUIZ WINNERS

The following will receive an autographed copy of Peter Chinn's "All About Model Aircraft."

T. Shipman of Nottingham, R. Lowe of Colchester, M. A. Bailey of Sowbridgeworth, A. T. Smith of Farnborough, H. Butler of Woodford Bridge, N. M. Aspinall of Doncaster, A. Clarkson of Liverpool, M. W. Leggett of Fakenham, R. Latham of Solihull, A. Holden of Greenford, A. M. Winstanley of Richmond, C. Goddard of Norwood, D. Mullen of Sheffield, L. Bloom of Rochester, D. Y. Thornton of Hartlepool, M. C. Swain of Blackpool, D. O. Stovel of Glasgow, H. G. Clancey of Barnsley, F. C. Walgrove of Penzance, H. Burrage of Maidstone, W. R. Manton of Harrow, G. W. Davis of Bristol, C. Emwyn of Cardiff, J. Leahy of Cahir, Eire, M. Isbister of Liverpool, 11.



# Readers hints and tips...



An effective bushing for bellcranks is a cut down old glow-plug says P.S. WOOLEY of Nkana, N. RHODESIA

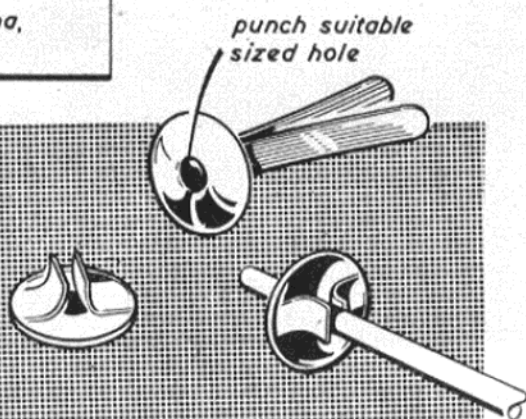
These two ideas will be found to be useful where the glow-plug motor is fully cowled or inaccessible the first is from J. HAGUE of SHEFFIELD and the second is suggested by C.D. FRIZELL of N. RHODESIA

plug screwed into bellcrank — fix with Araldite

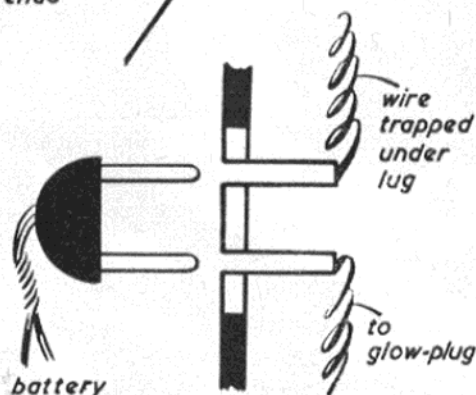
cut plug here

8 SWG. pass through fuse side  
clip leads on bolt ends

Superior to cup washers for all wheel retaining are these modified paper clips which stay in position during soldering by gripping the axle between the cut-short tags. This tip wins the tool chest this month for P. PLAUGHTON of Gore, NEW ZEALAND



punch suitable sized hole



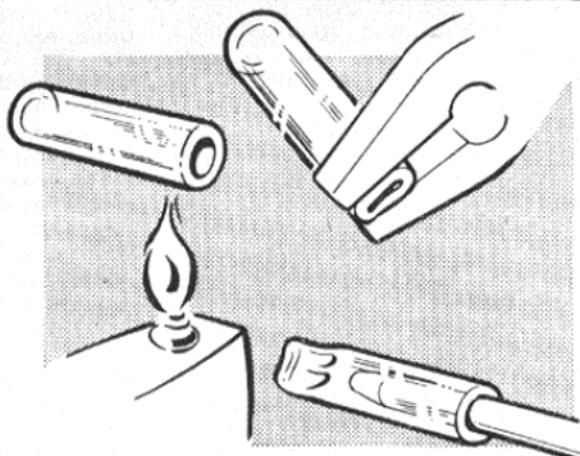
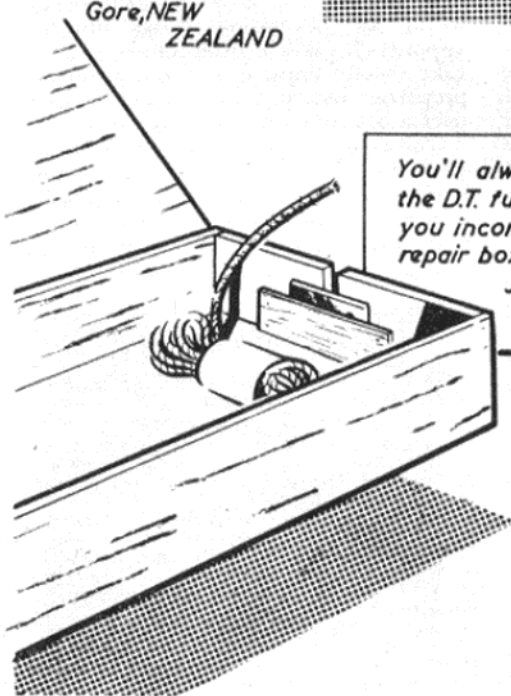
battery

neoprene connection

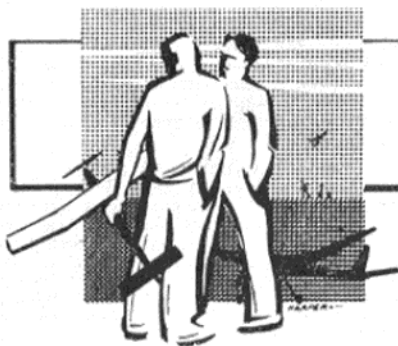
22 S.W.G. piano wire

CLIP ATTACHMENT for GLOW-PLUGS

You'll always know where the D.T. fuse trimmer is if you incorporate in your repair box this idea of J.A. TURNER of STOCKPORT



This efficient sealing cap for the fuel tin spout is suggested by J. TURNER of BIRMINGHAM. The same reader also carries small quantities of dope in nail polish bottles for field repairs



# CLUB NEWS

## MONTROSE M.A.C.

Our comparative inactivity during the past year has been due to the fact that most of our time (and money) has been spent on equipping our new clubhouse.

The hard core of our membership is still with us, the more active consisting of five Montrosians, three rural and two R.A.F. members.

Our activities cover all types of modelling from R/C to plastics and this year for the first time since 1954, we held our New Year open glider comp. The Oberbeck Cup has been re-allocated to this event and was won by C. G. Cambell with an original design which he calls *Uthan*.

## WOMBATS M.A.C.

We have now been running for nine months, collecting 25 members, mostly seniors, during that time. We are probably unique in having two permanently rented clubrooms, one of which is neatly fitted out as a workshop. The other room is also being fitted out, and when finished about 20 members will be able to build at once. The clubrooms are very conveniently placed above Harding's model shop. We have a "pub" next door, a chip shop within 30 sec. staggering distance and a hot dog stall 1 min. away which is open on Sundays!

The members are dead keen on all types of models except scale, open power coming into prominence with a spate of ETA 19 *Dixielanders* and Oliver o.d. lightweights. ETA 29 power jobs are on the way together with Wakefields and a club design A/2. A few members have R/C equipment and interest among the others is high.

We were annoyed by the Loughborough College rally. We only knew it was off through a chance meeting with a L.C. bod at the local fair the night before the rally! However, we managed to help out a bit by doing some timing for the bods who turned up. (We disclaim any association with L.C. after this issue.)

## SIDCUP AERONAUTICAL SOCIETY

Interest in all aspects of model flying has increased in recent weeks and even the team race enthusiasts are building gliders and power jobs to take to Chobham and fly. Club meetings are well attended and the various talks, film shows and indoor flying comps have been well received. We would like to air one grievance—since no properly organised competition for the area centralised C/L competition was arranged by the London area we ran a small competition

at our local flying ground and hopefully submitted our times—they were returned, of course. We do not blame the S.M.A.E. comp. sec., he was only doing his job, but had our times been accepted we would have had a 1st and 3rd place in the F.A.I. team race and a 1st and 2nd in the "A." We did attempt to find a suitable flying ground, and organise a competition but we could not do the impossible within the time. We do feel most strongly that it is not good enough for an area as large as London to be dependent upon competitions organised by other areas. We are quite willing to lend a hand.

## SOUTH BRISTOL M.A.C.

Owing to the customary lack of flying space in and around Bristol the majority of our activities are centered on C/L flying, in particular team race and stunt.

In view of the small flying field, and also to encourage the juniors, the F/F comp. sec. has organised a number of contests suitable for 0.8 c.c. sports models, these include a scramble, nomination, and scale contest.

Bob Bishop set a new club speed record of 103 m.p.h. using a P.A.W.-powered F.A.I. team racer.

## HESWALL M.A.C.

At our annual general meeting the chairman announced that club membership had risen from 10 to 40 during the year. The treasurer announced that funds had risen by about £17 and the secretary resigned. A new secretary and comp. sec. were elected and the chairman and treasurer re-elected.

Club meetings have been enlivened by R. Angell's rubber-powered speed job and colour slides of the Nats. and Farnborough by D. Stewart.

## LIVERPOOL & D.M.A.C.

We are pleased to welcome back our Italian member after his holiday in his homeland. Whilst there, he entered several F.A.I. comps., best placing being second in the William Sperandino Cup.

We have commenced this year's programme with a film show (about models, of course) and hope to follow this with a lecture by our Australian member, Bernie Spinks, who is a C/L expert. Later we intend to have an R.T.P. meeting and perhaps organise competitions for this type.

Heston aerodrome has, provisionally, been added to our list of available flying fields.

## HAYES M.A.C.

The Hayes team of Laurie Barr, Jim Baguley and Jim Sporrin, won the L.D.I.C.C. for us once again, and the annual C/L comps. are now under way. Top F.A.I. speed so far is McGladery's 90.3 m.p.h. with *Olympic*, and Balch won "A" T/R in 5.39, and had the model stolen when his shed was burgled four nights later. Club members are asked to watch for a Fox 35

with A.M. spraybar and needle, a tuned Rivers 2.49 with a shiny c/case, and aluminium washer under the liner (this motor came direct from the manufacturer—all other tuned 2½s have sand-blasted c/cases)—and a 3 c.c. Special Rivers (2.49 on c/case, but recognisable by porting—exhausts at sides only, not fore and aft as well).

## ANGUS AND DISTRICT LEAGUE

Montrose were once again the top club in the Angus and District Aeromodeling League, for the 1959 season. They scored 3,828 points Arbroath were second with 2,927, and Bucksburn third with 898.

Top individual was David Petrie of Montrose, with 1,615 points. Colin Campbell came second with 986.

The contest results for last year are:

1st U/R glider .. A. McCallum (Arbroath) .. 6:12
2nd U/R glider .. D. L. Petrie (Montrose) .. 4:12
3rd U/R glider .. D. L. Petrie (Montrose) .. 7:4
A/1 glider .. H. Fairweather (Arbroath) .. 5:35
U/R rubber .. C. M. Christie (Bucksburn) .. 9:00

Arbroath M.A.C. have about 20 members, the maximum they can hold in their clubroom. A large number of their members are juniors, and they are certainly turning out the models, but they cannot be persuaded to enter competitions. We trust that Arbroath's encouraging contest record last year will help to get a few on the right road.

Bucksburn A.T. are still smarting from their contest record of last year. Models are being built as fast as possible, juniors are being indoctrinated into building gliders, and seniors are embarking on huge programmes. The Belfry lads are still bothered by lack of members, and worried about the poor flying ground facilities.

Dundee M.A.C. have lost their regular clubroom, but have a room where they meet once a week. Modellers are keen on sport flying, C/L and scale.

With 25 members and Barry Links as a flying ground, Dundee are in a healthy position. We hope to see them on the contest field next year.

## CRYSTAL PALACE M.A.C.

We started the year well by having the largest entry in the "National Models Exhibition." We have once more sought the assistance of the Croydon Council and consequently now meet at All Saints' School, Upper Norwood, every Monday at 7.30 p.m. The new meeting place has stimulated some members to investigate indoor flying and an r.t.p. pylon is under construction. A club buffet is another new acquisition. Plans are being made for a mass exodus to Scampton again this year, and more new members are required to keep the price of transport down.

## HIGH WYCOMBE M.A.C.

We will be holding our sixth C/L rally on May 1st, 1960, at R.A.F. Booker; the events include "A" and "B" team race, combat and, for the first time, stunt.

## NAPIER, ENGLISH ELECTRIC M.A.S.

We are now really getting on our feet after just celebrating our first anniversary and hope to enter more contests in the coming year. C/L flying has increased in popularity recently, probably due to the weather.

## WEST BROMWICH M.A.C.

The majority of members are concentrating on C/L this year, with the accent on stunt, combat and team racing. The combat boys hope to prove once again the general superiority of the orthodox model as opposed to the flying wing which was much in evidence last year.

A number of models of the revolutionary Saunders-Roe *Hovercraft* have been constructed, with very pleasing results, being able to traverse

## SLOPE SLIDER

continued from page 70

for 20 seconds or so, and then turns consistently to one side, then one of the wings is probably heavier than the other and ballast should be added to the lighter one. It should not be necessary at any time to alter the washout on the wings or to warp the fins.

Colour the model as brightly as possible, because when a model is trimmed to fly straight it can disappear downwind in a matter of seconds. Slope soaring is not a nice

restful branch of aeromodeling, for models do not always wheel just above your head, drifting slowly backwards and forwards along the ridge. More often, they turn downwind and come back at you with the speed of a Class "B" Team Racer. If they miss you, and the ridge, you are left with a half-mile retrieve over rough country. So make the model show up clearly when it is on the ground if you want to be sure of finding it!

ponds on a cushion of air set up by a prop or fan, just as in the real craft. Recent bad weather and lack of a decent flying field has restricted flying activities, and perhaps this is the reason why a number of members are building these unusual models which only require a pool for operation.

#### ASHFORD M.A.C.

We had a good contest season last year with most of the rallies within reasonable reach being attended.

We held a successful combat rally, and this year we hope to include stunt and F.A.I. T/R. The rally last year considerably improved the club's financial state and since then we have been able to attend a lecture on balsa wood given by Mr. Patterson of Solarbo, and hold a rousing Christmas party.

We are now holding monthly club combat rallies, to improve our combat flyers and generally bolster enthusiasm.

Any "lone hands" in our area are welcome to our club, and details may be obtained from the local model shop.

#### WATFORD (WAYFARERS) M.A.C.

Twenty members attended the club meeting held recently at Reeds School. It was decided for the forthcoming year to use the name of Watford Wayfarers, thus amalgamating the members of the Wayfarers competition group and the local Watford club. Meetings will be held on the last Wednesday in each month at the above school commencing at 7.30 p.m. and new members will be welcomed. Plans for rubber-powered R.T.P. and several film shows are under way to promote interest at these meetings. More competition minded members hope to concentrate on all the F/F classes this season, although interest in team racing is high, several E.T.A.-powered models being planned.

#### HORNCHURCH M.A.C.

The annual general meeting was held recently with nearly 50 members in attendance. A committee of seven were elected with Bob Wells retaining the position of secretary. The successes of 1959 were gloated upon and news of a large hall for club meetings was welcomed.

#### DAGENHAM M.A.C.

Several changes have occurred in the club recently, including a new committee and a new address. The trend is now swinging to F/F, but this won't mean that the combat boys will be less active this season. We were represented at all the rallies within 100 miles of home, so if local modellers want to get around this season, come along and join us at Valance House, Becontree Avenue, Dagenham, on Thursdays at 8 o'clock.

#### POULTON, BLACKPOOL & FYLDE M.A.C.

We continue to thrive and the latest meetings have been quite well attended. During the past week or so several members have been busy improving (?) the appearance of the clubroom by painting large, brightly coloured pictures on the walls thereof. Due to the weather there has been little outdoor flying activity. B. Rossall has finally decided that there must be something wrong with his *Eureka*; it has now hit the ground some six or seven times under full power. He is currently building a *Meanderer*. We have been asked to take part in a hobbies exhibition in Kirkham in the middle of March and we are hoping to recruit some new members from here. A visit to a local home for disabled children to give a film show and a display of both outdoor and indoor flying is being planned for the near future.

#### ENFIELD & D.M.A.C.

We have been trying to keep our members competition-minded during the winter, by a series of combat events. The latest of these was won by Roger Jones, who we think is a future winner in stunt competitions. We were also pleased to see Mick Pinnock flying again, having recovered from being married and starting a family. As some of you may remember, Mick was winning many combat events up to two years ago. We are interested in contacting clubs in our area, in order to arrange an inter-club combat event.

We have held several chuck glider competitions recently, Wakefield fiend Bob Moore usually coming out top. As a novelty we have decided to hold an unorthodox event, and some of the odd looking models which have appeared seem to indicate that it should be good fun.

The club rally will probably be held on July 10th, and as in previous years events will be team race "A" and "B," stunt, speed, and combat. We hope that everyone who has supported this event in the past will again come along for a good day's flying.

#### WIGAN M.A.C.

The winter weather has left few members with the will to fly these days; most are engaged in building, and are keeping their models for the club comp. later in the month. Not so Ted Wilding, however; he is still out with his R/C planes, come rain or shine.

Our membership is still increasing and this influx of new members is being encouraged as much as possible, since it is so vital to the hobby. Encouraging signs of the new season's activities are in evidence with Mike Hosker trying his hand at the high thrust line type of F/F model, but he is very non-committal about the results so far. Brian Picken has been seen airing his Max 35-powered monster recently, too; perhaps he thinks the timekeepers will see this one longer

at this year's club power competition.

Other signs of activity this month come once again from the few keen indoor modellers, who plan yet again to improve on last year's figures, and once more spread the gospel a little farther afield.

#### MACCLESFIELD M.A.C.

At a recent club meeting the more progressive element decided that our competitions were too limited in their scope and the result was that the number of competitions has now been more than doubled. Considerable enthusiasm has been shown for these new competitions, prominent amongst which are "1/2A" combat, 0.8 c.c. combat, rat race (the rules of which are not yet properly known; the nearest attempt to define them being: "Well, it's like combat, only you don't use streamers"), scale and concours d'elegance. Entries to the last two are to be displayed at the Hobbies Exhibition, for which we are going to provide a stand.

Despite the very cold weather, support has been very good and attendance at the competitions has been very praiseworthy. At the chuck glider comp. the ground was frozen hard and many came just for the dubious pleasure of breaking their models while trimming them. Stan Richardson showed his usual good form and put up many good flights. At the balloon bursting and the combat all, except the winning models, suffered some injury (often irreparable), but at the "1/2A" not one of the models was irreparably damaged, with the result that "1/2A" combat is now much more popular than the other two.

#### Competition results

Balloon bursting: 1st J. Smith—Mr. Butterworth  
2nd —  
3rd J. G. Eifflaender  
Combat: 1st J. G. Eifflaender  
2nd J. R. W. Smith  
3rd B. W. Spearing  
"1/2A" combat: 1st J. G. Eifflaender  
2nd J. R. W. Smith  
3rd B. W. Spearing  
Chuck glider: 1st S. Richardson  
2nd J. G. Eifflaender  
3rd J. R. W. Smith

#### CHANGE OF SECRETARY

NAPIER, ENGLISH ELECTRIC MODEL AERONAUTICAL SOCIETY. R. E. Blake, 24, Dunstable Place, Luton, Beds.

CLEETHORPES & D.M.A.C. C. Taylor, 10, Nicholson Street, Cleethorpes, Lincs.

LOUGHBOROUGH & DISTRICT "WOMBATS" M.A.C. J. A. Harris, "Wendover," 51, Garendon Road, Loughborough, Leicestershire.

DAGENHAM M.A.C. P. Palfreman, 27, Bell Farm Avenue, Dagenham, Essex.

## S.M.A.E. CONTEST CALENDAR

Mar. 6th GAMAGE CUP. U/R Rubber.  
PILCHER CUP. U/R Glider.  
WHITE CUP. U/R Power.

De-centralised. June 6th

Mar. 20th \*K.M.A.A. CUP. F.A.I. Glider  
Elim.

GUTTERIDGE TROPHY. F.A.I.  
Rubber. Area Centralised.

Apr. 10th \*ASTRAL TROPHY. F.A.I. Power.  
S.M.A.E. CUP. F.A.I. Glider  
Elim.

WOMEN'S CUP. U/R Rubber/  
Glider.

JETEX TROPHY. Area Centralised.

May 1st HALFAX TROPHY. F.A.I.  
Power.

\*WESTON CUP. F.A.I. Rubber.  
Area Centralised.

May 21st FIRST F.A.I. C/L TRIALS.  
22nd FIRST F.A.I. R/C TRIALS.  
Centralised.

June 5th BRITISH NATIONAL  
CHAMPIONSHIPS. R.A.F.  
Scampton.

THURSTON CUP. U/R Glider.  
SHORT CUP. P.A.A. Load.

S.M.A.E. CUP. F.A.I. R/C Multi.  
LADY SHELLEY CUP. Tailless.  
KNOKKE TROPHY. C/L Scale.

SIR JOHN SHELLEY. U/R Power.  
MODEL AIRCRAFT. U/R Rubber.  
SUPER SCALE. F/F Scale.

RIPMAX TROPHY. F.A.I. R/C  
Rudder only.

TEAM RACING. Class B and 1/2A.  
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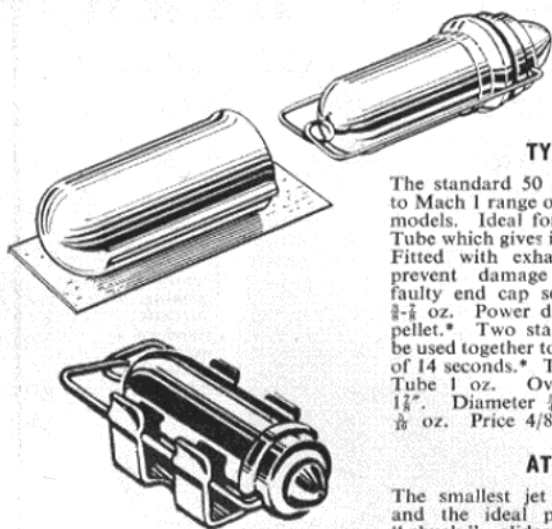


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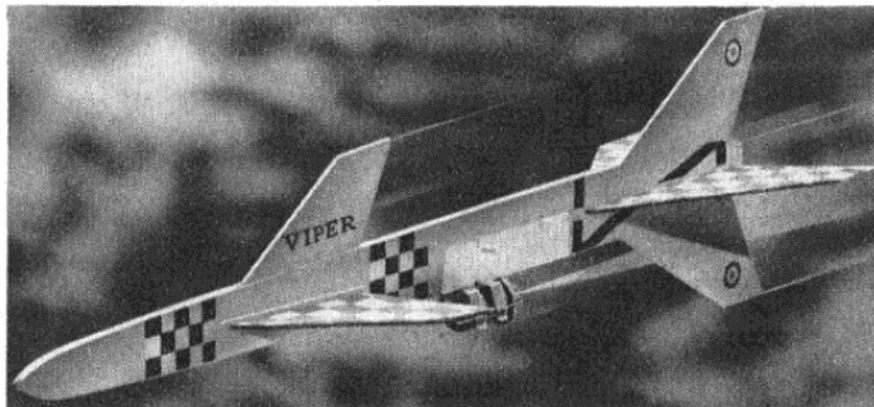


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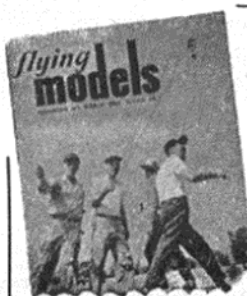
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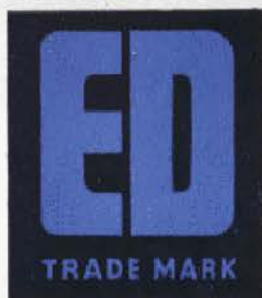
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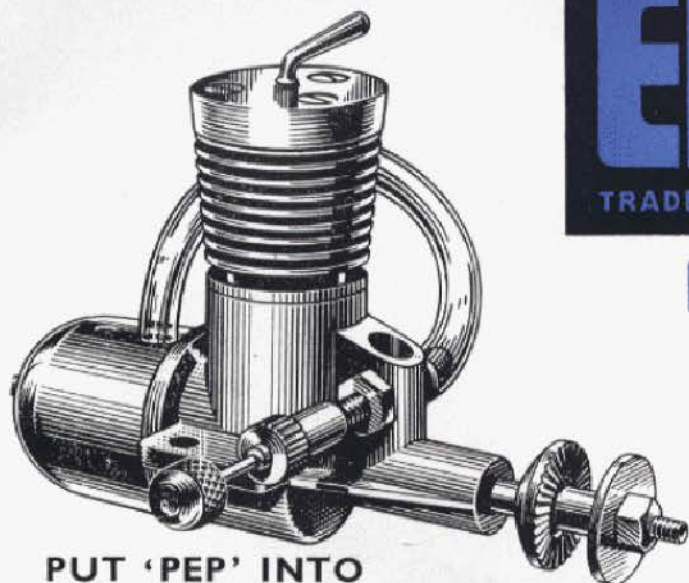
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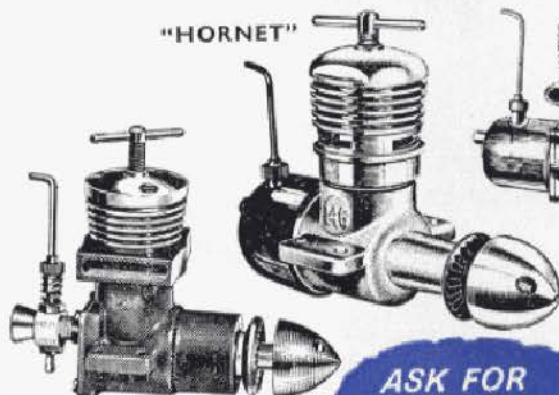
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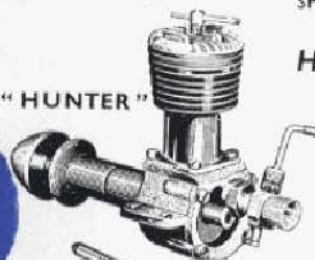
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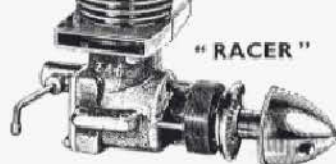
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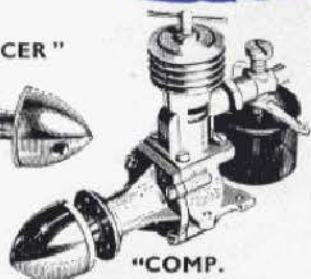
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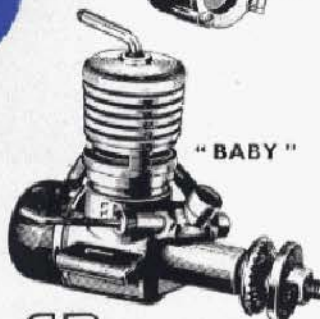
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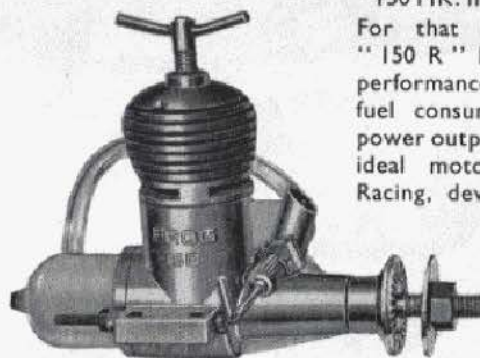
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