MODEL AIRCRAFT

Christmas Number

IN THIS ISSUE

DECEMBER 1954

1'6

Stairway of Stars! or ALLBON above all!

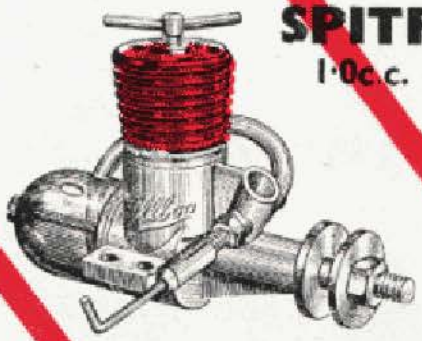
BAMBI
·15c.c. 108/11

DART
·5c.c. 64/2

Whatever the choice of phrase it is certain that no brighter stars have shone in the modelling firmament than those of the famous Allbon range. Every engine from the diminutive Bambi to the D.C.350 is packed with power and reliability, offering years of faithful service to modellers the world over.

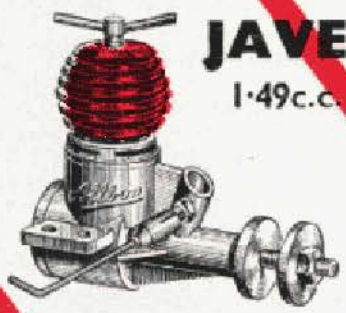
Our well-known slogan " Engineered to last a modelling lifetime " is no idle boast, as thousands of satisfied users will bear witness. Quality is the prime consideration in the manufacture of Allbon engines, that is why we use the very latest in machine tool equipment operated by highly skilled engineers.

We specially recommend that you examine the new .76 c.c. " Merlin " which is already in your local model shop, and feel certain you will agree that it is the engine bargain of the year. Do not forget either the extensive range of accessories we produce, including the unique Allbon cut-off valve.



SPITFIRE
1·0c.c. 64/2

ALLBON SUPER FUEL 3/3 Per Bottle



JAVELIN
1·49c.c. 65/4

Trade Distributors:—
E. KEIL & Co. Ltd.
KeilKraft Works, Russel Gardens, Wick Lane Wickford, Essex.

D.C. 350 & D.C. 350(G)
3·5c.c. 78/5

Available in either diesel or glowplug form. The diesel version is illustrated here.

THE NEW MERLIN

Latest addition to the range, featuring rotary crankshaft induction: beam or radial mounting; angled needle valve, and outstanding performance.

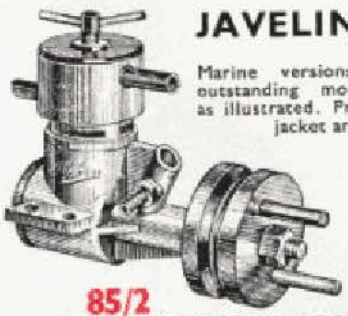
·76 c.c. Capacity

And Only 47/6

MARINE CORNER

JAVELIN & DART

Marine versions of both these outstanding motors are available as illustrated. Prices include, water jacket and flywheel.



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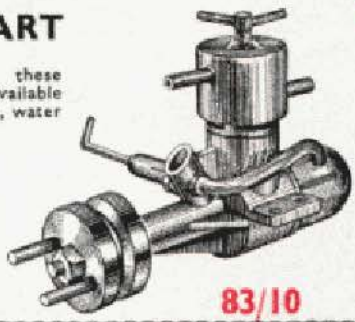


83/10

Engineered to last a Modelling Lifetime

DAVIES CHARLTON LTD. Barnoldswick via Colne Lancashire

The Kit that did the Trick!

E.D. RADIO QUEEN

THE PLANE THAT CROSSED THE CHANNEL IN 40 MINUTES

On Wednesday, 22nd September, at 1.35 p.m., E.D. "Radio Queen" took off from the Cliffs of Dover. Forty minutes later, under radio control from an escorting plane, it crossed the French coast—and thus became the **first** model plane to cross the English Channel.

The famous "Radio Queen," which has captured so many competition prizes, was powered by the E.D. 3.46 c.c. Hunter Diesel and fitted with the E.D. Mk. IV Radio Control Unit.

The take-off from Dover Cliffs was under the control of Mr. Sid Allen, who then handed over to Mr. George Honnest-Redlich, circling in an Auster Plane.

The astonishing success of E.D. enterprises over the past few years have in this latest achievement been proved beyond all doubt. Where reliability is valued and precision workmanship acknowledged E.D. products have always been the choice of the wiser modelling world.

E.D. "RADIO QUEEN" AIRCRAFT KIT SET

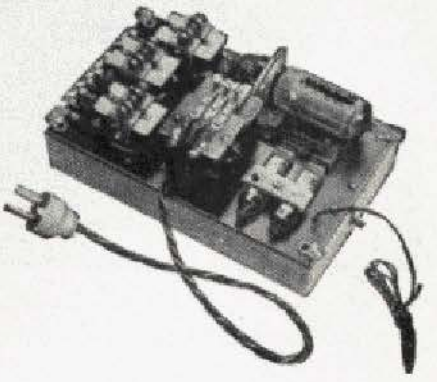
Price £3 19 11

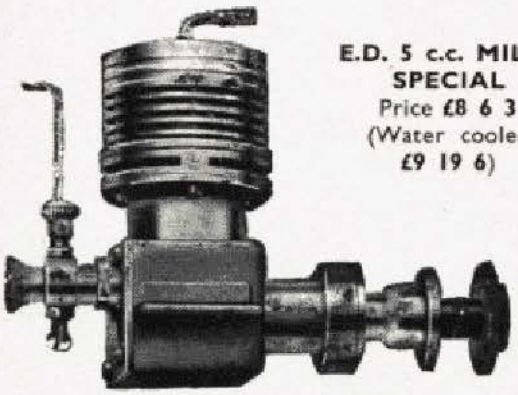
E.D. Mk. IV RADIO CONTROL UNIT TUNED REED 3 CHANNELS

Price complete £22 19 1

Receiver £14 5 0

Transmitter, Control Box and Aerial £9 5 3





E.D. 5 c.c. MILES SPECIAL
Price £8 6 3
(Water cooled £9 19 6)

E.D. 2.46 c.c. RACER
Price £3 1 5
(Water cooled £5 4 6)

E.D. 3.46 c.c. HUNTER
Price £3 18 5
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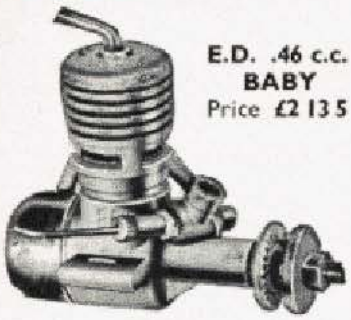
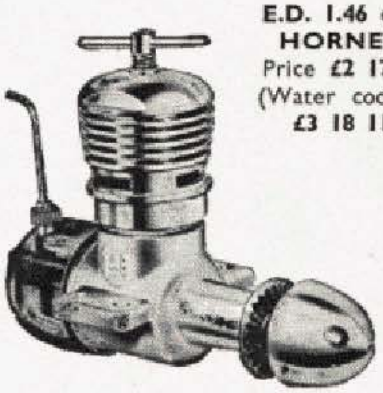
AND THIS IS THE ENGINE THAT DID IT!

E.D. 1 c.c. BEE
Price £2 15 0
(Water cooled £3 16 0)



E.D. .46 c.c. BABY
Price £2 13 5



E.D. 1.46 c.c. HORNET
Price £2 17 0
(Water cooled £3 18 11)

E.D. 2 c.c. COMPETITION SPECIAL
Price £3 19 0
(Water cooled £4 5 6)

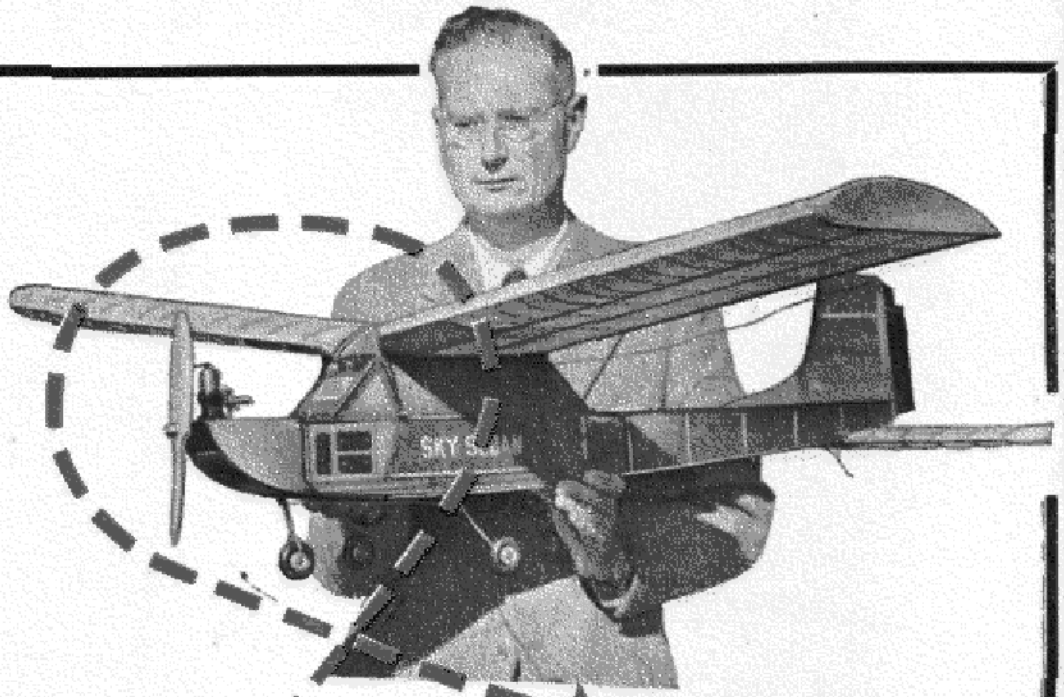
All prices include Purchase Tax

E.D. **ELECTRONIC DEVELOPMENTS (SURREY) LTD**

DEVELOPMENT ENGINEERS

KINGSTON 4411-2 18, VILLIERS ROAD, KINGSTON-ON-THAMES, SURREY, ENGLAND.

World Record



Hilton L. O'Heffernan with his R/C model "Sky Sedan" with which he raised the world duration record for R/C model aircraft from 1 hr. 40 mins. to 2 hrs. 31 mins.*

The flight was terminated voluntarily after dusk and the plane landed with engine running.

Seldom in all history of success in any field has a contestant raised an existing record by as much as 50 per cent. as Hilton L. O'Heffernan has done.

This is no doubt the outstanding success of the year, and our congratulations go to Mr. O'Heffernan for his remarkable flight.

* Subject to ratification by the *F.A.I.*

The Record Plane "SKY SEDAN"

Here are the main features : Span 5 ft. ; Chord 10 in. ; Length 46 in. ; Loaded weight 61 oz. ; Engine, Mills 1.3 ; Fuel, Mercury ; Receiver, home made, based on "Aeromodeller No. 1" with own modifications ; Transmitter, own design, home made.

Design of the model was based on Phil Smith's "Skyskooter" with which, powered by Mills .75, Hilton L. O'Heffernan set up two British R/C duration records last year.

—and the ENGINE . . . .

sustained, reliable power, and plenty of it, to lift plane, radio equipment and fuel load (r.o.g.)—"Elasticity" to guarantee even running during all manoeuvres whether at ground level or 2,000 ft. up—Low fuel consumption to keep all-up weight down to the minimum . . .

Mills DIESEL

Yes— **MILLS 1.3** (*as used in the "Sky Sedan"*) **87/-** *inc. P.T.*

MILLS P.75 (*as used in his previous record flights*) **58/-** *inc. P.T.*

(5.75 with fuel cut-out 5/10 extra)

MILLS BROS. *(Model Engineers)* **LTD.**

143 GOLDSWORTH ROAD, WOKING, SURREY

MODEL AIRCRAFT

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DECEMBER 1954 No. 162 Vol. 13

Contents

EDITORIAL

With the approach of the end of the year it is customary to look back and review the events of the past twelve months critically, with the object of assessing the good and the bad things ; and if not going to the length of making resolutions for the new year, at least bearing in mind the better points with the object of propagating them, and the not-so-good ones with the intention of eliminating them.

The international contests this year have left the trophies more scattered than ever, and this brings to the fore the previously discussed plans for a " Model Air Olympics " combining all the international class competitions in one large meeting. As it seems unlikely that there will ever be sufficient money—or sponsorship—to enable the teams to forgather as they have attempted to in the past, it seems that it would now be more economic to hold all the events in one place.

At home, the S.M.A.E. scheme which couples insurance and allows for associate members is working well, as the number of clubs affiliated has risen by a third during the year, whilst in addition there are over 3,500 associate members. The flying field situation is still one of the blackest spots in the hobby, and efforts to improve it continue to be nullified by selfish and irresponsible vandals and their destructive behaviour when they are guests on aerodromes.

The trade generally have had a good year ; the demand for kits and materials has risen and in most cases the endeavours to increase production has met with success, and at least two firms have moved to new and larger premises.

" Model Aircraft " has shared in this prosperity and the number of copies sold has increased steadily throughout the year. We thank our readers and the trade for their continued support and hope that the promise that this last year has shown will be maintained in the future. We feel that during the past year we have fully justified our claim to be the most progressive modelling publication, and we are confident that our plans for the future development of " M.A." will enable us to uphold this position.

Cover Story

Christmas is usually a time for reflection of the year's events and highlights, and we ourselves, when deciding on a cover for this Christmas issue, skimmed through the cover photos that have appeared over the last eleven months. Automatically our thoughts turned to snow scenes and the like, but we decided to avoid the obvious, and so on our gay cover we feature three pictures of three ordinary modellers. We use the word " ordinary " in no derogatory sense, but rather because they are all consistent competitors, and as such are the backbone of the movement.

Sgt. A. J. Botting and his young son (top right) of the R.C.A.F., are familiar figures in R/C events at most of the big meetings.

John Snewin of Blackheath M.A.C. (bottom right) consistently appears in the S.M.A.E. contest results, and he is seen here launching one of his light-weight rubber duration models.

Completing the trio is John Webster of Farnborough M.A.C., flying in the " Sir John Shelley " at the Nationals.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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British Nationals

● There is every likelihood that the 1955 British Nationals again will be held at Waterbeach aerodrome, near Cambridge. The commanding officer of the station, Group Captain B. A. Chacksfield, has expressed his willingness to co-operate again for the 2-day meeting (Sunday and Monday). We feel sure that this gesture by the R.A.F. will greatly be appreciated by modellers attending the rally, and we hope that Group Captain Chacksfield's hospitality will not be abused as it was last year. (Now read item "Habits"!)

Indoor Flying

● Fliers from as far afield as Sheffield and London attended the last S.M.A.E. indoor flying meeting at Cardington aerodrome on October 10th. On this occasion another new record was established in the hand-launched stick class when Phil Reed of Birmingham put up a flight of 23 min. 58 secs.

Unfortunately Cardington will not be available during the winter months, and strenuous efforts are now being made to find a hall in London suitable for indoor flying. Also it is proposed to form an "Association of Indoor Fliers" to keep all those interested in touch with the latest developments.

Habits

● A marked deterioration in the public's attitude to litter can be observed all over the country, indicating that the average Englishman — or Englishwoman for that matter—has less national pride than his or her forebears. This is naturally reflected when the public are admitted to "open" events held at airfields, by the amount of litter which is left strewn all over the airfield at the close of the day.

This is giving model aircraft contest organisers more and more anxiety, and a number of airfields, the use of which were enjoyed by model clubs, are now closed to aeromodelling for this reason alone.

It is difficult to understand the appalling state of the countryside, unless, of course, some people are in the habit of throwing their litter and rubbish about in their own homes in a similar manner.

As we are blessed with some of the best countryside in the world, let us keep it, and our airfields in particular, clean and spotless as befits an educated race.

Lost Models

● It is really remarkable the number of models that become totally lost through owners omitting to attach their names and addresses. If a person finds such a model, he can hardly be blamed for taking it home "for the youngster to play with." Would you wish *your* model such a fate?

Neither is such carelessness confined to modellers in this country. Recently a leading foreign competitior in an international R/C contest lost his expensive six-channel control model when it flew out of range. It bore no indication of ownership, and in addition, he failed to attach the "sticker" label supplied by the organisers.

If you value your model, always attach a label bearing your name and address, and when contest organisers supply stick-on labels, use them!

German C/L Nationals

● The German C/L Nationals held recently at the Post Stadium in Berlin proved highly successful and marked what will probably become an annual event on the

German modelling scene. Guests included a U.S.A.F. team, and together with world champion Bob Lutker, gave demonstrations of stunt and combat flying.

Competition was keen among German stunt fliers, with only minor differences in the final point score ; Heinz Wetzels with his Webra-Mach 1-powered model eventually won the championship. Wetzels, it will be remembered, finished sixth in the World Championships.

Team racing was conducted in accordance with F.A.I. rules and 15 teams competed. Three large lap indicators enabled spectators to follow the progress of the competing teams. The final saw two Berlin and one North Rhine-Westphalia team in the circle, and the eventual winner was our correspondent, Wilfried Kroger, with his *Nervensage*. We will be publishing plans and building instructions of this model in a future issue of MODEL AIRCRAFT. On this occasion it averaged 45 laps on one tankful (10 c.c.), with its E.D. Racer engine modified for flutter-valve. Though slightly faster, the Mach 1-powered models suffered from bad luck and also had more frequent pit stops.

In the speed section, serious competition was evident only in the 2.5 c.c. class. Rudi Schafer, with his Mach 1 diesel, clocked 149.5 km./h., closely followed by Kugler with his Jaguar glow-converted engine job. This model unofficially reached 151 km./h., which would have been a new German record.

Combat flying was tried as an experiment and proved popular, if spectacular, when two models collided in mid-air.

An impressive list of entrants competed in the *Concours d'Elegance*. A beautifully constructed 3-engine Junkers Ju 52, with even the corrugated sheeting true to scale, won a well deserved first for Franz Burzinski of Kettwig

This meeting at least proved that in aerobatics and team racing the flying standard of German teams is high enough to justify participation in international events, though much experience has yet to be gained in the speed classes.

High Stakes

● The radio controlled duration flight of 1 hr. 40 min. 35 sec. put up by G. D. Pike (Foresters M.F.C.) on July, 11th 1954, has been ratified by the F.A.I. as a world record. However, a further claim for the record is to be submitted by the S.M.A.E. on behalf of Hilton O'Heffernan of Thurlestone, S. Devon, whose model made a flight of 2 hr. 31 min. 17 sec. on October 7th. It may be remembered that Hilton last year set up two British R/C duration records.

The model used for the world record attempt was a 60 in. span high wing monoplane designed and built by Mr. O'Heffernan, and incorporated a receiver also built by him. Powered by a Mills 1.3 c.c. diesel driving a Frog 10×6 nylon prop, the model had a total dry weight of 51 oz. The 3-valve transmitter was also of his own design and home-made, being crystal controlled and incorporating a ¼-vertical aerial. Power was supplied from a 12 V car battery and vibrator pack.

According to Mr. O'Heffernan, the flight was comparatively uneventful. About 10 min. before reaching the previous best time of 1 hr. 40 min., the model was allowed to climb unchecked, and then that time was passed at an altitude of 2,000 ft.

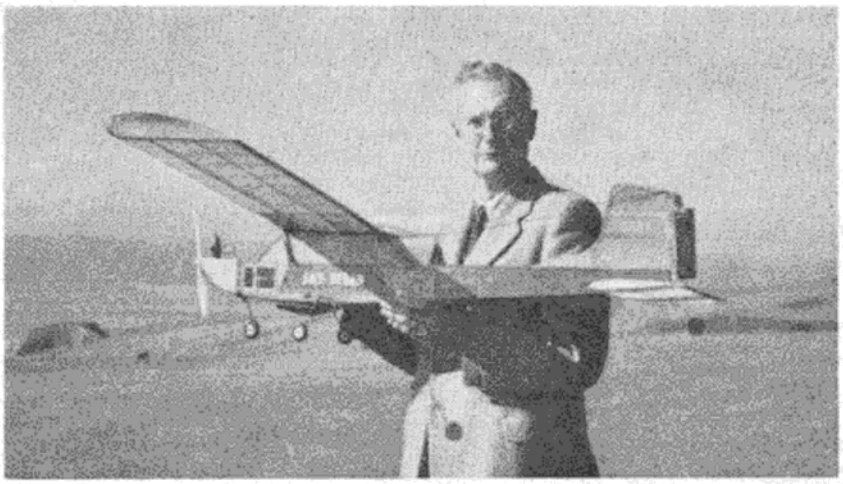
During the flight the model had carefully been kept as level as possible when coming out of spins to avoid stalling the engine. After 2 hr. 10 min. the light was failing and every type of stunt—bar loops—was tried in an effort to cut the engine, but it just wasn't having any! Finally, the model had to be brought in, and the pilot made a perfect stalled landing with no damage, just 93 yards from take-off.

Rally for Scotland

● Scotland is to receive a modelling treat in the way of a rally in 1955, which, the organisers say, will probably be the biggest model aircraft rally ever staged in Britain. To be sponsored by Pan American World Airways, the meeting is tentatively fixed for the second or third week-end in September. In addition to boasting 14 contests, it will feature static displays and exhibitions by the aircraft industry, demonstrations and film shows.

The contests will include F/F Rubber, Glider and Power (all open) 1.5 c.c., 2.5 c.c., and Rubber PAA-load, F/F Scale, Concours, Team Race A and B, Stunt, Combat A and B, and Speed. Oddly enough, for a rally of this proposed size, no mention has yet been made of an R/C contest, though this omission may well be rectified when fuller details are announced.

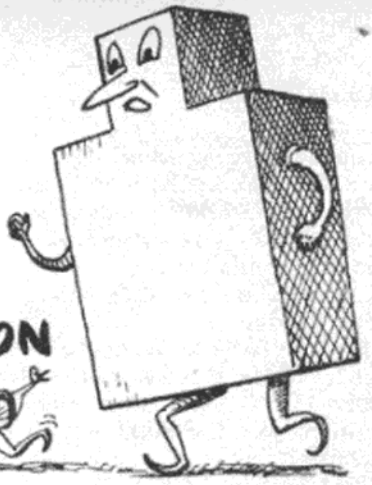
Preliminary work is being carried out by Mrs. Freda Shirt in co-operation with the West of Scotland Aeromodelling clubs.



Hilton O'Heffernan with his duration record breaking "Sky Sedan," which was designed solely for duration R/C flying.

JACK and the BALSA STALK

A Christmas Pantomime by L. RANSON



Another twist to the ancient wheeze,
That balsa doesn't grow on trees.

The scene is a typical homestead in Pantomimia. It comprises a tumbledown shack and two outbuildings : a fat one which serves as a cowshed cum model workshop, and a lean one which would be a welcome addition to Chobham Common. Personnel inside the shack are the usual pantomime complement of impecunious widow and loving son. The latter is generally regarded as the village idiot, since he is the only inhabitant addicted to model flying. He is called Jack—presumably because of his habit of lifting things.

WIDOW : Just a sec. before you toddle
Off to fly that ruddy model :
You cannot go and leave your mum
With cupboard bare and empty tum.

JACK : Well, I've got to win that golden watch,
So hitch your belt another notch—
There's always some excuse with wimmin
When you're off to do some trimmin'.

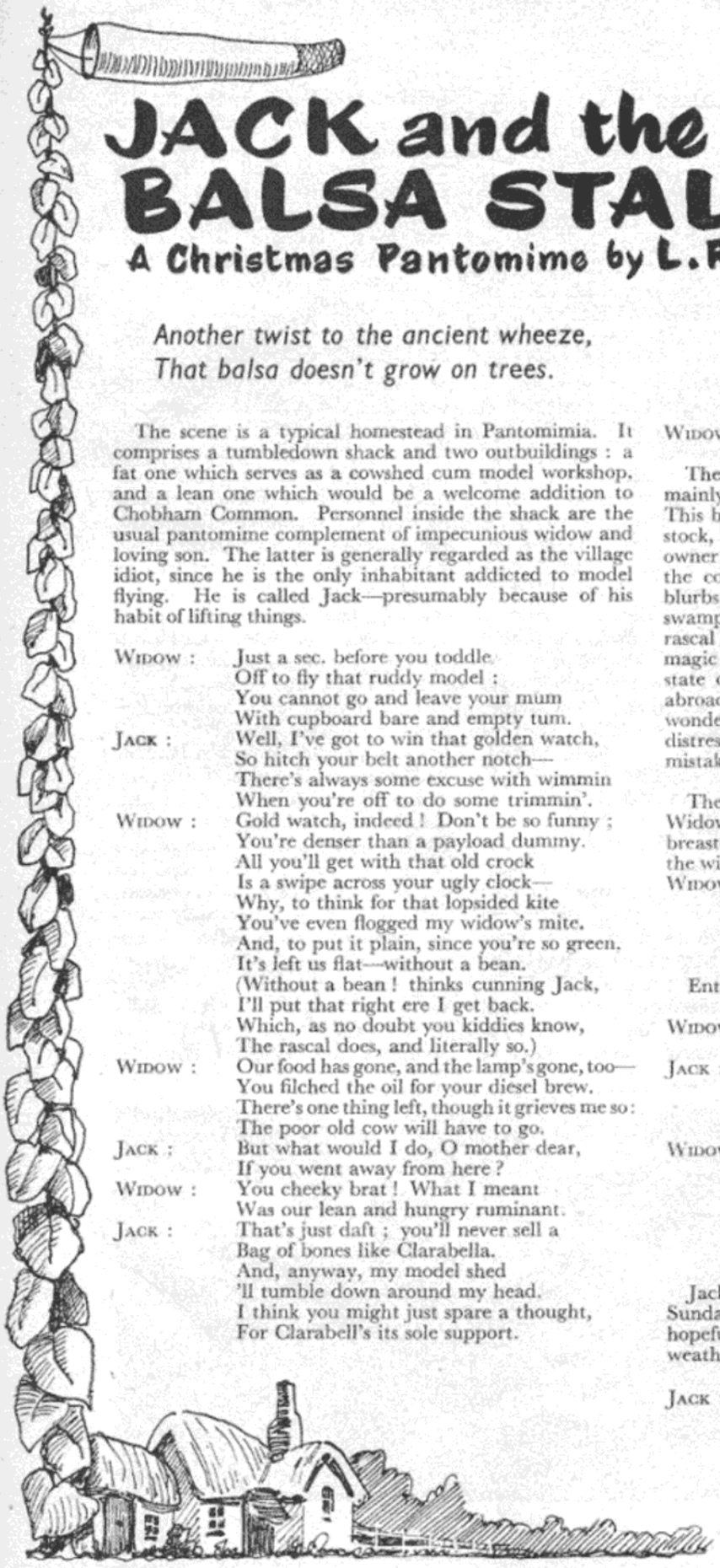
WIDOW : Gold watch, indeed ! Don't be so funny ;
You're denser than a payload dummy.
All you'll get with that old crock
Is a swipe across your ugly clock—
Why, to think for that lopsided kite
You've even flogged my widow's mite.
And, to put it plain, since you're so green.
It's left us flat—without a bean.
(Without a bean ! thinks cunning Jack,
I'll put that right ere I get back.
Which, as no doubt you kiddies know,
The rascal does, and literally so.)

WIDOW : Our food has gone, and the lamp's gone, too—
You filched the oil for your diesel brew.
There's one thing left, though it grieves me so :
The poor old cow will have to go.

JACK : But what would I do, O mother dear,
If you went away from here ?

WIDOW : You cheeky brat ! What I meant
Was our lean and hungry ruminant.

JACK : That's just daft ; you'll never sell a
Bag of bones like Clarabella.
And, anyway, my model shed
'll tumble down around my head.
I think you might just spare a thought,
For Clarabell's its sole support.



WIDOW : Serves you right. Now, on your way.
You should reach town by market day.

There ensues Jack's adventures in town, which consist mainly of idling around Ye Anciente Modelle Shoppe. This being a fairy tale establishment, it has everything in stock, including the very item you wish to purchase. The owner of the shop is an Equadorian gremlin, who sits on the counter all day writing up long-winded publicity blurbs of the difficulties of wrestling the raw balsa from the swamp-ridden jungles, when all the time the cunning old rascal grows the stuff in his back garden with the aid of his magic balsa beans. When Jack arrives, the gremlin is in a state of extreme anguish, for there is a strong rumour abroad that balsa wood is being replaced by a new wonder medium—a thing called television. Such is his distress that he hands Jack a packet of the magic beans in mistake for engine bolts.

The next scene takes place in Jack's home, where the Widow pauses in the knitting of a left-handed, double breasted stop watch cosy and gazes impatiently out of the window :

WIDOW : Where has that varmint got to now ?
He's taken so long to sell the cow,
He'll get less money, if you please,
Than Northern Rally in entry fees.

Enter Jack, laden with sundry modelling materials.

WIDOW : Ah, there you are. But, where's the lolly ?
He's blued the flamin' lot, by golly !

JACK : A'l right, Ma. No need to blubber,
I've tissue, dope and skeins of rubber.
Sufficient for our simple means,
Plus a bag of balsa beans.

WIDOW : But where's the cow, you little rake ?
I'll give you beans, and no mistake !
(Whereupon the now furious dame
Heaves the beans through the window pane.
And sadder still—no cause for laughter—
Poor old Jack comes tumbling after.)

Jack's bedroom the next morning—a typical summer Sunday. Being something of an optimist, Jack is looking hopefully out of the window for a sign of good flying weather.

JACK : What a cloud ! My sainted aunt !
It can't be true, it's just a plant !
And so it is : a hollyhock
Of solid balsa, medium stock.
Seems that magic balsa bean
Climbs faster than a Torp 15.
Methinks I'll shin up just to see
How much it's worth in l.s.d.

Upon reaching the top, Jack stares in amazement at a limitless expanse of glorious flying field. A mellow sun beams kindly above, and there is not a breath of wind.

JACK : I must be going round the bend.
A flying field without an end !
Makes a change, I must confess,
To see an airfield o.o.s.
But what's that notice on the tree,
By Order of the Giant I/C ? :
" On this field no one can fly
(Unless he be as big as I),
For though a flying field you lack,
I'm doing very nicely, Jack."

Typical of the concientious aeromod, Jack blithely ignores this notice and tramps off across the field. After going for some miles without meeting so much as a stray thermal, he comes to a house. A rather queer house, since it is built on the lines of an oversize payload model. He knocks on the door, which is opened by an exceedingly beautiful damsel.

JACK : What a smasher ! I declare
I never thought you half as fair.
According to the fairy tale
You're quite an ancient sort of gal.
DAMSEL : A pin-up girl's preferred, I think,
By the modern kiddywink—
But do not tarry, the time is nigh
For the Giant's return—you'll have to fly !
JACK : But I haven't brought my model plane.
DAMSEL : I don't mean that, you scatterbrain.
He's coming now, so you must hide—
See that basket—duck inside.

The basket happens to be the domicile of the fabulous P.A.A.hen.

JACK : That's no duck, but a blooming hen ;
She doesn't know her spotter's gen.

The door opens and in tramps the Giant, who sits down at the table and calls for his supper.

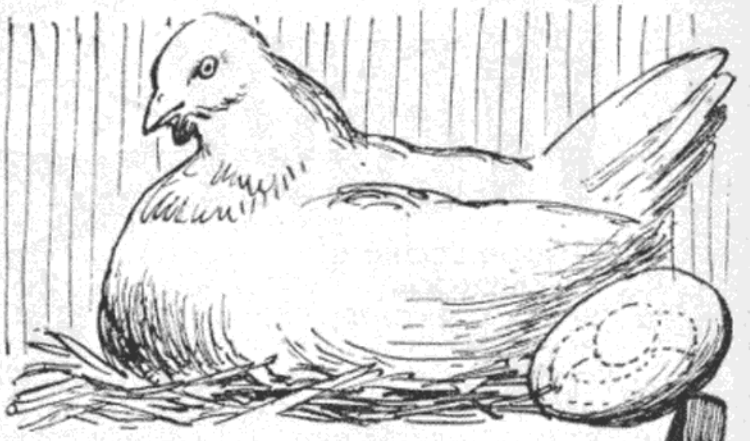
JACK : It must be Mr. Cube, by crummy,
Or a blown up payload dummy !
GIANT : Fee-fie-fo-fum, and phrases odd.
I smell the blood of an aeromod.
DAMSEL : 'Tis but the fumes of the diesel fuel
I spilt by chance into your gruel.

To add to Jack's bewilderment the P.A.A.hen suddenly transforms itself into a sleek payload model, and proceeds to lay a large, gleaming gold watch. Jack jumps up in alarm and is spotted by the Giant.

GIANT : An aeromod !
DAMSEL : Now, don't talk wet,
It is, in fact, the local vet.
The hen's not well : it's got the jerks,
And laid a watch without the works.

Jack slips quietly away and returns home.

WIDOW : Where've you been, you little monkey ?
The garden's full of horrid fungi.
JACK : All right, ma. No need to bicker,
Take a look at this golden ticker.
WIDOW : Well, slap me down with my widow's weeds,
Another of your shady deeds !
Now, see you take it back at once.
JACK : Calm down, ma. It's only bunce.



There'll be plenty more from the balsa stem,
Once I've filched the magic hen.

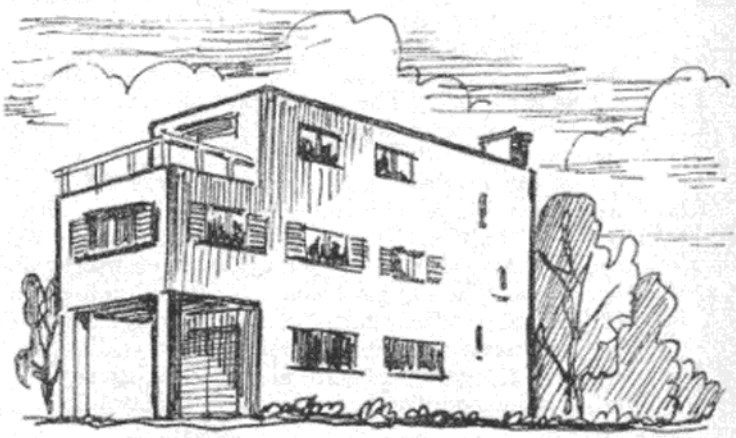
Two days later the widow is still awaiting the return of Jack who has gone off in quest of the P.A.A.hen.

WIDOW : If the Giant don't get him—sure enough
He'll run off with that bit of stuff.

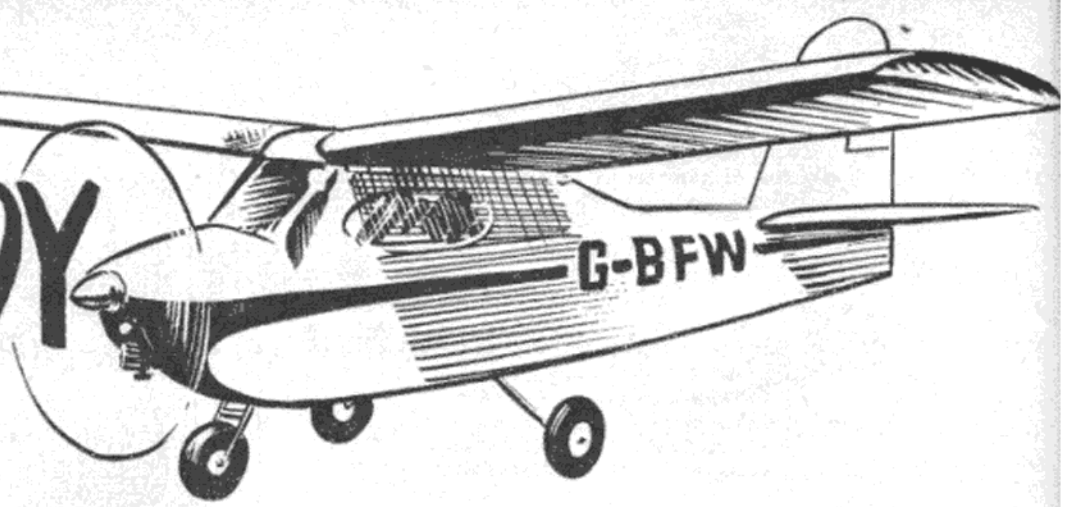
In walks Jack, triumphantly holding the P.A.A.hen.

WIDOW : You're home at last—but don't relax :
Run and fetch the blinkin' axe
Before the Giant of aspect grim
Tears us all from limb to limb.
At this stage of the pantomime
He should be halfway down the vine !
JACK : That's old fashioned ; the latest version
Calls for no such wild exertion.
The Council saw the garden's state
And decided to investigate.
They found the airfield on this mission
And put it under requisition.
WIDOW : But what about the Giant that's . . . ?
JACK : Converted to a block of flats.

So, now with all the fun concluded
Ends this pantomime
Of the magic hen that brooded
Once upon a "time."



WENDY



A GOOD LOOKING F/F CABIN JOB FOR 1 C.C. ENGINES

by Brian Fry

THIS month we present *Wendy*, a model with a low aspect ratio and short moment arm, as a change from cabin models with the opposite features. Fourth member of a family line, this *Wendy* incorporates all modifications proved necessary by her predecessors. In addition to having stable flight characteristics, her clean lines gained her a first in a Concours d'Elegance in March this year against some stiff competition.

Fuselage

Build the two sides over the plan from $\frac{3}{16}$ in. balsa, adding all gussets. When set, remove from plan and join together by F2 and F3 ($\frac{1}{8}$ in. sheet), checking for alignment. Pull in at tail and firmly cement ends together. All cross-pieces can then be cemented in place.

Next, bend rear undercarriage wire to shape, and bind in position with strong thread, after which all $\frac{1}{8}$ in. sheeting may be added at the cabin position. Cut out and cement in place all dorsal formers F4, F5, F6. Then add the " V " piece behind the cabin (Plan view) from $\frac{3}{16}$ in. sq. dorsal stringers, and cover in between the " V " with 3/32 in. or $\frac{1}{8}$ in. sheet.

Bend nose wheel assembly as shown and firmly solder a short length of tin, in the position indicated, to form a tube. This assembly should be bolted to the ply nose former with four strips of tinplate. These pieces of tinplate should be kinked slightly so as not to distort the former too much. Holes are made in the $\frac{1}{8}$ in. former immediately behind to accommodate the nuts and the protruding bolts. Securely cement the $\frac{1}{8}$ in. sheet nose former in place and when set, cement the $\frac{1}{16}$ in. ply nose former on the front. Naturally this joint should be well pre-cemented, as the nose wheel takes all the hard knocks.

Next, slide in the engine bearers and firmly cement in place, checking that they are at right angles to the nose former. The mounting holes can then be drilled to suit engine used, giving about 3 deg.-4 deg. right thrust.

On the original, the lower cowl was made up from two side blocks and sheeted with $\frac{1}{4}$ in. sheet between the two. If using a lighter engine, a solid cowl is advisable to counteract the resulting tail-heaviness. The top cowl was made from laminations of $\frac{1}{4}$ in. sheet. The underside of the fuselage from F1 to the rear of the cabin is now sheeted with $\frac{1}{16}$ in. sheet. The rear wheels are added, together with all other refinements such as windscreens, dowels, etc.

Wings

The wings are straightforward, and are built in two halves and then joined together. Pin down lower spars and add ribs. Add top spar trailing edge, which runs from the tip to the centre section rib of the panel concerned, and also the leading edge which, like the top spar, extends past the tip rib, and is chamfered to support tip sheet. A thick sheet gusset brings the leading edge round to the narrower chord centre section. When the two panels have been built the tips are raised to the required height, and the lower spars are chamfered at the centre section so that they are flat on the building board.

The spars are then joined by $\frac{1}{16}$ in. ply dihedral braces and the gap in the centre section at the trailing edge is filled in. Next, sheet centre section with $\frac{1}{16}$ in. sheet. Sand leading edge to correct contour, then remove blobs of cement and check all joints.

Tailplane

Pin down lower spars and leading edge. Add ribs, top spars, trailing edge and $\frac{1}{8}$ in. sheet tips. Sand tips and leading edge to shape.

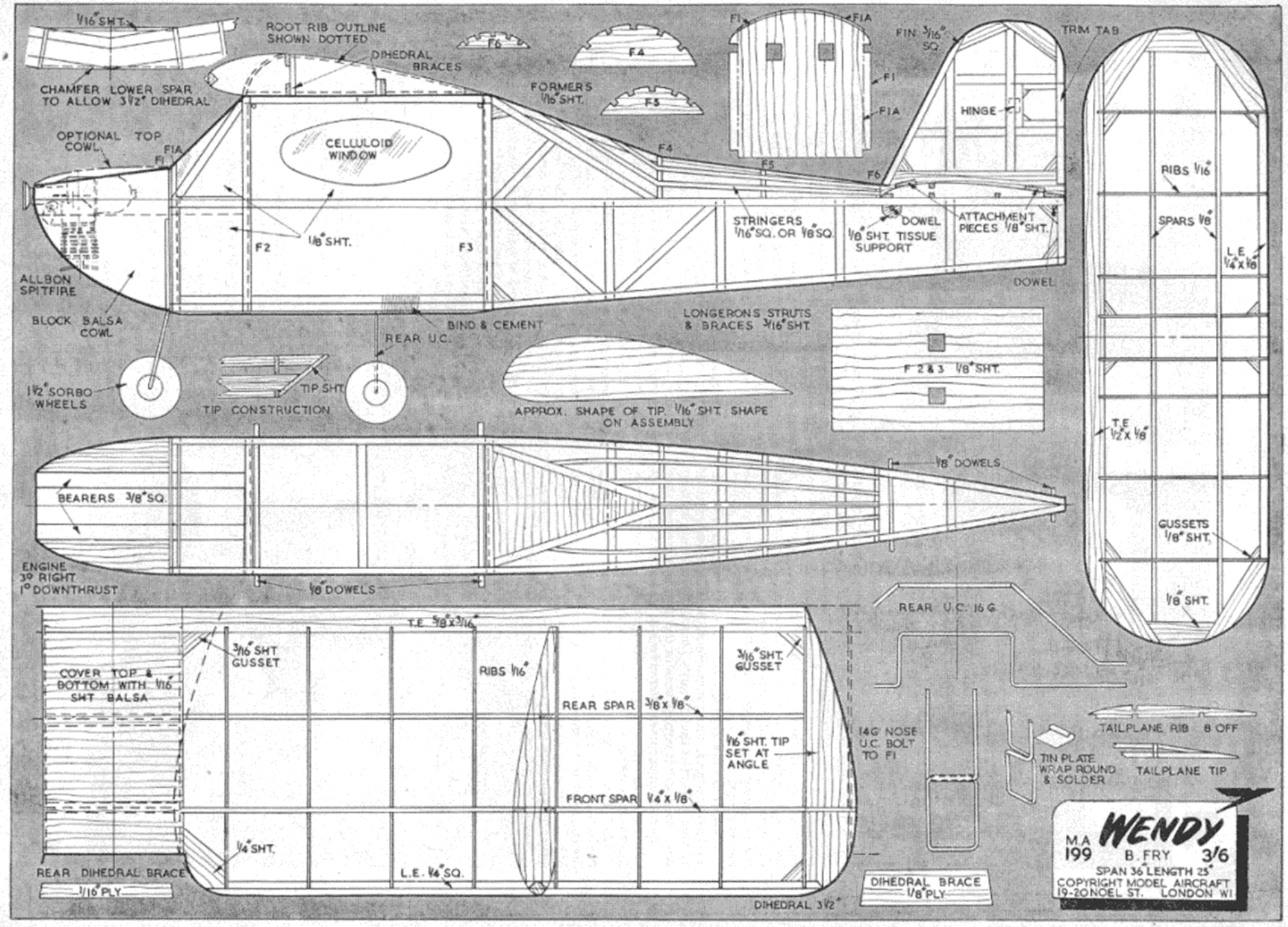
The fin is built from $\frac{3}{16}$ in. sq. and $\frac{3}{16}$ in. sheet over plan. After removing from plan, round off leading and trailing edges and securely attach fin retaining strips, checking that they are at right angles to the fin. Trim-tab hinge is made from a milk bottle cap.

Covering

The fuselage and fin of the original were covered with red heavyweight Modelspan tissue and the wings and tailplane with their lightweight yellow tissue. The whole model was given two coats of clear dope, after which black dope was added to the nose for decoration. The fuselage was then fuel-proofed.

Flying

Put on plenty of rubber bands to prevent flying surfaces lifting in gusts of wind and hand launch from shoulder height until a flat glide is obtained. On no account pack up leading edge of tailplane. Use ballast to trim out any stalling tendency. Power flights may then be attempted with no downthrust. If the model stalls under power, add downthrust until a steady climb is obtained. It should be trimmed for wide left-hand circles.


1/16" SHT.
ROOT RIB OUTLINE SHOWN DOTTED
DIHEDRAL BRACES
CHAMFER LOWER SPAR TO ALLOW 3 1/2° DIHEDRAL
F6
F4
F5
FORMERS 1/16" SHT.
F1
F1A
FIN 3/16" SQ.
TRM TAB
HINGE
OPTIONAL TOP COWL
CELLULOID WINDOW
F2
1/8" SHT.
F3
STRINGERS 1/16" SQ. OR 1/8" SQ.
DOWEL 1/8" SHT. TISSUE SUPPORT
ATTACHMENT PIECES 1/8" SHT.
DOWEL
ALLBON SPITFIRE
BLOCK BALSA COWL
BIND & CEMENT
REAR U.C.
LONGERONS STRUTS & BRACES 3/16" SHT.
F 2 & 3 1/8" SHT.
1 1/2" SORBO WHEELS
TIP SHT.
TIP CONSTRUCTION
APPROX. SHAPE OF TIP 1/16" SHT. SHAPE ON ASSEMBLY
RIBS 1/16"
SPARS 1/8"
L.E. 1/4" x 1/8"
T.E. 1/2" x 1/8"
GUSSETS 1/8" SHT.
1/8" SHT.
1/8" DOWELS
BEARERS 3/8" SQ.
ENGINE 3° RIGHT 1° DOWNTHRUST
1/8" DOWELS
T.E. 5/8" x 3/16"
3/16" SHT. GUSSET
COVER TOP & BOTTOM WITH 1/16" SHT BALSA
RIBS 1/16"
3/16" SHT. GUSSET
REAR SPAR 3/8" x 1/8"
1/16" SHT. TIP SET AT ANGLE
FRONT SPAR 1/4" x 1/8"
1/4" SHT.
L.E. 1/4" SQ.
REAR DIHEDRAL BRACE
1/16" PLY
DIHEDRAL 3 1/2"
REAR U.C. 16 G
14G NOSE U.C. BOLT TO F1
TIN PLATE WRAP ROUND & SOLDER
TAILPLANE RIB 8 OFF
TAILPLANE TIP
DIHEDRAL BRACE 1/8" PLY
M.A. 199
WENDY
B. FRY
3/6
SPAN 36" LENGTH 25"
COPYRIGHT MODEL AIRCRAFT
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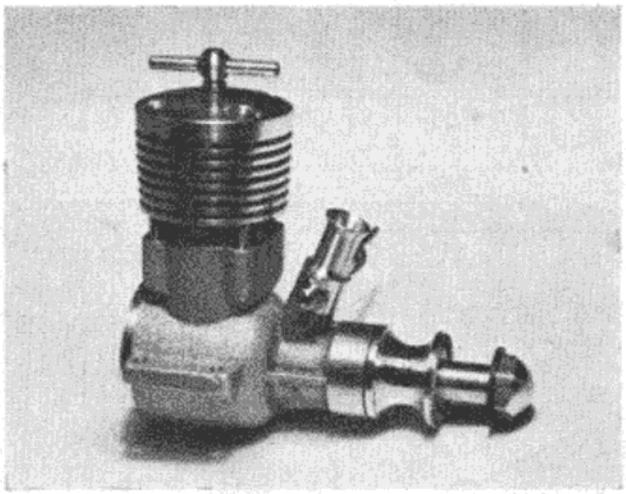
Engine Tests

No. 66 The Oliver Tiger MK. III



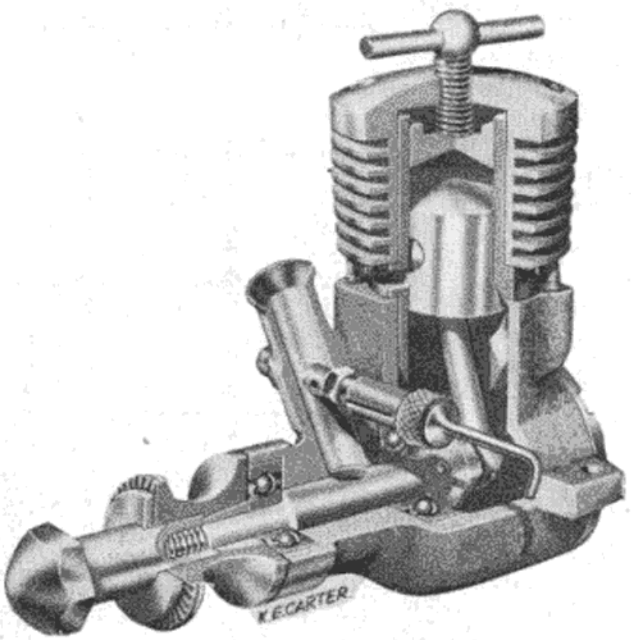
THE Oliver " Tiger " engines have been mentioned from time to time in MODEL AIRCRAFT, and in the October issue the current 1954 models were fully described. It should be pointed out that, unlike the majority of engines currently available, the Oliver is not a factory-built engine, turned out by the hundred every week. Consquently, it is not widely advertised, nor is it generally found among the stocks of any but the more progressive model shops.

Thus, it is only through an occasional mention in the model Press and, more important, by its appearances in competition, that the Oliver " Tiger " has become known. But " known " it now is, and for the very good reason that " Tigers " have shown themselves to be in the front rank of today's miniature engines—irrespective of which side of the Atlantic one takes one's standards.

The Oliver " Tiger " Mk. III aircraft unit, which is the model with which we are dealing this month, was introduced less than six months ago, being the successor to the Mk. II unit which had gained a number of contest minded adherents during the previous season.

Among the particular successes enjoyed by Oliver-powered models have been an almost monotonous series of wins in Class " A " team racing. The High Wycombe club, for instance, noted for its pre-eminence in Class " A " team racing, uses Oliver " Tiger " engines exclusively, while it is interesting to note that, in the recent Championship of Europe model racing car events, five of the first six places in the 2.5 c.c. class were filled by Oliver-powered models ; in the 1.5 class *all* the entrants used Olivers. The present 2.5 and 1.5 Oliver aircraft engines were, of course, developed from the original Oliver " Tiger " model car engines, which, by their outstanding performance, first attracted attention to the marque.

Today, six years after J. A. Oliver's first " Tigers " started to dominate 2.5 c.c. model car racing, the Oliver " Tiger " still remains an essentially individually produced unit. It should be emphasised here that this is one case where the description " hand built " is fully justified. This is not one of the hacksaw and file affairs that modern mass-production has put to shame. The " Tiger " is a precision engineered article of the highest quality, obviously built with such aids to accuracy as modern methods have shown necessary, but at the same time enjoying the advantages of unhurried selective assembly, hand fitting, and a stringent " passing out " test.



Our test unit was received direct from the manufacturer, but was stated to be a perfectly standard example, a claim which would appear to be substantiated by the maker's offer to tune the engine for greater performance after tests, although it is pointed out that the Mk. III does, in any case, carry certain modifications as standard which put its performance above that of the Mk. II model. We should also mention that recommendations are issued for those who wish to tune their Oliver engines for greater performance. Alternatively, the manufacturer will carry out the necessary modifications on user's engines at extra cost.

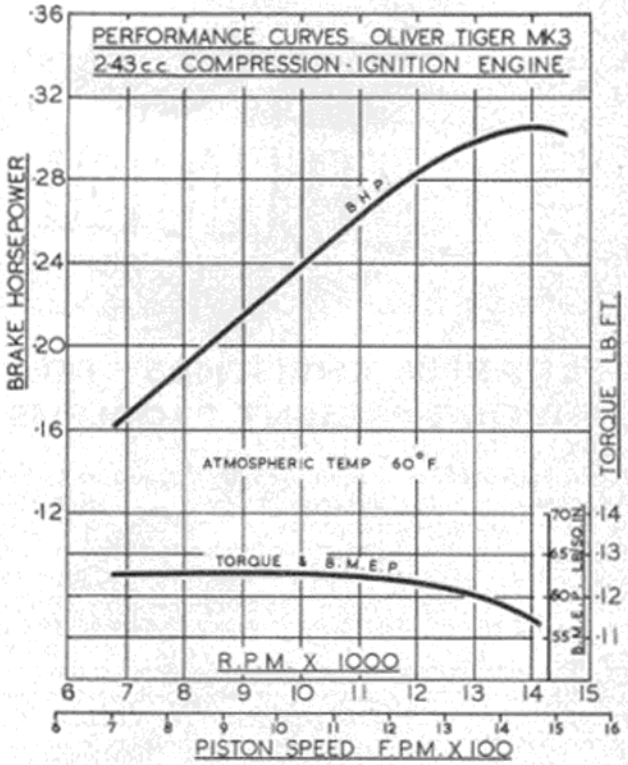
Specification

Type : Single cylinder, air cooled, two-stroke cycle, compression ignition. Crankshaft type rotary valve induction with sub-piston supplementary air induction. Circumferential exhaust and transfer porting with conical crown piston.

Swept Volume : 2.433 c.c. (0.148 cu. in.)
Bore : 0.550 in. Stroke : 0.625 in.
Compression Ratio : variable.
Stroke/Bore Ratio : 1.136 : 1.
Weight : 5½ oz.

General Structural Data

Crankcase sandcast in L.A.C. 113B aluminium alloy



and shot blasted on external surfaces. Screw in rear cover turned from high grade alloy bar stock. Cylinder liner of carbon steel, EN.8 cyanide hardened, ground, lapped and Delapena honed. Piston and contra-piston of Brico cast-iron, ground and Delapena honed. One piece counter-balanced crankshaft, casehardened on crankpin only and mounted in one $\frac{3}{8}$ in. × $\frac{7}{8}$ in. and one $\frac{1}{4}$ in. × $\frac{5}{8}$ in. ball journal bearings. Hiduminium RR.56 alloy connecting rod. Finned cylinder barrel and head, machined from high grade alloy bar stock, close sliding fit over cylinder liner and assembly secured to crankcase with four studs. Extended collet type propeller driven on tapered split sleeve, with sleeve nut. Screw-in carburettor with spraybar type needle valve assembly. Beam type mounting lugs.

Test Engine Data

Running time prior to test : 2 hours.

Fuel used : 40 per cent. Shell "Royal Standard" kerosene, 35 per cent. Ether, BSS.579, s.g. 720, 25 per cent. Castrol M (castor base) lubricating oil, plus 3 per cent. amyl-nitrate.

Performance

Since the graph clearly shows the very high level of performance reached by the Mk. III Oliver, there is little occasion to elaborate on this. It is worth pointing out, however, that the output shown of approximately .305 b.h.p. at 14,000 r.p.m. is the highest ever recorded in these tests for a 2.5 c.c. unit, also that the specific output that this represents, of over 120 b.h.p./litre, is also the highest we have ever recorded for a miniature compression-ignition engine.

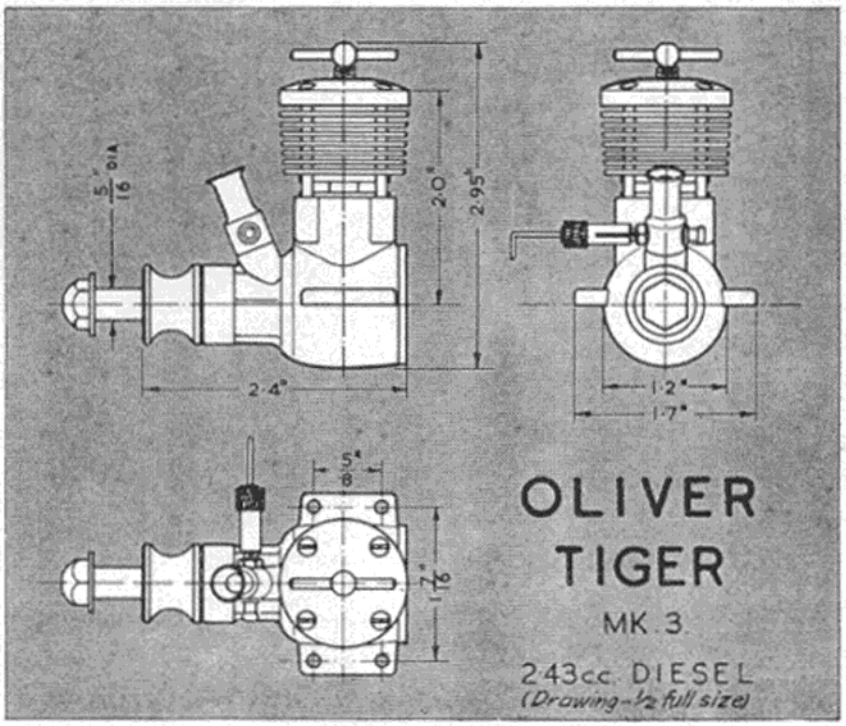
The Oliver gets its performance, not merely by a flattening and extension of the torque curve to improve top end power. The engine is obviously one of the most *efficient* miniature engines yet produced. This is proved by two facts : (a) the exceptionally high b.m.e.p. shown by the engine over the entire r.p.m. range, and (b) the very moderate specific fuel consumption attained. In terms of actual operational performance, this means, (a), that the Oliver will turn almost *any* propeller faster than any other engine of equivalent capacity will turn the same prop, and (b) that it will propel a model further and faster on a given amount of fuel—a fact well borne out by recent Oliver T/R performances.

So far as handling characteristics are concerned, the Tiger Mk. III is quite easy to start, using standard diesel procedure. It is unnecessary to prime through the exhaust ports. The optimum needle setting on the test engine was two turns open, varying only slightly between the highest and lowest speeds tested. There is a rather unusual yet clearly discernible tendency towards detonation if the mixture is too weak and compression too high. Thus, the familiar practice of weakening the mixture to a point just above that at which the engine cuts out should be avoided. Provision of an adequate quantity of a suitable cetane number improver in the fuel, such as amyl-nitrate, will ensure that the engine will fire the correct mixture strength without recourse to excessively high compression settings.

A rather uncommon quality in a high performance engine is the wide measure of speed control obtainable with the compression lever : the engine can be slowed almost to a mere tick-over from 12-15,000 r.p.m., by reducing compression by a complete turn of the lever. On test, there was slight vibration under medium loads, but at high speed, lightly loaded running was notably smooth. Torque readings were maintained steadily and both the needle valve and compression lever held settings firmly.

Power/Weight Ratio : (as tested) 0.88 b.h.p./lb.

Specific Output : (as tested) 124 b.h.p./litre.



M.A. PRESENTS A LOADED CHRISTMAS TREE TO HELP YOU WITH YOUR PRESENT PROBLEMS

CURRENT NEWS

New developments by Solarbo are announced this month. First on the list is sheet balsa faced with plastic impregnated paper, which gives an enormous increase in strength—a promising development to use for formers. To ensure matched strip balsa, selected sheets will be part cut and sold intact, probably in widths of 1½ in. A third new line will be a balsa drawing/modelling board of unique construction which will be strong, light and washable. Also scheduled for production in the near future are pre-cut wing ribs in 4 to 8-in. chord widths, and one or two popular sections at first. When these are available, new designs will probably be quickly modified to take advantage of this labour-saving innovation.

* * *

Pioneers of the pre-fab. kit in this country, Jetex have now added the "Super Sabre" to their range, This comprehensive kit with tailored parts includes a cut-out cardboard jig to aid assembly. Powered by Jetex 50 B or Atom 35 motors, the kit makes an attractive flying scale model. Price 10s. 6d.

* * *

Three of a new series of Frog Junior fighters are now available—the Sabre, Avro 707 and Javelin. Kits feature cut-out printed parts and are rubber powered. Kits, complete, sell at 3s. 9d.

* * *

World-wide distribution of the Elmer variable pitch propeller has been taken over by Aylwin Kelsey and Partners of Gloucester. Now available in America it costs 5 dollars 35 cents, which includes adapter for U.S. threads and adjustment tools. The price in this country is now 25s. 8d. including P.T.

This month, with the festive season upon us, we offer this feature to help solve the problem of what to give for Christmas presents. The Model Aircraft Christmas tree on the facing page illustrates 50 items ranging in price from pence to pounds. The numbered items listed below are divided into convenient price groups, the exceptions being products such as balsa, dope and tissue, where the items are easily recognisable. The prices quoted are correct at the time of going to press and purchase tax has been included where it is applicable.

These presents are all obtainable from or through your local model shop, but do not go there on Christmas Eve and expect to get the chosen item in time for Christmas—give the shopkeeper a chance and order it beforehand. The presents on the tree do not do more than suggest an item or so from each manufacturer's range ; reference to their advertisements or enquiry at your local shop will produce a much wider selection of suitable items.

FIVE SHILLINGS AND UNDER

1. **FROG** Junior Fighter Series, *Javelin* kit, 10 in. span, rubber powered scale F/F. Three in series, each **3s. 9d.**
2. **KEIL KRAFT** EezeBILT *Sedan*, rubber powered; pre-cut balsa parts. Kit **3s. 6d.**
3. **RAGG** Cutting Tool, with three interchangeable blades. **3s. 9d.**
4. **SKYLEADA** Siloujette kits—six in series—*Hunter* illustrated; Jetex powered chuck gliders. **2s. 6d.**
5. **SOLARBO** Balsa Pak—Assorted boxed balsa. **4s. 11d.**
6. **TRUCUT** Propellers—wide range of wooden props. From **2s. 0d.**
7. **WONDERGLASS**—fibre/resin kit—interesting new material. **4s. 6d.**
8. **X-ACTO** knives with interchangeable blades. From **3s. 0d.**
9. **YEOMAN** colour coded tanks, from **3s. 6d.**

TEN SHILLINGS AND UNDER

10. **AVIAN** 1/48 scale solids—*Hurricane* (illus.), *Spitfire*, *Sabre*, *Mustang*, *Tempest*, *Swift*. **5s. 7d. & 6s. 0d.**
11. **BONDAGLASS.** Glass fibre/resin kit. Starter's outfit with full instructions. **5s. 10d.**
12. **CELSPRAY.** No. 3 spray gun—suitable for cellulose—complete, **8s. 6d.**
13. **DROME** Airwheels. Sizes 2 in. to 3½ in., prices from **7s. 0d.**
14. **JASCO** *Trojan*—beginner's C/L kit—**10s. 0d.**
15. **BOOK**—"Model Jets & Rockets for Boys," **8s. 6d.**
16. **M.S.** *Gemini* Glider, 26 in. span, designed for beginners. **6s. 0d.**
17. **SKYLEADA** *Vulcan* flying scale model for Jetex 100. Kit **8s. 6d.**
18. **VERON** *Provost*. Quickie kit—18 in. span C/L scale model. Kit **8s. 9d.**

ONE POUND AND UNDER

19. **DAVIES CHARLTON** Universal engine test stand—fits engines up to 3.5 c.c. **12s. 6d.**
20. ***ELMER** automatic variable-pitch propeller. **25s. 8d.**

**N.B. Recent price change has misplaced this item.*

21. **JETEX** "Tailored series" pre-fabricated kits. *Skyray* illustrated. Also *Sabre* and *Skyrocket*. **10s. 6d.**
22. **M.S.** Airwheels. Range 2 in.–6 in., prices from **11s. 8d.**
23. **WOODSIDE** Ruddermag—ingenious device for R/C enthusiasts. **14s. 3d.**

TWO POUNDS AND UNDER

24. **E.C.C.** P.100—a sensitive polarised relay for R/C work. **29s. 6d.**
25. **MERCURY** *Junior Monitor* C/L stunt kit. **22s. 6d.**
26. **PARAMOUNT** *Moose* A2 competition glider kit. **22s. 6d.**
27. **VERON** *Sabre F86E*. 34 in. span flying scale ducted-fan model. Kit—**29s. 2d.**

OVER TWO POUNDS

28. **ALLBON** Merlin 0.049 cu. in. popular-priced diesel. **47s. 6d.**
29. **ALLEN-MERCURY** "25" contest diesel engine. **66s. 6d.**
30. **AMCO** "PB" 3.5 c.c. competition diesel engine. **71s. 3d.**
31. **AMCO** "BB" 3.5 c.c. ball bearing contest diesel. **93s. 5d.**
32. **BOOK.** "Aircraft of the 1914-18 War." **42s. 0d.**
33. **E.D.** Bee—popular 1 c.c. diesel engine. **55s. 0d.**
34. **E.D.** Mk. IV transmitter and tuned reed 3-channel unit, complete **£23 15s.**
35. **ELFIN** 1.49 c.c. high performance new design diesel. **91s. 0d.**
36. **ETA** 29 racing glow-plug engine. **143s.**
37. **FROG** 50 diesel suitable for small power models. **50s. 0d.**
38. **JETEX** Scorpion—the most powerful Jetex motor. **45s. 6d.**
39. **KEIL KRAFT** *Junior* 60—popular model for R/C. Kit **46s. 1d.**
40. **MILLS** 0.75 c.c. diesel—ideal for the beginner. **58s.**
41. **MILLS** 1.3 c.c. diesel—useful for a wide range of models. **87s. 0d.**
42. **WOLF** ¼ in. electric drill. Many useful attachments available. Drill price **£5 19s. 6d.**
43. **X-ACTO** "Burlington" hobby chest—comprehensive cutting tool outfit for the modeller. **84s.**


BALSAWOOD
MODELSPAN SUPER TISSUE
TITANINE
217 DOPE
BRITFIX
SONIK FINISHES
Balsa-Pak
Model Jets & Rockets for Boys
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The Modelling Mania

By Pam Buckland

WHEN my husband casually announced that he was thinking of resuming aeromodelling, it made little or no impression on me. He had not long been demobbed and no doubt found life in a quiet Sussex village somewhat tedious after the colour and excitement of the so-called mystic East. I thought it a good idea, though it seemed rather a childish hobby for a man. I was blissfully unaware of the disquieting effect that this apparently innocent project was to have on our lives. It may have been a coincidence, but when we visited the local fête the following week, the highlight of the show was an exhibition of C/L flying. That clinched it!

The next day, fired with enthusiasm, my better half dashed off to the model shop and bought up quantities of balsa wood, cement, dope, covering tissue, and plans for a *Vandiver*—or it may have been a kit—anyway, there seemed to be an awful lot of it. The entire paraphernalia was spread out on the floor, and for several days I had to live with this object virtually being hatched under my feet. In the fullness of time, the kite (which I was given to understand was the accepted term for such a model) was completed. In my erstwhile ignorance I had visualised models cut out of cardboard, possibly, and stuck together, but I was learning fast. The overpowering odour of dope permeated the once peaceful household; dope and cement proved to be impossible to remove from shirts, handkerchiefs and the like, and it was nothing to find balsa shavings in the bed. Every time I opened the back door I became entangled in yards and yards of Laystrate wire; and engine tests practically reduced me to gibbering idiocy. How could one small engine make *so* much noise?

After a few abortive attempts we eventually got the thing airborne. I say "we" because in the early days I was allowed to help by hand launching. I also made a useful fall guy in the event of mishap! Not long after this, we moved to Kent, and Frank joined the local branch of the S.M.A.E. (which everyone knew, he loftily informed me, stood for you-know-what. Everyone but me, obviously). I was surprised to discover that almost all the members were young ex-service men. I also discovered that what I had long suspected was, alas, only too true. Aeromodelling is a mania, a fever which never cools; a pastime which demands all one's energy and time, patience and understanding, and frequently a large proportion of one's cash.

My husband was now fortunate enough to have a workshop, which made life a little more bearable; it was infinitely preferable to have these fiendish objects under construction somewhere other than the living room. Now he was experimenting with stunt flying and scale models. The birth of the *Tipsy Junior* was followed in quick succession by the *Ercoupe*, *Chilton*, Miles *Gemini*, Grumman *Widgeon*, *Moth Major* and a *Tiger Moth*, which won second prize and a certificate of merit at the Rotary Exhibition.

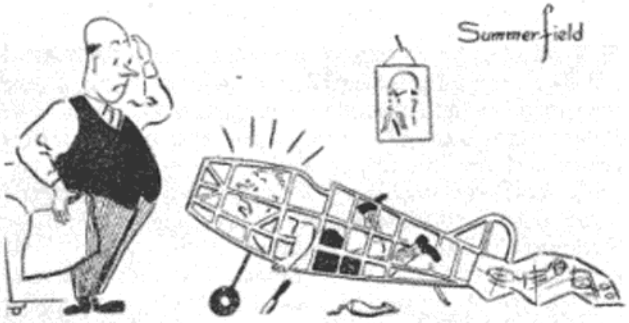
Friends from the club paid us frequent visits, envying Frank his workshop. To me it was a fearsome place, reeking of fuel, and generally blue with the smoke from engines being tested and possibly my husband's language if the results were not up to standard. Battered wrecks of past successes (?) were transfixed to the walls like broken butterflies on pins, a motley array of some hundreds of dope bottles lined the window sills, and the cupboard could scarcely contain the assortment of (dare I say it?) junk.

Frank could rummage in there at will, and nothing even quivered, but if I so much as looked inside, the entire contents invariably were precipitated onto my head. " Serves you right ; shouldn't be in there " was the callous comment. The young men would congregate in there (the workshop, not the cupboard), blissfully inhaling the heady aroma of dope, happily extolling the latest performance of their respective brain-children.

It was all quite beyond me. Charming girl friends were stood up at short notice if it looked like being a fine evening for flying. " Aeromodellers should all be misogynists," I would mutter darkly. I soon found I was not alone in my grousing ; the other wives and girl friends, too, bemoaned that with these keen types, modelling was the be-all and end-all of their existence. Eventually, I decided that the only way to combat this menace was to try and understand it further. So surreptitiously I began to peruse the vast accumulation of modelling magazines that we had acquired over the period of five years. I tried asking what I hoped were reasonably intelligent questions, and in time I became, if not an avid fan, at least more understanding, and occasionally even enthusiastic about this cult, which I now regarded as a potential rival for my husband's affections !

I am now resigned to not seeing Frank for hours on end, and I face with comparative calm the prospect of the years of modelling that lay ahead. I have a scale model of my own now, a daughter who, at the tender age of six months, is never happier than when sitting in her pram, in the workshop, chewing on a handful of plastic props ! At present she is content to play for hours with a broken plane, starting a non-existent engine with dexterous flicking movements, and her greatest thrill is to be allowed to go flying.

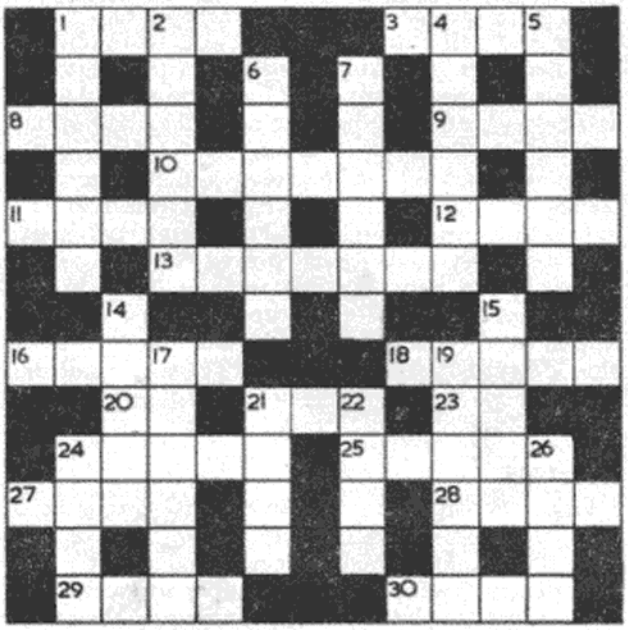
I foresee a future bestrewn with models, plans, dope, etc.; fancy having a husband *and* a daughter keen on modelling. I don't know, though . . . wonder if I could learn to fly a C/L model ? Excuse me, must go and read " How to Make Model Aircraft."



*" Don't just stand there Dad—*GET ME OUT *!"*

Christmas Crossword

BY M. J. GARDNER



ACROSS

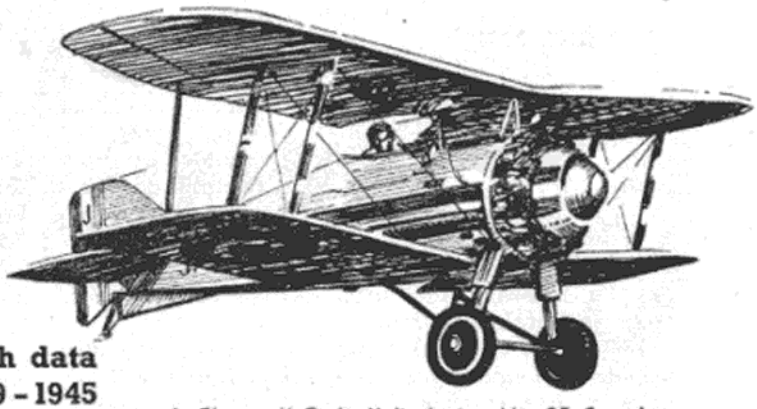
1. Instrumentally it has a steadying influence (4).
3. Thin metal (4).
8. Acid flux component (4).
9. It's a cinch for size (4).
10. No lion's support (4, 3).
11. To go off course (4).
12. Part of a glider's stays ? (4).
13. Cad ties worn in engine manufacture ? (7).
16. Nature's gift to the modeller (5).
18. So " tired " in the U.S.A. (5).
20. FI-FO-FUM lacks this (2).
21. Its all Greek to an engine manufacturer (3).
23. Channel conquerors (2).
24. Useful for free flight enthusiast or cricketer (5).
25. Can easily be broken, but not repaired (5).
27. Cantankerous part of a power job (4).
28. Usually built on (4).
29. A muddled Tory starts from scratch (4).
30. Useful for holding things up ! (4).

DOWN

1. This rig led to a type of model (6).
2. It stands till it falls (6).
4. Essential to duration (6).
5. This French engine is one in a million (6).
6. No glow lights the way for this engine (6).
7. A round retainer (6).
14. Strong pixie (5).
15. Presented to the lamed modeller (5).
17. Man from the lost and found section ? (6).
19. He aids and abets (6).
21. Edward in a spin (4).
22. What 19 down should be (4).
24. What every speed model should be (4).
26. A sting on wings adds up to 0.049.

Solution on page 495

COLOUR SCHEMES



A Gloster "Grebe" displaying No. 25 Squadron marking of two horizontal black lines. Aft of the roundel the lines join in a point.

Part two of this series continues with data for scale models of the period 1919-1945

by P. M. H. LEWIS

WITH the return of peace, silver dope overall was adopted for R.A.F. aircraft. Exceptions were types which are not covered in this survey, e.g. heavy night bombers. Red, white and blue roundels continued on the upper and lower surfaces of the wings and on both sides of the fuselage. Stripes of the same colours decorated the rudders with the blue foremost until this order was reversed in 1930 to avoid confusion with French machines. The most interesting feature of the period was the introduction, about 1924, of multi-coloured designs to act as distinguishing markings between squadrons of fighters. They were carried between the roundels on the upper wings and fore and aft, or aft, of those on the fuselage. A selection of these designs is shown in the accompanying illustrations and their exact location may be ascertained by reference to the aircraft of the period.

The first to be decorated in this way were the *Snipes* of Nos. 25, 32 and 56 Squadrons. *Woodcocks* of No. 3 Squadron—J8292, J8303, and of No. 17—J7512, J8295, were the next. The *Siskin* is sadly neglected these days ; it can be made into one of the most colourful models, especially if it is based on one of those flown by No. 1 Squadron—J8834, J9909, No. 56—J8382, and No. 111—J8960. During the 1920's, *Grebes* were used by, among others, the following squadrons : No. 25—J7363, No. 29—J7381, No. 32—J7571, and No. 56—J7585. *Gamecocks* appeared in the hands of the pilots of No.19—J8037, No. 23—J8084, No. 32—J8073, and No. 43—J7908. The red and blue marking of No. 23 Squadron was seen on their *Bulldogs*, two of these being K1672 and K1671. Other *Bulldog* units were No. 19—K2159, K2164, and No. 56—K2495, K2223. The aircraft of the last unit did not have the black decking common to the first two squadrons. *Furies* were kept well in the public eye during the 1930's by No. 1 Squadron—K2048, K2065, K2802, and No. 25 Squadron—K2054, K2059, both Mk. 1's : K7270, K7268, both Mk. 2's. No. 43 Squadron was another *Fury* 1 unit with K1932 and K1933 and, in November, 1938, was flying with its machines in fighter camouflage.

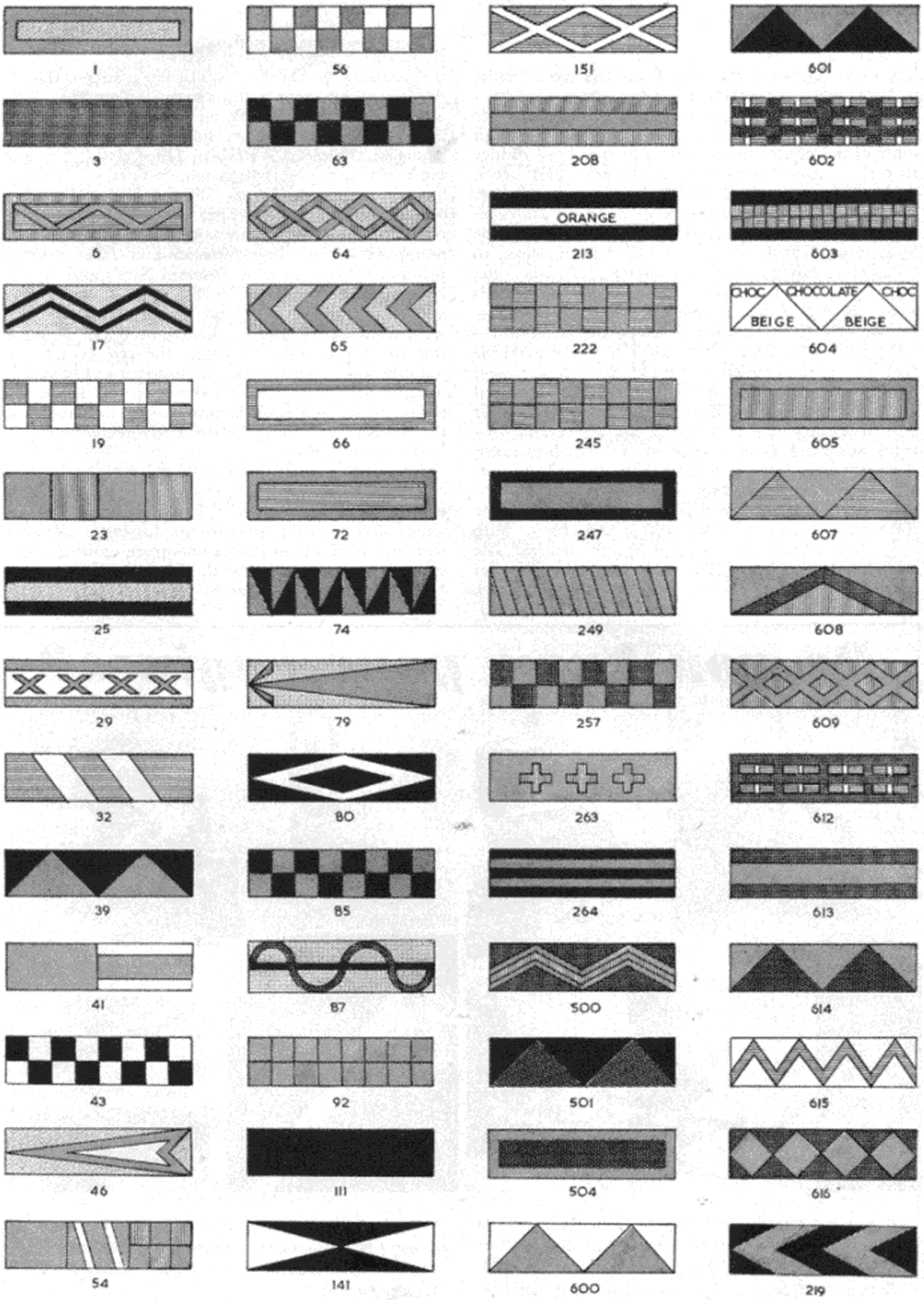
The *Gauntlet* was first seen with No. 19 Squadron, which operated with K4095, K4088 and K4087 in blue and white checks. Red and white checks were on those of No. 56 Squadron—K5287, K4094. No. 3 Squadron's *Gladiators*—K6150, wore a green teardrop, while the *Demons* of the Auxiliary 600, 601 and 604 Squadrons were brightened with bands of triangles. The light bombers and army co-operation types in most cases had the squadron number on their sides, either in black or in the flight colours, e.g., *Atlas*—J9564, *Hart*—K3957, *Hind*—K5414, *Audax*—K3698, *Hector*—K8097, *Vildebeeste*—K4166 "S," *Wapiti*—K1373, and *Wallace*—K3565, the last two of No. 501 Squadron with black top decks. Training *Tutors*, *Tiger Moths* and *Magisters* of the 1930's were all-yellow with polished cowlings.

Fleet Air Arm machines of the period included the *Flycatcher*—N9680 of No. 401 Flight, *Nimrod*—S1623 "509," *Osprey*—K2779 "208," *Shark*—K8471 "652," *Seal*—K3519 "804," *Swordfish*—K4190, and *Skua*—L2889 "A7G." These were finished in silver, with metal cowlings and struts, etc., painted with anti-corrosion cream paint. Until 1935 they carried rudder stripes until these were abandoned by both Services during that year.

American aircraft of the pre-war years were extremely colourful, and fighters consisted mainly of the Boeing P12E, Curtiss P6E, Seversky P35 and Boeing P26A used by the Army. The Douglas O-46 and N.A. O-47 performed observation duties. These types were either olive-drab overall, or had yellow wings and tail units in conjunction with olive or blue fuselages. Markings consisted of the white star insignia with red centre on a blue circle carried above and below both wingtips, with a rudder stripe of blue next to the hinge and seven red and six white horizontal bars aft. U.S. Navy and Marine aeroplanes, including the Boeing F4B-4, Grumman FF1, F2F-1, F2F-1 and the Curtiss F9C-1 and F9C-2, had grey fuselages and metal-covered surfaces, silver fabric-covered wing and tail surfaces, and chrome-yellow finish on top of the upper wings. Rudder stripes were vertical, red, white and blue with the blue foremost, but in many cases the whole tail unit was in the particular aircraft-carrier colour.

1939-1945

From the beginning of the expansion scheme in 1936, the aircraft coming into use with the R.A.F. were again camouflaged. Irregular patches of "sand and spinach" were applied on upper surfaces, while black or grey, or both—with a division on the centre



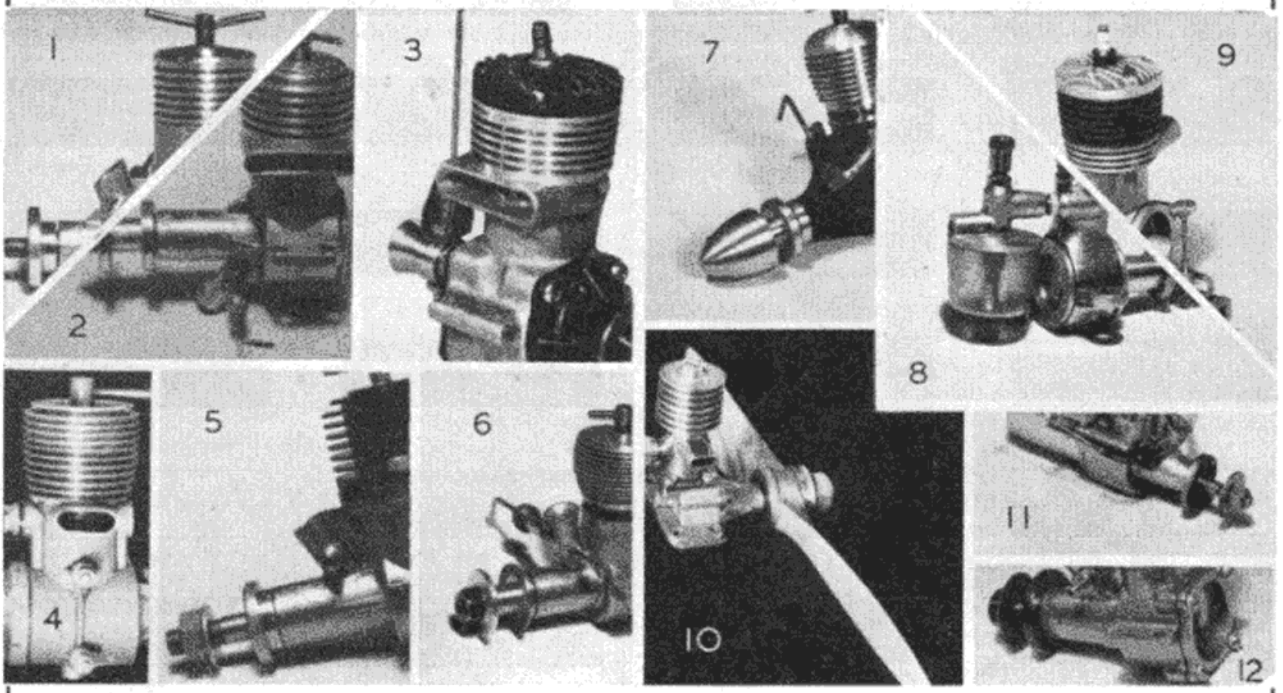
R.A.F. SQUADRON MARKINGS

line—was used underneath. Roundels were on the upper wings and fuselage and were surrounded by a yellow ring. No tail markings were used until the introduction of the fin flash during the war, although some of the fighter squadrons in France bore rudder stripes. From September, 1941, grey and green camouflage with grey undersurfaces came into vogue, and representative types were as follows : *Hurricane* of No. 85 Squadron—P3408 VY-K ; *Battle* of No. 105 Squadron—K7578 " F " ; *Spitfire* 1 of No. 19 Squadron—K9790 WZ-N ; *Defiant* of No. 264 Squadron—L7029 PS-Z ; *Typhoon* of No. 56 Squadron—EK183 US-A ; *Tempest* 5 of No. 56 Squadron—NV974 US-K ; *Airacobra* of No. 601 Squadron—AH577 UF-M ; *Mohawk* BK585, *Tomahawk*—AH892 KH-R. Trainers such as the *Master, Magister* and *Tiger Moth*—T6190 of 18 E.F.T.S., had camouflaged upper surfaces with yellow finish below. Fleet Air Arm machines with grey and green above and grey below included *Seafires, Wildcats, Reliants, Barracudas, Avengers* and *Fulmars*, while *Hellcats* and *Corsairs* appeared in midnight blue overall.

German Me. 109's and F.W. 190's used an upper surface camouflage of mottled blue and grey or drab green, combined with pale blue or grey below. The straight-edged black cross with white border was carried on the upper and lower wingtips, with the swastika on the fin. Until early in 1944, U.S. Army aircraft were a drab green above with light grey undersurfaces, after which time they flew in their natural aluminium finish. These included *Mustangs, Mohawks, Warhawks, Thunderbolts, Owls*, and the many light observation monoplanes. U.S. Navy aircraft, such as the *Corsair, Wildcat, Hellcat, Dauntless, Seagull* and *Helldiver*, appeared in midnight blue overall. Advanced trainers were left in their natural metal, these including *Harvards* and *Falcons*, while primary trainers such as *Stearman* N2S's and N.A.F. N3N's were all-yellow. N2S-2 3375 " 89," 07710 and 3247, and N3N-1 65, 0665 " 52 " and 0019 " 12 " were from Grosse Ile, Michigan, in 1943. A white star on a blue circle without the red centre was painted above and below the wingtips. Later, this insignia was carried above the port and below the starboard wings and on each side of the fuselage, with the addition of a blue-bordered white rectangle on both sides of the star.

Japanese aircraft used a light grey and green camouflage, with light grey undersurfaces and a national marking of a red circle above and below the wings and on each side of the fuselage. Russian wartime machines used grey and green mottled upper surfaces in conjunction with light grey below, and bore the red star on wings, fuselage and rudder.

Do you know your engines?



If you can identify these engines, send the answer in a sealed envelope marked " Know Your Engines," to " Model Aircraft," 19-20, Noel Street, London, W.1. Entries must be posted to reach this office not later than Monday, December 27th, 1954. The senders of the first two correct solutions opened on that date will each receive a year's free subscription to " Model Aircraft."

Topical Twists

This column, as always, at pains to instil
A spirit of peace and friendly goodwill
(Although it would seem that some may dissent
From endorsing this claim of kindly intent),
Offers its readers, if any exist,
Seasonal Greetings with a topical twist :

Best wishes abroad to the dear F.A.I.,
Who make up the rules, but don't tell us why.
And a convivial nod to our Society here,
Selecting the teams that no longer appear.
To the keen contest type a word of good cheer
Before he partakes of the pudding and beer,
Not to forget as a " seasonal " hint
The training demands of the five-flighted sprint.
And to our Realist friend, just one purist plea :
Not to imbibe of the liquor too free,
For worse than the pylons to fright and appal
Are little pink creatures—not real at all.
We greet all the boffins and the whole expert clique,
Who never fly models, but know how they tick ;
And all the unknowns who foster the trade,
Purchasing kits which never are made.

Having thus greeted all manner of bod,
We leave to the end the average type mod,
Reserving a message specially for him :
May the light of his TV never grow dim.

Debatable Points

We trust that the models of the experts who attended the recent Model Aeronautical Conference go as far above our heads as the high flown subjects they learnedly discussed. Just to take one of the awesome items on the agenda : " The Application of Model Techniques to Full Size Investigation ; " to our uninformed mind this conjures up all manner of weird fantasies, although possibly to the serious aeronautical student there is some deeper import than tissue covered *Viscounts* and C/L fighters. Even so, we cannot shake off the frightening impression of London Airport organised on the basis of an Area Eliminator, or the fearful echo of the derisive cheers of the flying field ghouls as someone prangs a million pound prototype.

But to come right down to earth, we submit for the benefit of the lowbrow denizens of the cabbage patch, an outline of our own more practical model conference :

1. " The academic approach to model flying : papers on basic flight with dotted lines for folding."

BLOGGS MINOR.

2. " Model Engine tests, including elementary first aid and a study of the self sucking digital protector."

O. O. OUCH.

3. " Rockets—First principles in the official avoidance of reactionary projectiles with some notes on the passing of babies."

A. N. Y. SEC.

4. " Radio Control and the new licensing laws. First steps in the understanding of Greek."

P. O. JARGON.

5. " Team racing as an adult recreation, with illustrations on the care and maintenance of the Dan Dare Water Pistol."

I. PRANKS.

Olympian Heights

The F.A.I., having failed to eliminate the luck hazard in international contests, have had the good sense to abandon all hope of a straight battle of skill, and, with the introduction of the five flight rule, to leave the issue to depend on the athletic prowess of the retrieving squads. Recognition of the fact was displayed by our American friends in dubbing the Wakefield and Power Finals, the 1954 Model Air Olympics.

Incidentally, a study of that much ballyhooed event—particularly the Beauty Queen—brings home the sobering fact that we in this country have much to learn in the art of contest organising. When a similar event was held over here we became so engrossed in all the petty details concerning the choice of a first-class airfield, on-the-spot accommodation, catering facilities, etc., that we thoughtlessly overlooked the more serious and essential features, such as the election of a beauty queen, a fly past of jet planes, and a grand parade of all the contestants.

Perhaps, if the opportunity again presents itself, we can make amends by staging a real super-do at Wembley stadium. This would not only provide the necessary Olympic atmosphere, but would suitably accommodate the beauty queens, brass bands, V.I.P.s and other personnel so necessary to the modern demands of model flying.

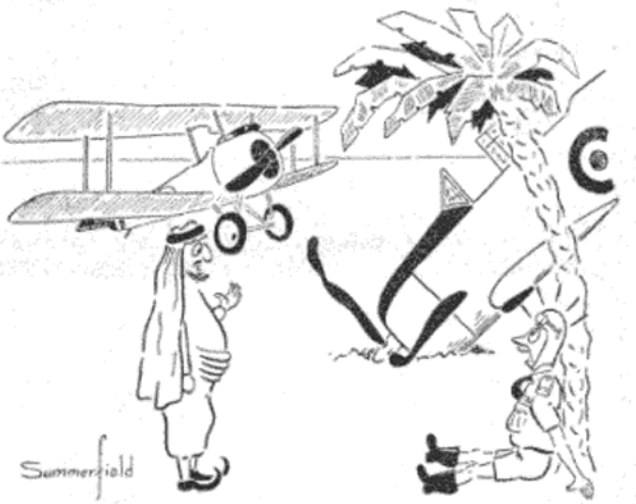
Possibly, as a concession to its model origins, the event could include a retrieving marathon. A chuck glider could be rigged up on the electric hare system, and competitors sent off in hot pursuit. The first one to complete five three-minute circuits of the track to be declared champion and presented with a gold spangled beauty queen.

Fly-Fishing

From Club News comes a report of someone " using a long d/t in order to fish for a thermal."

This seems to be quite an original sort of angle, but the general tactics seem to be somewhat at fault. According to expert thermalologists the surest way of obtaining a bite is to leave the d/t off altogether. The thermal, it seems, is particularly allergic to a scorched nimbus.

A really cunning dodge is to use a concealed fuse—that should fool even the wiliest thermal.



" Well ? You said 'Fetch a Camel' ! "

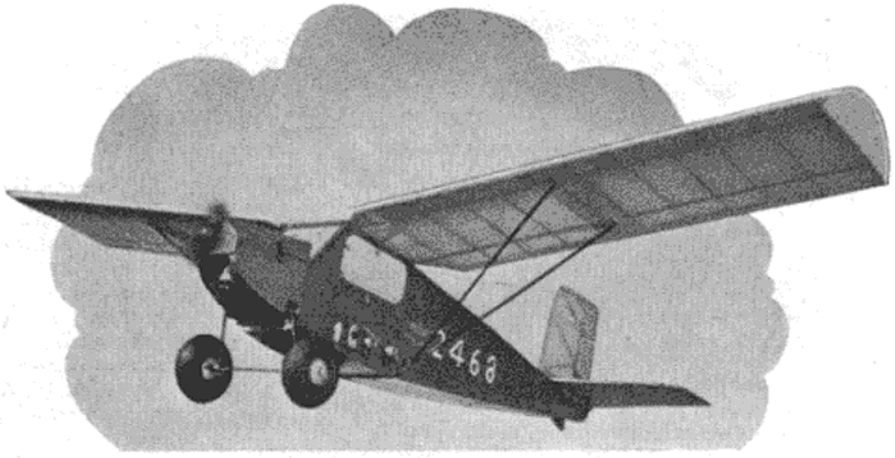
Last month

HARRY STILLINGS

dealt with the construction of the fuselage and wings of his

HAPPY WANDERER

and in his concluding article he describes the installation of the radio receiver and gives flying instructions

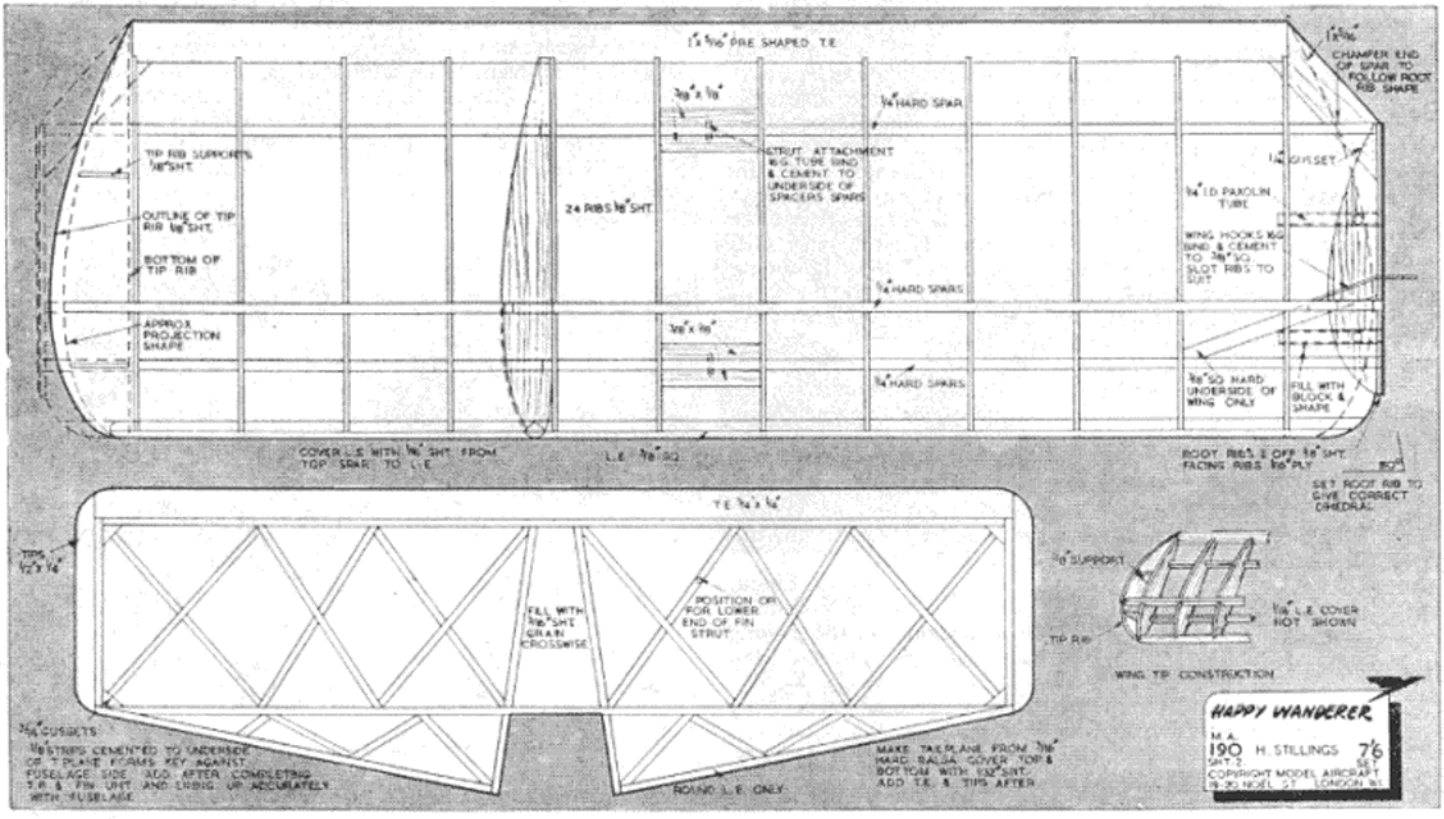


Fin and Rudder

Build over plan—make sure rudder is absolutely free by testing that it instantly falls by its own weight when fin is held flat. Loop is formed from 16-gauge piano wire, stapled and cemented in place, with tape strengthening strips cemented on each side. See that loop is dead in line with rudder trailing edge so that both neutral positions are identical and *really* neutral. When set, fin can be cemented in place on tailplane, care being taken to see that it is held dead upright and central until quite hard. Note that lower ends of fin struts must be cemented in position indicated (i.e., over $\frac{3}{16}$-in. rib, and *not* over unsupported 1/32-in. sheet).

Radio Installation

Actuator has already been fitted, so take a length of 16-gauge piano wire and get it dead straight—this may take some time, as piano wire can be most contrary, but persevere, as straightness of the drive is most important to reliable actuator operation. Now bend crank exactly as shown on plan—the amount of rudder throw has been very carefully arrived at by exhaustive trial with an adjustable crank. Fit rubber motor (flat $\frac{1}{8}$ in. well lubricated, one loop 18 in. long). Add switch, sockets, etc., on switch panel on port side, or use your own personal layout, as desired. The h.t./l.t. battery pack is located on cabin floor against bulkhead, retained in position with a strip of $\frac{1}{2}$ in. square hard balsa cemented to floor, and rubber band over small hooks in this strip and bulkhead. Actuator battery (preferably flat $4\frac{1}{2}$ V flashlamp type) is housed in compartment behind windscreen (partly for weight distribution



THIS PLAN IS IN TWO SHEETS—FUSELAGE AND WINGS. FULL SIZE WORKING DRAWINGS, PRICE 4s. 0d. AND 3s. 6d. RESPECTIVELY, ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 7s. 6d., POST FREE

purposes) and should not be placed in cabin. After completing wiring-up, receiver is held in position in cabin with rubber bands over the hooks in each corner. For additional safety cement half a rubber sponge at back of cabin bulkhead against which receiver can safely strike in the event of a heavy impact overcoming the tension of the rear bands. Aerial is taken through small hole in rear of cabin ceiling, with knot tied inside to allow ample " play." The upper and lower doors on each side can now be fitted.

Covering

Nylon is the most durable covering material, but heavy-weight Modelspan is satisfactory. Cover fuselage from rear of cabin to tail, wings and fin. Cover sheeted tailplane with lightweight Modelspan, and give all three coats of dope, taking care to avoid warps. Colour may be added as desired.

Flying

Model *must* balance at point shown—test-glide over long grass (fully equipped) and note carefully any tendency to stall or nose-dive. Correct stall by packing leading-edge of tailplane 1/32 in. at a time until glide is quite flat. To correct nose-diving tendency pack trailing-edge 1/32 in. at a time until glide is flat. If there is a natural " built-in " tendency to turn either way, correct by adjusting trim-tab a little at a time until glide on neutral is dead straight. Start power-on tests with prop back to front, or revs. kept down, and with 2 deg. right thrust and 2 deg. down thrust. Limit first flights to about 2 min. power run, and make adjustments to glide, thrust, etc., a little at a time. It must be emphasised that the glide is the criterion in trimming for R/C—concentrate on getting this right by packing tailplane as required and adjusting trim-tab until glide is dead flat, with no tendency to stall or become

Harry Stillings, the designer of " Happy Wanderer," is the subject of this cartoon, drawn by his brother G. W. Stillings. Harry, a commercial artist himself, took up model flying shortly after the last war and played a leading part in the growth of the Exeter M.A.C., acting as club and area secretary.

This summer he has given many successful flying demonstrations with his radio model at local fetes and fairs.

steep, and is absolutely straight on neutral. Then correct turn, stall, etc., under power *entirely* by adjustment of engine thrust. If trim-tab or tailplane packing is used to correct power-on flight the glide will be all wrong when the motor cuts.

The prototype needed $\frac{1}{16}$ in. packing under the leading-edge of tailplane for perfect glide, but each model will differ slightly and yours may need none. The model is very stable, with excellent recovery from turns, yet responds immediately to every signal. Provided the wheels are accurately tracked *Happy Wanderer* will take off into a beautiful scale climb after a 50-ft. run on short level grass, and less from a runway. Let the model gain height upwind, using the button only to keep her headed into wind if necessary. A left turn can be safely held on for 180 deg., but right is best taken in two " bites " of 90 deg., as the model will tighten up into a spiral if right is held on too long. This, of course, is needed if stunts are attempted, and speed can be built up in a right spiral for loops, rolls off the top, etc., and for losing height when required. When the model has gained about 50 ft. height upwind (or more if you wish) start flying backwards and forwards about 200 yards upwind of the transmitter. In this way, should anything go wrong, she will drift back *towards* you, and not away from you. When the motor cuts she will go into a flat stable glide, and as the turn is only slightly less than under power you will very soon be taking spot-landings as a matter of course. I have flown the original from a tree-surrounded field only 100 yd. × 50 yd., making spot landings every time; also from the edge of a 100 ft. cliff, out over a valley, and bringing the model back to a spot landing on the edge of the cliff only a few yards from the transmitter. This has been done in varying wind conditions from calm to fresh, yet no change in trim has been called for.

Needless to add, a strict pre-flight radio check should always be carried out before flying, and test-checks made during the day whenever you are indulging in a long session. If the ground is unsuitable for a take-off, hand-launching is easy, two or three running steps and a firm " shove " being all that is necessary.

INCIDENCE and NICHES

by R. H. Warring

THE angular setting of the wings and tail is normally quoted in degrees and called either the incidence angles or rigging angles. In practice, however, incidence values in terms of packing thicknesses are far more useful. Even when drawing out a new design, incidence angles are more conveniently, and more accurately, laid out in terms of the actual "rise" of the leading edge with respect to the trailing edge, rather than by setting out the incidence line with a protractor.

First, a few words about incidence angles. Any aerofoil is said to have *positive* incidence if it is inclined upwards (i.e., leading edge above the trailing edge, with respect to the horizontal or datum line); and *negative* incidence if inclined downwards. These angles are related to a suitable *datum line*—usually the centre line of the fuselage, for convenience.

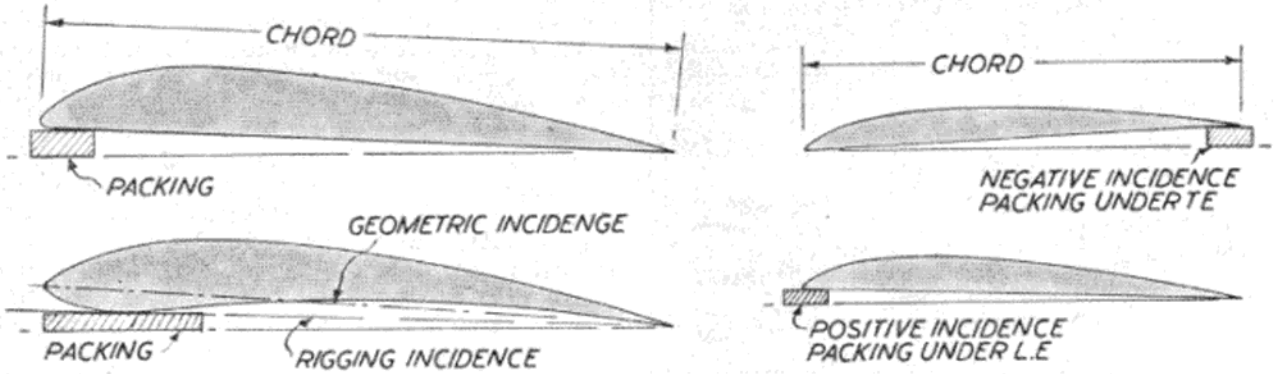
Now if the top of the fuselage is parallel to the centre line (datum) the necessary wing incidence is given by packing up the wing leading edge. In practice the fuselage top is usually sloped upwards to give the estimated incidence required with the wing resting on top of it. The effect is just the same. More packing may have to be added later when trimming; or, to *reduce* the built-in incidence, the trailing edge can be packed up.

Modellers seldom use packing under the trailing edge of wings for trimming purposes in this country, although it is quite a popular method in America. Usually we prefer to trim out by adjusting the tailplane incidence. The starting point is often a tailplane set parallel to the datum line, i.e., with zero incidence. The same rules then apply. Packing added under the leading edge increases or gives the tailplane *positive* incidence. Packing under the trailing edge decreases or gives *negative* incidence. Rubber models and glider are frequently rigged with *negative* tailplane incidence. Power models, and particularly duration type power models, frequently have *positive* tailplane incidence.

There are also different ways of *measuring* incidence. Strictly speaking the geometric incidence of an aerofoil section is measured from a line from the trailing edge passing through the centre of the leading edge. For practical purposes, however, we usually determine incidence with reference to the undersurface of the section.

In the case of flat-bottom sections this is straightforward. Any upsweep at the leading edge is ignored and the incidence is measured as the angle between the undersurface and the datum (in degrees) or the equivalent thickness of packing under the front of the section. Where the section has marked undercamber, however, incidence may vary considerably according to the *location* of this packing. Here the incidence is measured with respect to a tangent to the undersurface—e.g., the angle formed by a straight line or flat piece of wood drawn or laid against the undersurface. The equivalent, as far as packing dimensions are concerned, is given by locating the packing under the lowermost part of the front of the section.

In Table I equivalent packing depths are worked out for a complete range of incidence settings and various chord sizes. These figures are corrected to the nearest thousandth of an inch, which is beyond the limit of accuracy required for all practical purposes. To use this table, simply relate the wing or tailplane chord concerned in the left hand column and follow across until the appropriate incidence column is reached. For example, a 6-in. chord wing which is to have 4½ deg. incidence requires 0.469 in. packing (or this dimensional rise incorporated in the top of the fuselage when drawing out the design). The same figures are applicable to negative as well as positive incidence settings and may



be interpolated for fractional chord sizes not included in the table.

A majority of modellers prefer to use fractional measurements in 1/64 in. 1/32 in., etc., rather than decimals. Also, where actual packing is concerned, standard sheet or strip is normally employed, which ranges in size from 1/64 in. upwards. Unfortunately packing dimensions cannot be so accurately determined in terms of such fractional measurements, although the small differences involved will almost certainly be negligible in practice.

The same table is reprinted in 64th fractional sizes in Table II. The bold figures in this table correspond to packing dimensions which are very nearly exact. The other figures are not quite so accurate, but quite accurate enough to use. Where no figures are given, this means that the actual dimension is more or less mid-way between 64ths and you should work from the figure given in Table I.

As approximate values, the following hold true.

3½ deg. incidence is equivalent to 1/16 in. packing per inch of chord length.

4½ deg. incidence is equivalent to 5/64 in. packing per inch of chord length.

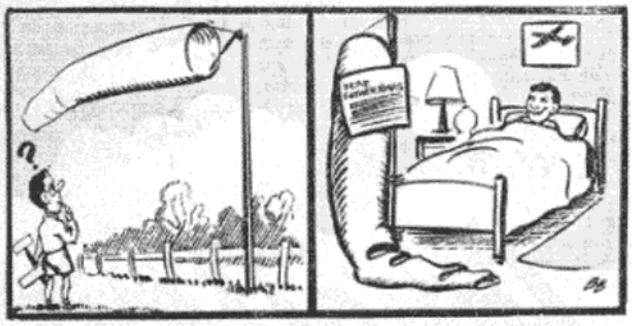
6 deg. incidence is equivalent to 3/32 in. packing per inch of chord length.

7 deg. incidence is equivalent to 1/8 in. packing per inch of chord length.

9 deg. incidence is equivalent to 5/32 in. packing per inch of chord length.

10 deg. incidence is equivalent to 11/64 in. packing per inch of chord length.

For example: packing required for a 7-in. chord to be set at 7 deg. = 7 × 1/8 = 7/8 in. approx. A nearer value, as given by the table, is 55/64 in., or 0.853 in.



The effect of "standard" packing thicknesses can also be estimated from the table. On a 4-in. chord, for example, 1/16 in. packing under either the leading or trailing edge is equivalent to changing the incidence by roughly one degree. For fine trimming a *minimum* change of less than half a degree is advisable, indicating that 1/32 in. packing is much to be preferred. On the other hand, with a large chord, considerable thickness of packing may be required to bring about a noticeable incidence change.

Suppose, for instance, that a 12-in. chord power model shows signs of being under-elevated and it is decided to add packing under the wing to increase the wing incidence. Packing 1/16 in. thick is not going to make much difference. To add an extra two degrees would require nearly 7/16 in. packing, so working with packing thicknesses smaller than about 3/16 in. would have little or no apparent effect.

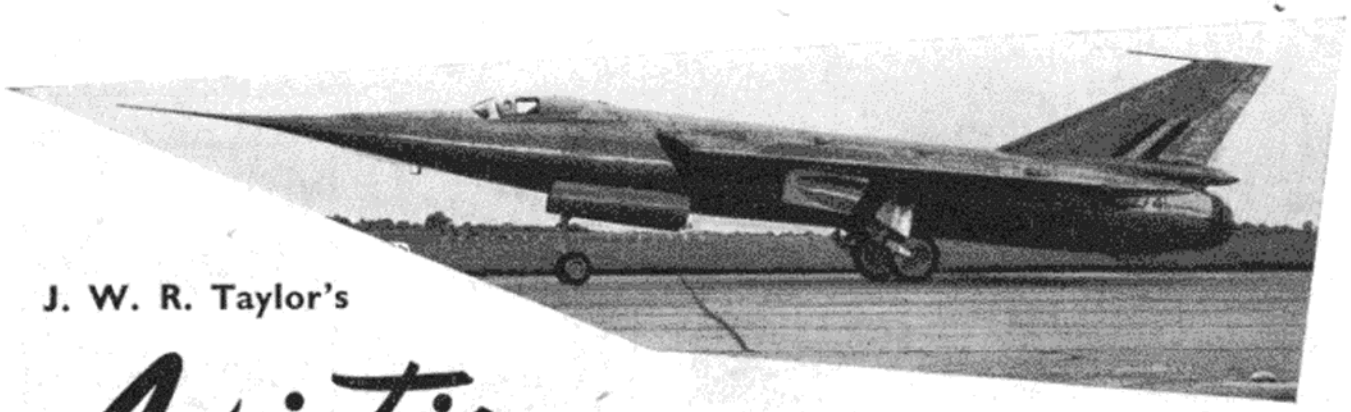
These tables are worth saving for reference for they can save you a lot of time when laying out new designs, help you check incidences established by trimming flights, and give a clue as to the *amount* of change produced by various thicknesses of packing.

TABLE I. INCHES TO INCIDENCE (DECIMAL FRACTIONS)

Chord Inches	Rigging Incidence—Degrees ½	1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10
12	0.104	0.210	0.313	0.418	0.521	0.626	0.731	0.835	0.938	1.042	1.251	1.463	1.670	1.877	2.083
11	0.096	0.1925	0.287	0.383	0.477	0.5735	0.670	0.766	0.860	0.955	1.147	1.341	1.531	1.720	1.910
10	0.087	0.175	0.262	0.349	0.436	0.523	0.610	0.698	0.785	0.872	1.045	1.219	1.392	1.564	1.736
9	0.078	0.1575	0.235	0.313	0.391	0.469	0.549	0.626	0.704	0.781	0.938	1.097	1.253	1.408	1.562
8	0.070	0.140	0.209	0.278	0.347	0.417	0.488	0.557	0.626	0.694	0.834	0.975	0.114	1.251	1.389
7	0.061	0.1225	0.182	0.244	0.304	0.365	0.427	0.487	0.547	0.608	0.730	0.853	0.974	1.095	1.215
6	0.052	0.105	0.156	0.235	0.260	0.313	0.366	0.418	0.469	0.521	0.626	0.731	0.835	0.938	1.042
5	0.044	0.0575	0.131	0.1745	0.218	0.262	0.305	0.349	0.393	0.436	0.523	0.610	0.696	0.782	0.868
4½	0.039	0.079	0.117	0.157	0.195	0.235	0.274	0.313	0.352	0.391	0.469	0.549	0.626	0.704	0.781
4	0.035	0.070	0.104	0.139	0.174	0.209	0.244	0.278	0.313	0.347	0.417	0.488	0.557	0.626	0.694
3½	0.0305	0.061	0.091	0.122	0.152	0.183	0.213	0.244	0.274	0.304	0.365	0.427	0.487	0.547	0.608
3	0.026	0.0525	0.078	0.104	0.130	0.156	0.183	0.209	0.235	0.260	0.313	0.366	0.418	0.469	0.521

TABLE II. INCHES TO INCIDENCE (64th PACKING)

Chord Inches	Rigging Incidence—Degrees 1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10
12	7/64	—	5/16	—	—	**5/8**	47/64	—	15/16	—	1 1/4	1 15/32	1 43/64	1 7/8	2 5/64
11	3/32	—	9/32	25/64	—	37/64	43/64	**49/64**	55/64	61/64	1 9/64	1 11/32	**17/32**	1 23/32	1 29/32
10	—	11/64	17/64	—	7/16	—	39/64	45/64	25/32	**7/8**	1 3/64	1 **7/32**	1 **25/64**	1 **9/16**	1 47/64
9	**5/64**	5/32	**15/64**	5/16	**25/64**	**15/32**	**35/64**	5/8	**45/64**	**25/32**	**15/16**	1 3/32	1 1/4	1 **13/32**	1 **9/16**
8	—	**9/64**	—	—	**11/32**	—	31/64	—	**5/8**	—	—	—	—	1 1/4	—
7	—	1/8	3/16	1/4	—	—	27/64	31/64	35/64	39/64	—	55/64	—	1 **3/32**	1 7/32
6	—	7/64	**5/32**	**15/64**	17/64	**5/16**	23/64	—	15/32	—	**5/8**	47/64	—	**15/16**	—
5	3/64	—	1/8	11/64	**7/32**	17/64	19/64	11/32	25/64	**7/16**	—	**39/64**	—	**25/32**	7/8
4½	—	**5/64**	—	**5/32**	—	**15/64**	—	**5/16**	29/64	**25/64**	**15/32**	**35/64**	**5/8**	**45/64**	**25/32**
4	—	—	7/64	9/64	11/64	13/64	15/64	—	**5/16**	11/32	27/64	31/64	—	**5/8**	—
3½	1/32	1/16	3/32	1/8	—	—	7/32	1/4	—	—	—	—	31/64	**35/64**	39/64
3	—	—	**5/64**	7/64	1/8	**5/32**	—	—	**15/64**	17/64	**5/16**	—	27/64	**15/32**	—



J. W. R. Taylor's

Aviation NEWSPAGE

Clearly seen in this picture of the Fairey "Delta II" is its "needle nose," which can be lowered for improved vision during landing and take-off.

Shaped like a hypodermic needle with wings, the Avon-powered **FAIREY DELTA 2** will inject new leadership into Britain's supersonic flight research. Size and performance are secret ; but it could be the fastest jet in the air, as there is no news yet of high speed flights by the U.S.A.F.'s Douglas **X-3**. Add to this the fact that it stayed up 35 minutes on its second test flight and it looks better still, because the fantastic fuel consumption of America's rocket-powered Bell **X-1A** and Douglas **SKYROCKET** Mach 2 barrier-busters limits their usefulness to four or five minutes per flight.

Big problem with needle-nose research planes has been to give their pilots safe forward vision. Bill Bridgeman lands the **X-3** blind, under radioed instructions from a **SABRE** "chase plane." Fairey test pilots Gordon Slade and Peter Twiss have no such trouble with the **DELTA 2,** because its whole nose lowers "like a drawbridge" to improve forward view for landing, take-off and taxying.

The delta wings are razor thin, yet the high-pressure main wheel units retract fully into them. Leading edge fences are fitted just outboard of the new-style semi-circular root air intakes. Other features are the nose-mounted A.S.I. pilot head, and pointed fairing under the rudder, presumably housing a tail parachute-brake.

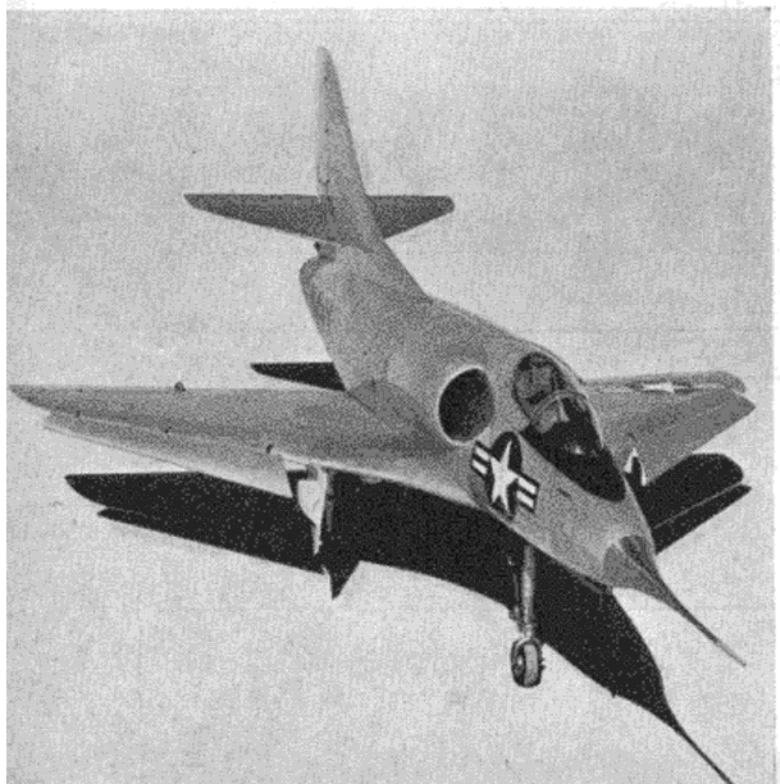
☆ ☆ ☆

BETTER BARRELS. Swedish Air Force Saab *J*-29 jet-fighters are being fitted with afterburners and modified outer wings, to improve performance and handling at high speeds. As can be seen in the illustration, the changes result in an extended, bulkier jet tailpipe and increased wing chord at the leading edge outboard of the wing fences. The modified aircraft are designated *J*-29*F*.

☆ ☆ ☆

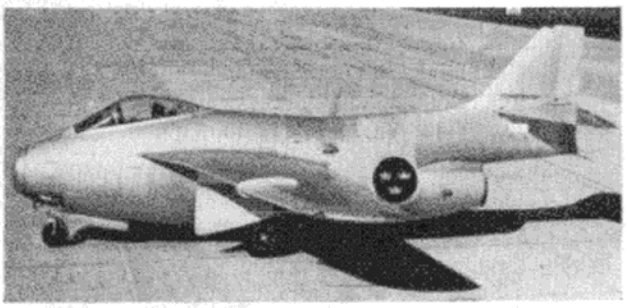
If your idea of an **ATOM BOMBER** is something the size of a *B*-36, take a look at the little Douglas *A4D Skyhawk*. Although less than half the size of many current jet-fighters, it will not only lift an A-bomb, but will carry it faster over greater distances than anything else in its class. Exact figures are secret ; but it is believed to have a top speed well over 650 m.p.h. and a range of 650 miles.

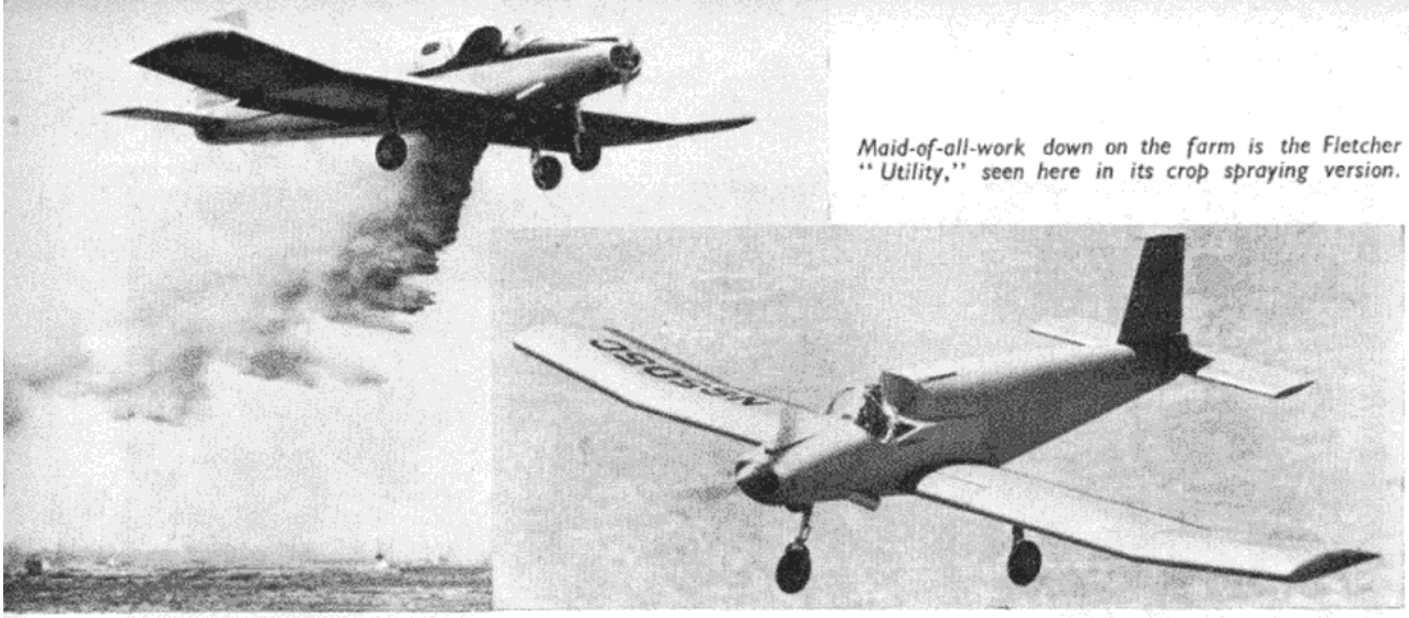
Powered, like most of America's latest and hottest military aircraft, with a Wright-built Armstrong Siddeley *Sapphire* turbojet, the single-seat, all-duralumin *Skyhawk* has been designed for simplified mass production. Its wings are delta-shaped, not for the usual reasons, but because this configuration



Left : Despite its small size, the Douglas "Skyhawk" can carry an atom bomb at over 600 m.p.h.

Below : The Swedish F-29 gets a new look with the fitting of afterburners and new outer wings.





Maid-of-all-work down on the farm is the Fletcher "Utility," seen here in its crop spraying version.

enabled designer Ed Heinemann to get the wing area he wanted into a span of around 25 ft. As a result, *Skyhawks* can be stowed aboard carriers more easily than current types of attack aircraft, without having to fold their wings.

Designed, built and flown in 18 months, the *Skyhawk* is already in production for the U.S. Navy.

☆ ☆ ☆

There's nothing glamorous about the new **FLETCHER UTILITY AGRICULTURAL PLANE**; but it carries more load per horse-power than almost anything else with wings. Tailor-made for life on the farm, it is extremely rugged, and will lift a 1,250 lb. load from any 870 ft. strip of reasonably level ground. Normal payload is crop-spraying insecticide, weed-killer or fertiliser in a 27 cu. ft. hopper behind the pilot; but there is space aft of the hopper to carry two farm hands to load the aircraft during spraying operations, and the **UTILITY** could also be adapted to carry eight people or 50 cu. ft. of cargo, or for search and rescue work.

Powered by a 225 h.p. Continental engine, it offers maximum serviceability and safety. Its structure is coated with special paint to protect it from chemical corrosion, and the 40-g "safety section" around the pilot can withstand loads equal to flying the fully-loaded aircraft into the ground at a 45-degree angle at 70 m.p.h. The 42 ft. span wings have an area of 294 sq. ft., and use an NACA 4415 high-lift section. Maximum speed is 124 m.p.h.; endurance 3.4 hours at 108 m.p.h.; and stalling speed, flaps down and power on, 42 m.p.h.

☆ ☆ ☆

Since 1952, the U.S. Department of Defence has put as much research and development effort into guided missiles as into conventional aircraft. The annual budget for each is now running at about £107 million; and the department has spent a grand total of over £1,500 million on its overall guided missile programme.

☆ ☆ ☆

NEW BREED OF BIRD-DOG is the Cessna *Model OE-2*, 25 of which have been ordered by the U.S. Marine Corps for observation and reconnaissance missions. Basically similar to the well-proven *OE-1* (*L-19 Bird-Dog*) liaison plane, it has a 265 h.p. Continental engine (52 h.p. more than the *OE-1*), which puts the top speed up to 180 m.p.h., without affecting the aircraft's ability to operate from small, unprepared front-line areas. Most noticeable external change is the tail, narrow fin and rudder, replacing the rounded fin and rudder of the earlier version.

The *OE-2* can carry a 250 lb. bomb under each wing, three rockets, a telephone wire-laying container, chemical spray tank for laying smoke-screens, or an aerial delivery container for parachuting supplies to ground forces.

Latest of a long line of Cessna observation planes is the new OE-2 which can cope with a multitude of light duties, and operate from small improvised landing areas.

Off the Beaten Track

Sgt. Usher of R.A.F. Martlesham Heath, winner of the R.A.F. Championships power event, with his Elfin powered "VerTig-O."

ACCENT ON POWER

by

P. G. F. CHINN

VERTICAL take off for power duration models, on its showing thus far, should become more popular next season. With the importance of utilising the maximum available power (as has been put forward so frequently in these columns) now recognised, the practicability and desirability of vertical take off is becoming more and more apparent —especially for such events as the World Power Championships.

Contrary to expectations, v.t.o., properly applied, simplifies, rather than complicates, launching procedure. We are convinced, having accumulated some knowledge of the hazards of high speed (horizontal) take offs under windy conditions, that v.t.o. is a lot safer under such conditions.

One of the 1954's converts to v.t.o. was J. A. Gorham, whose *VerTig-O* was proxy flown to fourth place in the 1954 world championships. A replica of this model was flown into first place in the power event at this year's Royal Air Force M.A.A. championships by Sgt. Usher of R.A.F. Martlesham Heath, who had completed the model only a day or two earlier and had had very little previous experience with it.

Obviously, the " undercarriage " (abiding, too, by the three-point rule) must be sensibly designed and it is interesting to note that in place of the long " stick " support used by some of the first v.t.o. models, Gorham gets equally good results from a short retractable wire prong attached to the underfin.

First British Reed-Valve Engine

It is said that a change is good for the soul ; how very true. It was, indeed, a pleasant change to inspect the new Elfin BR 1.49 reed-valve engine and to note its several out-of-the-rut features. By the time these words appear in print, production of the new BR 1.8 and BR 2.49 models should also be well advanced and the first models appearing in the model shops.

The original Elfin engine first appeared a little over six years ago in the summer of 1948. This was, of course, the famous 1.8 model which had such repercussions on model diesel design immediately afterwards. Until this period, most diesels had differed appreciably in general layout from the high performance miniature spark-ignition and glowplug-ignition units (then entirely new) which had been brought to such an advanced stage of development by the Americans. These latter type engines were much lighter, more compact, operated over a higher r.p.m. range, and delivered greater power than the diesel, and the most notable among the smaller types were the Arden engines.

When the Elfin appeared, it was immediately apparent that, while still a diesel, its design had been influenced by the Arden engines. It used the then unique system of cylinder porting that had been adopted by Arden, and its general appearance also suggested Arden influence in the use of a shaft rotary valve, with inverted intake, and in the adoption of a cone shaped two point radial mounting. Most important, the performance of the new Elfin was also up to Arden standards and the immediate effect was to revise the former conceptions of diesel design and to focus attention on the shaft-valve, radial port, lightweight layout.

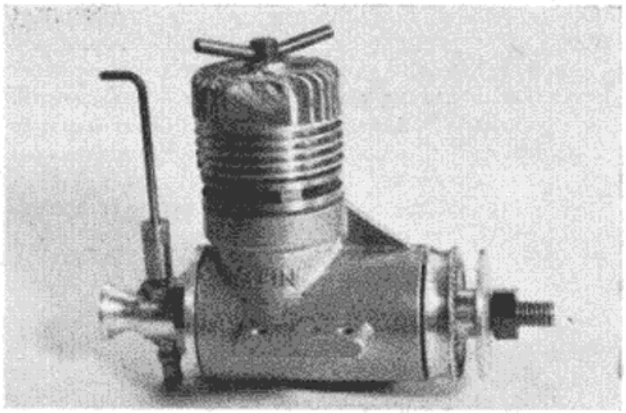
We do not suggest that Messrs. Aerol Engineering, the Elfin manufacturers, were entirely alone in recognising the merits of this type of design for diesel use : a number of other designers were also working along similar lines. In fact, the New Zealand-built Pepperell .12 shaft-valve radial port diesel anticipated the Elfin by nearly two years. But undoubtedly the Elfin, by its immediate success with competition enthusiasts in this country, hastened the adoption of circumferential porting in particular, by many other makers. The following year, Aerol Engineering introduced the equally famous radial mount 2.49 model, which so many of us recall with affection, and it is probably true to say that these two engines are still regarded by many contest men as the best

engines that the manufacturers produced. Certainly, the extensive list of contest wins that these two models achieved was most impressive.

Now, looking at the new BR type Elfin, one wonders whether this might herald the beginnings of another—even if less universal—re-shaping of British model engine design trends. Again, the biggest design change made by Aerol Engineering originated in the United States—the adoption of the reed-valve induction system which has proved so successful on the Cox .049 (" Space Bug " and " Thermal Hopper ") engines.

Since we published the first article in this country on the reed valve as used in this latter engine (September, 1953, issue) there have been many attempts to convert existing rotary valve engines to this form of induction. These experiments have met with varying degrees of success. In a few instances, improved performance, particularly for team racing work, has been reported. In others, no particular advantages have accrued, due, in certain cases, to the fact that some of the people who have tackled these conversions have obviously had little idea of the characteristics peculiar to the reed-valve system. Here we might add, by way of warning, a comment from a prominent manufacturer who, answering an advertisement, allowed one of his engines to be converted to reed valve. He states that the work was of a most shoddy nature and that " the apology for a valve assembly lasted some fifteen seconds only." The design and construction of a successful reed valve is certainly something which cannot be arrived at without considerable knowledge and experiment.

Thus, the Elfin emerges as the first British production reed valve engine and, at the same time, the first quantity produced reed valve diesel. The valve assembly itself is housed in the screw-in type crankcase cover. The cover is in the form of a cap, deeply recessed on the inside, and has a central intake port into which the carburettor is screwed. The reed itself consists of a single leaf which resembles the design of the two-leaf Cox unit and appears to be of a similar copper alloy. (Reference to the September, 1953 " M.A." article will show the shape of the reed as used by Cox and Elfin.) The outer rim is held firmly against the housing by a short compression spring, which is locked in position by a circlip of the type used for motor-cycle gudgeon pins.

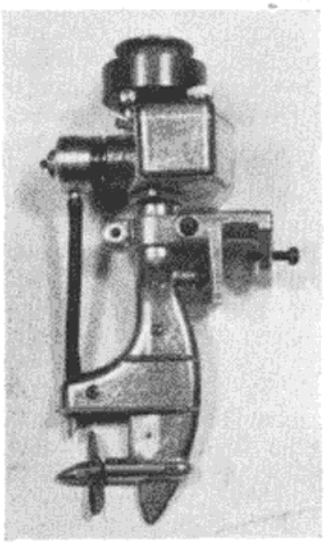


The novel design of the new Elfin BR 1.49 c.c. is a refreshing change from usual practice.

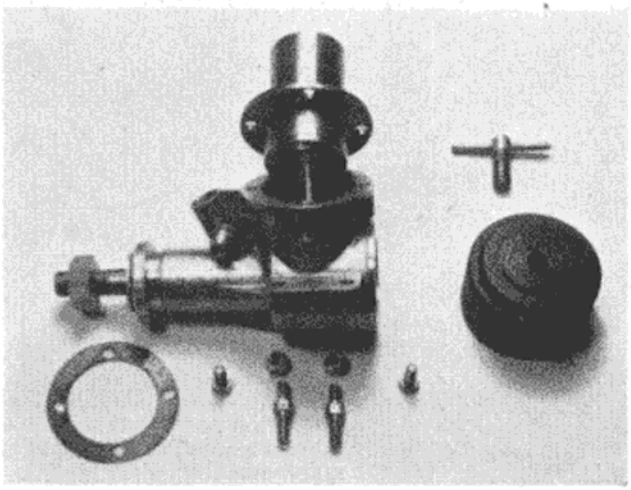
Although interest naturally centres on the use of the reed valve (also variously known as flutter-valve, clack valve and clapper valve), this is not the only novel feature of the new Elfin. As will be noted from the photograph, two other features give the engine a most uncommon appearance. These are found in the design of the crankcase and cylinder head.

The crankcase houses two ball journal bearings to support the crankshaft (a new feature only so far as Elfins—always plain bearing models previously—are concerned), but the way in which the crankcase design has been simplified to accommodate these is interesting, since it must obviously result in an extremely stiff structure. Especially noteworthy is the unusual lug location that has, in consequence, been adopted. This reduces overhang to negligible proportions and should be of even greater value in marine installations.

The cylinder liner, though porting is different from previous Elfins, is of fairly orthodox design, but the finned barrel is not screwed on ; instead, it slides over the upper part of the cylinder and is locked in place by means of a separate cap, recessed



Left : The new Atwood watercooled outboard motor. Based on the well-known Atwood .049 model aircraft motor, it uses a special flexible shaft drive to the propeller.



Right : Unusual cylinder assembly is featured by the Allen-Mercury 25 diesel engine.

into the vertical head finning, which screws on to threads at the very top of the liner, i.e., that section of the cylinder wall surrounding the contra-piston. Theoretically, this system is better in that it reduces any possibility of distortion due to thread loading, while a practical advantage should be realised in a reduced tendency for the head to loosen. A final useful feature of the new Elfin is the screw-in central mounting of the carburettor which, secured by a locknut, can be rotated to any position for convenient installation.

The Atwood Outboard

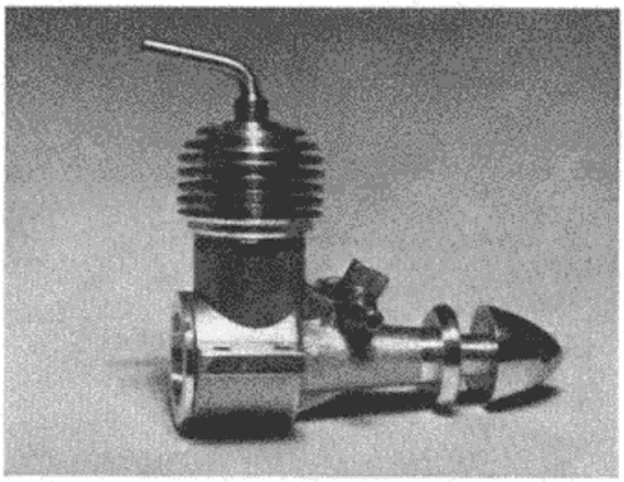
Last month we mentioned the two new American outboard motors and described the Allyn "Sea Fury" unit. The Atwood, with which we have also made acquaintance, is no less worthy of our attention, but to avoid any risk of upsetting the faithful aircraft types, we will condense our remarks on this occasion.

To sum up the Atwood against our earlier remarks on the Allyn, we would say that it is the "performance and practicability" model of the two. The Allyn, generally speaking, is the better looking. This is true in the case of its realistic mounting clamp. In practice, however, we found it a little difficult to get the mounting clamp really tight. On the other hand, the Atwood fitting, which is a robust clamp around the lower housing itself, really holds the unit rigidly to any setting.

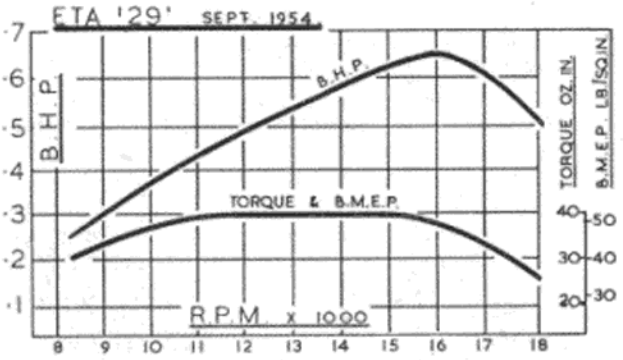
The Atwood is also available in a water cooled version and our model is one of these. The pick-up tube is positioned just behind the tip of the upper prop blade and water is conveyed via a rubber tube to an intake pipe on the water jacket. Unlike the Allyn power head, direction of rotation is standard and, as we mentioned last month, transmission is entirely different, being by means of a flexible shaft instead of a bevel gear drive.

The Allen-Mercury 25

Inclusion of the Allen-Mercury 25 in this discourse on "off the beaten track" developments may seem to be a bit out of place, but this new engine does exhibit a departure from the orthodox in the cylinder assembly.



A superbly made engine from Norway. Jan David-Andersen's new 1 c.c. D-A diesel.



In view of a recent suggestion that the output of model engines does not exceed .05 b.h.p./c.c., these new performance curves just issued by Eta Instruments Ltd. for their 4.87 c.c. "29" are interesting, since they indicate an output of over .13 b.h.p./c.c.

The engine is conventional in that it is of the shaft-valve, annular port type. The cylinder liner, however, has a wide flange between the transfer and exhaust ports and this is secured to the crankcase at four points, leaving a 360-deg. transfer passage between the liner and crankcase wall—an arrangement practically identical with that of the Yulon 30 engine of 1949. Instead of using screws, however, special studs are used at two points on the flange, which also serve, with nuts, to hold the slide-on cylinder barrel in place. This appears to be a good system. Dismantling and reassembly is a somewhat more lengthy and tedious process and would certainly not encourage one to replace a con-rod in the middle of a team race (as we heard of someone doing with another make), but it can be argued that this is all to the good in discouraging unnecessary stripping.

A New Norwegian Diesel

Recently an interesting new shaft valve diesel came our way from northern Europe : a pre-production example of the David-Andersen 1 c.c. from Norway.

It was in response to suggestions made by the writer, after being consulted by Jan David-Andersen, that this new model was designed for production and so we were particularly interested to see the finished article. David-Andersen has been building diesels for many years and, in fact, wrote a book about them back in 1945, before any British diesel had appeared.

The new D-A 1 c.c. is a modern design of good performance. There are two exhaust ports of adequate area and two inclined transfer ports are arranged between them. The cylinder liner is a close sliding fit in the upper part of the crankcase and is vertically located by means of a flange and, radially, by a spigot. The cylinder barrel then slides over the upper part of the liner and screws over the top of the main casting.

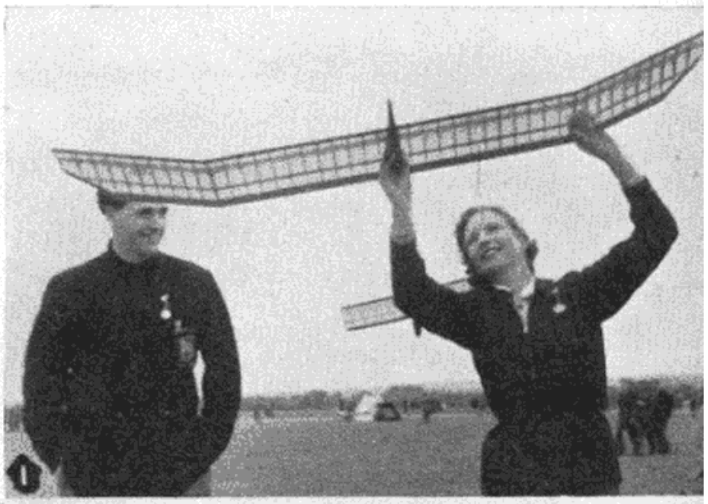
The workmanship throughout is of the highest order and we find this model a worthy companion to the 2.46 c.c. D-A model, and one which should achieve especial favour with newcomers to model aircraft in Scandinavia.

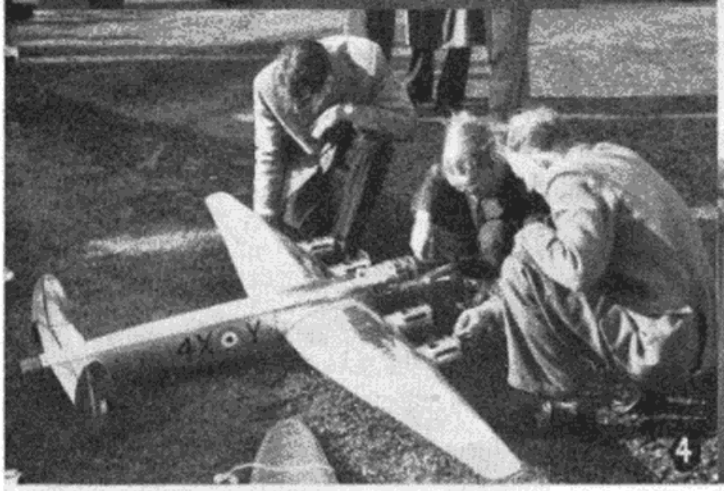
ALL-BRITAIN RALLY

held at Radlett Aerodrome, Herts.

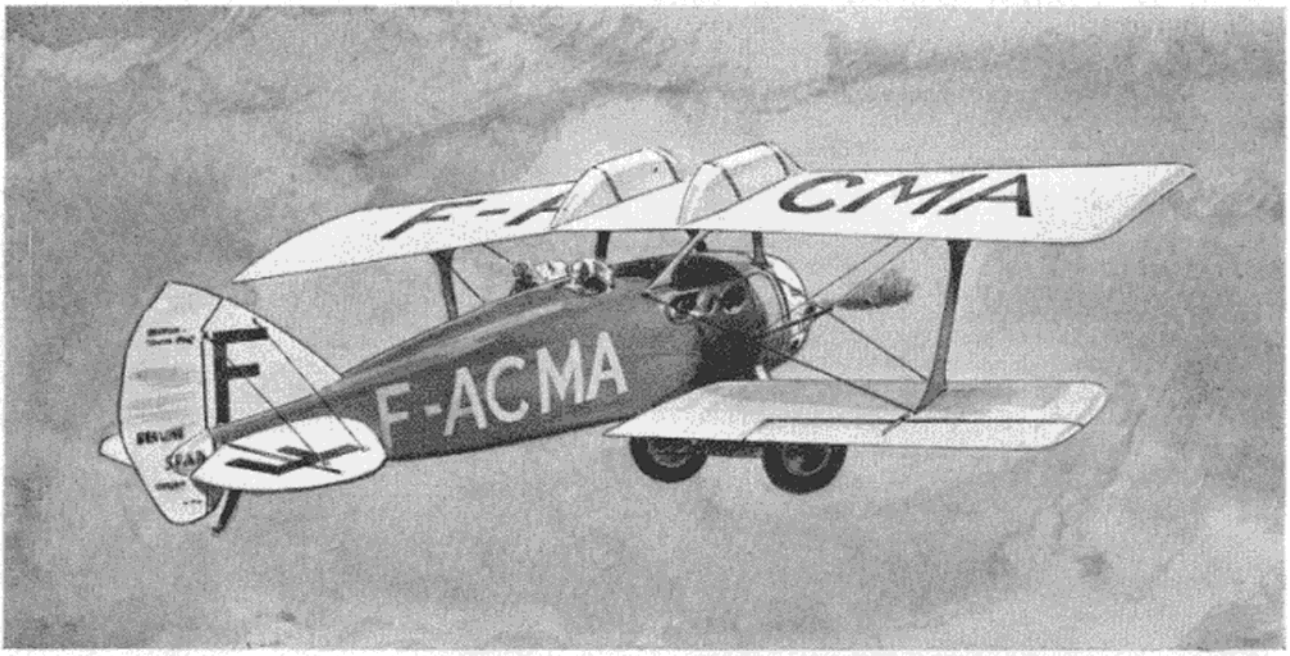
Always a popular event, this year's All-Britain Rally, sponsored by the St. Albans' M.A.C., and again held on Sir Frederick Handley Page's aerodrome at Radlett, attracted over 700 entrants from more than 80 clubs. The public, too, rolled up in their thousands, and the total attendance was around the 18,000 mark. Team racing again proved one of the biggest draws, and altogether there were 91 entries for this event. The R/C contest, too, was well supported, though the gusty weather at times made flying a hazardous task and greatly limited the scope of the event.

World-wide interest in the Jetex engine was emphasised by the number of foreign entries in the Jetex International event, nearly one third of the pre-selected competitors coming from abroad. A strong contingent came from Sweden, and it was fitting that a Swedish girl should present the Cup.





1. Mrs. M. A. King, nee Pat Healy, watched by husband Mike, displays her model which took first place in the Glider Duration.
2. Roger Clark launches for Sid Allen, who tied for second place in the R/C Aerobatics.
3. Z. Datkiewicz of the Polish Air Force M.A.A., with his fine model of a "Mewa."
4. John Cunningham and Peter Bugge of de Havillands inspect A. J. Briggs' beautifully detailed "Lincoln."
5. J. O'Donnell receives the cup, a smile, and a handshake from Miss Dagmar Almquist of Sweden, as winner of the Jetex International contest.
7. V. Jays urges his model off the water to win the Seaplane Power Duration.
8. O. F. W. Fisher's *Ionosphere* won him first place in the Tailless Power Duration. The plans of the *Ionosphere* are available from the M.A. Plans Service, No. 157.



Prototypes Worth Modelling

No. 47. The Spad S.33 Berline . . . . . by C. B. Maycock

A FREQUENT visitor to the Plough Lane Aerodrome, Waddon, Croydon (later to become Croydon Airport), in the early 1920's, was the attractive Spad *Berline* six seater, belonging to the French national airline of those days. It was typically Spad in its lines, being well streamlined, and it had a strong, purposeful look about it. The simplicity of the design commends itself as a choice for an R/C or F/F model. The large fuselage, strong and simple undercarriage and centre section struts, single "I" pattern interplane struts—all are points in its favour from the modellers' point of view.

The colour scheme was certainly eye-catching ; the fuselage was painted a rich blue (cobalt blue) and the wings, tail surfaces, under-carriage, wheel centres, interplane and centre section struts were all silver. The registration letters were in silver on the fuselage sides and in black elsewhere.

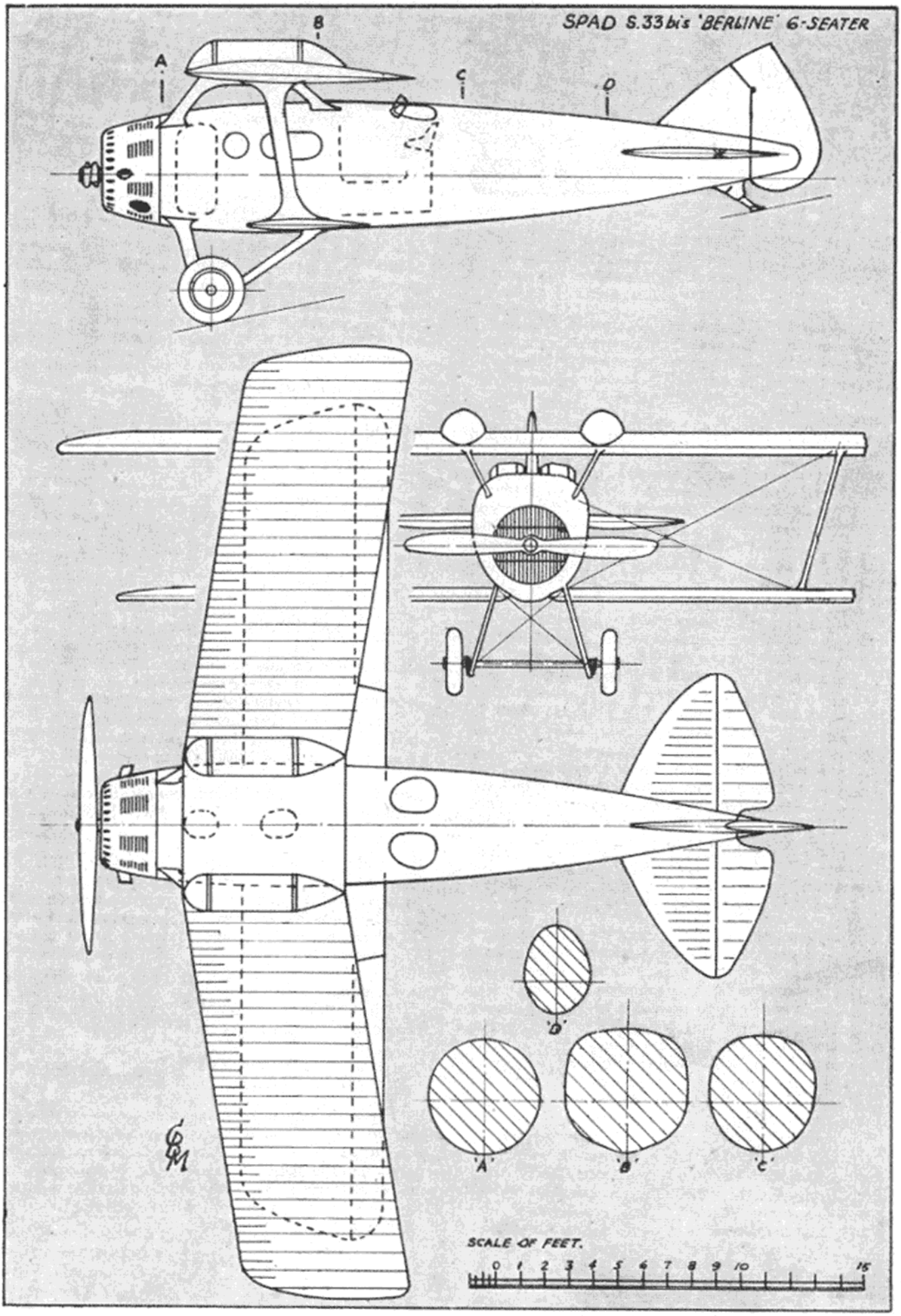
Lettering

At this time the tail surfaces carried the nationality letter, in addition to it being shown on both sides of the fin. On the top and bottom surfaces of the tail-plane the letter F faced aft on the starboard side, and forward on the port side. The letters were of equal size with those on the fin. The full registration letters were spread across the full span of the top and bottom wings. Those on the upper surfaces had the tops of the letters adjacent to the leading edge, and those on the bottom had the tops towards the trailing edge. One aircraft was registered F-ACMA.

The pilot and navigator sat in separate open cockpits one each side of the centre line, and the passengers entered by a door in the forward part of the fuselage on the starboard side. The engine, a 250 Salmson A-Z9 water cooled radial, drove a two bladed wooden airscrew. Surrounding the motor was an aluminium cowling, liberally pierced and louvred in the true Spad manner. A short exhaust pipe protruded on each side on the horizontal centre line. Two aluminium fuel tanks were mounted on the top centre section, the fuel lines being led down the inner face of the centre section struts.

Wooden Construction

Designed by M. Andre Herbemont of the Bleriot-Spad concern, the S.33 *Berline* had a span of 38 ft. 4 in. and a length of 29 ft. 9 in.; the wing area was 463 sq. ft. Construction was usual for the period—wooden wings, two main spars, and closely spaced ribs with single nose rib between. All flying surfaces were fabric covered. The fuselage was semi-monocoque, plywood and fabric covered. A single axle for the landing wheels was bound to the under-carriage by shock cord, and the tail skid was sprung in the usual manner. There was a complete absence of dihedral on both sets of wings, evidently a Spad peculiarity.


SPAD S.33 bis 'BERLINE' 6-SEATER
A
B
C
D
'A'
'B'
'C'
'D'
SCALE OF FEET.
0 1 2 3 4 5 6 7 8 9 10 15

Books for Christmas

AIRCRAFT OF THE 1914-1918 WAR. *By O. C. Thetford and E. J. Riding.* The Harborough Publishing Co. Ltd. Republished under licence by Harleyford Publications. 42s. 0d.

Interested in Quirks or Rumpeties, Brisfits or Tripehounds? The republication of this book, which is probably the most comprehensive of its kind, is an advent that will be welcomed by scale modellers and others interested in the aircraft used during the first world war.

Eighty aircraft—British, German, French, Italian and American, are fully described with a large photograph and one seventy-second scale three-view drawings. Twenty-four aircraft are shown in photographs and described fully, and a further section contains 94 of rare and experimental types. When this book was first published in 1946 it soon established itself as a standard reference work although there was some controversy and criticism of some of the details. With this reissue several plans have been redrawn, a number of new photographs introduced and others replaced by more suitable ones in addition to numerous alterations to the text.

Although no doubt there will be further criticism levelled at this book, as it is on a subject about which people tend to be dogmatic, it is a subject which in itself is full of ambiguity stemming from the wide variations of detail design modifications in the aircraft. It is from the interest which arises from these points that evidence can be collected and collated to assist in producing even more accurate reference works. This book, as it stands, is an invaluable reference and an asset to any library on aircraft.

AIRCRAFT TODAY. *Edited by John W. R. Taylor.* Ian Allen Ltd. 9s. 6d.

This book might well be termed a potpourri of aviation containing, as it does, chapters ranging from royal flights to flying saucers. Editor John Taylor has gathered together 14 people, each an expert in his or her own field, to present a fascinating survey of aviation, together with many fine photographs of modern aircraft and their ancestors. A number of these photos, some never before published, will recall memories of planes long since forgotten amidst the multitude of types that has appeared since the war—aircraft such as the slip-wing "Hurricane," the Avro "Manchester" and the Hillson bi-mono aeroplane.

In fact, the serious student of aircraft, as well as the layman, will find much of interest in this book. John Taylor rightly points out in his foreword that he has deliberately avoided repetition of facts and figures that can be found elsewhere, but a most useful chapter is "Spotters Notebook." There are many people, enthusiasts included, who are often mystified by aircraft type designations, and this section clearly explains the number and symbol systems used by the aircraft manufacturers and air forces of both Gt. Britain and the U.S.A.

A chapter on model aircraft deals with their relation to their full-size counterparts, such as wind tunnel tests and so on, and also gives the layman a broad outline of the hobby.

This book is well worth 9s. 6d., and its contents are presented in a straight-forward way that makes it simple to grasp principles which hitherto have been rather hazy to many.

MODERN AIRLINES AND AIRLINERS. *By H. A. Taylor.* Temple Press. 9s. 6d.

This book is one of the "Boys' Power and Speed' Library" series, and like its companion volumes is written in such a lucid manner that even the most technical aspects of the subject become of absorbing interest to the young reader. H. A. Taylor learnt to fly in 1928, and since 1934 has been an aviation journalist specialising in air transport, thus the author is no "armchair" pilot.

Logically, the young reader is taken step by step through the process of making a journey by air—arrival at the airport, Customs clearance, etc. The realistic approach to the subject is further increased when the author takes his reader into the cockpit of an airliner, and explains the procedures used for take-off, the crew's duties in the air, and so on. In fact, adult readers would find much to interest them in this book, too, and there is hardly an aspect of civil aviation that Mr. Taylor does not explain or mention. His style is easy to read, and the numerous photographs and line drawings help considerably in forming a mental picture of civil flight operations.

RADIO CONTROL FOR MODEL SHIPS, BOATS AND AIRCRAFT. *By F. C. Judd.* Data Publication Ltd. 8s. 6d.

J. C. Judd is an amateur radio enthusiast (G 2BCX) and radio development engineer and consequently he has a wide knowledge of radio theory upon which to draw. He puts his knowledge to good use in this book which is clearly written and well illustrated. The chapters deal with the radio components, transmitters and receivers, servo mechanisms and controls, aerials and layouts for models, and cover the subject quite thoroughly. Definitely a good reference book for the radio control enthusiast.

GAMAGES BOOK OF MODEL TRAINS, BOATS, AIRCRAFT, ETC. Messrs. Gamages Ltd. 1s. 0d.

Each year this model catalogue seems to become bigger and better, and this new edition is no exception; the modeller will find much to interest him between the 130 pages. The model railway movement is well covered, and the model aircraft section, though smaller by comparison, shows that most items of interest to the aeromodeller can be obtained from Gamages.

Letters

R.O.G.—N.B.G.?

DEAR SIR,—The removal of the cross-section rule for F.A.I. models was a refreshing indication that we are ridding ourselves of the tedious and illogical requirement to make our models " realistic."

This, the purists should know, is the day of the flying bedstead, the delta and goodness knows what other weird craft, all far removed from the eminently flyable *Puss Moth* and Taylorcraft designs. I daresay that many more keen fliers of the international class model are as disinterested in full-size practice as I am. In any case, the word " model," except for scale aircraft, is a misnomer, but as we are no doubt stuck with it let the difference be clearly understood.

Our emancipation should now be completed by scrapping the R.O.G. requirement. V.T.O. gas models, and Wakefields with a bent pin providing two of the three required points of contact make the rule look silly. R.O.G. is an unneccessary hazard.

Furthermore, the interpretation of the rule by judges, as at Long Island this year, is a constant source of trouble ; it lost for England the 1954 team award. By what fraction of a second was the duration of O'Donnell's model increased by being pushed? Perhaps the duration was actually reduced.

Hand-launching might help to still the clamour from those who would make international flying " popular." It would permit the use of flying grounds lacking take-off areas and allow models to be flown from the highest upwind point.

May we get up-to-date by 1955?

Yours faithfully,

Anebee, Canada. BARRY V. HAISMAN.

JET MOD.

DEAR SIR,—Some time ago on your " Aviation Newspage," you made mention of the R. E. Leduc ramjet experimental aircraft, and also published a photograph of the then latest production. You also mentioned that the Leduc factory were proposing fitting an auxiliary motor for landing purposes. This is now out, in the form of a small jet motor set inside the main " stove pipe." The diameter of the small jet pipe is approximately 1½ to 2 ft. and protrudes that far out of the main exhaust orifice.

This may be of use to scale modellers who possess a Jetex motor and augmenter tube.

Yours faithfully,

R.A.F., Airienne, France. J/T BECKETT.

HELP WANTED

DEAR SIR,—We would be very pleased if any of your readers could recommend a suitable engine for use on control line models at a height of over 6,000 ft. Our difficulties are a limited flying space among the jungle and pinewood clearings—hence our choice of C/L models —and a location on the mountain tops of the Himalayan foothills.

We have experimented with many types of fuels and have now obtained a mixture which will start the E.D. Bee, Allbon, Javelin, Mills .75 and 1.33 engines.

If any reader has experience of an engine which will give full power at 6,000 ft. and over, we should like to hear from him.

MODEL AIRCRAFT arrives regularly, and we look forward to the most helpful articles which it always contains.

Yours faithfully,

Punjab, India. F. ALEXANDER.

COLOUR SCHEME CORRECTIONS

DEAR SIR,—Your new series on authentic colour schemes for scale enthusiasts is a good notion. With this sort of article it is most difficult deciding what to leave out and I think your contributor has made a pretty fair effort in this respect. I am glad to see he has not been dogmatic about the precise shade of green dope used on British aircraft, as have writers in the past. It is my opinion that squadron aircraft were a variety of shades, one explanation being possibly due to odd drops of dope, irrespective of shade, being poured into one can, etc., and then slapped on by squadron mechanics regardless.

As the word " authentic " appears in the sub-title, I would like to point out one or two corrections as follows :—

No operational Fokker D7 appeared bearing *Patee* crosses. Photographs of such will undoubtedly prove to be " stills " of incorrect Hollywood re-paints. The drawing of the D7 represents the camouflage lozenges approximately three times too large and of too regular shape.

No mention of Roland or Halberstadt single-seaters which were much more widely used during 1916/17 than the Fokker D6 quoted.

Richthofen (spelt with two h's) Staffel aircraft were scarlet; red is a bit vague. At the time they were equipped with Albatros D3 and D5's, the all scarlet scheme was started and some of the pilots were distinguished by the ailerons and empennage being painted a contrasting colour thus:—

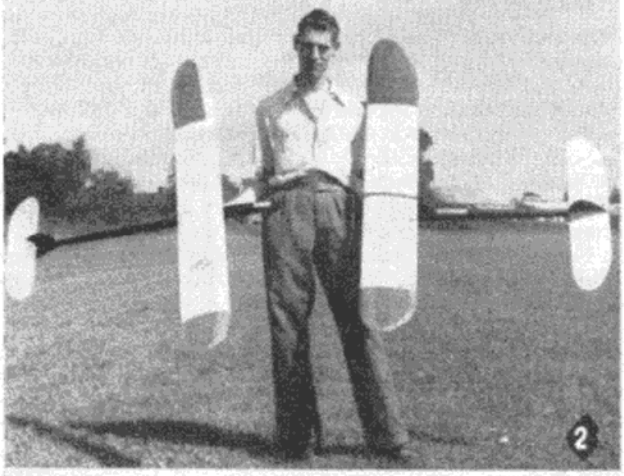
Schaefer—Black.
Allmenroder—White.
Wolf—Green.
Lothar Von Richthofen—Yellow. (Being complimentary to the " Yellow Dragoon " cavalry regt. with which he commenced the war.)

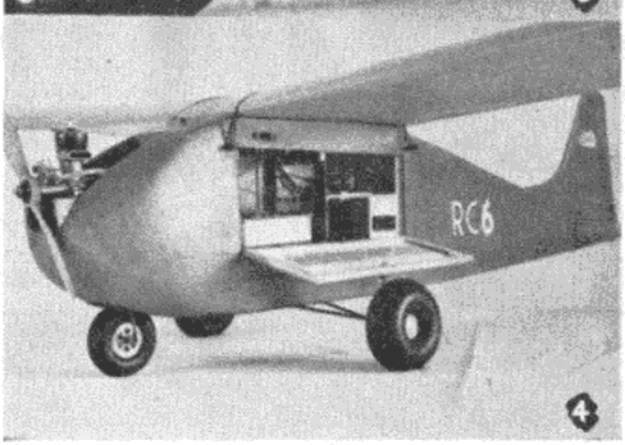
Many Pfalz D3 aircraft were finished with aluminium dope.

It is a pity that the drawings were not a little better and the proportions of the roundels more constant. However, I am sure the articles will bring knowledge to many who have up to now been ignorant of such details.

Yours faithfully,

Luton, Beds. P. L. GRAY.





PHOTONEWS

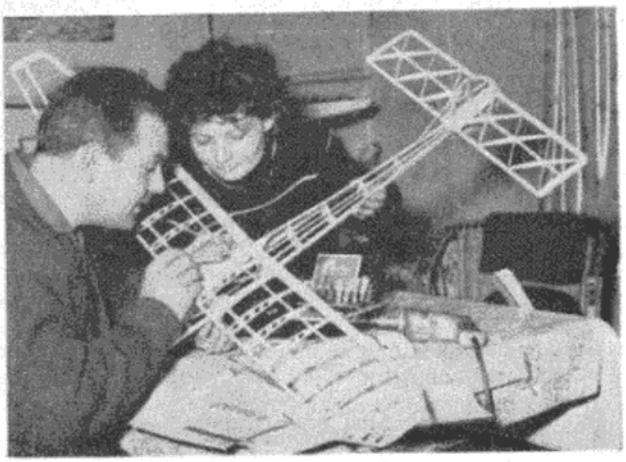
OUR first picture this month will recall nostalgic memories of sunny days and rising thermals. It shows Mr. Arnold's 38 in. span rubber model with a variable pitch prop, and this particular job holds the Bournemouth Model Aircraft Society's r.o.g. and H.L. rubber duration record.

Dave Posner, in photo **No. 2,** displays the two models which made him gala champion at this year's Northern Heights Gala.

The ferocious-looking aircraft in Photo **No. 3** is A. J. Howe's H.M. 300—Henri Mignet's development of his original *Flying Flea.* The model has a wing span of 26 in. and is powered by a Mills .75 c.c. diesel. The builder tells us that it has a fine all-round performance and that its flight characteristics are similar to Ray Malmstrom's *Martian* (February issue).

Photo **No. 4** is a reminder that our old friend S/Ldr. Eric Cable, although now in Malta, is still pursuing his activities with R/C jobs. He designed this model, sporting tricycle undercart, for operation with the E.D. 3-reed receiver. However, Eric says that as his home-made transmitter was not giving sufficiently reliable results, he reverted to single channel (E.D. Mk. II) operation. He is now in the process of installing a Bonner compound escapement and a motor control unit, which is made from a modified E.D. clockwork actuator.

We think photo **No. 5** is unusual in that it shows a husband *and wife* at work on a model. In fact, it's Monsieur and Madame Bardou, of Val D'Isere,



working on *Stooge II* (M.A. Plan No. 156). We're sure you'll agree that this is an excellent way of passing the long winter evenings in the French Alps. Comes the spring and they have breathtaking mountain scenery as a background for their flying, coupled with the thermals one would expect to find in such a region.

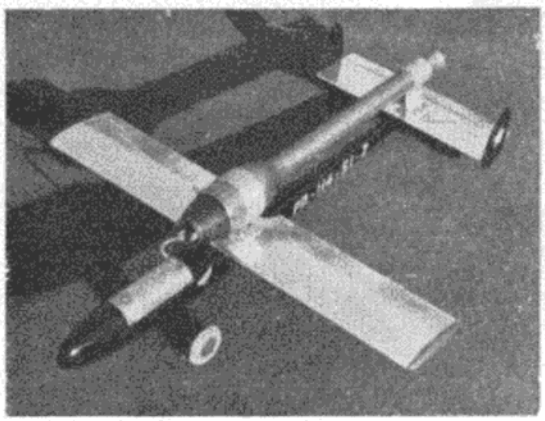
That the modelling movement is strong in Yugoslavia was proved recently when we received a batch of photos from one of our readers in that country. One of the more interesting models is shown in **No. 6**—a Dynajet-powered C/L job, designed by D. Prohaska, who is now developing a home-made jet.

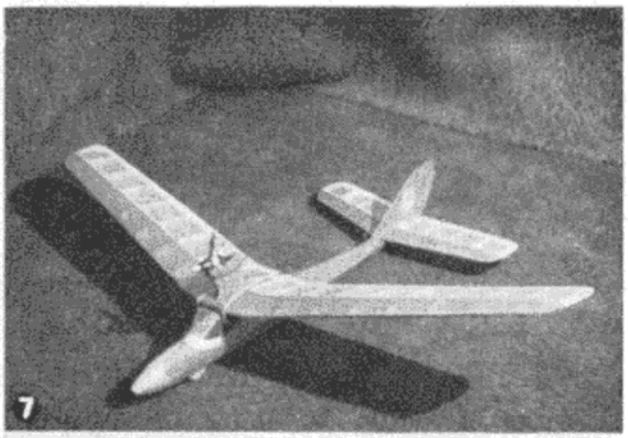
Depicted in photo **No. 7** is Les Clarke's pride and joy—the *Tarquin*—built from a Frog kit and powered by a Kalper .32 c.c. unit using the 3-blade plastic prop supplied with the kit. This model was built for "sport" flying, which, its owner tells us, it does admirably. In fact, Les hasn't yet stopped raving about the 11 min. thermal-assisted flight on a 28 sec. engine run it made at Sherburn in 1953 !

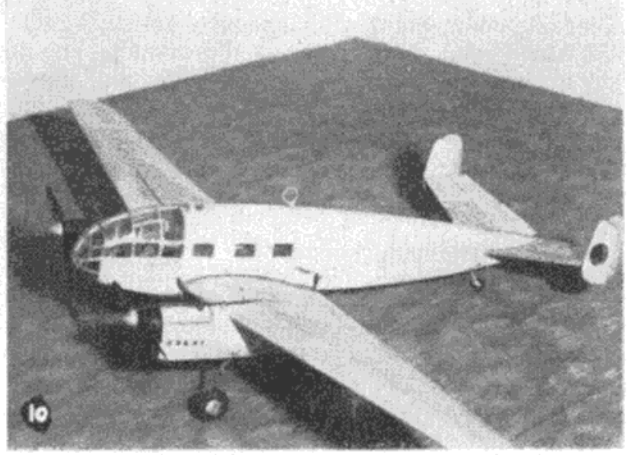
Photo **No. 8** comes from across the Atlantic and features American reader Walt Mooney with his Rearwin *Speedster*, powered by a McCoy .049 diesel. This is only one of the many fine models built by Walt, and the professional finish evident in this example can be accounted for by the fact that he is an aeronautical design engineer with Consolidated in San Diego.

An attractive Mercury *Monocoupe* is seen in photo **No. 9,** and was built by P. W. Green, who also designed the *Bee* 25, published in last month's MODEL AIRCRAFT. This particular model is powered by an Elfin 1.49 c.c. engine, and has detachable wings, tailplane, undercarriage, cowl and wheel spats. To preserve the model's clean lines, the wing is secured internally by rubber bands.

Pete Russell's fine 1 in. to 1 ft. flying scale C/L Siebel *S204D* is the subject of our last photograph. The model has a span of 71 in., and a special feature is the retracting undercarriage operated by the pilot. Total weight is 3 lb., and the Siebel gets its urge from two E.D. 3.46 c.c. engines, giving a top speed of approximately 65 m.p.h. on 75 ft. lines. Pete thinks it might do a loop, but hasn't had the nerve to try it yet !







L.S.A.R.A. Conference Report

THE bold step taken by the Low Speed Aerodynamics Research Association of staging the first Model Aeronautical Conference held in this country proved a complete success and has paved the way for further meetings of a similar nature.

The conference, held in the Royal Aeronautical Society's library on Saturday, September 25th, followed usual scientific conference procedure, consisting of a number of papers read by members of the association, each followed by a period of discussion.

The conference was opened by Mr. N. K. Walker, B.Sc., the association's director of research, who described the work and organisation of the association and outlined the present research position.

This was followed by a paper delivered by Mr. W. A. Crago, of Saunders-Roe, on the subject of the "Dynamic Scale Free Flight Model," in which he covered the early work carried out in England and the U.S.A. by this method and outlined recent experiments carried out by his company, particularly in connection with flying boats.

In addition to covering the practical aspect of testing by the medium of free flight models, Mr. Crago gave examples of the methods used with films and demonstrated some of the special equipment employed.

The general conclusion was that much invaluable work can be carried out with dynamic free flight models provided always that the principles of dynamic similarity are maintained. The films showing model flying boats undergoing planning and landing tests were quite impressive. The flying boats were free flight models in the complete sense, in that no attempt had been made to control them once they had been launched. The following paper covering the work done by the L.S.A.R.A. on radio control therefore served to entice the art of testing by dynamics free flight models one step further, by permitting the definite control of their manoeuvres during flight.

Mr. D. W. Allen outlined the development and principles of the L.S.A.R.A. multi-channel proportional control radio link system, which is now in production for use in guiding aerial targets for gunnery practice.

The advantages of proportional control were clearly demonstrated, and some of the difficulties encountered in its development were evident in the films shown, which were taken during the development period. There is little doubt that this method of controlling dynamic free flight tests will find increasing popularity, particularly for research on stability problems.

Scale effects, naturally, assume a major importance in all model tests and they can cause considerable difficulties in dynamic tests, particularly when they bring the model into the critical V/L region.

The paper unexpectedly received from Schmidt of Germany on this subject, and read to the meeting at this stage, proved exceptionally interesting, although the author's conclusions were not altogether free from controversy, as demonstrated by the equally interesting paper read by R. W. W. Annenberg on the same subject, and which presented a different viewpoint.

Opening the afternoon session, Mr. Annenberg's paper on "Aerofoil characteristics at low Reynolds' Numbers" supplemented the morning papers and provoked serious thought. This was followed with a series of practical results obtained by the Model Aerodynamics Research Project operating at the Battersea Polytechnic, outlined by Mr. R. F. A. Keating, some of which show considerable promise.

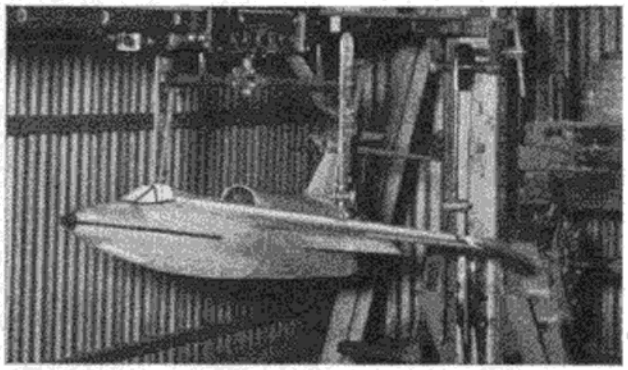
With high performance taking an increasingly important place in both model and full scale aircraft, the paper read by Mr. T. W. Smith on the development of the L.S.A.R.A. vertical climb models was of special interest, particularly as the latest model of the series has proved its worth in competitions recently.

A survey of the development by the L.S.A.R.A. of ducting for rocket power units with a view to augmenting their thrust was given by Mr. P. R. Payne in substitution for Mr. A. A. Judge, who was prevented from attending. Much useful information was imparted, capable of use by those interested in this method of propulsion.

The meeting concluded by some notes on the testing of model engines by Mr. N. K. Walker—in substitution for Mr. P. G. F. Chinn, who also was unable to be present—in which some essential points for attention were discussed.

The attendance at the meeting was approximately 60, and this number remained undiminished almost to the end—a sure sign of the interest of the proceedings. This was confirmed by the unanimous vote that the conference should be established as an annual event in the future.

It was particularly pleasing to note the representative nature of the attendance, which included members of the aircraft and allied industries. Representatives of the Ministry of Supply and research students of Queen Mary's College were also present.



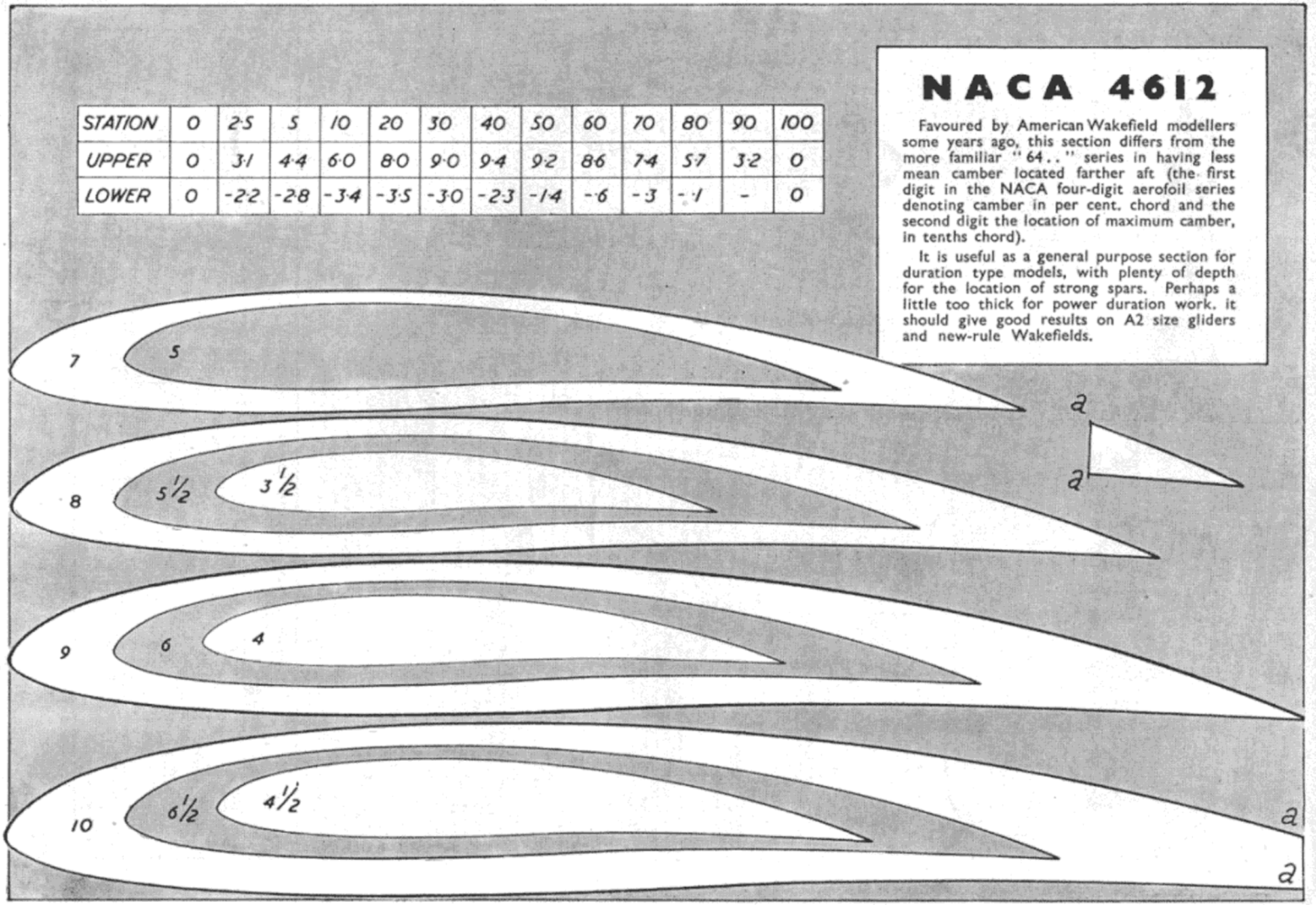
A Saunders-Roe flying boat model suspended from the launching ramp prior to tank testing.

NACA 4612

STATION	0	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	0	3·1	4·4	6·0	8·0	9·0	9·4	9·2	8·6	7·4	5·7	3·2	0
LOWER	0	-2·2	-2·8	-3·4	-3·5	-3·0	-2·3	-1·4	-·6	-·3	-·1	-	0

Favoured by American Wakefield modellers some years ago, this section differs from the more familiar "64.." series in having less mean camber located farther aft (the first digit in the NACA four-digit aerofoil series denoting camber in per cent. chord and the second digit the location of maximum camber, in tenths chord).

It is useful as a general purpose section for duration type models, with plenty of depth for the location of strong spars. Perhaps a little too thick for power duration work, it should give good results on A2 size gliders and new-rule Wakefields.



Club News

AND NEWS FROM THE S.M.A.E.

SOUTHAMPTON M.A.C.

A small contingent of club members attended the area A/2 and Power Eliminators at Larkhill. Ron Cooper unfortunately lost his glider o.o.s., while N. Worley completed our tale of woe by pranging his o.d. power job on take-off for his second flight. This keen junior had no better luck at Radlett, where he scored a direct hit on a too-enthusiastic cameraman immediately after releasing his Jetex job in the I.C.I. trophy. Effects were far more disastrous on the model than on the photographer.

BRADFORD M.A.C.

In the Gutteridge, we placed 1st, 3rd and 5th. C. P. Miller took top area honours with 13 : 48—four perfect maxs. making up the bulk of his total—whilst son Adrian scored 12 : 39. Dennis Lees was fifth with 12 : 12. Later, in the A/2 competition, J. Oxley and S. Eckersley amassed respectable scores, but Bradford regards itself principally as a power club, and in the Halfax we really went to town, taking six out of the first nine places in the area. Maestro Lanfranchi, despite engine overruns which deprived him of one flight, was first with 11 : 50, flying *Swiss Miss*. S. Eckersley came second, scoring 10 : 55 with his own-design job—almost literally an A/2 with a Torp. 15 !—and third (10 : 13) was another *Swiss Miss*, flown by Ron Calvert.

CROYDON & DISTRICT M.A.C.

A month of hectic activity has seen many hopes dashed to the ground ! The All-Britain Rally at Radlett found Martin Dilly's new Clipper Cargo model untested, a ground loop wrecking his chances of lifting a prize—or even some ballast. N. Marcus suffered timer trouble with his cargo model, whilst the Cameron-Butcher team racer was sick, even losing its heat. Only win was registered by J. Palmer, who won the rubber fly-off—a real joint effort this, as seven helpers and chasers were involved.

Norman Marcus placed first in the area with 10 : 44 flying an ancient A/2 in the "M.E." Cup, leading D. Gatland, Jack North and Dick Standing to a 31 : 44 aggregate. In the Gutteridge the club was well to the front of London entries, J. Palmer collecting 12 : 35 and Ed Bennett, Dusty Miller and J. Blount all within a minute of that time.

Varying fortunes, mainly in the shape of downdraughts, met entrants in the K.M.A.A. Jack North turned in his usual first-class time with his much maligned A/2 to collect 11 : 08. This machine is now many seasons old, but never fails to confound the cynics. J. Palmer and Des Yeabsley followed close behind with 10 : 25 and 10 : 11.

HEANOR & DISTRICT M.A.C.

Our indoor activities started off with a lady visitor making a paper aeroplane, schoolboy type. A few of the lads followed suit just for fun, till our comp. sec., Ron Evans, suggested a contest.

He allowed six minutes to make fresh "models," then a further two minutes' test flying before he shouted "clear the floor" in his best parade-ground style.

The winners were K. Plumb, 10.2 sec., A. Lisson 9.8 sec., and M. Ward 9.6 sec., which shows that the lads have not forgotten their schoolboy tricks with a bit of paper.

The previous Thursday evening saw the introduction of r.t.p. in our club, and some good flights were put up by our secretary's Jetex "50" semi-scale job which is complete with pilot, dashboard and canopy, and finished in well polished maroon cellulose. On its last flight this little job pulled the pole over with the speed of uncountable laps, and the pole has a heavy steel base one and a half inches thick !

ANGUS & DISTRICT AEROMODELLING LEAGUE

Montrose M.A.C. had a meeting to vet the proposed S.M.A.E. handbook. Most items were accepted without comment, although we hold out for r.o.g.—every class except sailplanes, but one character even wanted to r.o.g. ! The five three min. max. versus three four min. max. flights controversy inevitably started a scuffle after which the vote showed a majority of only one in favour of the former.

We hope to make a belated start on F.A.I. power designs this winter to complete the A/2—Wakefield—F.A.I., Power, triangle in our model stable.

The weather prevented us from competing in either the "Gutteridge" or the "Halfax" events. Despite this, Falconer and Petrie have developed and flown a 1.49 c.c. powered *Marquls* complete with the inevitable large wing end-plates.

HORNCHURCH M.A.C.

Use of a full circuit stretch of tarmac has had a reviving effect on control-line speed interest. Members who hitherto have led quiet, respectable lives, are now laying waste to the tarmac area with a fearsome array of streamlined projectiles.

In a quieter mood, the latest in the club series of "all-in" free-flight comps. coincided for once with ideal weather conditions. Dead calm air seems to favour rubber rather than glider, two ultra lightweights taking first two places. Top man was D. Thompson with a two flight aggregate of 5 min. 51 sec., followed by club sec. Len Ranson's total of 5 min. 18 sec.

MEANWOOD INDEPENDENTS

The cup for "Top Scorer of the Year" wound up as a tie between Dave Perkins and Keith Jacques ! It was, however, decided to award it to Dave for having the better average score—2.2 points per contest, from a maximum available of 3 points per contest. Keith managed only 1.5 points, and did in fact only just beat our F/F fiend Richard Place, who "made with the handle" to the tune of 1.41 points ! Even as late as the last contest, three of the boys were still fighting for "Top Scorer," odd man being Donald Haworth, who is averaging 1.1 points.

Top branch was Leeds, with a one point lead over Derby branch. Just imagine now what our inter-club finals are like !

Top model (good old Jacques) was, of course, the *Ker*, claiming 10 of our 11 out-right victories. The eleventh was a B.B. *Kombat Kapers* of Brian Adamson's who, incidently, is Derby branch's top average scorer.

Top engine—no rash guesswork here—yes, the B.B., also with 10 outright wins from a possible 11. Odd one out in this case being a "one-off" McCoy 0.29 R.H. powered *Ker*, built and serviced by Keith; flown (and pranged !) by Dave. There's a combination for you !

WHITEFIELD M.A.C. N.W. AREA

Success again went to J. O'Donnell when he attended the Croydon Gala. John made no less than 13 flights in the contest to make him Gala Champion, with an aggregate of 30 : 23 sec.

When the club attended the *Yorkshire Evening News* Rally, the only success went to H. O'Donnell, who placed 5th in the Rubber event and 2nd in the Chuck Glider. After having had his comp. flights in the latter event, Hugh discovered that some inconsiderate type had stolen his model.

JETEX INTERNATIONAL CONTEST RESULTS

Name	Pellet	Motor	Total Sec. 2 Flights	Aggregate Ratio of 2 Best Flights	
1. J. O'Donnell	1	350	315	14.31	£20 and Trophy
2. N. Torle (Sweden)	1	Jetmaster	265.6	10.21	£15
3. I. V. Dowsett	1	100	275.2	9.17	£10
4. W. Houghton		Scorpion/Jet-master	178	8.47	£5
5. P. R. Buskell	1	200	232.3	8.29	
6. I. Lind (Sweden)		Jetmaster	193	7.42	£5 Under 16 years
7. F/O P. J. Cannell	1	Scorpion	111	6.93	
8. K. Groves (Canada)	1	Scorpion	106.6	6.66	
9. S. Isacson (Sweden)	1	Jetmaster	163.9	6.30	
10. L. Ohlsson (Sweden)	1	Jetmaster	160	6.15	
11. G. Torle (Sweden)	1	Jetmaster	159.2	6.12	
12. L. Ranson	1	200	171	6.10	

AEROBODS OF NOTE

ROY CHESTERTON

Faithful to Wakefields, Roy has had many successes with this type. Flying Ted Evans' famous Jaguar design, he won the Wakefield Trophy for Britain in 1948

J. O'D. again came out top, this time at the Wakefield Elims. held at R.A.F. Tern Hill. He was closely followed by John Trainer, who placed 3rd. Both members flew two models because they each lost one. J. Trainer got his model back the same day, but unfortunately it was damaged. H. O.'D. didn't get his models back from the U.S.A. in time for the Elims., so he flew a ballasted light-weight job and on the 3rd attempt wrote it off completely. He had no spare model. Also on the same day, J. O.'D. placed 1st in the "M.E." Cup (Team Glider) and John Parrott 4th.

WEST HANTS A.A.

August proved an exhilarating month for the club, commencing with the S.R.D.E. Team Race Rally held at Christchurch, when we won the trophy for the second year running. Five clubs from the Southern Area competed in the event, which rapidly developed into a ding-dong battle between Amesbury and ourselves for the honours of the day. At the commencement of the last race, both clubs had acquired a total of 20 points and both had won a place in the Class "A" Finals, which was the final event of the day. A. Jones of West Hants, however, came home with a comfortable lead, winning for himself a cash prize of £1 and the trophy for the club for one more year.

This triumph was followed by a win against Bournemouth M.A.S. in the three round inter-club contest.

Sid Taylor is also to be congratulated for gaining 3rd place in the Kiel Trophy power event. His model was lost after the third flight after a fly away of eight minutes plus. Fortunately, it was found and returned without damage, but only to be lost again at the All-Britain Rally at Radlett after the first flight.

Plans for the winter months include an extensive programme of indoor flying. R.T.P. for rubber and jetex models, microfilm, and chuck glider events also being arranged.

SOUTH MIDLAND AREA

The Wakefield Eliminator was held at R.A.F. Henlew in windy conditions and a late start was made due to "Battle of Britain" Sunday services. Only two maxima were scored—by Wood (Luton), and Cooke (Henley), but Clements (Luton) eventually gained top place with a total time of 8 : 58, Cooke (Henley) was second with 8 : 48, Wood (Luton) 8 : 38 and Lamble (West Herts) 8 : 12 was fourth. In the "M.E." Cup team-glider event, West Herts were too good for Henley, recording 23 : 36 against 21 : 08, with Luton third, scoring 16 : 14.

The Power and A/2 Eliminators were also held at Henlew, the conditions again being rather dull and windy. In the Power event, first round, three maxima were scored, by Lamble (West Herts) and Painter and Cooke both of Henley. Painter then pranged his model but scored maxima with his reserve model in the second, third and fifth rounds, his fourth round score being 1 : 53. Cooke lost his Oliver 2.5 c.c. powered model on his third flight attempt, when he forgot to trip the timer!—but flew his 1.5 c.c. Tiger-cub reserve model for the rest of the contest. Top times were: D. Painter (Henley) 13 : 53, J. Lamble (West Herts) 11 : 39; A. W. M. Cooke (Henley) 9 : 19; J. Waldron (Henley) 7 : 31.

In the A/2 event, Ward (Beavers) and Larcey (Henley) had a close duel, Larcey eventually beating Ward by a mere 2 sec, both being 2 minutes ahead of the rest of the field. Top scores were: P. Larcey (Henley) 10 : 44; C. Ward (Beavers) 10 : 42; R. E. Cooke (Henley) 8 : 33; J. Waldron (Henley) 8 : 22; A. W. M. Cooke (Henley) 8 : 09. There were 26 entries in this event, compared with only seven power and nine Wakefield entries.

CHEADLE & DISTRICT M.A.S.

Rubber has predominated the last few weeks in this club, Andy Anderton having taken most of the places. His Mk. 4 and 5 Olympus new rulers have conducted themselves very well, taking a Northwest rubber champs second (to John O'Donnell) with 14 : 22, after a 3.0 p.m. start, following a "Battle of Britain" church parade, and a 21-mile flat-out cycle ride.

NORTH-WESTERN AREA

At a recent area committee meeting, the following new rules were decided upon for indoor rubber team racing in Manchester for the 1954-55 season. In view of the increasing interest in this activity a league is being formed with home and away fixtures. Mr. D. Cooke, 63, Stancliffe Road, Wythenshawe will answer any enquiries.

(1) Model to be rubber driven, of semi-scale in appearance with celluloid cockpit, or cabin, and to have two 1 in. diameter fixed wheeled U/C.
(2) Maximum length overall 20 in.
(3) Minimum span 12 in.
(4) Maximum all up weight 2 oz.
(5) Length of line to be 6 ft. 0 in. from centre of pole to inside of wing tip.
(6) Height of pivot of line to be 3 ft. 0 in. above ground.
(7) Model must r.o.g. after each winding.
(8) Three flights allowed in each contest, all attempts count as a flight, the lowest one counts.
(9) The model must complete 40 airborne laps; bounce laps do not count.
(10) The first winding up can be completed at leisure, timing commences when model is released; subsequent winding up is taken in time.

A team comprises three men from a club or group.

The total aggregate of the team (minimum scores) count for the result.

HIGH WYCOMBE M.A.C.

Often not even reaching the final at Enfield, the Class "A" Team Race boys really had a go at the Cambridge Rally. Everything went right and all five entries were unbeaten. With rain washing out the final, a toss up decided Smith the winner with Edmonds second and Lee third.

Opposition at the Y.E.N. Rally was poor. The Class "B" winner was doing 30 laps at 82! In Class "A," our two slowest models reached the final and Edmonds was leading comfortably when one of the opposing pilots tried to pass underneath. Edmonds placed third and Andrews finished second.

At Radlett we had a little bad luck. One entry pranged and the other lost its heat by one lap, but the other four jobs won their heats. Edmonds did his heat in 4 : 13 with one stop at 85 and the other three were clocking well over 80 m.p.h. One time all four reached the final, but by then speeds had dropped to 80 and Smith won a close race in 9 : 24, with Lee second and Andrews third. Perhaps that long thin wing paid off after all!

MILL HILL AND DISTRICT M.A.C.

During the last few weeks, there hasn't been a dull moment for the club. Best of all, our recent activities enlarged our status in the public eye.

The Saturday following the "M.E." Exhibition (where Bob Thoroughgood won a Bronze Medal) was devoted to a static display at the Mill Hill Community Association Horticultural Show, which was well attended and gave us some good publicity.

During September, there was a "Battle of Britain" at home put on by R.A.F. Hendon. The club was approached in good time prior to this event by F/O Bentley, and thanks are due to Mr. Gordon (S.M.A.E.) for putting him in touch with us. The resulting exhibition was probably our best to date.

Although the flying part of our display was something of a fiasco, due to the enormous crowd, several models did get airborne, notable among which was Chas. Crawley's televised D.H. *Mosquito*. It provided competition to the H.P. *Victor's* low fly-past by doing an emergency landing on one wheel and one motor, best part of one wing disentegrating in the process.

EAST ANGLIAN AREA

Members of eastern area clubs were able to have their say at the area annual general meeting held in November.

Venue was the Brentwood Model Engineering Society's Hut, and business was under way sharply at 2.0 p.m.

So that ruffled tempers could be cooled down a little before the special film show after the meeting, tea was provided!

Main film attractions were three coloured epics of recent Wakefield contests, with a special commentary by C. S. Rushbrooke.

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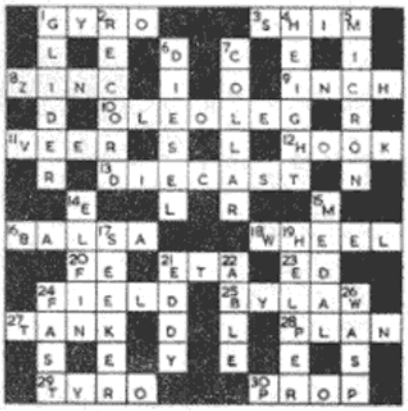
Thornaby Pathfinders.—Hon. Secretary: T. M. UNSWORTH, Clarendon Hotel, Dorecot Street, Stockton-on-Tees, Co. Durham.

NEW SECRETARY

Sidcup Aeronautical Society. A. A. Houlding, 87, Longlands Road, Sidcup Kent.

Crossword Solution



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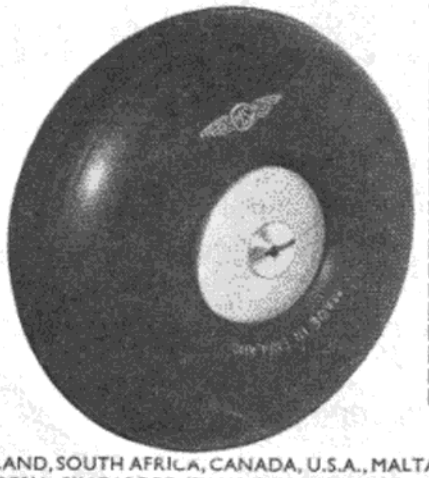

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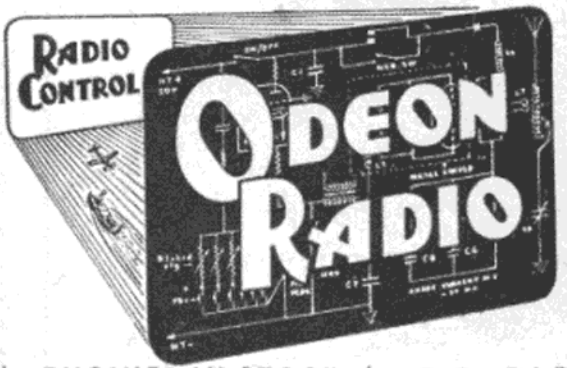

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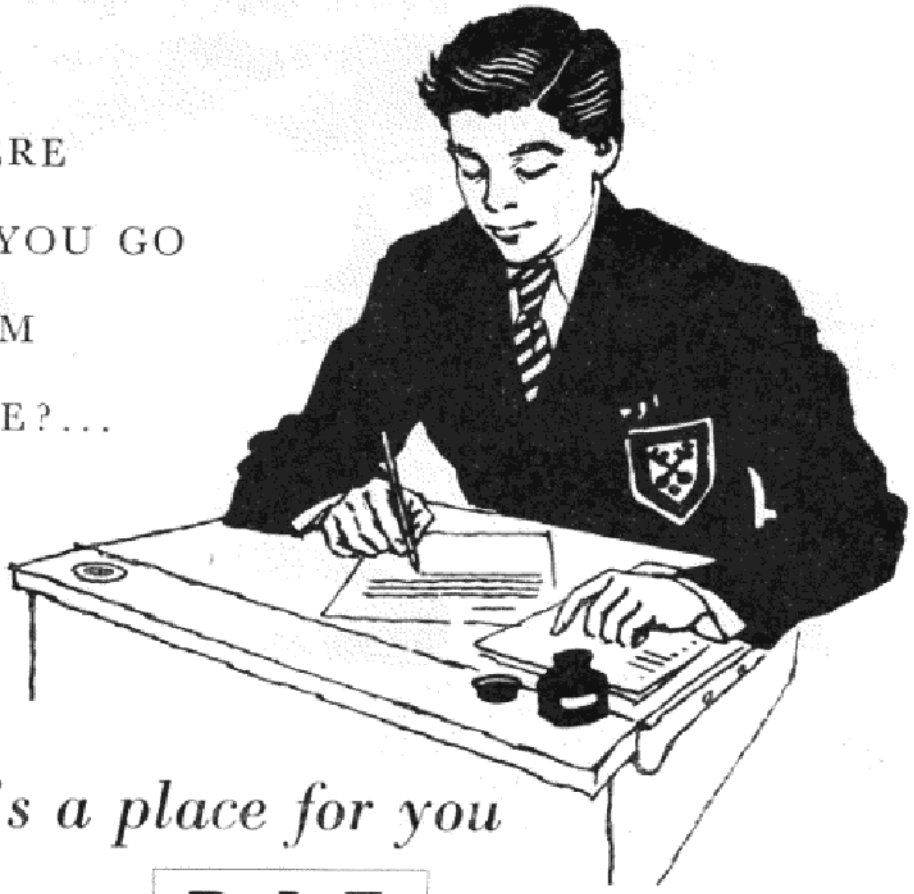

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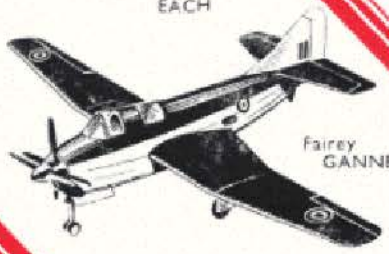

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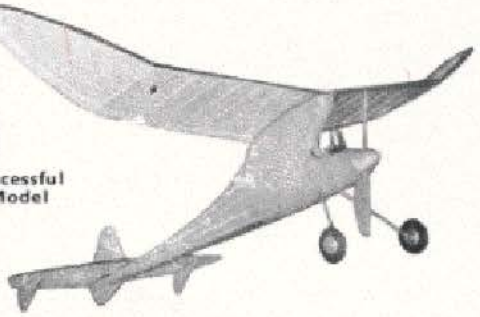

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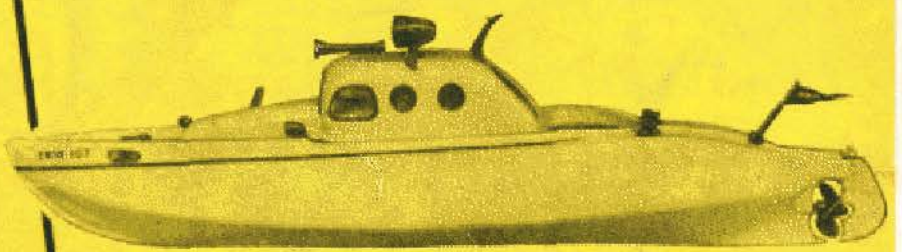

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