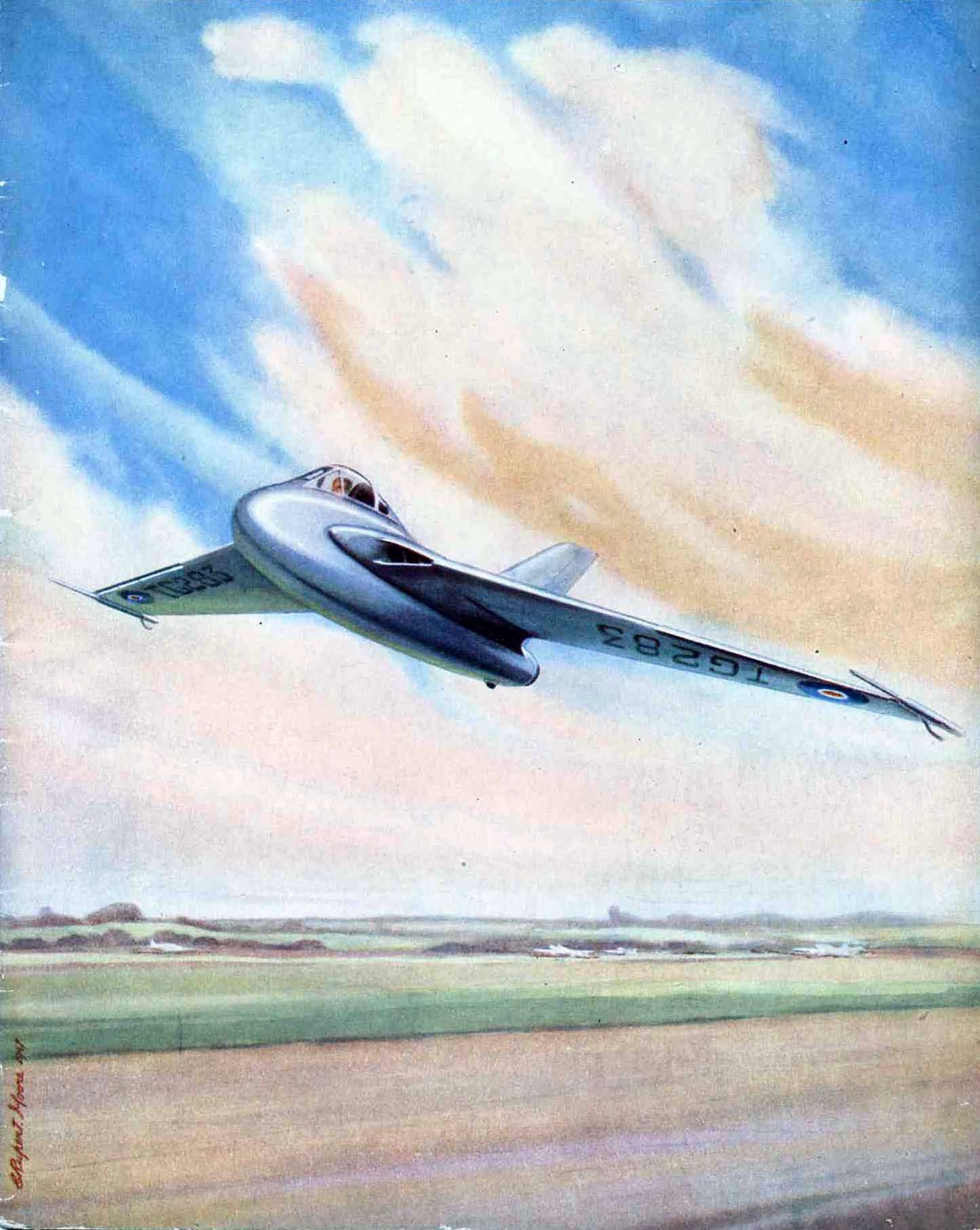
MAY 1947

AEROMODELLER 1/3



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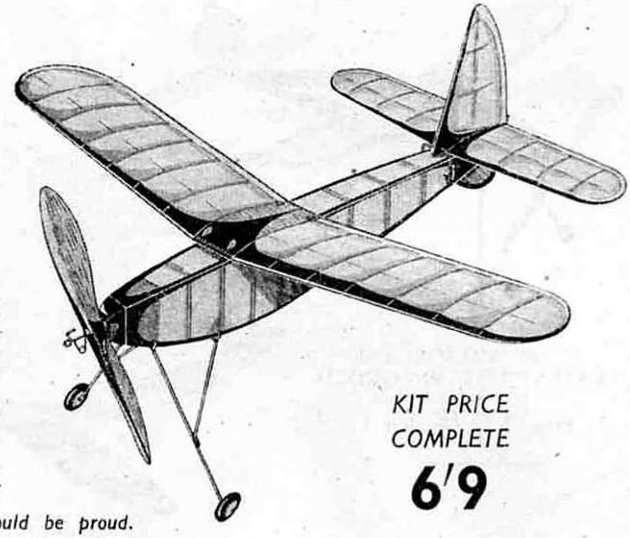

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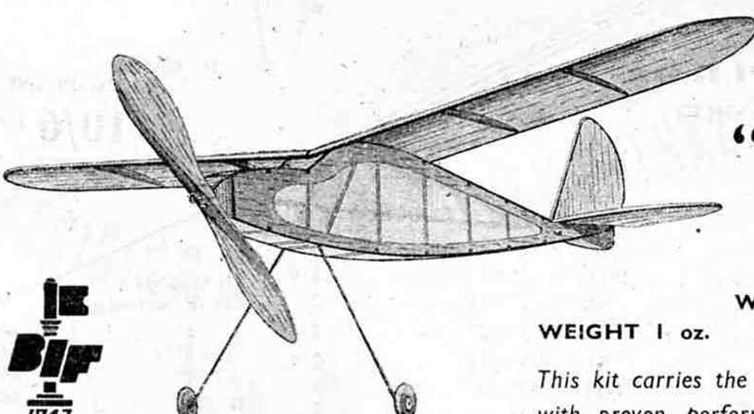

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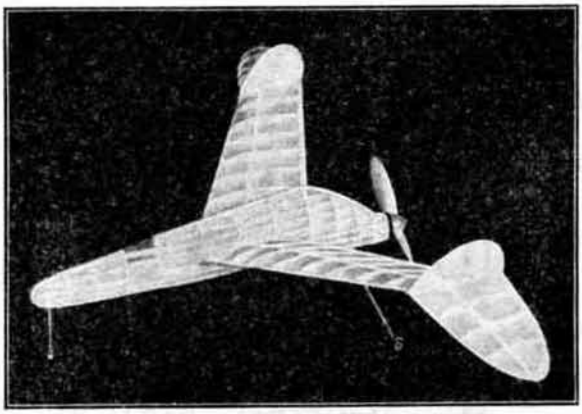

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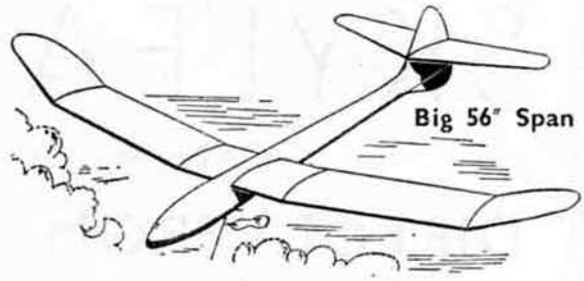

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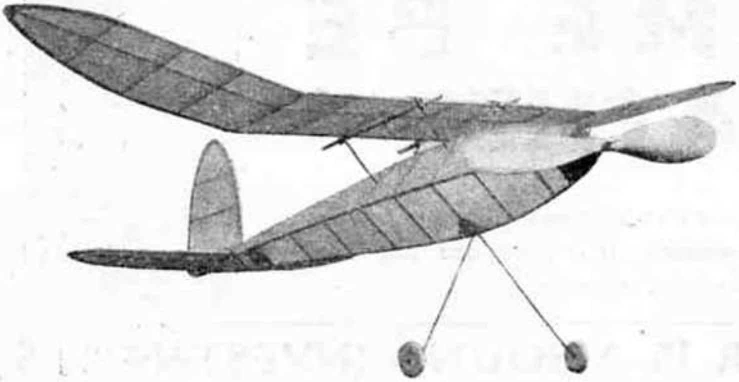

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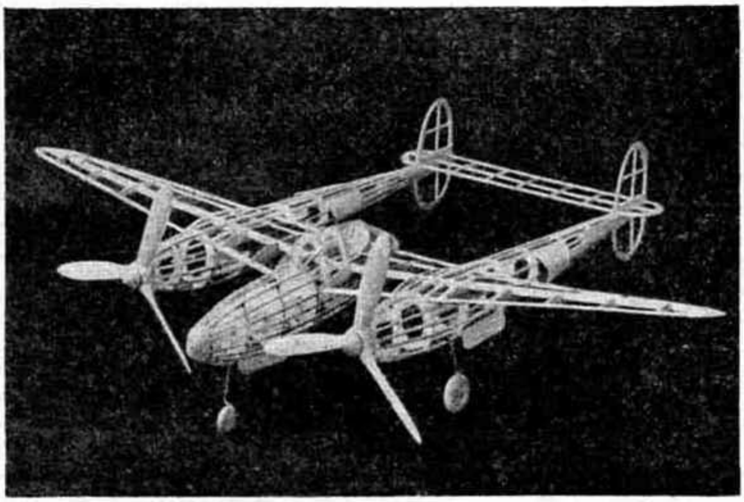

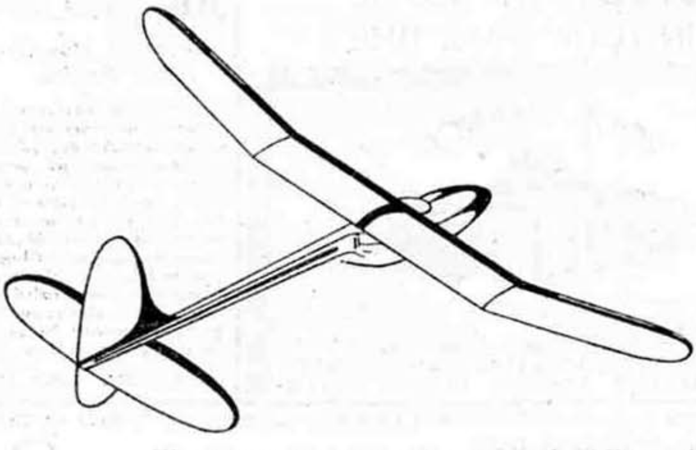

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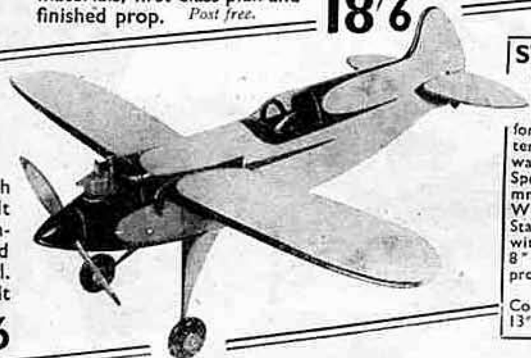

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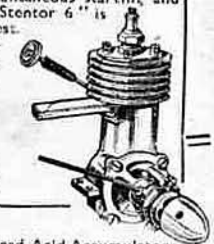

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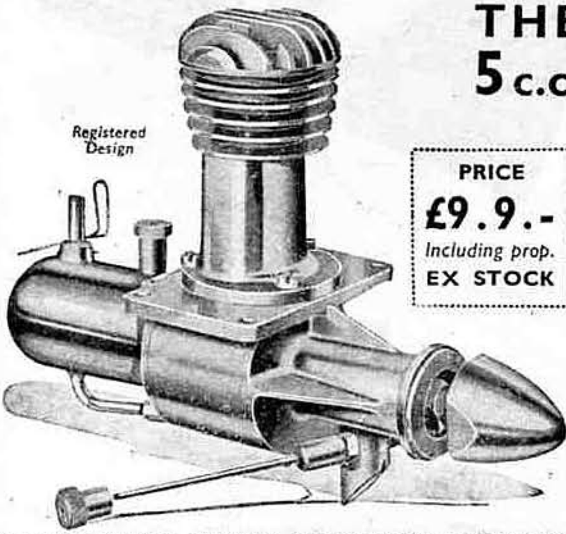

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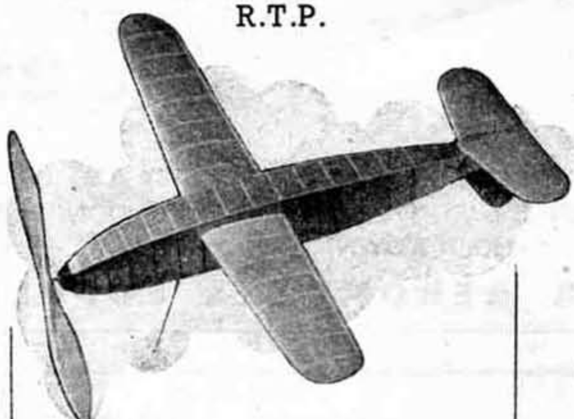

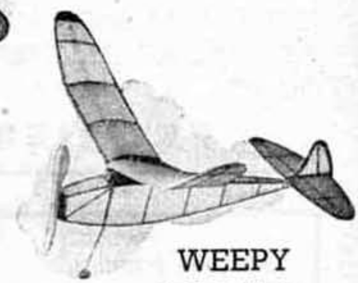

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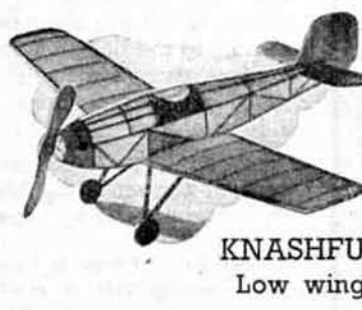
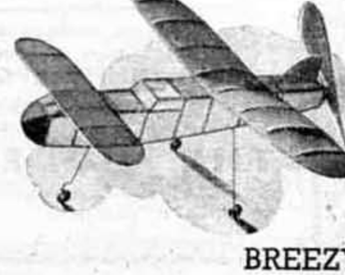


KNASHFUL
Low wing

WUMPEY
Polyhedral



BREEZY
Canard

The **AEROMODELLER**
INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

ESTABLISHED 1935

VOL. XII No. 137 MAY, 1947

The Model Aeronautical Journal of the British Empire

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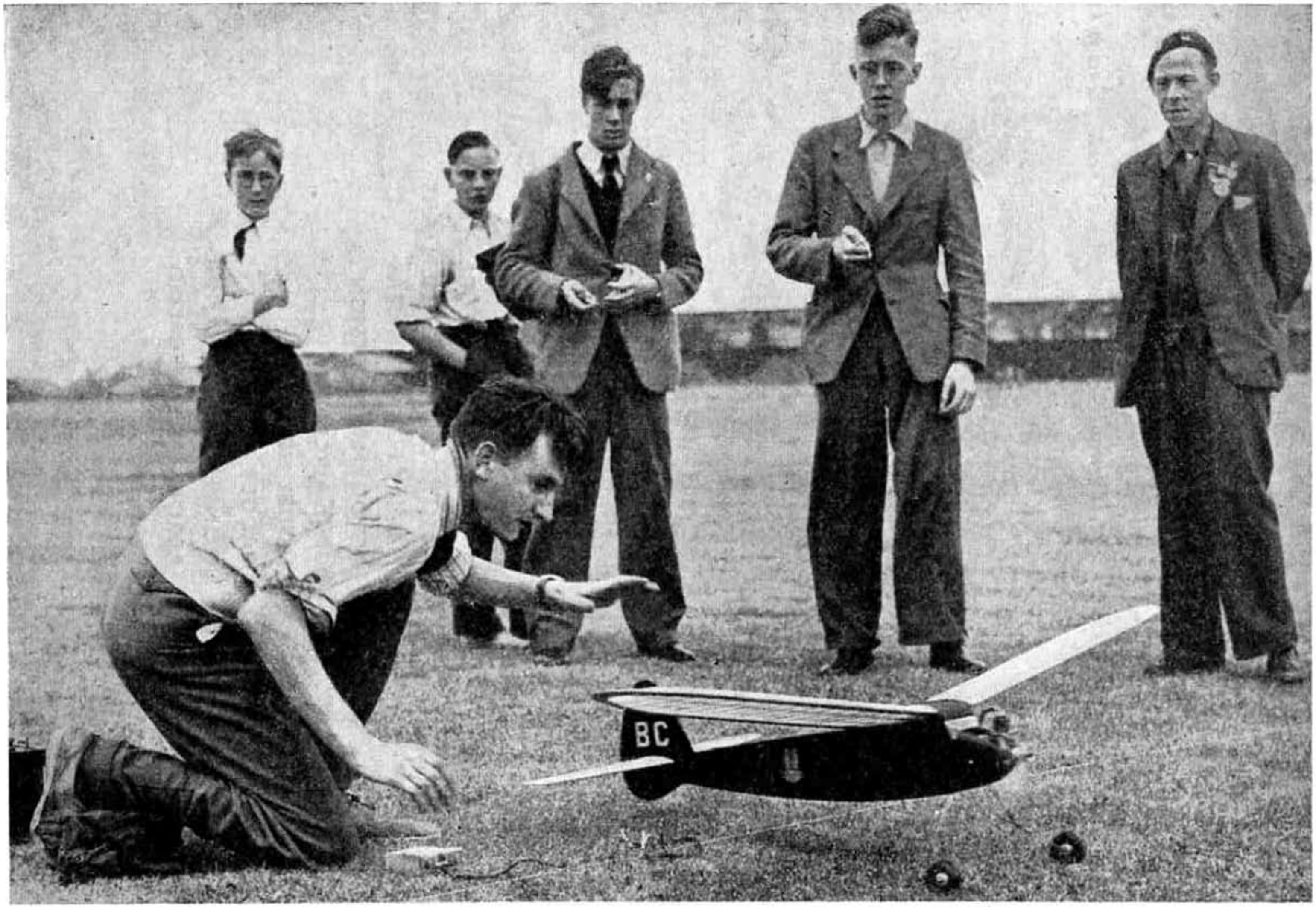


UP SHE GOES. Readers will hardly need the telltale initials BC on the fin to recognize this happy shot of Bob Copland seeing his model over the line to take off in the power event at Northern Heights successful Langley Rally last summer.

EDITORIAL

WEATHER PERMITTING

EVER since the present owners took over the AEROMODELLER long before the last Great War, the monthly Editorial has been the responsibility of the Managing Director, Mr. D. A. Russell. Now, for the first time in current history, indisposition has brought about the temporary absence of Mr. Russell, and it therefore falls to your Editor to take up the reins until his return to health.

From a thousand and one matters that could well be discussed, probably the main item that affects us all is the weather. The past winter surely " took the cake ", and from an aeromodelling view-point was perhaps the worst ever. From club reports coming in from all over the country I learn that general club meetings had to be abandoned in many cases owing to snow, floods and general damage to property, whilst flying was entirely out of the question. However, as I write this, a welcome break in the long list of weary days has arrived, and Spring is indeed with us.

Apart from all our weather worries, the Fuel Cut is now having far reaching effects, and on this point I would ask the indulgence of our many Plans Service customers who are probably wondering what has happened to the " Service " part of the business. Unfortunately all sections connected with our business were well in the " dead " area, and all supplies were in due course affected. This applies particularly to the special sensitised paper on which our prints are produced, and we are now some thousands of prints short of meeting our requirements.

Whilst doing our utmost to give " return of post " service, in many cases this has proved impossible under present circumstances, and we apologise to those of our readers who have had to wait fulfilment of their orders. " *Owing to circumstances beyond our control* " has become a well worn cliché during the past few years, but never was it more applicable to current conditions.

And finally a word about the forthcoming British Nationals, scheduled by the S.M.A.E. for the Whitsun Holidays. Apparently a great deal of difficulty has been experienced in obtaining a suitable venue for this important fixture, and in answer to a request from the AEROMODELLER for complete details for the information of our readers we are told (only five weeks before the meeting date) that no details can be supplied.

We rest assured that we have done our best to satisfy the many hundreds of readers who have approached us for further information regarding this important National occasion, and must regretfully pass the buck back to the S.M.A.E. with the sincere hope that they are successful in their search, and that the meeting, wherever held, is an unqualified success.

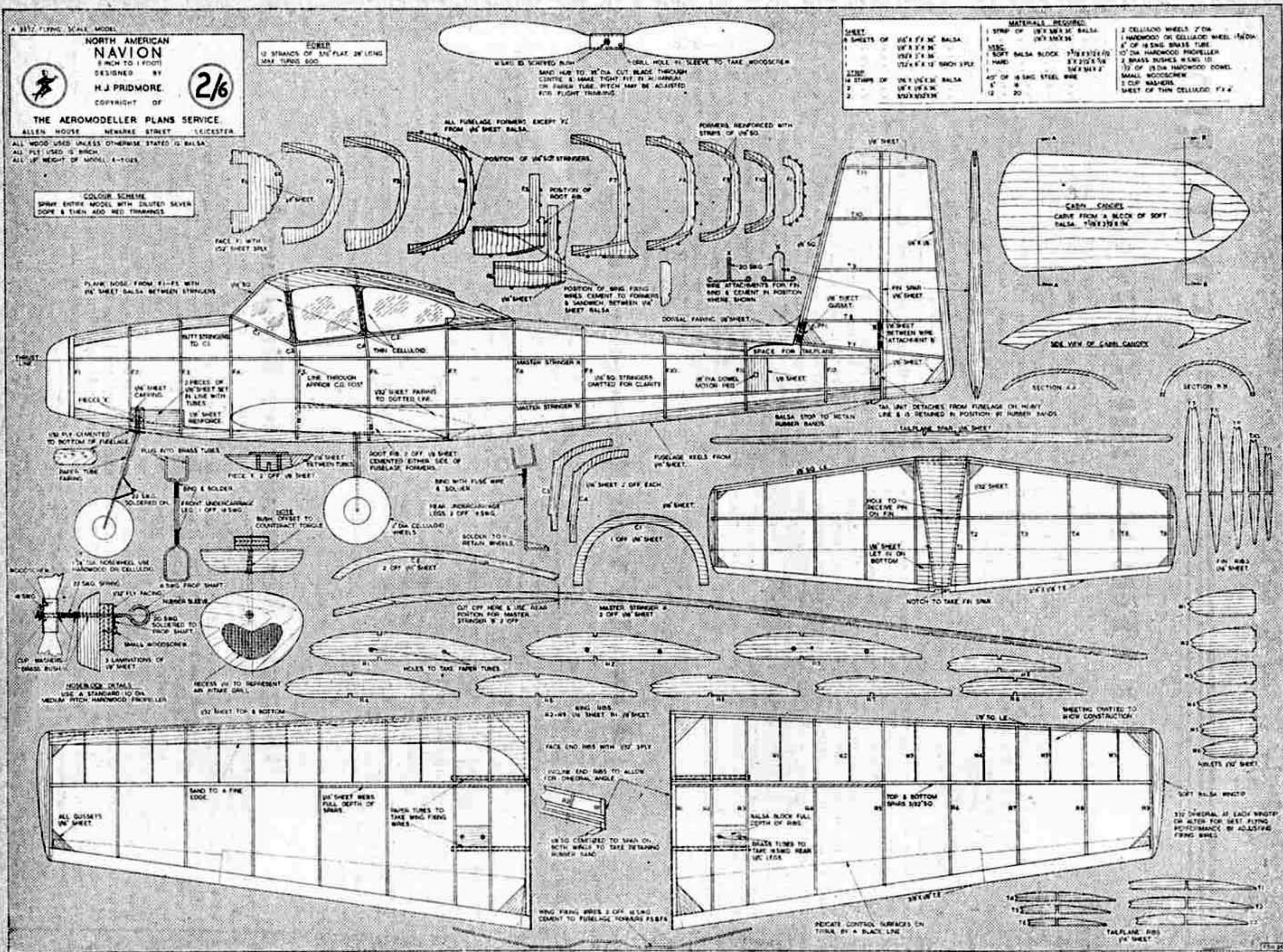
C. S. R.

Brush Up Your Aeromodelling

FOR the first time in this country a group of enthusiasts will be assembling at Eaton Bray on Saturday, 31st May, to join an instructional camp. It has long been the practice abroad for the model aeronautical governing body to institute summer camps of this nature to instruct their members. It has been left to the enterprise of Eaton Bray Model Sportsdrome to provide such facilities here. These camps start with midday dinner on Saturday and end with midday dinner on the following Sunday week, so that, in effect, each camp runs for eight days. Members of this camp will be housed, fed, and given instruction in various branches of aeromodelling by acknowledged experts. During their stay they will have an opportunity of meeting like-minded enthusiasts and exchanging views, as well as an unequalled opportunity of learning the right way to go about their hobby. A special workshop is being set aside for use of camp members only, while instruction will be of a nature suited to individual needs, so that the unexperienced may learn much on a wide range of subjects, while the more expert will be able to complete their knowledge on more specialised lines. In addition to the attractions at the Sportsdrome itself, the ground is within easy reach of Whipsnade Zoo, the London Gliding Club and Open Air Swimming Baths at Dunstable Downs. Numbers are strictly limited, but a few more can be accommodated if immediate application is made to the Aerodrome Manager at Eaton Bray for full particulars of the course and reservation form. Inclusive fees at £5 15s. are most moderate and represent less than the usual cost of a week's *ordinary* holiday. Those unable to attend camp No. 1 may reserve for No. 2, opening 5th July, or No. 4, opening 6th September, where a few vacancies still remain.

Belgian Aeromodeller Honoured

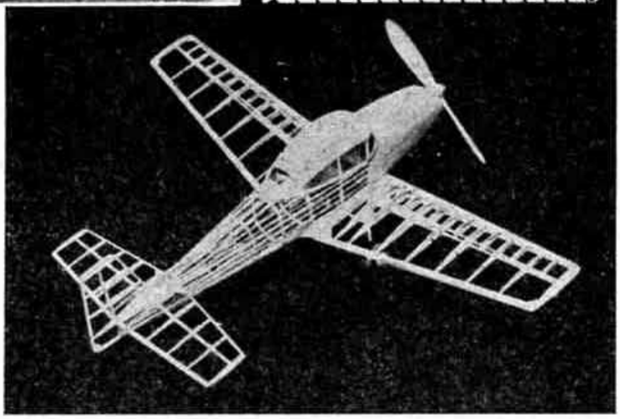
Visitors to Eaton Bray during International Week last year, will remember a tall dark young Belgian guest who took a leading part in flying activities. We are now happy to congratulate this enthusiast, Monsieur Roger Clasens, on the award of the Prix Colonel Daumerie, for his thesis on " Urban Aeronautics ". He was awarded this honour, newly instituted in memory of a Belgian war hero, by a committee of leading Belgian aeronautical experts. It carries with it the right to bear the title of " Laureat Prix Colonel Daumerie ", as well as a substantial cash reward. Roger Clasens, who is an architect by profession, has long been one of the leading figures in Belgian model aeronautics, and, in association with Clasens Père, was responsible for much of their governing body's post-war reconstruction. We feel that aeromodellers throughout the world must share some part of the pride that such a signal honour should be bestowed on one of their number. This is yet one more instance of how the aeromodeller performs a service to the community by his intelligent study of aeronautical problems and adds yet another name to those many famous figures in full size aviation who have graduated to their present position through the medium of model aeronautics.



A FLYING SCALE MODEL
NORTH AMERICAN
NAVION
DESIGNED BY
H.J. PRIDMORE
COPYRIGHT OF
2/6
THE AEROMODELLER PLANS SERVICE
ALLEN HOUSE NEWARKE STREET LEICESTER
ALL WOOD USED UNLESS OTHERWISE STATED IS BALSA
ALL PLY USED IS BIRCH
COLOUR SCHEME
SPRAY ENTIRE MODEL WITH DILUTED SILVER DOPE & THEN ADD RED TRIMMINGS
MATERIALS REQUIRED
SMALL WOODSCREW
ALL FUSELAGE FORMERS EXCEPT F2 FROM 1/16" SHEET BALSA
POSITION OF ROOT RIB
FORMERS REINFORCED WITH STRIPS OF 1/16" SQ.
CABIN CANOPY
CARVE FROM A BLOCK OF SOFT BALSA
SIDE VIEW OF CABIN CANOPY
SECTION A-A
SECTION B-B
THRUST LINE
THIN CELLULOID
MASTER STRINGER A
MASTER STRINGER B
SPACE FOR TAILPLANE
DORSAL FAIRING 1/8" SHEET
FIN SPAR 1/8" SHEET
TAILPLANE SPAR 1/8" SHEET
BALSA STOP TO RETAIN RUBBER BANDS
NOTCH TO TAKE FIN SPAR
HOLE TO RECEIVE PIN ON FIN
FIN RIBS
HOLES TO TAKE PAPER TUBES
NOSEBLOCK DETAILS
SMALL WOODSCREW
SAND TO A FINE EDGE
ALL GUSSETS 1/16" SHEET
TOP & BOTTOM SPARS 3/32" SQ.
SHEETING OMITTED TO SHOW CONSTRUCTION
SOFT BALSA WINGTIP
TAILPLANE RIBS

A 1 inch to 1 foot FLYING SCALE NORTH AMERICAN NAVION

DESIGNED BY H. J. PRIDMORE



Fuselage. Pin keels to drawing and proceed to cement one set of half-formers in place. Cement master stringers A and B in position and remove fuselage side from drawing. Cement on remaining half-formers, etc., on other side, and fit wing fixing wires in place. Next add all the 1/16 in. sq. stringers, and also the fixing tubes for the nose wheel undercarriage leg. Plank nose with strips of 1/16 in. sheet balsa and sand to a smooth finish. Carve the cabin canopy to shape from a block of very soft balsa, and cement in position on formers C3 and C4.

Wings and Tail-unit. Take care to cement the wing fixing tubes accurately in order to preserve correct incidence on both wing panels. The fin is detachable from the tailplane for transport, but may be cemented on permanently if desired, omitting wire fittings.

Propeller, etc. Fit a standard 10 in. dia. medium pitch, hard wood propeller into the tube and bush with brass tubing. Shape up nose block, and cement on the spigot laminations. Screw in a 16 gauge brass bush, taking care to see that it is set to give the required amount of side thrust as on drawing. Bend the 16 s.w.g. prop. shaft to shape and add the necessary fittings. If desired, the rubber motor tensioning device can be omitted, and the motor pre-tensioned before being installed in the model.

Undercarriage. Bend undercarriage struts from 18 s.w.g. piano wire, bind with fuse wire, and solder where shown. The wire prongs must be a tight fit in the tubes.

Rear wheels are of celluloid, whilst the nose wheel may be of hardwood or celluloid to suit the C. of G. balance of the model.

Covering and Finishing. Cover entire model with tissue, using paste for adhesive. Water shrink, and when dry brush on one coat of clear dope. The colour scheme used on the full-sized machine is silver on all surfaces, with red trimmings.

If registration letters are to be added, these are best cut from black tissue and doped or pasted into position.

Flying. Before flying, obtain correct C. of G. position after installing motor, and check model for alignment and warps. Obtain flattest glide by adjusting incidence of tailplane. When glide is satisfactory, wind on about 50 turns and launch model into wind. Increase amount of side thrust until a right-hand circle is obtained. No up or down thrust should be required, but may be given if necessary. The model may be flown without undercarriage, giving it the appearance of the full-size machine in flight with undercarriage retracted. The reduction in weight and drag being very beneficial. When flying the model in gusty weather the dihedral angle of the wings may be increased for extra stability.

Fullsize Plans. (see ¼-scale reproduction opposite), may as usual be obtained from the Aeromodeller Plans Service, Allen House, Newarke Street, Leicester, price 2/6 post free.

The original Navion was incorrectly fitted with a spinner, as shown here, but later versions had the scale type prop shown on the plan opposite.

AIRCRAFT IN MINIATURE Part III

By W · O · DOYLEND

As mentioned in the previous article, the general methods of construction of the various components of a model are always the same, whether the model is small or large. We can, then, summarise the sequence of operations for fuselages as follows :—

1. Cut block slightly larger all round than the measurements of the finished fuselage. 2. Plane and true-up block, and plane down to maximum thickness of widest part of finished fuselage. 3. Mark datum line and plot side elevation on both sides of block and carve to shape. 4. Mark centre line and plan on top and bottom of block and carve to shape. 5. Round top deck. 6. Hollow out cockpits or cabin. 7. Cut wing seating. 8. Shape underside. 9. Score panels and cut tail plane seating. 10. Clean finished fuselage down with fine sandpaper.

The fuselage of the Moth Minor is probably the most simple type that any modeller is likely to encounter. But even on this model there are several details which, when incorporated, enhance the appearance of the model considerably and help to give that extra touch of realism which should always be the aim of a good modeller to obtain. Let us, therefore, examine these several refinements for this type along with fuselage details.

In all the many different aeroplanes fitted with inverted in-line air-cooled engines of the Gipsy or Cirrus types, the rear ends of the panels of the engine cowling do not fit flush against the sides or bottom of the fuselage, but leave a gap of between three to six inches to allow the cooling air to escape after passing round the cylinders. On scale models this effect is obtained by making that part of the fuselage representing the engine panels slightly wider and deeper than the fuselage immediately behind. It will be necessary when planing the block down to maximum width (Stage 2), to make allowances for this slight extra width of the cowling.

The shaping of the fuselage immediately behind the cowling is best done with a small chisel. The scored line representing the rear edge of the cowling should be made much deeper on the lower half of the fuselage and the part of the fuselage behind it is narrowed down by carefully paring away the wood making the strokes towards the nose. The chisel must be prevented from slipping forward and taking away bits of the cowling as well. The same process is carried out on the underside of the fuselage. A further refinement of this on the Moth Minor is a slightly concave form to the sides of the fuselage thus narrowed down. This is shown more clearly in Fig. 1 and the effect is best obtained by using a small gouge.

Two other points of detail on the fuselage of this model are, firstly, the projecting air intake in the nose. On most air-cooled in-line types the cooling air is admitted through an aperture in the nose below the airscrew seating and slightly to one side of the centre line, and may usually be represented by painting its shape in black. On the Moth Minor, however, this aperture projects forward and to reproduce this on the model a strip of thin tin (the metal used as a seal in circular tobacco tins is ideal), is cut out, bent to rectangular shape 1/10 in. by 1/16 in. and pressed into slots cut with a fine chisel or razor blade on the starboard or right side of the nose. See Fig. 2. The intake should project only 1/16 in. so that it will not foul the airscrew.

Secondly, small anti-spin fairings are found on this type running forward along the fuselage from the tail plane. The shape of these is shown in the general arrangement drawings. A fairing for each side should be cut separately from a suitable strip of metal somewhat thicker than that used for the air intake. About 1/16 in. should be allowed on the inner sides of the fairings and they are pressed into slots cut in the fuselage with a fine chisel. See Fig. 3. They may be faired into the leading edge of the tail plane with plastic wood.

Nose Shaping.

In models of single engine types, the shape of the nose of the fuselage will vary according to the type of engine fitted, but since there are only a comparatively few types of engines in general use, we shall find a similarity in nose shaping on many widely different types.

The four or six-cylinder in-line air-cooled type of engine is used extensively in light and medium types, and the engine is nowadays always mounted in the inverted position to provide a better field of view for the pilot over the top of the cowling. This type of nose is essentially similar to that of the Moth Minor. The six-cylinder type has a slightly longer cowling, the detail differences and dimensions would, of course, be shown.

The Rolls Royce " Kestrel " type of engine has a distinctive type of cowling. It is a more straightforward shape than the in-line air-cooled types, curving up from the underside of the fuselage to a plain circular seating for the airscrew. Different " Marks " of Kestrel engines show slight detail differences, mainly in the arrangement of exhaust stubs or pipes and the positions of the small air intakes. Sometimes they will also be found to have two small streamlined " bumps " on the forward end to accommodate the front ends of the Vee cylinder blocks. See Fig. 4.

The " Merlin " and later " Griffon " types of Rolls Royce engines have very similar cowlings to the Kestrel. The main differences being that they are somewhat " cleaner " in their lines and rather larger. In some cases too, they have the " chin " type radiator as, for instance, on the " Lancaster," and " Typhoon."

Another nose shape with which the modeller might be concerned is the distinctive cowling found on the " H " type of air-cooled engines, such as the Napier " Dagger " fitted in the Hawker " Hector " and the " Rapier " which was installed in a few Airspeed " Courier " aircraft and in the Fairey " Seafox."

The general form of these cowlings is shown in Fig. 5 and the main points to watch in their shaping is the correct forming of the two air scoops with the airscrew seating between and the four exhaust pipes which are set in channels, two on each side.

The air scoops projecting top and bottom are best made integral with the fuselage, being shaped with a file and the airscrew seating must be brought up to a circular section. The channels for the exhaust pipes are cut with a small gouge and the pipes formed from short lengths of wire bent at right angles at each end and plugged into holes drilled in the channels.

The Pobjoy engine has also been used on a large number of small and medium-sized aircraft. This is a radial type, with the cylinders totally enclosed in a circular metal cowling. When dealing with this type of engine the nose of the fuselage is brought to a circular section and the front edge rounded over. In the front of the engine a narrow circular channel should be scooped out, separating the outer ring from the inner circle which is scored with vertical lines and which carries the airscrew seating. Note that the airscrew seating is

FIG. 1. COWLING GAP & SHAPED FUSELAGE.

FIG. 2. PROJECTING COOLING AIR INTAKE.

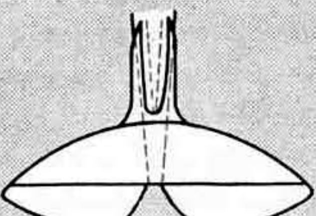


FIG. 3. FITTING ANTI-SPIN FAIRINGS.

FIG. 4. COWLING SHAPE FOR ROLLS-ROYCE 'KESTREL' ENGINE.

FIG. 5. COWLING SHAPE FOR NAPIER 'DAGGER' & 'RAPIER' ENGINES.

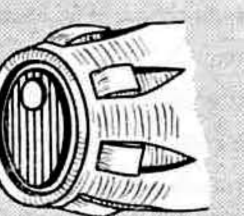


FIG. 6. COWLING SHAPE FOR POBJOY ENGINES.

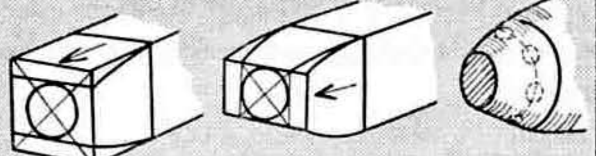


FIG. 7. STAGES IN MAKING CONE SHAPED COWLING.

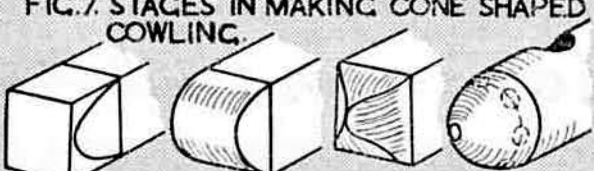


FIG. 8. STAGES IN SHAPING DOMED COWLING

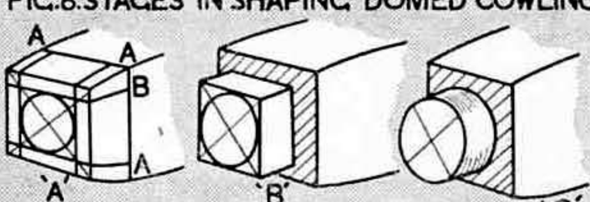


FIG. 9. MARKING & SHAPING NOSE FOR CIRCULAR COWLING.

off-set above the centre of the circular cowling as shown in Fig. 6, and this seating may be formed from a small metal washer. Small "gills," seven in number, are fitted round the cowling, these may be made from tin and pressed into slots cut with a chisel. To the rear of each gill a shallow Vee is cut in the fuselage, a razor blade is best for this work. Sometimes streamlined "helmets" are found in place of these gills and where this is the case they are best filed out of the solid block, allowance being made for them when cutting the block to shape in Stage 2 of the fuselage construction.

Another common type of nose shaping will be that used in conjunction with radial types of engines. Here, the actual shaping of the nose will depend upon the method the modeller will adopt in the reproduction of the engines themselves, more particularly the types of radial engines that are enclosed in circular cowlings and which may be either built up as separate units or carved "solid" as part of the fuselage.

The shape for uncowled radials will also depend upon whether the cylinders of the engine are to be built up on the fuselage nose proper, or whether the engine is to be built up and fitted to the fuselage as a separate unit.

In the former case, the shape of the crankcase cowling will have to be taken into account when setting out and carving the fuselage from the original block. This will generally be either of two types. Firstly, the cone-shaped cowling as illustrated in Fig. 7. The method of marking the nose is illustrated and the shaping is done with a chisel working towards the nose as shown by the arrow in Fig. 7A and 7B. The nose is finally rounded to its finished form ready for the fitting of the cylinders as shown in Fig. 7C.

The other shape is the domed nose illustrated in Fig. 8, where the method of marking and the stages in construction are clearly shown.

Where the uncowled engine is to be made as a separate unit, it will only be necessary to bring the nose down to a plain circular seating and the sequence shown in Fig. 7 will be applicable.

In cases where a separately built engine and long chord cowling are to be fitted, the nose seating will be slightly different, an additional projection of a smaller diameter than the fuselage nose proper being provided over which the metal cowling is fitted. See Fig. 9.

The nose should be marked out as shown in Fig. 9A. Firstly, shallow cuts are made with a fine tenon saw on all four sides along the lines AA, the depth of the cuts being equal to AB. Then, using a chisel and working from the front towards the saw cuts, the surplus wood is pared away leaving the block as shown in Fig. 9B. Now the projection is filed to a circular section as shown in Fig. 9C. Finally, the fuselage nose proper is shaped to its correct section using either a chisel or file. This particular type of seating will be useful for a large number of types using engines with long chord cowlings such as the Westland "Lysander," or the Vickers "Wellesley" long-range type, and also on the engine nacelles of such twin-engined types as the Bristol "Blenheim" and "Beaufighter," etc.

Turret Seatings.

Provision has to be made in fuselages of multi-engined types of bomber for the nose and tail gun turrets. It is always advisable to make the turrets separately even though they are to be formed from solid wood, and suitable seatings made on the fuselage to receive them.

The actual sizes and shapes of these seatings will vary according to different aircraft. The shape should be cut out with a tenon saw and the seating filed to a true finish. Nose turret seatings are similarly treated.

The Brains Behind the Books—No. 2—*being some little known facts about Harborough Books and their production.*

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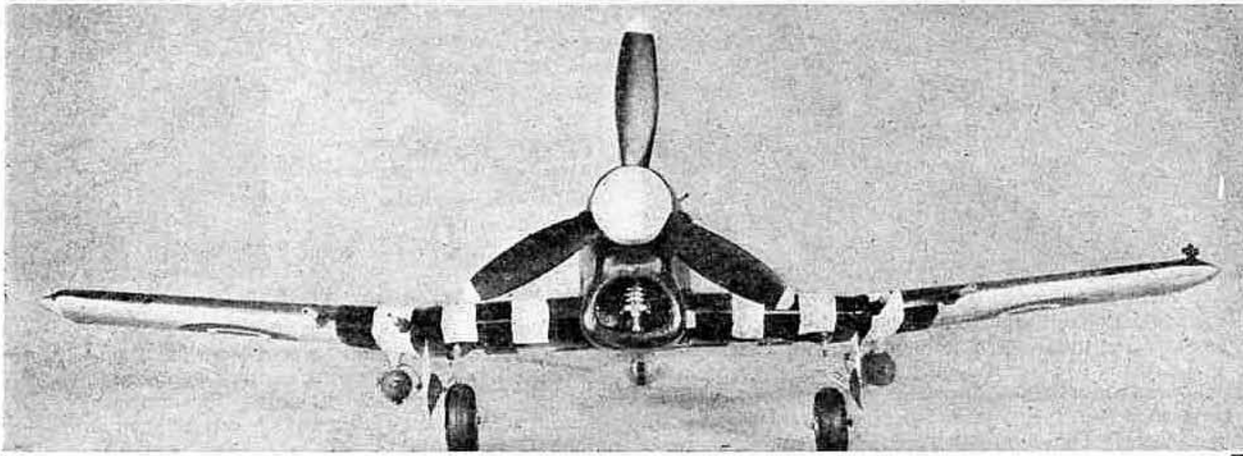
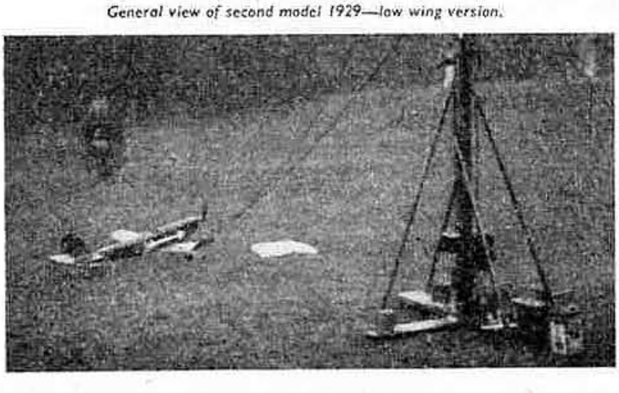
CONTROL LINE COMMENTARY By F. B. THOMAS



In view of the present steadily growing interest in the American-fostered sport of control-line flying, we present this new feature and hope that all readers whose interests lie in this branch of aeromodelling will send us photographs of their models, hints and tips, and notes of their progress, when F. B. Thomas, who has well over twenty years' experience of control-line flying, will sort out the most interesting material for following articles after the manner of our already well-established favourites "Petrol Topics" and "Petrol Vapour."—Ed.

MY first control-line model, constructed about 1925, was a rubber-driven round-the-pole model with a controllable elevator. This, I am afraid, was never very successful. As time went on, however, I met with greater success and I feel that readers may be interested in a brief outline of some of my most interesting models. The first success was in 1927, with a compressed air model. This was fitted with a 3-cylinder radial air motor and a Bowden wire-controlled elevator. The compressed air was fed to the model from a rotating gas bracket mounted on the central pylon round which the model revolved. The model flew and controlled quite well, but unfortunately the engine failed to stand up to the constant running and soon wore out. Success number two was finished in 1929 and gave excellent results despite its very unorthodox arrangement. The model was flown round the pole, the central pylon having at its base a ⅛ h.p. Stewart-Turner water-cooled two-stroke petrol engine. The drive from this was a speedometer cable to the rotating top of the central pylon. A flexible line led from the pylon to the model, taking the form of a length of piano wire, 15 feet long, running in a ⅛ in. diameter aluminium tube. This drove the airscrew through Meccano bevel gears, and worked remarkably well—effectively getting round the difficulty of installing so heavy a motor in the actual aircraft. At that time there were no miniature lightweight aircraft engines to be had. The flexible drive gave little trouble and one wire would last for about five hours running time. The elevator control was again by Bowden cable, with a spring return. The throttle and elevator leads from the base of the pylon ran along the ground to the dual control "cockpit" situated just outside the circuit. I still possess a 100 ft. 16 m.m. cine-film of this model in action.

General view of second model 1929—low wing version.



In 1932 I finished a much larger model fitted with a 16 c.c. "Atom-Minor" engine made up from castings. This model had a wing span of 6 feet and weighed 4½ lbs. The low tension supply was led out to the model from the centre pylon, which obviated the necessity for carrying a battery in the plane. This model flew very well and controlled nicely. She did many hours flying before the engine finally wore out, and never once sustained a crash. The wing was only a single spar affair, the leading edge being covered with 1 m.m. ply to take the torsion loads.

One of my last efforts before the war was made in 1939 and flew very well as a free flight model. Recently, however, I converted her to U-control and she flies and controls extremely well. She carries a large three-volt cycle lamp battery which has a life of about two hours. A third line is used to operate the ignition switch to the six-year-old "Brown Junior" fitted, which will still take her into the air after a 15 foot run.

Recently I have added a fourth line to this machine to control the engine speed, by moving the advance and

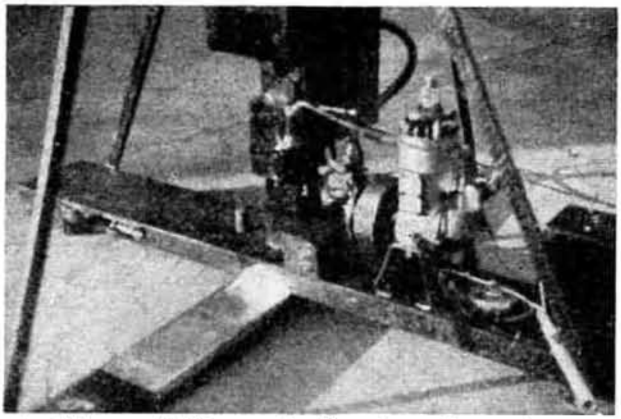
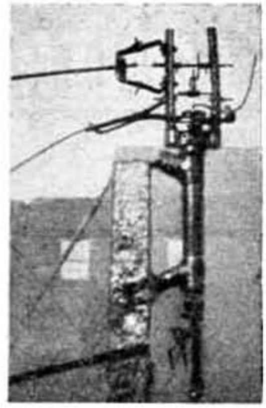


Photo left shows the engine installation for the second model. The engine, a $\frac{1}{8}$ h.p. Stewart-Turner water cooled two stroke, is fitted to the front of the pylon to drive the airscrew on the model through a 15 ft. long Bowden wire extension. Note that owing to the extension drive a flywheel is necessary.

Photo right shows the pylon head assembly The upper shaft is the drive to the air-screw, through a crown wheel and two pinions. The lower is the Bowden cable control to the elevator.



retard lever. Pulling on the line slows the engine, and allows a " rumble " approach to be made when landing. Releasing the line allows the engine to run at full revs.

The next model after the long break resulting from war service was an orthodox low-wing machine fitted with a " Majesco " 4·5 c.c. motor and a miniature 2-volt accumulator. This model has an excellent performance, with a speed range of 15–45 m.p.h., and controls very sweetly. The engine is mounted on " knock-off " bearers. The wing loading is 23 ozs./sq. ft.

Following this I built a Canard model, specifically for training beginners in U-control flying. The 1·3 c.c. Mills engine flies her well and she is remarkably stable. The control grip is fitted with an extension and extra handle to give dual instruction. The pupil stands on the right of the pilot in the centre of the circle, holding on to the extension grip, and pilot and pupil gyrate together as the model flies round them. The pilot has control of the engine cut-off line.

The latest in my collection is my U-controlled Typhoon, which is an ambitious job in many respects. The slack line normally used only for the engine cut-out is used in this model to initiate a number of operations. The first pull on this line after the model has taken off selects undercarriage up. The undercarriage immediately retracts into the wings. The second tweak drops a bomb from each wing, and the third pull brings the under-carriage down. Finally the fourth pull works the engine cut-off and the engine stops preparatory to landing. The engine is a 2 c.c. Majesco diesel, which, like the Mills, is an extremely efficient motor.

I feel that the details of the selector mechanism described above may be of considerable interest to many who would like to fit such a device to their own models. Full information on its working is therefore given in the following paragraphs.

The Selector Mechanism.

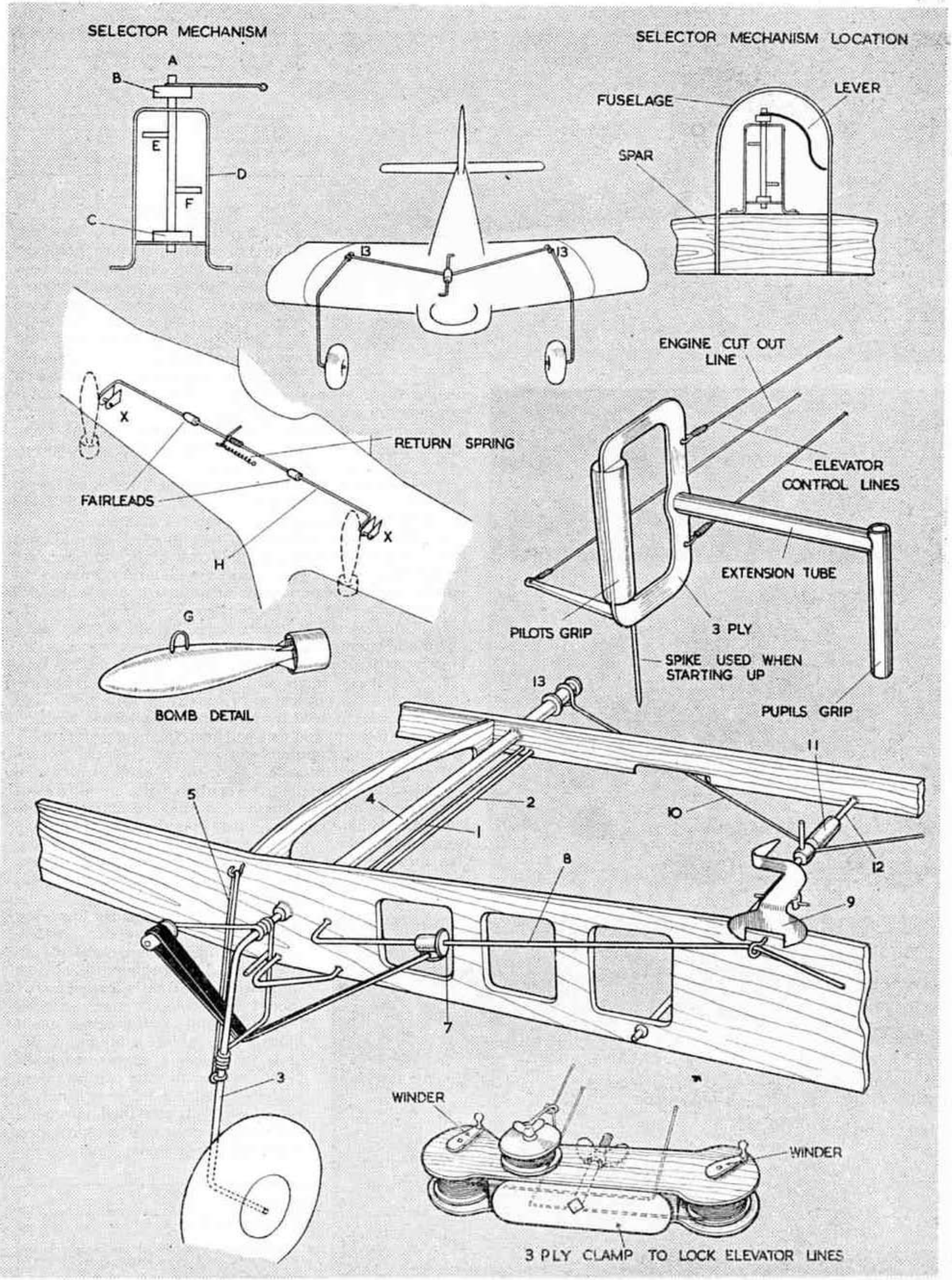
For this device the third (slack) line is attached to a wire emerging from the port wing tip. This wire is attached to a lever inside the fuselage. A pull on the slack line causes the lever to move the spindle " A " through 90 degrees, moving it via a clockwork ratchet, " B." When the lever is released, a spring returns it to its original position. The lower end of the spindle passes through a separate ratchet, " C," which is fixed to the spindle housing, which in turn is mounted on the centre section of the wing, inside the fuselage. The lower ratchet prevents the spindle revolving backwards when the lever springs back. The spindle carries two projecting lugs, " E " and " F." Lug " E " first of all actuates the undercarriage retraction. Ninety degrees further on the same lug actuates the bomb release. After another 90 degrees the second lug " F " lowers the undercarriage again and a further 90 degrees results in this lug tripping the engine cut-off. The details of the whole installation are omitted from the drawing as they would make it too complex. The methods, however, for actuating such components as the ignition switch can be easily worked out for the individual model.

The bomb release is very simple. Each bomb is attached by its loop " G " to the bomb releases " XX." When the tranverse wire " H " moves across, both bombs drop simultaneously. All this gear is attached to the rear of the main spar.

The sketch of the undercarriage mechanism should make things fairly clear. The centre section portion of the main spar is $\frac{1}{8}$ in. aircraft ply, likewise the false rear spar. The wing as far out as the undercarriage is covered with 1 m.m. ply. All the rest of the model is balsa. The undercarriage legs, " 3," are of $\frac{1}{16}$ in. spring steel rod and they rotate in tube " 4," which is fixed to both spars with plastic wood. A small rubber band holds the undercarriage leg between the jaws " 1 " and " 2 " of the lock. Turn now to collar " 11." When the slack wire is first pulled, this collar is pushed forward on wire " 12." The collar " 11 " has a piano wire stay which runs outwards to loop round the rearward projec-ting portion of the undercarriage leg at " 13." When the collar " 11 " moves forward it carries forward with it the wire " 10," which in turn pushes both undercarriage legs " 3 " forward.

Now before take-off, the second sliding collar " 7 " is slid along the wire " 8 " to the centre of the spar, until it locks in the claw " 9." This pulls the $\frac{1}{4}$ in. flat rubber " 6 " into tension. When the undercarriage legs are forced forward by the wire " 10 " (against the tension of rubber band " 5 ") the loop " 14," which is soldered to the undercarriage leg, is caused to disengage itself from the locking jaws " 1 " and " 2," and the rubber " 6 " retracts the undercarriage legs and holds them retracted. The undercarriage is lowered when the claw " 9 " is raised. This releases the sliding collar " 7," which in turn releases the tension in rubber " 6," allowing the rubber band " 5 " to return the undercarriage to its down position, and locking it. The lowering of the undercarriage is, of course, helped by the weight of the undercarriage itself. The wheels, when retracted, lie in front of the main spar, which is sited well back in the wing, almost at mid chord.

The apparatus as a whole is pretty involved, but simple enough in principle and works very well. I can visualise a clockwork driven selector spindle " A " being employed to perform the same cycle of operations on a free-flying model.


SELECTOR MECHANISM
A
B
E
D
F
C
SELECTOR MECHANISM LOCATION
FUSELAGE
LEVER
SPAR
13
13
ENGINE CUT OUT LINE
X
RETURN SPRING
FAIRLEADS
X
H
ELEVATOR CONTROL LINES
EXTENSION TUBE
PILOTS GRIP
3 PLY
G
BOMB DETAIL
SPIKE USED WHEN STARTING UP
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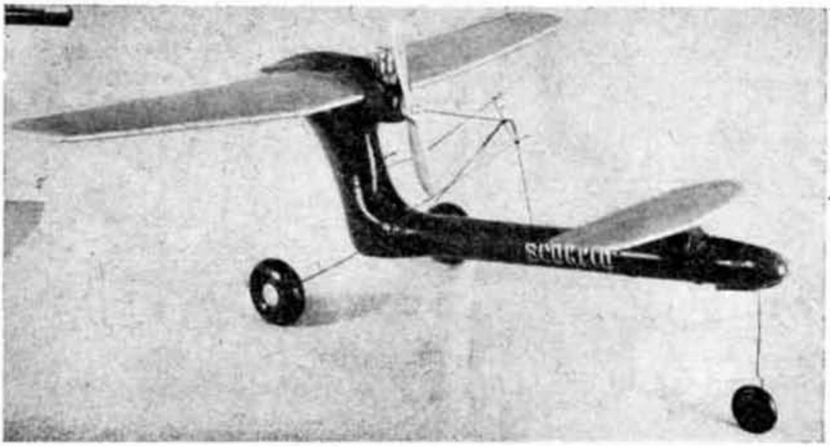
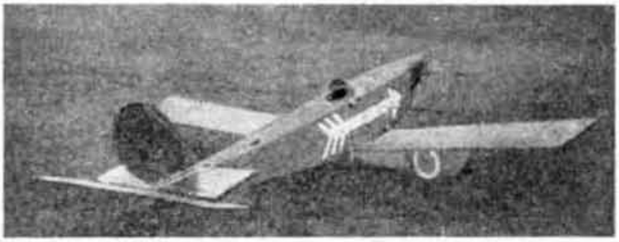
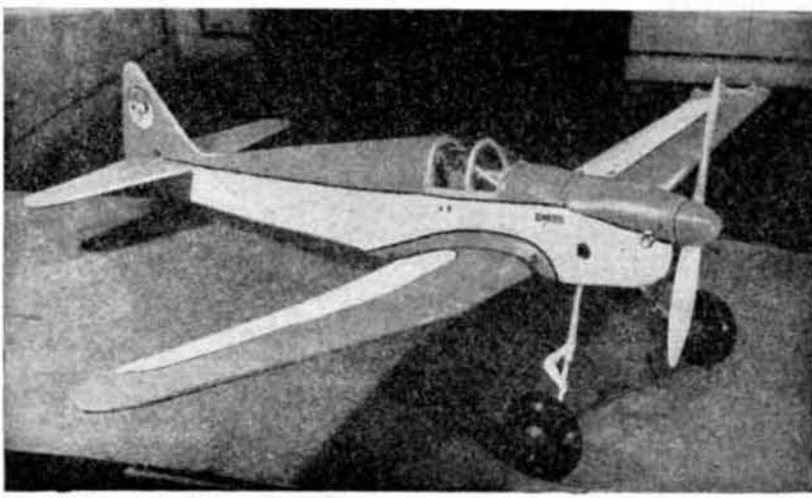
3 PLY CLAMP TO LOCK ELEVATOR LINES



The author's beginners' canard, fitted with a 1·3 Mills Diesel, used with the extended control grip illustrated on the previous page.

Top centre, left, is a close up of the unorthodox second model with the engine running, chocks in position to restrain the model until the "pilot" is ready for take-off.





Lower centre, left, is a view of the engine and ignition installation of F. B. Thomas's third model, 1932, powered by a 16 c.c. Atom Minor.

Left is the low-wing model described in the text, and powered by a 4·5 c.c. Majesco petrol engine.

Tips for the Tyro.

Very little information has appeared in these pages to help the control-line fan, in spite of the considerable number of modellers now interested in the sport. I therefore append below a selection of hints:—

1. Model should be overpowered as compared with a free-flying model. 4·5–10 c.c. engines are preferable to smaller sizes. Always set engine slightly rich to avoid it stopping during steep climbing.

This does not apply if a diesel engine is being used. A diesel model can be made much smaller and lighter, having no battery or coil to carry.

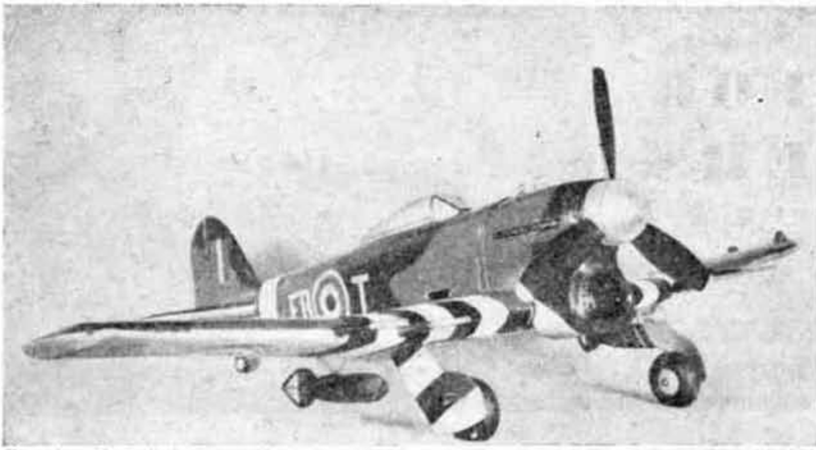
2. Ignition cut-off switch actuated by a slack line is essential. A time switch is useless as the engine is likely to cut with the model in an awkward attitude.

3. The largest possible battery must be carried. In 10 c.c. engined models a 2-cell, 3-volt cycle lamp battery, though heavy, will give about two hours' running. In smaller models, a miniature accumulator is essential—I have never used a booster battery for starting.

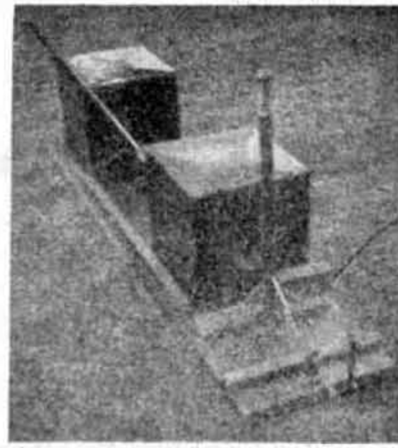
4. Undercarriage wheels must be set so that they follow the circle, otherwise they will cause great friction. This is particularly necessary when flying on a short line.

5. A tail-skid is preferable to a tailwheel. If the tip of the skid is bent downwards it is driven into the ground when the stick is held in the extreme backward position (*i.e.*, elevators up) and this will keep the model stationary with the engine running, and makes it possible to taxi and come to rest at will. Also, the control grip can be pegged to the ground in the centre of the circle to hold elevators up and the engine can then be started single handed. When running, the operator walks to the centre of the circle, picks up the control grip, and easing this forward, sets the aircraft in motion. The above only applies when the model is being flown on grass, which must be closely cut.

6. A model with fairly low wing loading is, in my opinion, preferable to a highly-loaded, fast-flying machine. Though more difficult to fly in wind, the lightly loaded model (about 18 ozs. sq. ft. max.) is more responsive and approximates much more to the feel of a full-sized aircraft than does a very fast model. Much greater liberties can be taken with the lightly loaded model, including a completely stalled approach and landing with engine on (provided a flat calm is present). All models



Above shows the author's latest model, a U-control Typhoon powered by a 2 c.c. Majesco diesel, on which the bombs and undercarriage both operate.



Right above is the "cockpit" used for controlling the author's earlier models.

must be trimmed markedly nose-heavy (*i.e.*, C.G. ¼ chord from L.E.).

7. Normal U-control with control grip held in pilot's hand is preferable to "outside U-control" where model flies round a fixed pylon with pilot sitting outside the radius of operation of the model. Though the latter abolishes giddiness, the former is preferable from all other points of view. There is a positive feel and any slackness of the control lines is instantly appreciated and the operator can walk backwards away from the model to keep the lines taut. When standing in the centre of the circle the pilot always sees the model from the same view-point, which makes height judgment and landing easier. When using short lines the operator can get appallingly giddy, but this gets less with practice. All my earliest models were made with outside U-control, and I speak from experience in condemning this set up.

8. A hand-grip with adjustable lines is a great asset. The grip I use carries the line on bobbins and the lines can be of any desired length. 25 lb. flax fishing line is ideal and far better than wire, which kinks. I hope the attached sketch shows the salient features of the adjustable control grip.

9. Lastly, a few words on actual flying. Initial flights should be made on a short line of 20–30 ft. and in a *flat calm*. Though the control movements are instinctive, in the case of the beginner they will not be reflex unless he has previously flown full-sized aircraft. To begin with there is plenty to contend with and a wind will bring disaster. Even with considerable experience, any wind stronger than about 5 m.p.h. is inconsistent with full control of the model. The longer the line the more affected is the model by wind. With 100 ft. lines, dead calm conditions are necessary. Always climb on down-wind part of circuit and depress nose of model as she heads into the wind. Accurate flying should be practiced, take off and landings being made in a small marked off part of the circuit down-wind of the operator. Any remarks on the relative merits of control-line and free-flying models are out of place, but I think that once having handled a control-line model few would revert to free-flying.

In conclusion, I would add that I will be very pleased to receive photographs and notes from any readers who would like to help to continue this feature in forthcoming issues. All correspondence should be addressed c/o the Editor, and will be forwarded on.

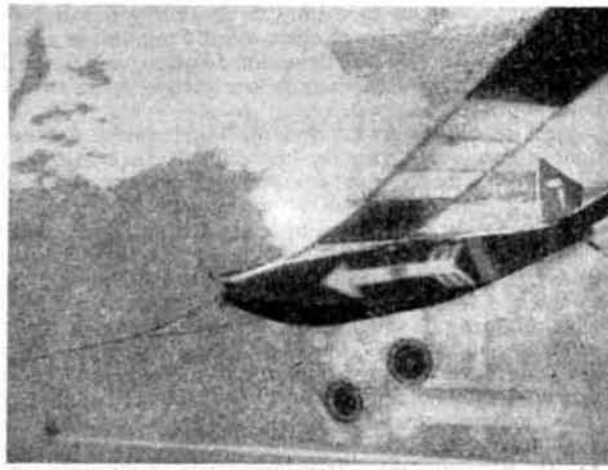
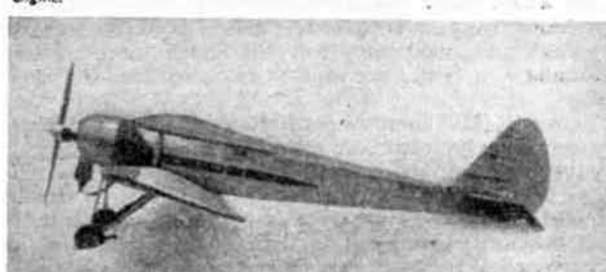
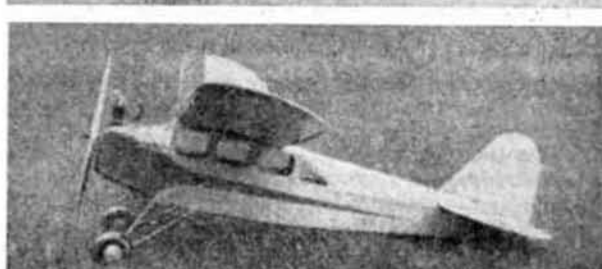


Photo above shows the parasol version of the second model at speed round the pole.

Below is a side view of the third model, and bottom the author's last effort before the war, a free flight model modified to U-control and fitted with a Brown Junior engine.





MAINLY FOR BEGINNERS

BY M · R · KNIGHT

Photo right shows the author with a successful composite model. Note the typical tail units, one with a single fin and the other with twin fins.

ONCE again your humble Philosopher, Elucidator, and Guide for Budding Aeromods, has to express appreciation of letters received in response to the invitation to readers to comment on this new series of articles and to send along any queries. From this month's postbag I have selected three for mention, and I want this time to deal with them before getting down to my main topic.

First of all, Denis Clarke, of Woodhouses, Ashton-under-Lyne, writes that he had difficulty in cutting out wing ribs neatly on top of a building-board, but got along fine with a sheet of glass his father obtained for him. Thanks, Denis, that is quite a good tip to pass on to aeromods, who have not heard of it. He then goes on to say that having had some good fun with gliders, he would like to tackle a simple beginners' rubber-driven job. My own Kamlet design struck him as a likely subject, but, he says, someone has warned him that low-wing designs are unsuitable for beginners. I'm afraid the answer to that is that the aeromodelling movement is rich in would-be " advisers " of this sort who dole out " duff gen " in generous measure. As readers will have seen from my article in the February AEROMODELLER, a soundly-designed low-wing job is very suitable for beginners, so there need be no misgivings whatever in building the Kamlet. The Kitten and Kingfisher designs to which I have previously referred, and which Denis enquires about, were built in the old-fashioned way of such heavy materials as birch, satin walnut and oiled silk, and the much more modern Kamlet is a better proposition in these balsa-conscious days.

From R. L. Thompson, of Earls Court, London, comes a refreshingly forthright letter making the interesting point that many youngsters, and still more older people, are deterred from linking up with more experienced modellers, especially if they are inclined to suffer from an inferiority complex, by disinclination to reveal an ignorance of technical and other terms ; " S.A.E." to a youngster unfamiliar with advertisements, instead of signifying " stamped addressed envelope " will mystify as much as the terms R.T.P. or R.O.G. can puzzle other readers. True, these expressions have been explained, probably, at some time or other, but Mr. Thompson feels they should be repeated from time to time, and he suggests that the AEROMODELLER should publish a few terms each month.

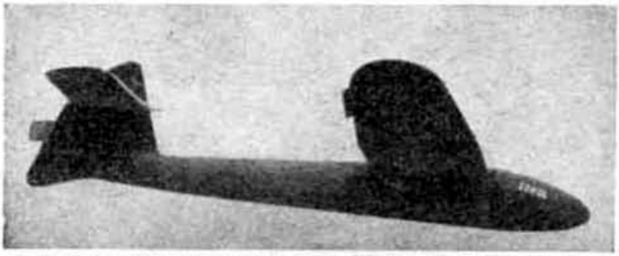
Well, that is a matter for the Editor, but as far as this series of articles is concerned I certainly intend to keep the uninformed reader in mind throughout, and repeat explanation of this, that and the other *ad lib* in the assurance that I shall have the understanding indulgence of those who already know the answers. Thanks, Mr. Thompson, I agree it can be wearisome to have an article referring in every other paragraph to some text-book or other, and that it is up to writers to explain themselves adequately as they go along, though, of course, this does not cancel the value of a good text-book.

Frank Hibbert, of Roehampton, London, begins an interesting letter—" I feel certain that hundreds of beginners, and others more advanced, will agree with me that your section of the AEROMODELLER is to a great purpose." Thanks, Frank, we'll try and keep it lively. He goes on to say, " But could we have a few diagrams, please ? In the February issue, for example, you gave us some gen. on aerofoil sections, and very educational, too, but I should like to have seen a few explanatory sketches."

Well, the answer is that I was not setting out to give anything more than a very general description of a typical model, and only mentioned aerofoil sections to explain what sort of things they were. I propose to return to this and other subjects and deal with them in greater detail, and where I feel the diagrams will prove helpful, I'm sure the Editor will oblige. Meanwhile, some idea of the way in which sections vary can be obtained by examining the various plans published in the AEROMODELLER.

This particular letter gives me a good starting point for my main topic, which is tailplanes and how they work. For this is a case where it is necessary for me to go back and touch again on something already said, just as I have said I shall be doing repeatedly. To understand what tailplanes are for, it is advisable to go back to last month's article on " Wings or Mainplanes." There, I trust you will recall, it was stated the cambered (or curved section) wing which we use in place of a flat surface, because of its much greater efficiency, has an inconvenient tendency to increase its angle of attack in flight until the model stalls, especially if started on this behaviour by a gust. In other words, a cambered wing is a somewhat unruly piece of apparatus, and the function of the tailplane is to keep it in order !

My purpose this month is to show how it does its work. First of all, however, let us look at a typical tailplane and see what manner of thing it is. Roughly speaking, it is a small edition of the wing. Like the wing, it has span, chord, plan form, aerofoil section, a leading edge and trailing edge, ribs, an " overcoat " of jap tissue or some other tissue, and sometimes a dihedral angle. But there are two quite important differences between the tailplane and the wing, apart from their respective



A high tailplane for improved performance is used by L. G. Temple for his famous A.P.S. sailplane "Sokol."

sizes, one being quite noticeable and the other not so obvious. The obvious difference is in the aspect ratio, which, you may remember, is the proportion of chord (distance from leading edge to trailing edge) to span (distance from tip to tip). The tailplane's aspect ratio is much lower than that of the wing; in other words, it is a more squat looking affair, with much less span in relation to the chord. An average figure would be an aspect ratio of 4, an example being span 12 ins., chord 3 ins.

The less noticeable difference between the tailplane and the wing is the amount of camber. Some years ago, when tailplanes often consisted of a piano wire frame covered with oiled silk, they were often made without any camber at all, and they proved quite satisfactory. Today, however, it is customary to use a built-up wooden structure like that of the wing, but with less depth of camber than the wing. For example, the depth of a wing rib might be one-eighth of the chord, but that of a tailplane rib might be one-twelfth. In short, to put it in the very simplest terms, a tailplane is invariably thinner than a wing as well as being of lower aspect ratio.

As to plan form, the tailplane can be of constant chord, tapered (usually with all the taper on the leading edge), elliptical, or, as Mr. Rushbrooke puts it in "The A.B.C. of Model Aircraft Construction," "moth wing" shape. The tips, like those of the wing, can be curved, evenly or unevenly, or square (this being necessary, of course, when the model has twin fins, one fitted at each end of the tailplane).

Structurally, we are up against the none too easy problem of keeping the rear end of a model as light as possible without flimsiness, for owing to the considerable distance from the mainplane, and therefore from the model's centre of gravity, very little addition to the weight of the tail requires a much greater amount of weight in the front of the model to restore the balance, and that means an unduly heavy model and consequently an impaired performance. It is usual to assist the process of keeping the tailplane light by using a two-spar system consisting of leading edge and trailing edge spars only, and no centre spar or spars. This, however, is not a rigid rule, and one of our illustrations shows a slightly more elaborate tailplane for a scale model of the Hawker Hurricane.

There must also be some means of attaching the fin or fins to tailplane. A single central fin usually has projecting pieces of bamboo or reed cane which plug into small tubes of paper, celluloid or light metal embedded in a stout central rib in the tailplane. A single fin, by the way, usually has a thin symmetrical section and consists of an edging of bent bamboo or reed cane, or fairly stout pieces of balsa, with ribs of balsa sheet. Twin fins usually consist simply of solid balsa sheet cemented to the outer ribs of the tailplane, which can be made a bit stouter than the others to take the strain.

Then there is the matter of the attachment of the tailplane itself to the fuselage. Rarely is it held on simply by a piece of rubber strip, as is often done with the wing. A popular method is to attach to the leading edge a thin wire saddle, shaped to fit over the fuselage, and including tiny hooks from which a rubber band is slipped around the bottom of the fuselage. At the trailing edge is a similar fitting, modified in view of the narrowness of the fuselage at its rear end. There are a number of other methods of attachment of the tailplane to the fuselage, of which more in due course.

Before getting down to the business of describing how a tailplane does its work, it is necessary to explain that there are two quite different types in use among modellers. One is known as a lifting tailplane, and the other as a non-lifting type. Their respective merits are often the subject of quite heated argument, and in this connection, as in many other aspects of design, a great deal of ballyhoo is talked. I have used both type of tail, and am therefore in a better position than some to deal with the subject in an unbiassed manner.

Whichever type of tailplane is used, however, it must be placed at a sufficient distance from the wing to enable it to exert sufficient leverage on the model to pull it out of trouble. The necessary distance will vary with the aspect ratio of the wing and the size of the tailplane, but a rough and ready safety rule is to make the distance between the centre of the wing and the centre of the tail—known as the tail moment arm—not less than twice the wing-root chord.

Let us now take a look at a non-lifting tailplane. This is the type that, as already explained, can be perfectly flat without detriment. Now that tailplanes are built up, however, ribs of shallow symmetrical section are used; that is, an aerofoil section in which what little camber is present is exactly the same above and below.

The non-lifting tailplane, whether flat or of symmetrical section, has so to be mounted on the model that when in normal flight it has no angle of attack, that is, the tailplane should meet the air edge-on. It just floats, so to speak, and, in fact, at one time the non-lifter was known as a floating tail.

It exerts its corrective influence in the following manner. When a gust lifts the nose of the machine, the wing's angle of attack is, of course, automatically increased, and as already explained, the tendency with a cambered wing is for this nosing up to increase, with the result that if nothing was done to check it, an angle would soon be reached at which the airflow over the wing broke away and the machine stalled and fell. However, the moment the nose goes up, the tailplane is thereby brought to a position angle of attack, commences to generate some lift, and this lift raises the rear end of the model where the tailplane is, and so, provided balance and adjustments are correct, a proper flying attitude is regained. Conversely, should a gust push the nose of the model down, the wing's angle of attack is reduced, thereby reducing the lift, while at the same time the air, now meeting the upper surface of the tailplane, the latter is pushed down and correct flying attitude is regained.

It is a wonderfully simple arrangement, this non-lifting tail business, and provided that the tailplane is large enough, things will be found very satisfactory. As to the tailplane area, the maximum allowed for international contest models by the authority concerned, the Federation Aeronautique Internationale, and for national contests in Britain by the Society of Model Aeronautical Engineers, is 33 per cent. of the wing area. It is good practice to abide by this rule, even if you are not contemplating contest flying, and the amount quoted is quite sufficient provided that the design of the model is sound in other respects; in fact, a smaller area will often suffice.

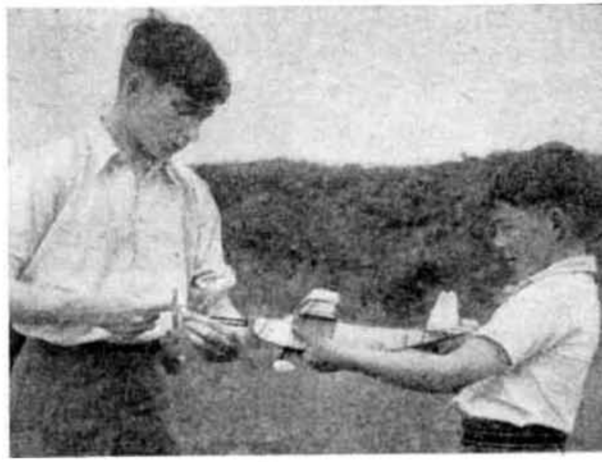
I have already referred to the powerful leverage of the tailplane, calling for as much weight saving as possible at the rear end of the model. This leverage also makes itself felt when anything occurs to disturb the balance of the model, such as the rubber motor bunching behind the centre of gravity, or the undercarriage getting bent back in a heavy landing, or a faulty adjustment of the tail by the modeller. The non-lifting tail is pretty good-tempered about such changes, and though the quality of the flight will be affected, small disturbances of the kind mentioned will rarely cause serious trouble. Thus, this type of tail is very suitable for a beginner's model.

Now quite a long time ago, cute modellers lying awake at night and pondering as to how model performances could be pepped up, fastened on to the fact that while a non-lifting tailplane contributes an appreciable amount to the weight the model has to carry, and while it renders good service in times of trouble, for the greater part of each flight it does no work. This was a state of affairs that in their opinion called aloud for improvement. Why not, they argued, make the tailplane work all the time? Why not make it contribute to the lift as well as stabilise the model?

Extra lift could be utilised in different ways. It would enable the model to be flown with less power, and as fewer strands of rubber would then be needed, more turns could be given to the motor, and consequently a longer flight obtained. The gain would not be tremendous, but would be worth while. Alternatively, the extra lift, especially if a little extra power be used instead of less, would improve the climb, and by reaching a great height, a model would not only have a longer glide, but would stand an improved chance of encountering a thermal current of air and being wafted by it to an even greater height. By either expedient, a longer flight should be possible, and thus the lifting tail offers a clear advantage, though not an overwhelming one, in contests where the wing and tail areas are limited by the rules. Incidentally, a lifting tail also tends to be more powerful as a stabiliser than a non-lifter.

Of course, as we are not living in Utopia, there is a price to be paid for these advantages. The lifting tail, in fact, recalls that childhood ditty about " the little girl with the little curl right in the middle of her forehead," who, " when she was good was very, very good, and when she was bad she was horrid." When the lifting tail principle is understood and correctly applied it is very, very good, and when it is misapplied it is horrid. The trouble is, that while very small changes in its setting have a very marked effect on the behaviour of a model, it is very difficult to determine, except by practical experiment, just when the setting should be on any particular design. Moreover, with this type of tail the model's centre of gravity is no longer at a point approximately 33 per cent. across the wing chord from the leading edge, but at some indefinite point further back. The precise angle at which it is set is also difficult to prescribe, but is generally at a smaller positive angle than the wing. The lifting tail is therefore a better proposition for a modeller with some experience than for an absolute beginner.

I must qualify that last observation to some extent. If we are prepared to forego any extra lift and concern ourselves with the powerful stabilising ability, then a tail with a lifting section can be used with advantage even on a beginner's model and is so used on the Kamlet.



An interesting little single fin design by Reader R. Twomey, a youthful enthusiast. Here is encouragement to beginners to have a shot at designing themselves when they have gained a little experience.

The reason for using it on this design, however, is that the flat undersurface of the tail makes it easier to construct accurately.

This modified type of tail is a " lifter " probably only in the sense that it has a lifting section. To work dependably, the camber should be reduced to the absolute minimum and the tail be mounted to fly at a slight negative angle. The centre of gravity may be slightly behind the 33 per cent. wing-chord position, but probably not much behind. Actual details of settings will be given when we come to the question of trimming a model. For the moment I am concerned solely to explain, as simply as possible, the differences between the two types of tail.

One final point. Whether you use a " lifter " or a " non-lifter," your tailplane works on the principle of the " longitudinal dihedral angle." That is to say, if you were to project a line through the chord of the wing (each aerofoil section, by the way, has its own chord-line, of which more later) towards the tail, it would meet the tail chord-line, the two lines forming a very broad " V." Unless a model has this " V," it will not fly, the only exception being certain designs where the downwash of air from, say, a parasol wing, hits the tail at such an angle as to force it down. The remedy is then to change the tail angle even if it means giving it a greater tilt than the wing, or, alternatively, to mount the tailplane above the fuselage and join it to the fin. One of our illustrations, in fact, shows a glider with a tailplane in this position.

It may also be interesting and helpful to refer briefly to the so-called " tail-first " type of aeroplane, full-size and model, or " canard," to give it its correct technical name. In this type the mainplane, from which most of the lift is obtained, is in the rear, and in place of a tail there is a small lifting plane near the front of the machine, set, of course, at a greater angle than the rear mainplane. Unstallability is the principal virtue claimed, the idea being that the smaller front plane will stall and the nose drop before the rear mainplane on which the machine principally relies for lift can ever reach the stalling angle. The canard has its own peculiar problems, notably getting the side surfaces satisfactorily disposed, and getting the centre of gravity far enough forward without having to pile on dead weight in the nose. It is an interesting type, when you have the experience and the patience to make it work.

AERODYNAMIC DESIGN

PART SEVEN BY JOHN HALIFAX

Cowlings.

I wonder how many power model enthusiasts will direct surprised glances at that word, coming as it does directly under the heading "Aerodynamic Design." For it is a strange fact that in this era of scientific aeromodellers, we have all been so busy examining boundary layers and sub-layers, and generally revolutionising everything, that we have had no time to spare for unimportant details like engine cowlings. Yet in full-scale practice the fitting of a *suitable* one can halve the drag of the complete fuselage assembly, and there is no reason to doubt the validity of this for models.

I emphasise the word "suitable" because many of the affairs one sees erected round engines to-day are anything but. They prevent effective engine cooling, increase the drag, reduce the effective thrust of the airscrew, and are often of such a nature that they must be removed for competition flying. Yet the application of a few simple rules enables all this to be avoided, and a really practical cowling to be produced at the same time.

Single Cylinder Engine—Helmet Cowling.

This is illustrated in Fig. 2, and is applicable to both upright and inverted engines: in the latter case remember to drill a small hole at the lowest point for the normal (at rest) position—this to drain away excess oil, which can be troublesome if left to accumulate.

Baffle plates should only be fitted if cooling is found to be inadequate.

Coal Scuttle Cowling.

Since accuracy of description is the primary function of a name, our "coal scuttle" seems quite apt. Moreover, both machines are useful, the cowling particularly having a much lower drag than the Helmet type above.

The height of the entrance should be from 60% to 75% that of the cylinder, the lower figure being for a diesel, and the width equal to the diameter of the cylinder. If baffle plates are used the area may be reduced by 25%. The exit area should be 40%–50% that of the entrance.

Twin Cylinder Engine—The Townend Ring.

In actual fact of course, this is a "flattened" Townend ring, but since it works on the same principle, the name can stay. If a radial engine is to be cowled, the dimensions must be modified accordingly.

Note particularly the bulbous section, and its maximum camber point (shown in Fig. 4). Although its VL number is normally rather low, work so far indicates that it rarely operates in the sub-critical region because of the state of the airflow after passing through the airscrew. It should be set at four degrees to the tangent of the fuselage (the lines of which must be continued forward of the engine bulkhead for this purpose). The tangent touches the fuselage where it is cut by the vertical centre line of cowling.

With suitable amendments, all three examples are interchangeable, and this statement alone indicates the very fluid state of the subject at the moment. Years of research must be carried out before it will be possible to calculate the dimensions of a projected cowling as we can, for example, an airscrew to-day. Until then, every designer must be a research worker as well.

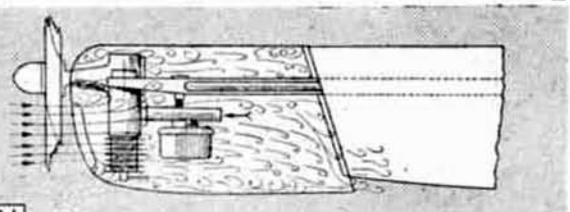


FIG 1. TYPE OF AIRFLOW EXPERIENCED IN A 'SCALE' TYPE COWLING

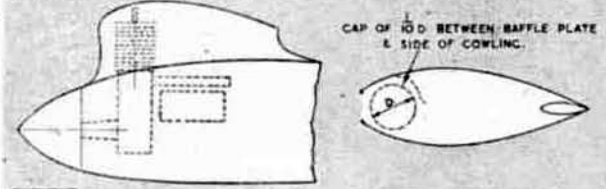


FIG 2. HELMET COWLING. NOTE— ONE BAFFLE PLATE SHOWN IN POSITION.

COAL-SCUTTLE COWLING. UPRIGHT & INVERTED EXAMPLES.

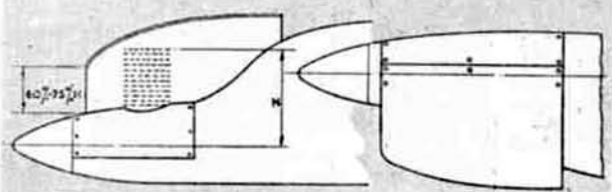


FIG 3.

FIG 4.

D - CYLINDER DIAMETER

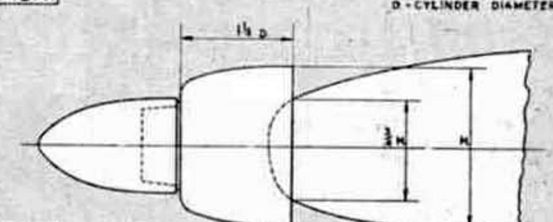
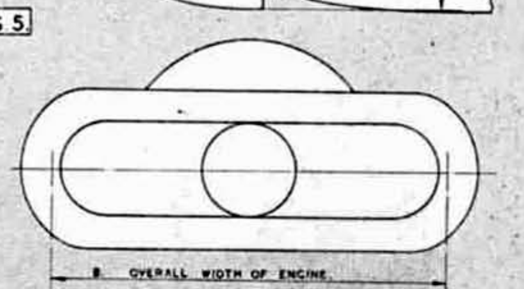
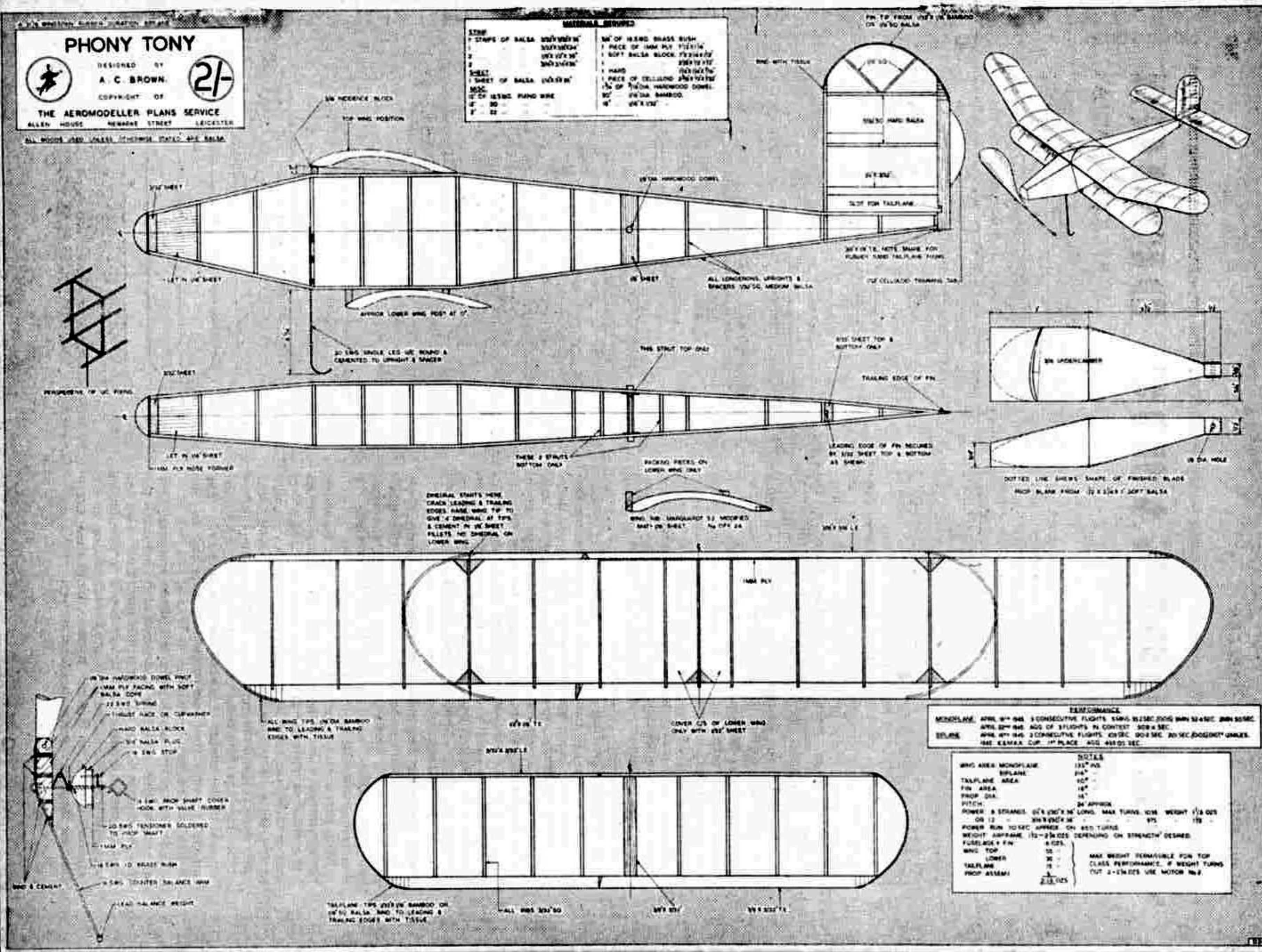
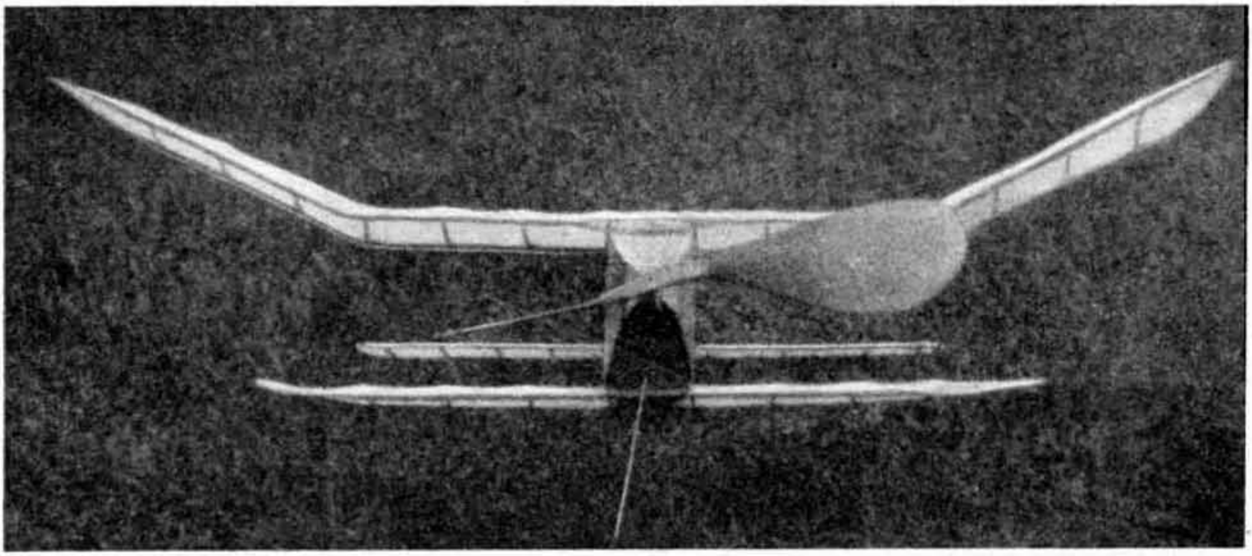


FIG 5.



NOTE:- CONVERGENCE OF FUSELAGE MUST EXTEND OVER AT LEAST ½ FROM THE T.E. OF THE COWLING.


PHONY TONY
DESIGNED BY
A. C. BROWN.
COPYRIGHT OF
2/-
THE AEROMODELLER PLANS SERVICE
ALLEN HOUSE NEWARKE STREET LEICESTER
TOP WING POSITION
APPROX. LOWER WING POSN AT 17"
ALL LONGERONS, UPRIGHTS & SPACERS 1/16"SQ. MEDIUM BALSA
THIS STRUT TOP ONLY
TRAILING EDGE OF FIN
LET IN 1/16" SHEET
THESE 2 STRUTS BOTTOM ONLY
PACKING PIECES ON LOWER WING ONLY
DOTTED LINE SHEWS SHAPE OF FINISHED BLADE
1MM PLY
SLOT FOR TAILPLANE
PERFORMANCE
MONOPLANE
BIPLANE
NOTES
WING AREA MONOPLANE
BIPLANE
TAILPLANE AREA
FIN AREA
PROP DIA.
PITCH
POWER
FUSELAGE + FIN
WING TOP
LOWER
TAILPLANE
PROP ASSEMBLY



LIGHTWEIGHT BIPLANE

PHONY TONY

DESIGNED BY A. C. BROWN

THE word "lightweight" automatically brings to any aeromodeller's mind a vision of the notorious paper bag full of rubber, but equally this is thought of as a high-wing or parasol monoplane. Such has been the general run since Mick Farthing pioneered the course. It is interesting, therefore, to find the same principles of structural and aerodynamic design applied to a biplane with equal success. The resulting model, now offered to our readers, proved the winner of that Biplane Classic the K. & M.A.A. Cup in 1945. Phony Tony, A. C. Brown's prodigy put up the impressive aggregate of 498·05 seconds to win the event, and that this was no mere flash in the pan has been proved by consistent flying on many occasions since. Consecutive flying times taken from a recent day's flying are tabled as 109·0 secs, 120·2 secs, 201·0 secs . . . from this last flight the model was recovered some 12 miles away.

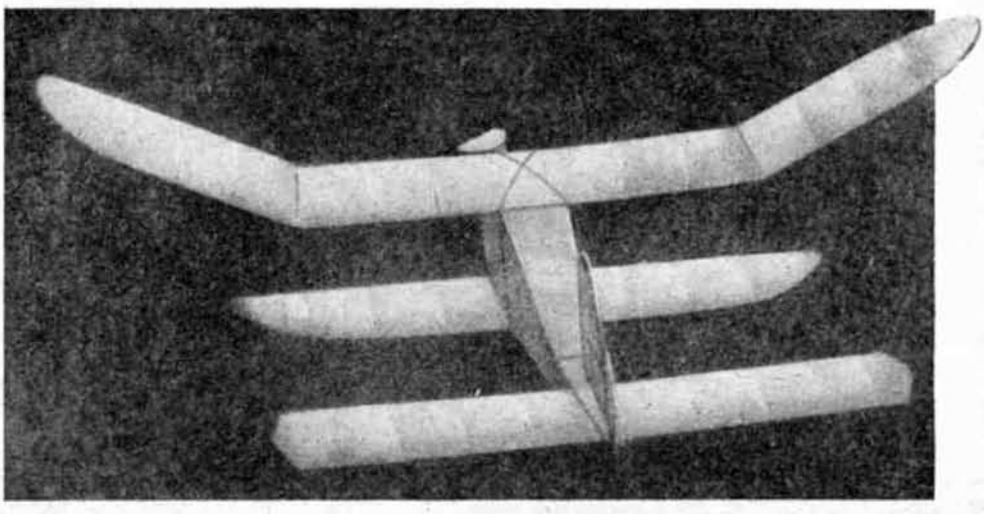
The cult of the biplane tends to be limited nowadays—less by lack of interest than the entirely erroneous belief that they are "difficult." Phony Tony is the ideal model to dispel such thoughts. Trimming is simplicity itself and will offer no more problems than a normal high wing monoplane, if the builder ignores the lower wing altogether when making adjustments. Splendid flights are no trouble and fliers will be rewarded not only by their contest placings but also by the attentive crowd that invariably attends the launching of a successful "bipe."

Generally the model follows standard lightweight practice with regard to construction featuring sparless wings and slabside fuselage. Thoroughly in keeping with modern trends is the absence of any undercarriage in the ordinary sense of the word, the only support for the instantaneous take-off being a thin wire whisker under the fuselage. A single bladed folding prop transfers the power of the rubber motor into suitable "urge."

Types with Pot-Hunting aspirations this season can get full size plans of "pot-collector" Phony Tony, price 2/- post free from Aeromodeller Plans Service, Allen House, Newarke Street, Leicester.

Above: Front view of Phony Tony gives an excellent impression of the tip dihedralled upper wing, the massive paddle type single bladed folding prop, and the drag defeating undercarriage "whisker."

Right: Phony Tony from the rear. The simple nature of the slabside fuselage and the sparless wing construction can be clearly seen. While of interest to the expert, no novice need be afraid of this fascinating biplane.



CIVIL AIRCRAFT · NO· 39

THE HAWKER CYGNET

By E. J. RIDING

DESIGNED and built for the light aeroplane trials organised by the Air Ministry at Lympne in 1924, the Hawker Cygnet was that company's one and only venture into the light aeroplane field.

Two machines were built, and for the competitions one was fitted with a 1,100 cc. A.B.C. Scorpion twin cylinder opposed engine, and the other, in which the late Sq. Ldr. W. H. Longton scored highest marks in the shortest pull-up competition (66·7 yds.), had a 1,100 cc. inverted vee-type Anzani.

Unfortunately, recurring engine trouble put both Cygnets out of the competitions—the A.B.C. Cygnet was actually within sight of winning the £2,000 prize when a rocker arm broke during the reliability trials.

Both Cygnets were entered in the 1926 Lympne Trials, this time fitted with 36 h.p. Bristol Cherub III flat twins—perhaps the most reliable and successful engine of its type in existence at that time. In 1926, each machine had to pass a series of tests—dismantling and erecting, dual controllability, take-off and pull-up—before entering the competition proper, in which marks were awarded for the ratio of useful load carried to the weight of fuel consumed over a distance of 1,963 miles.

The winner was P. W. S. Bulman, flying the second Cygnet, G-EBMB, his performance being as follows:—Total flying time: 30 hours 40 mins. 15 secs., at an average speed of 64·9 m.p.h. The useful load carried was 430 lbs., and the weight of fuel consumed was 388·8 lbs., giving a fuel consumption of 39 miles per gallon.

The other Cygnet, G-EBJH, entered by the R.A.E. Aero Club and piloted by Ft. Lt. Chick, gained second place, and only two other machines out of a total of 16 entries succeeded in completing the course.

In the 1924 trials neither machine carried official registration letters, the only means of identification apart from the engines being the numerals 14 and 15 carried on the fuselage sides and below the lower wings of the Anzani and A.B.C. machines respectively.

The 1926 trials were organised with a view to selecting a suitable aircraft with which to equip the existing flying clubs, but with the advent of the De Havilland Moth the official conception of the term "light aeroplane" had to be revised, and although the Cygnet had won the Air Ministry competition hands down it was not adopted for general use. With the exception of a brief appearance at the Bournemouth race meeting in 1927, both Cygnets were allowed to fade into obscurity. G-EBJH was crashed and written off in November, 1927, and 'MB, after lying derelict in the old pre-1914–18 wartime hangars at Brooklands, was broken up in 1933.

Photos by Courtesy of "Flight"

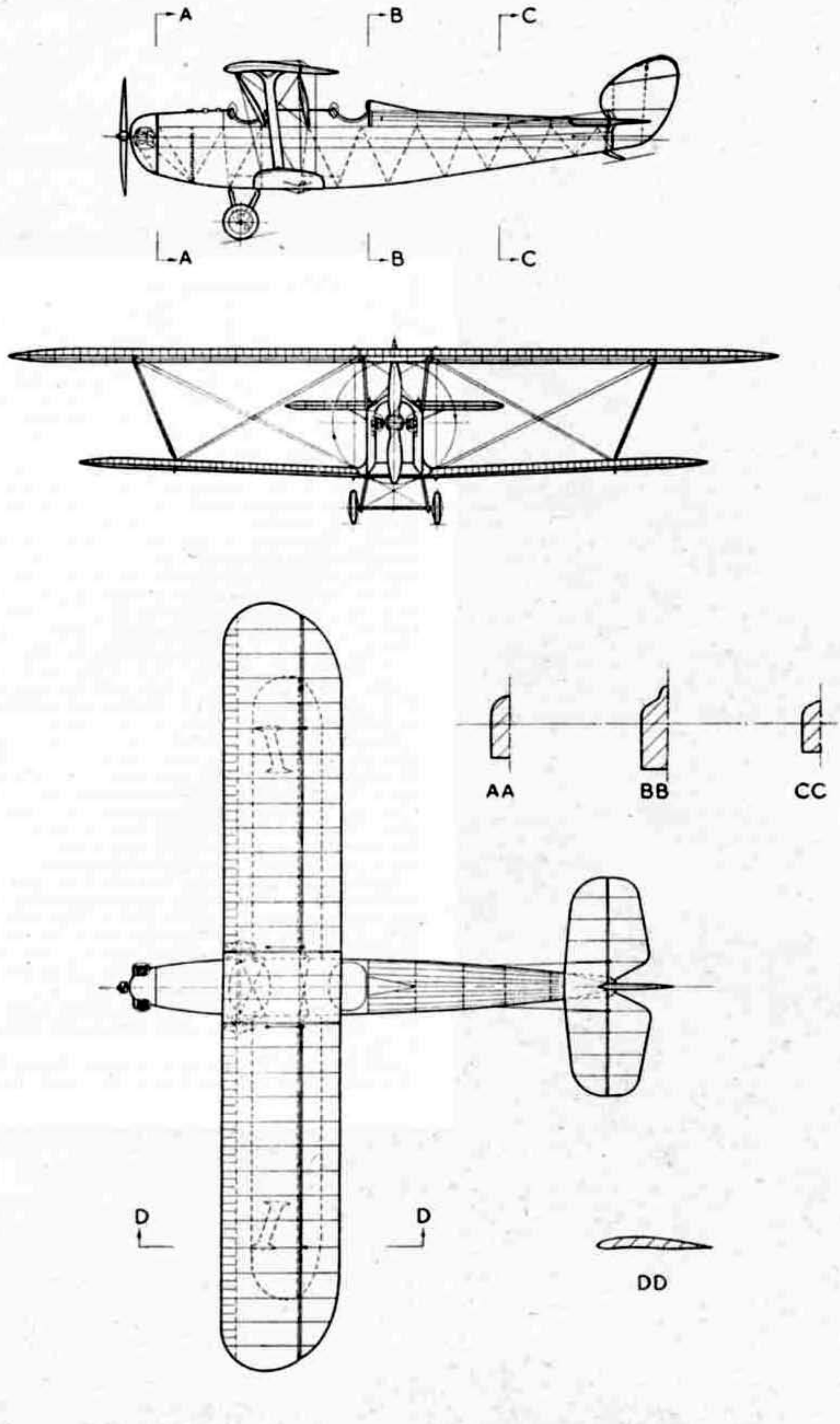
Construction: The Hawker Cygnet was perhaps the lightest two-seater aircraft ever to be built in this country, the tare weight being a mere 364 lbs., *including engine.*

Great pains had been taken to pare away all surplus weight, even the longerons and crossmembers being spindled out to an "x" section. The fuselage was an all-wood structure employing spruce longerons and diagonals with thin wedge-shaped stringers running down the back and sides supporting the fabric covering. The wings were of unequal span and chord with box type spruce and plywood spars carrying Warren type girder ribs. The ailerons, running along the whole length of the wings, could be pulled down in order to vary the wing camber. The vee-type undercarriage employed rubber cord shock absorbers.

Colour: Both machines were originally clear doped all over with black racing numerals. Later the racing numerals were replaced by black registration letters on the upper surface of the top planes and underside of the lower ones.

Finally, both machines were painted aluminium all over with black registration letters on the wings and fuselage sides, together with the nationality symbol "G" on both sides of the tailplane and rudder.

SPECIFICATION: Length, 20 ft. 3 ins. Span (upper), 28 ft.; (lower) 23 ft. Chord: 4 ft. 3 ins. and 2 ft. 6 ins. Height, 6 ft. 7 ins. Wing area, 213 sq. ft. Tare weight, 364 lbs. Loaded weight, 772 lbs. Max. speed, 65 m.p.h. Cruising speed, 50 m.p.h. Landing speed, 30 m.p.h. Power: One 36 h.p. twin cylinder horizontally opposed air-cooled Bristol Cherub III engine.



HAWKER CYGNET

FT.

PUNCTURES permitting Fliar Phil presses on quite regardless towards a rendezvous with Camp No. 1 at Eaton Bray. No other road hogs being in sight, he takes this opportunity of getting out his pencil and concentrating on this month's display of readers' wonders.

The Model of the Month has already received a write-up in the pages of the "AEROMODELLER," being the beautifully made sail plane of Mr. Sanderson, Percival Aircraft test pilot. It made its first flight at an R.A.F. Station Rally last October. The model is based on the well-known "Sunnanvind" design, but has a redesigned wing and tail-plane, the span being increased to 6 ft. 9 ins. The wing features the laminar flow L.D.C.2. section. The results were all that could be wished for, as the model turned in a delightful performance.

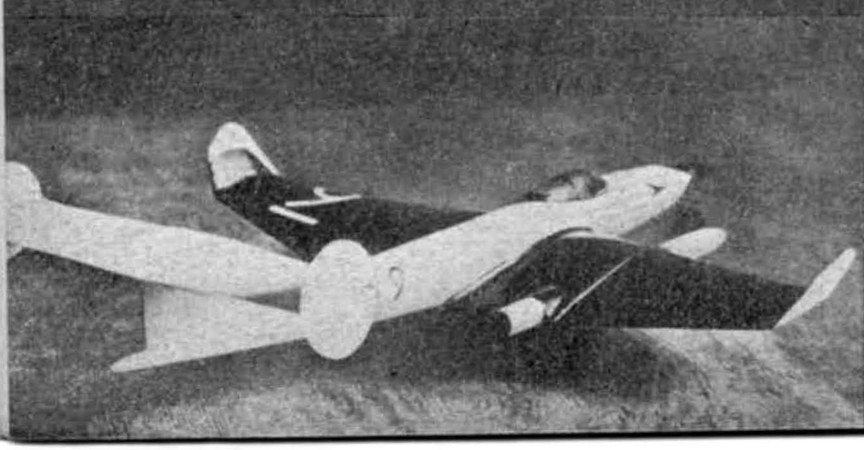
Our first photograph on the left is of a glider designed by Cpl. Dulkiewicz, recently of the Polish Air Force and now serving in the R.A.F. The model is very nicely made and Fliar Phil was lucky enough to meet the designer at Eaton Bray at Easter and was assured that the model is now covered and flying well very.

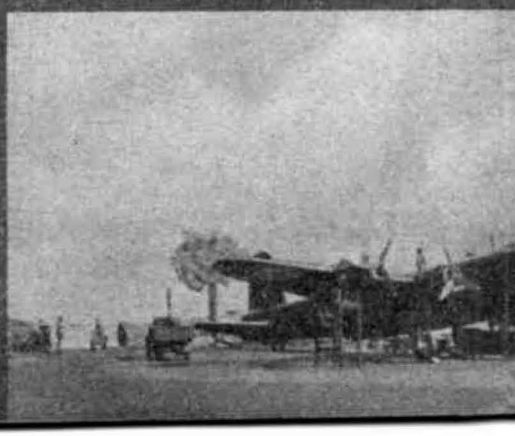
From Canada comes the second photograph on the left which shows a 44 in. span petrol model powered by a "Dreadnought" ·19 (3·15 c.c.) built by a staunch "AEROMODELLER" reader, Cyril Spray of Windsor, Ontario. This is a typical Canadian gas model with the high wing mounting carefully disguised by a cabin, instead of the usual very ugly pylon. Mr. Spray offers the comment that aeromodellers do not seem to be very well catered for in the Dominion at the moment, as there is no functioning model magazine in Canada.

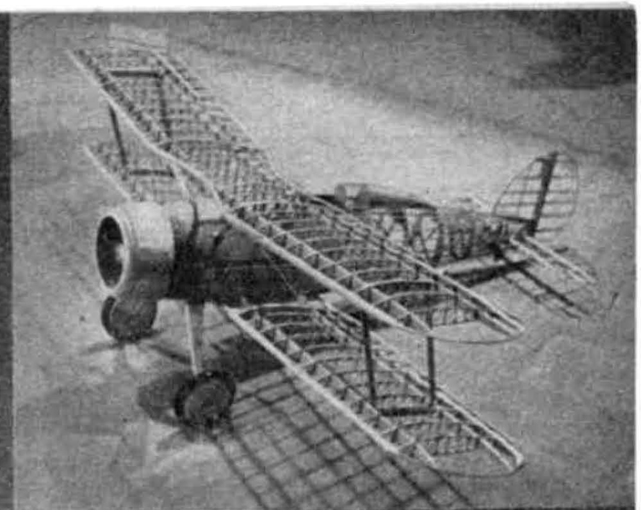
The unorthodox is featured bottom left in the shape of a twin rocket experimental monoplane built by F/Sgt. P. Wheldon of Quinton, Birmingham. The model was intended as a high speed R.T.P. type and at the moment test flights are under way. The wings are shoulder fitted and the compressed paper rocket units fitted to them are removable. The fuselage was carved from the solid and without the rocket fuel this little 14 in. span model weighs only 1 oz. Results of the tests are not yet to hand but we hope to hear from Sgt. Wheldon shortly.

Although not a solid fan himself, Fliar Phil always appreciates a cunning alliance of modelling and photography. Below centre is one of the best examples of a clever fake we have yet seen and is the work of M. J. Hickling of the Nautical College, Pangbourne, and his father. The whole base of the model aerodrome setting measures 9 ft. long by 4 ft. wide, and the hangars and huts are all fitted with electric light. All details and accessories were made in the case of some of the lorries while in hospital. The scene in the photo below represents a Stirling dispersal area, the pretty cloud background being carefully engineered for the occasion.

Just lately there seems to be a vogue, despite the housing shortage, or larger and sometimes better solids. L. R. Jerome of Reading, sent







us the photograph, bottom right, of a very interesting Boeing Fortress B.17G, which has taken him three years to build. Note the span which is 6 ft. 5 ins. and the weight which is in the region of 15 pounds. Fliar Phil can only presume in this case that perhaps Mr. Jerome has a very large piano. However, the model itself features so many details which work that it is something of a solid modellers dream. Landing and tail wheels are fully retractable, operated from the cockpit, and the main wheels are sprung in oleo fashion. The model is equipped with full lighting even down to undercarriage lights which intimate position of the undercarriage! Landing lamps, navigation lights and cockpit lighting are operated by switches on the instrument panel and the fully opening bomb doors are also worked from the cockpit. Four radial engines are installed in the nacelles and the airscrews are driven by four 6-volt electric motors.

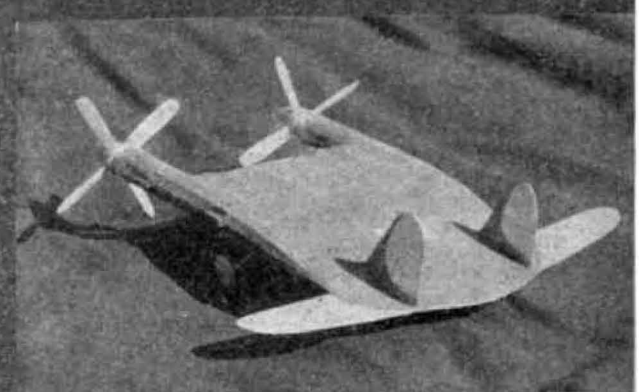
Radio control enthusiasts are a steadily growing band and E. S. Bassett of Doncaster is one of their number. The photo on the right shows the builder with his radio model of 8 ft. span powered by an O.K. Super 60. The fuselage length is 46½ ins. and the all up weight complete with batteries is 7 lbs. 12 ozs. The model is now covered and only awaits suitable flying weather before it makes its maiden trip. The transmitter fitted works the receiver in the model perfectly which in turn works the rudder flap.

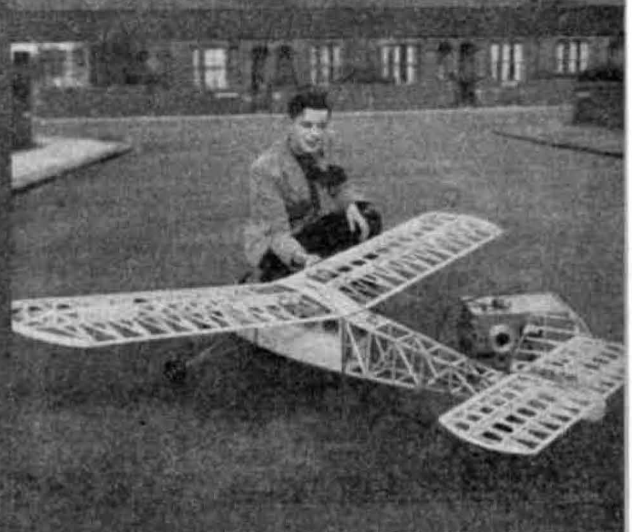
A most interesting experiment in R.T.P. speed work was brought to an untimely conclusion a few months ago by the sad death of the designer Cdt. Pilot A. C. Taylor, in a flying accident. The original model, illustrated top centre right, was based on the unorthodox Chance-Vought XF5U-1 and designed as an R.T.P. speed model. The overall length was only 18 inches but an unofficial speed of 24 m.p.h. was put up during the first test which was all the flying the model had.

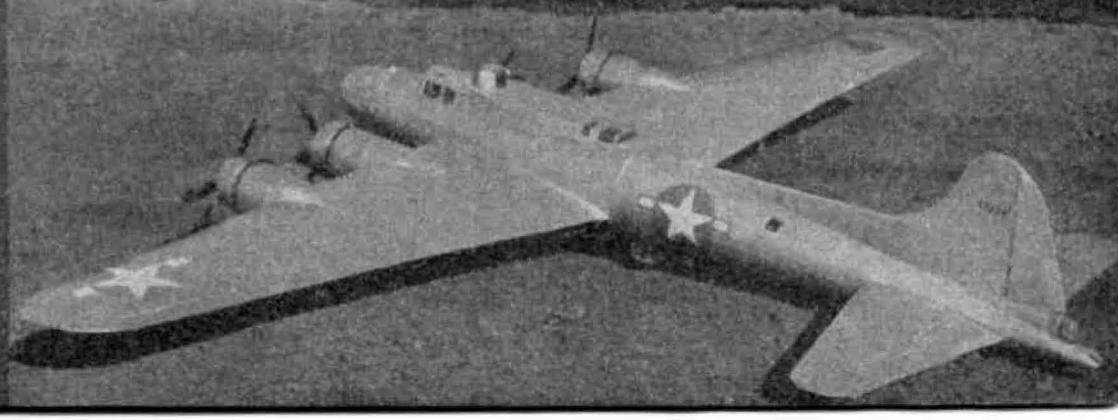
Photo top left is another that has travelled a considerable distance to reach Fliar Phil and Model News. The subject is a fully detailed model Gladiator built-up from over two thousand parts exhibited by the Victorian Model Aeronautical Association at an "All Models Exhibition" at the Town Hall, Melbourne, Australia. There's no lack of enthusiasm or craftsmanship "Down Under!"

It is a well-known fact that few model traders can resist the lure of their own wares and our centre and last photo above seems to prove the point. It shows Ian Davies, Director of the well-known balsa firm of E. Law & Son, caught in a busy moment at Eaton Bray while tinkering with a couple of his petrol models. When time, that elusive factor, allows he is an ardent aeromodeller and Fliar Phil hopes to see him and many other traders proving their own designs at Eaton Bray.

Indeed, Fliar Phil himself may occasionally be seen there urging on a model of doubtful performance and peculiar design, now that the tide has gone out and the drome is once again in full view . . .







GADGETS to the fore once again—especially in the Editorial Office when these lines were being written. The most unbelievable devices were being pressed into use in an attempt to keep the office at a habitable temperature. Cardboard was nailed tightly over all doors, and the windows are never likely to open again, so enthusiastic were the activities of our Draught Excluding Detachment. Our Assistant Editor was last seen blazing merrily in a paraffin-soaked overcoat near some frozen pipes—whether he had been making a valiant attempt to de-freeze them or was merely making a last desperate stand against the cold is not known . . . Anyway, we didn't put him out until the last minute, editorial modelbods being hardy types, and thus increased the temperature by a welcome ten degrees. You who bask in the warmth of Spring (?) spare a thought for us who laboured in the Ice Age !

Now that the sun is shining, let us take a look at an idea suggested by G. G. C. LEMAN of Charterhouse, put into practical form by Consus and Bagley (the Old Firm). Putting undercarts on petrol models well forward is a sensible safety measure that enjoys almost universal popularity. The practice has one great drawback, however, in that an undesirably large proportion of the total weight is thrown on the tail when the model is resting on the ground. This results in the tail rising more sluggishly than is desired at take-off, and a longer take-off run than would otherwise be required. A scheme for a cure is offered in Fig. 1. By fitting a sprung tailwheel connected by a piano wire shaft to the movable elevators, the elevators are depressed while the tail is in contact with the ground at take-off, as in a full-size machine. This, of course, has the effect of lifting the tail very quickly, and as soon as this happens the tailwheel returns to its normal position, and the elevators to neutral. No guarantee is supplied with this idea, but it would seem to have a reasonable chance of working. The main drawback is the possibility of the tail coming up before the model has obtained sufficient speed, giving only prolonged taxying because of the tail dropping back sharply every time the tailwheel comes off the ground and the elevators return to neutral. A little experimenting, however, should soon cure this fault if it arises.

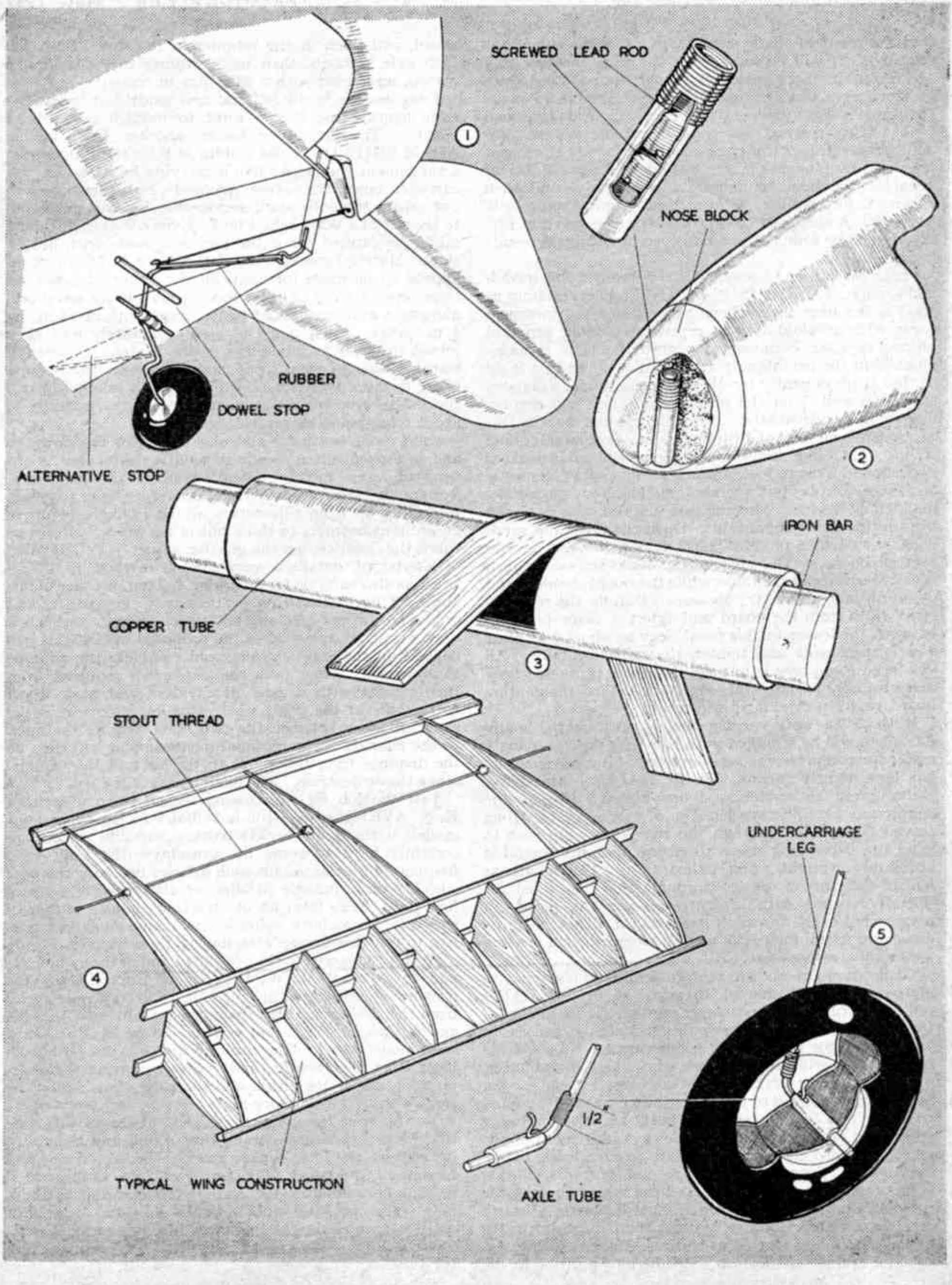
Aerials have a great attraction for solid model gadgeteers, and still another system of making these is sent in by S. G. B. DUNLEAVY of Londonderry. Simple enough—all you have to do is to take a tube of Durofix or balsa cement and dab a little on to the tip of the aerial mast, drawing steadily and slowly across to the other point of attachment. Wrap the strand of cement around it with the aid of the tube end and sever. This leaves you with a fine white line which can be painted if required and looks much better than thread or wire.

In Fig. 2, R. C. MILLS of Cranbrook, gives you an ingenious and essentially practical method of converting an ordinary pair of school compasses into a cutter for making circular formers from sheet. A portion of a broken razor blade is fitted between the two halves of a split piece of pencil, and the whole is then clamped in the normal screw-up holder of the compasses, making a useful tool that will cut accurate circular formers with the minimum of trouble.

From R. K. FARROW of Ilford comes the solution to tracing problems arising from the occasional necessity of laying out the other wing of a design whose plan, through considerations of space, shows only the port or starboard. We all know the agonizing moment when, our tracing paper in place, we have very nearly completed tracing the wing we want—and then discover that a too enthusiastic stroke of the pencil a little while back moved the whole out of alignment without our noticing, and the shape we have drawn on the tracing paper fits the original only here and there. Well, we can save ourselves our inevitable scream of anguish by making use of this simple suggestion. Instead of tracing the outline of the printed wing on tracing paper and reversing, merely pin the plan down firmly on to a table or other suitable surface with several sheets of carbon paper underneath, carbon side upwards, and run over the outline with a pencil, when the correctly reversed drawing will appear on the back of the plan, so that, even if the paper slips, the accuracy of the reversed outline will be unimpaired.

Those of you who find that your glider makes a noise like a moneybox will welcome news of the way in which R. SANDERSON of Upper Heyford effectively prevents a rattle from his weighting. Take a look at Fig. 3, which shows all the details. The container is a $\frac{1}{2}$ in. B.S.F. bolt with the head cut off. After being drilled centrally 11/32 in. and tapped $\frac{3}{8}$ in. B.S.F., it is screwed in place in the suitably shaped noseblock. A $\frac{1}{2}$ in. hole drilled in the noseblock should provide a comfortable friction fit. All that is now required is a number of lead weights died $\frac{3}{8}$ in. If suitable lead bar is unobtainable, cut and file $\frac{3}{8}$ in. dia. pieces out of other bar or solid lead block. The end of each weight is slotted to take a screw-driver. An assortment of weights must be made, adjustment then being easy ; simply alter their number as required, turning them by means of a small screw-driver and leaving the last one flush with the surface of the model.

Consus, who has often suffered sadly scalded fingers in attempts to steam-bend the harder varieties of woods, hails with rejoicing a method of bending hardwoods and ply by means of dry heat offered by R. J. COX of Birmingham. No more steaming kettles, for all the equipment consists of is a metal tube (preferably with $\frac{1}{4}$ in. walls, $\frac{3}{4}$ in. internal diameter, $1\frac{1}{4}$ in. external diameter, and made of copper) into which an iron bar of just under $\frac{3}{4}$ in. diameter fits loosely. The tube is gripped in a vice, and the bar heated to red heat in a fire and inserted in the tube. The wood to be bent is pressed on to the tube until the heat can be felt through the wood, showing that the heat has completely penetrated. Work the wood


SCREWED LEAD ROD
1
NOSE BLOCK
2
RUBBER
DOWEL STOP
ALTERNATIVE STOP
IRON BAR
COPPER TUBE
3
STOUT THREAD
4
UNDERCARRIAGE LEG
5
1/2"
TYPICAL WING CONSTRUCTION
AXLE TUBE

into the required shape, bending it round the tube or as required. It will be found that the wood bends easily and retains its shape very well, though normally a slightly greater curve than is finally required should be made as there is a slight tendency to spring back when the wood cools. This method, as used by violin makers, has another variant in the chair-makers' trade. They heat the wood by plunging it into heated sand for a sufficient time for the heat to penetrate completely, and then remove it for bending. This method requires more skill, however. A sketch of the first apparatus is given in Fig. 4. It will be found that a hard permanent bend results from its use.

Sheer low cunning is a speciality of photographic model-bods and R. J. BENNISON of Cambridge is certainly as good as the next man where this quality is concerned. Away with celluloid discs to represent turning props in photos, says Mr. Bennison, just grab the blow arrangement from the neighbour's vacuum cleaner and rig it up so that it plays gently (*gently* or else the model will move around as well!) on the props, when they will revolve merrily and consistently. No whit less ingenious is this gentleman's method of stripping balsa. Consus can't help feeling that, like himself, Mr. Bennison hates *making* gadgets and likes to look around to find what domestic appliances can be put to new and home-loving-female-maddening devices. This method is specifically designed to ruin the dining room table. Open the table and sandwich in as long a piece of board as possible, and several exercise books. The edges of the books should be flush with the surface of the table, while the board should stand about an inch above it. Measure carefully the required strip width from the board and insert a razor blade in between the leaves at this point, leaving about ¼ in. clear as a cutting edge and tighten the table right up. All you need to do now is to push the wood through firmly and steadily, keeping the edge firm against the guiding board, and a perfect strip will result.

With balsa still varying widely in quality, many modellers will be troubled with ribs that sag annoyingly under the compression loads developed after the covering has been tightly shrunk. P. W. HALL of Amesbury, Wilts, cured his models of "bow-legged" ribs by the simple scheme illustrated in Fig. 5. A piece of strong thread is threaded through the ribs from wing root to wing tip, care being taken to ensure that the thread is absolutely straight when pulled taut. The points at which the thread passes through the ribs must be liberally coated with cement, likewise the points of attachment of the thread at root and tip. This scheme is especially useful for petrol models where the rib spacing is normally rather wide.

Genius now descends to the problem of undercarriages, and wheels, fixing thereof, thereto. W. A. POLLARD of Leeds evolved the very clever method shown in Fig. 6. Designed for celluloid wheels in particular, it can easily be modified for the hubless wooden type. No soldering is necessary, a blessing to those who, like the originator, found that their first and last attempt at soldering a washer on to the end of the axle resulted in a sadly melted wheel! The binding is quite neat, and the retaining spring not only prevents any sideways movement of the wheel, but also effectively prevents any tendency to slip up the leg. Construction and assembly are as follows. Enlarge the hole on one side of the wheel to take the piece of aluminium tube, which must be cut to a length of approximately 1/32 in. greater than the total width of the wheel, and slotted as shown. Make the 22 s.w.g. retainer spring. Now drop the tube into position in the wheel, and hook in the retainer in the slot. Push the stub axle through, then bind retainer to leg with fine cotton, and cover with a thin film of cement.

Long grass is lovely for that new model but becomes a trifle aggravating if you want to indulge in a bit of R.O.G. To the rescue comes another Irish laddie, ADAM SHIELDS of the Dublin M.F.C., with a cunning arrangement that looks like a carrying box (in fact *is* a carrying box), but when required—hey presto, opens out into a take-off board serviceable for any model up to the size of a Wakefield, Fig. 7. Even a Wakefield model might be catered for if the box was made with deeper sides. Material specified is ⅛ in three-ply, but they would appear to be more fortunate in the Emerald Isle than over here. Cardboard of a good stout quality should do almost as well when fixed to the framework of 1½ in. by ⅛ in. laths. Each panel is made separately and then joined together by hinges as in the sketch. A word of warning—as the straps and buckles are on the outside of the box and therefore on the face of the take-off board, they should be placed as near the ends as possible to avoid tripping up an erratic model.

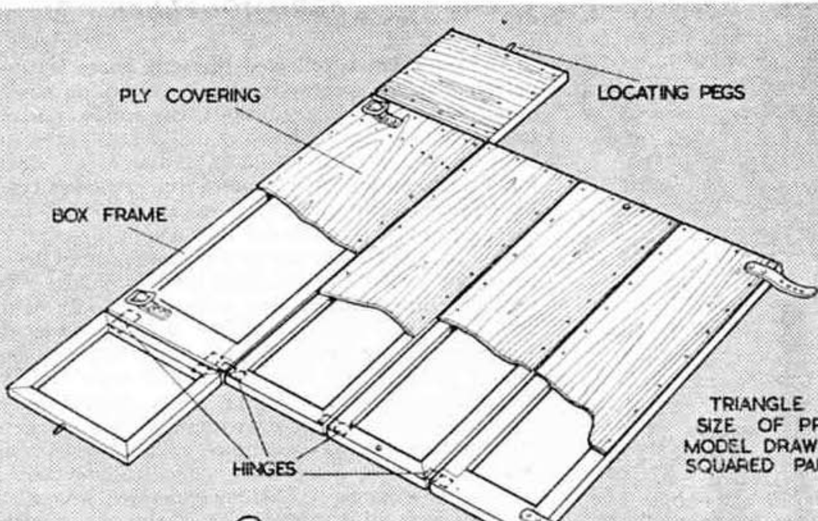
Solid modellers have a strong liking for the unusual, and as a result often decide to build a model that is not featured even in the extensive range of the AEROMODELLER Plans Service. They therefore have to resort to scaling up from silhouettes, which is likely to prove an arduous business to those not in the know. However, this is the chance to get the gen, for reader J. F. CHOWN, of Knutsford, details a very simple method in Fig. 8 which is also suitable for enlarging 1/72nd or other plans. Mark off horizontally on graph paper the span of the original drawing or silhouette. From one end of this line draw vertically the span of the proposed model (this will depend on the chosen scale), and complete the triangle thus formed. Now take the dimension required from the original with a pair of dividers and step it off *horizontally* at the point where this measurement is the exact distance between the two lines forming the apex to the triangle. The required measurement will then be the distance from this point to the apex of the triangle along the *vertical* line. The sketch makes it easy.

Just the job for the coming season is an idea from K. S. AVERY of Newton-le-Willows for carrying your models without a wheeled truck. Suitable wheels are certainly hard to come by nowadays (the junk yard frequented by Consus for such articles has only the gear wheels from a mangle to offer, or alternatively a set of four (best steel) from an old traction engine, neither of which is particularly suitable), so many modellers may like to use this simple attachment to a bicycle, Fig. 9.

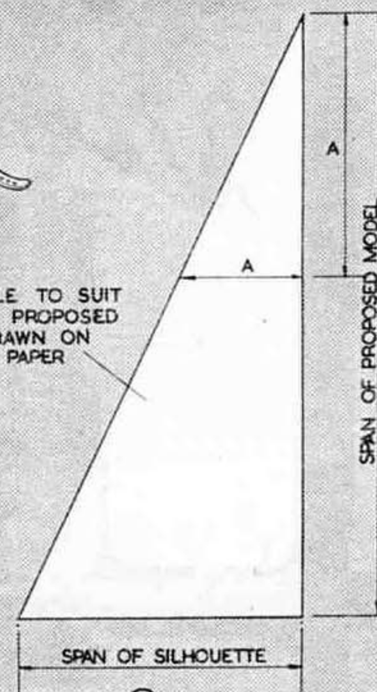
Nothing is sacred to the grasping hand of the gadgeteer, and to prove it M. W. PAYNE of Exeter sends the conversion illustrated in Fig. 10. Cut one side away from the rubber pad and shape the remainder with a file and sandpaper block, and you have a perfect tyre for a solid model wheel. You can buy the pads price 1d. each from most Woolworths, and you ask, sparing the assistant's blushes, for shock-absorbers (is that really the right word?) for lavatory seats!

To cap this, however, J. CLARK of Cullercoats tells that we can save ourselves all this trouble and heartburn by visiting the local Singer Sewing Machine depot and buying up their stock of little rubber rings as illustrated in Fig. 11, removing the embossed name and fitting a hub. The resulting wheel is ideal for solid work but equally suitable for the tailwheel of a flying model.

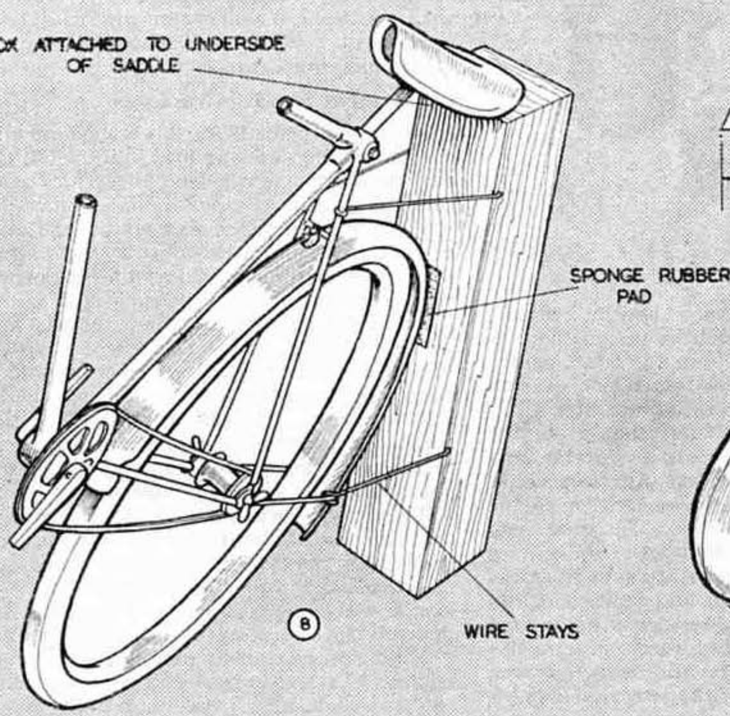
Well, you've had your basinful. No further helpings till July.

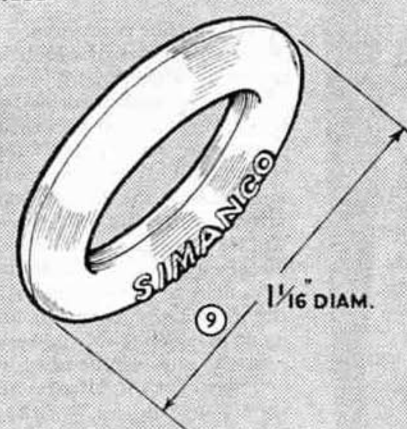

PLY COVERING
LOCATING PEGS
BOX FRAME
HINGES

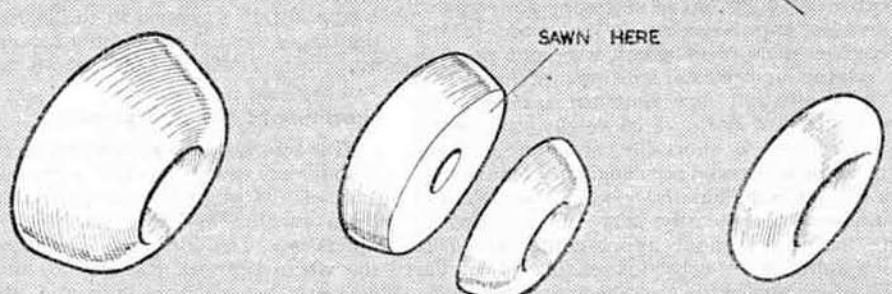
(6)


A
A
TRIANGLE TO SUIT SIZE OF PROPOSED MODEL DRAWN ON SQUARED PAPER
SPAN OF PROPOSED MODEL
SPAN OF SILHOUETTE

(7)


BOX ATTACHED TO UNDERSIDE OF SADDLE
SPONGE RUBBER PAD
WIRE STAYS
(8)


SIMANCO
1 1/16" DIAM.
(9)


SAWN HERE
RUBBER BUFFER
FINISHED TYRE

(10)

A ·8 c.c. Diesel

The engine actual size.

BY LAWRENCE · H · SPAREY

THE little compression ignition engine, particulars of which we present here, is really a development from the 5 c.c. engine which was described in last May's issue of this Journal. So successful was the 5 c.c. prototype, that it was felt that a smaller edition might be even more acceptable, and more able to take advantage of those peculiar virtues which the compression ignition engine has for model aircraft work. The very small diesel engine does, in fact, open up quite a new field in model aeronautics, in so far as the absence of batteries and ignition equipment makes possible power-driven aeroplanes of a size and weight not hitherto practicable.

This, in itself, is a revolutionary advance model aeronautics, yet the remarkable lightening in weight of the necessary power plant enables improvements to be made to the engines themselves which were not possible with engines relying on electrical ignition systems. It is a generally acknowledged fact that the necessity for saving every fraction of an ounce of weight was responsible for the comparatively short life, and many fragile features of the orthodox model aero engine. Fortunately, the model diesel, not being handicapped by the weight of external equipment, may easily bear the addition of strengthening features without approaching anywhere near to the weight of an orthodox engine of similar capacity. Thus, in spite of the greater strains to which a diesel engine is naturally subjected, features may be incorporated which not only nullify the effects of these increased strains, but which may result in an engine actually capable of a longer useful life.

As the design is followed through, these features will become evident, yet we may draw attention here to the exceptionally robust crankshaft, the ample bearings, the truly massive bearing-housing of the crankcase, and the large big-end bearing—5/32 in. in diameter. Bearing in mind that many 5 c.c. engines of the orthodox type have big-end bearings of only ¼ in. in diameter in many cases, it will be appreciated that such proportions on an engine of under 1 c.c. capacity as are featured here, must make for exceeding reliability and long life. Yet the weight of the complete unit with fuel is only 3½ ounces, and it will fly a model aeroplane of 36 to 40 inches span.

Except for one exception, the machining of the engine should present few difficulties, and only one or two dimensions are truly critical. These critical dimensions have been given on the drawing in *decimals*, whereas all other measurements are shown as fractions. Thus the model maker may more easily concentrate on those things which really matter. The one exception which we mention above is, of course, the fit of the piston within the cylinder. This must be a truly immaculate fit, as any leakage of gas past the piston, with an engine of such small stroke, would be disastrous. Most of the failures with the 5 c.c. engine were due to a bad fit of these components; with the present small engine the matter is of still more importance.

Component No. 1. Crankcase.

As the components for this engine are all of such small size, no castings are specified, although if the constructor cares to make up a wooden pattern for the crankcase, and can get it cast in aluminium, he may do so. In the original, the crankcase was machined from a solid piece of duralumin, and little difficulty was experienced. The duralumin rod was chucked off-centre in the four-jaw chuck, and the bearing housing stub was turned. The job was then roughly sawn to shape, and finished to scribe lines with a file. The piece was then held in the three-jaw chuck by the bearing stub, and the crankcase bored and screwcut, and the hole for the bearing drilled and reamered. It will be noted that the disc of the *crankshaft* revolves in a closely fitting recess in the back of the crankcase. This was done so that the crankcase space might be kept to a minimum.

The job was then removed from the chuck and mounted on an angle-plate on the faceplate of the lathe, so that the seating for the cylinder might be bored, and the crankcase machined down to the correct height. This dimension, it will be noted, is one of the critical ones, as upon it depends the correct opening of the ports by the piston.

Milling of the transfer passage and the clearance for the con-rod was done in the lathe, by bolting the crankcase to the cross-slide, after packing up to the correct height. A ⅛ in. end mill was used in the chuck. On removal from the lathe, the job was finally cleaned up with a file and fine emery cloth, buffed, and all necessary holes drilled and tapped.

Component No. 2 Cylinder.

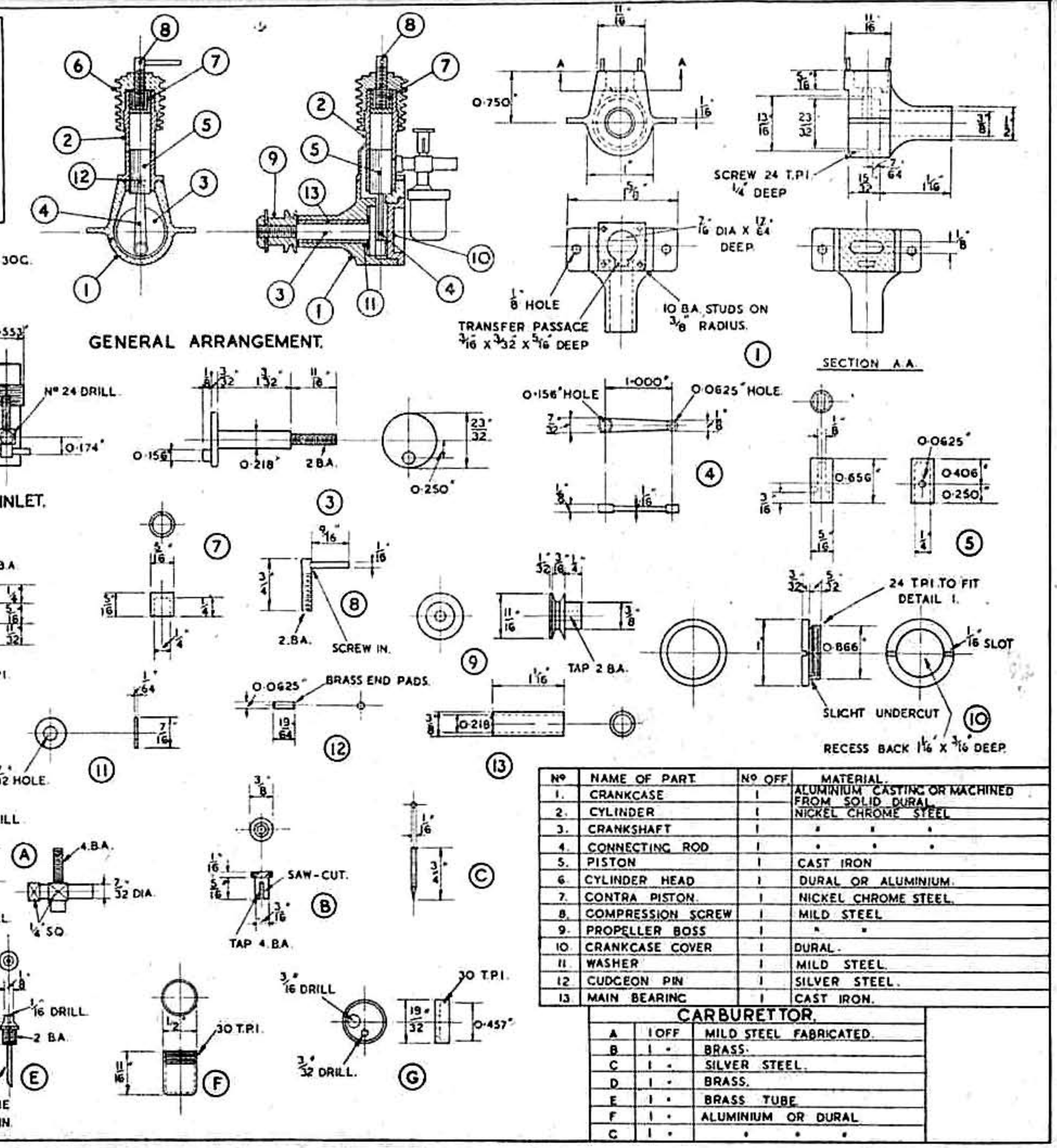
This was made of nickel-chrome steel, which has been found very good for the purpose, and is also easily worked. Most of the machining on this component is plain turning and screwcutting, and will present no difficulty. The bore, however, may be considered to be the whole heart of the engine, and upon this must be concentrated all ones care and ability. Although the bore and piston are the most vital parts of the engine, the actual diameter of these components is not critical; what matters is that they should be a most perfect mating fit. As a start, drill the bore with a 9/32 in. drill, and

·8 DIESEL ENGINE.

DESIGNED BY L.H. SPAREY.

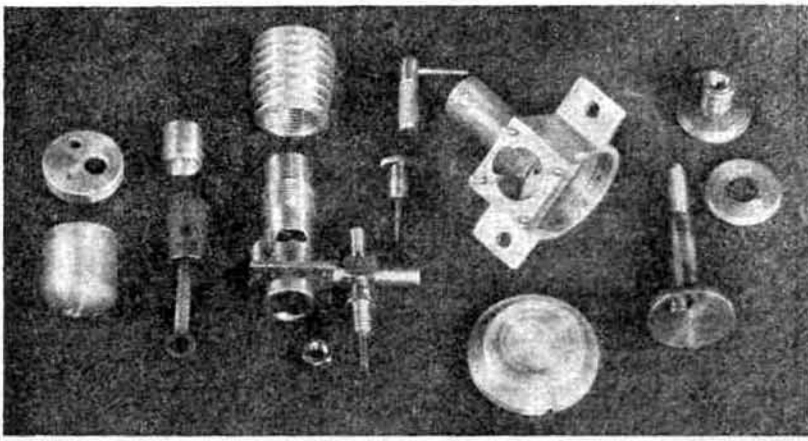
EDWARD BUILDINGS, RUTLAND STREET, LEICESTER.

3/6



Nº	NAME OF PART	Nº OFF	MATERIAL.
1.	CRANKCASE	1	ALUMINIUM CASTING OR MACHINED FROM SOLID DURAL.
2.	CYLINDER	1	NICKEL CHROME STEEL
3.	CRANKSHAFT	1	" " "
4.	CONNECTING ROD	1	" " "
5.	PISTON	1	CAST IRON
6.	CYLINDER HEAD	1	DURAL OR ALUMINIUM.
7.	CONTRA PISTON.	1	NICKEL CHROME STEEL.
8.	COMPRESSION SCREW	1	MILD STEEL
9.	PROPELLER BOSS	1	" "
10.	CRANKCASE COVER	1	DURAL.
11.	WASHER	1	MILD STEEL.
12.	GUDGEON PIN	1	SILVER STEEL.
13.	MAIN BEARING	1	CAST IRON.

CARBURETTOR.		
A	1 OFF	MILD STEEL FABRICATED.
B	1 "	BRASS.
C	1 "	SILVER STEEL.
D	1 "	BRASS.
E	1 "	BRASS TUBE
F	1 "	ALUMINIUM OR DURAL
G	1 "	" " "



The components displayed before assembly. A high standard of workmanship must be adhered to.

then bore with a single point tool to a diameter just 4 thous. less than 5/16 in. Then finish with a " floating " reamer. This means that the reamer is not held rigidly in the tailstock chuck, but is steadied by the tailstock centre, the reamer being held in a tap-wrench to prevent turning. Use slowest back-gear, slow feed, and plenty of suds or oil, and keep the job revolving during the whole operation of entering and withdrawing the reamer. In this way a true, polished hole will result.

The bore may now be lapped. The question of lapping technique and methods is, of course, too complicated to be entered upon here, and we must take it that the would-be constructor has had some experience in this direction. Whatever method is used the resultant bore must be truly round, parallel, and with a very high finish—a result not easy to obtain by careless or haphazard methods !

Port positions and size must be set out with accuracy, and are best completed by filing up from drilled holes. It will be noted that the positions of the transfer and two exhaust ports are given from the *underside* of the cylinder flange to the *bottom* of the ports. On the other hand, the inlet port, being a round hole, is measured from the *bottom* of the flange to the *centre* of the hole. The transfer passage is bent up from thin sheet steel and soft-soldered on, but it must be noted that all work such as this, and the cutting of the ports, must be done before the lapping process. This must be the very last operation of all. It is important that all surplus lapping compound or metal polish be removed from the job. Wash thoroughly in paraffin oil, and then scrub out in several washings of soap and hot water. This is important.

Component No. 3. Crankshaft.

Turn this from nickel-chrome steel, and ensure that the shaft is parallel and bears a high, polished finish. The whole shaft, including the crank pin, should be machined from the solid. It will be noted that the web of the crankshaft is left as a solid disc, and that no attempt has been made to balance the engine by shaping the web in the orthodox manner. In engines of this size the amount of metal which can be removed from the web of the crankshaft bears so small a relationship to the reciprocating parts which it is desired to balance, that it is practically useless to attempt to do so. Balance on engines of this size seems to be unimportant, which is fortunate because it is almost impossible to achieve ! On the other hand, the minimum of free space in the crankcase is of the highest importance, as the displacement is so small that every precaution must be taken to increase crankcase compression. Therefore do not cut away the crankshaft web in an effort to obtain balance. You will achieve no results in this respect, but will definitely impair the efficiency of the engine in other ways.

Component No. 4. Connecting Rod.

This also is made from nickel-chrome steel, and care must be taken to get the centres of the bearing holes at the correct distance from each other, and of the correct size. The con-rod is mostly handwork, and should be *case-hardened* when finished. As a final operation, the bearing holes should be lapped out, using tiny laps made from brass or copper rod.

Component No. 5. Piston.

All the above remarks upon accuracy of bore apply with equal force to the piston, which is of cast iron. It will be found an advantage to turn the piston on a long shank of smaller diameter. This may be gripped in the chuck for turning and lapping processes. Rough turn the outside, drill and bore internally, and mill the internal slot in the lathe. The piston may be gripped in the toolpost by the shank, and a ⅛ in. end-mill operated from the chuck. The gudgeon-pin holes may then be carefully marked out, drilled and reamered. Finally, lap to a fit with an external expanding lap. When lapping is completed, carefully part-off from the shank, and remove burr with the finest of Swiss files. It must be emphasized here that if the fit between the piston and cylinder is not perfect, the engine will not work ! Constructors will not need to be reminded that under no conditions must the piston be actually lapped within the cylinder ; there is not room for the thinnest layer of lapping compound between them, and should they be intimately lapped, even with jewellers' rouge, the fit will be too loose when the rouge is washed out.

Component No. 6. Cylinder Head.

A plain turning in duralumin or aluminium. The former is to be recommended owing to the cleaner thread which may be screw-cut in this material.

Component No. 7. Contra-Piston.

Make this of the same material as is used for the cylinder, for preference nickel-chrome steel. The contra-piston must be a light tap-in fit in the cylinder bore, as there must be no leak here. Leaky contra-pistons are a common fault, and will prevent the engine from running.

Components Nos. 8 and 9. Compression Adjusting Screw and Propeller Boss.

Plain turnings from mild steel. The pulley should not be made from aluminium or dural in an effort to achieve lightness, as these metals will yield under the tightening up of the propeller nut, and will bind up the engine. The pulley groove is useful when finding starting positions of throttle and compression screw.

Component No. 10. Crankcase Cover.

Turn this from dural, as there is less danger of the threads binding-up and stripping, as sometimes happens when aluminium is screwed into aluminium.

Component No. 11. Washer.

This is of mildsteel, and should not be hardened, as the thickness in only 1/64 in. and there is danger of a hardened washer such as this breaking up under load, with disastrous results. For the same reason, brass or bronze must not be used.

Component No. 12. Gudgeon Pin.

Silver steel, with end-pads of brass. These pads should be a tight tap-in fit in the piston, and should be very carefully forced into place with a small pin punch and a light hammer. Rest the piston on a true V-block during this process to avoid distortion.

Component No. 13. Main Bearing.

This is of cast iron, and should be lapped on a small copper lap after pressing into the crankcase, to fit the crankshaft. If a good fit is obtained in the first place, together with a polished surface, the bearing will last for a very long time indeed.

Carburetter.

The body of the carburetter is made from a piece of ¼ in. square mild steel, through which a hole is drilled; a piece of 3/16 in. round mild steel is inserted and the whole silver soldered up. This body may then be chucked, turned and threaded, as shown. Note that the jet (No. 80 drill) is formed in the body itself, and is not a separate component. The body is soft soldered to the cylinder wall. The tank may be turned from aluminium.

General Notes.

The fuel which seems most successful for this engine is as follows:—1 part Pool Petrol, 1 part ordinary paraffin oil, 1 part medium grade lubricating oil, 2 parts ethyl ether (anæsthetic quality).

As the compression adjustment bears a direct relationship to the throttle setting, running position can only be obtained by trial and error methods, bearing in mind that if the engine does not fire or misfires, the compression is too low. Work up from low compression to the correct running point, taking care that the engine does not become flooded in the process. A propeller of 8 inches in diameter with a pitch of 4 inches seems well suited.

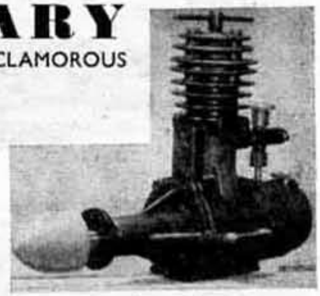
Full Size Plans.

These are available from The Drysdale Press, Ltd., Edward Buildings, Rutland St., Leic., price 3/6 post free.

BRITISH DIESEL SUMMARY

A BRIEF DESCRIPTION OF BRITISH DIESELS AT PRESENT ON OR REACHING THE CLAMOROUS MARKET IN THIS COUNTRY

BY ARTIFEX



The Kemp 4·4 c.c.

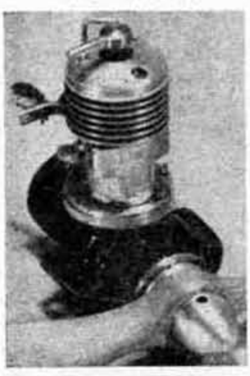
IN the last few months British manufacturers have really got down to their production programme, with the result that some fourteen engines are now on the British market, mostly with performances quite as good if not better than contemporary continental types.

First in the field and a justly established favourite, the Mills 1·3 has those qualities of design and finish which impress even before the engine is tested. It is a very easy starter, and is powerful without undue weight. The neat cut-out is fitted to the fuel supply.

A newcomer which seems likely to rival the Mills in popularity is the Electronic Developments E.D.II of 2 c.c. capacity. This is again well finished and an easy starter. The cut-out is similar in action to the Mills, but the compression is altered by means of a screwed cylinder head, the whole of which turns by means of a screwdriver or coin slot in the top. This is completely effective and reduces the height considerably.

The B.M.P. diesels, 0·9 c.c. and 3·5 c.c. caused much interest at Dorland Hall, and should prove popular designs. There is plenty of power, although the total weight seems a little heavy owing to the very sturdy construction. The 3·5 c.c. has an ingenious built-in cut-out which can be seen left.

The B.M.P. 3·5 c.c.



The Frog people need no introduction and their "100" 1 c.c. is by the same designer as their "175" petrol engine, so it is fair to conclude that performance will be of the same order.

Electra Engines have established a reputation for square dealing and their artistry in helping out with unwilling engines is a fair criterion by which to judge their new 0·8 c.c. diesel which features crankshaft compression adjustment.

Leesil have abandoned their old design and are producing a Dyno-derived type of 2·5 c.c. This is well finished and if it lives up to its ancestor's performance it should satisfy everyone. It was illustrated in last month's AEROMODELLER. A rough diamond is the Milford Mite, 1·4 c.c. whose rather unattractive exterior conceals excellent compression, and complete lack of play. The manufacturers invite buyers to test their engine before taking it away, than which no trail could be fairer!

Clan Models of Glasgow have an eccentric crankshaft design on the stocks, and Kemp are preparing a 1 c.c. engine on the same lines. The 4·4 c.c. Kemp, illustrated above, is fast becoming well known, and showed a very easy disposition on test. It is attractively finished in anodised black, and a neat spinner masks the prop retaining nut.

The long awaited Owat has finally overcome its production difficulties to emerge in a shape almost identical with the French Micron 5 c.c.

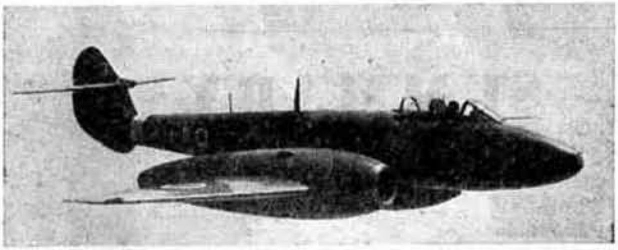
Finally, there is the Clansman 5 c.c. again from Glasgow. This is one of the cleanest engines in production and comes complete with beautifully polished prop, testing stand and fuel. The finish is delightful and the design is perfectly sound.

In conclusion, British dieselmen will be interested to note that the Yanks, though late starters, have two extremely good engines now in production, the 4·9 c.c. Leon Schulman "Drone" and the Eagle "Mite" 1·6 c.c. which is interesting as the smallest engine with fixed compression in production.

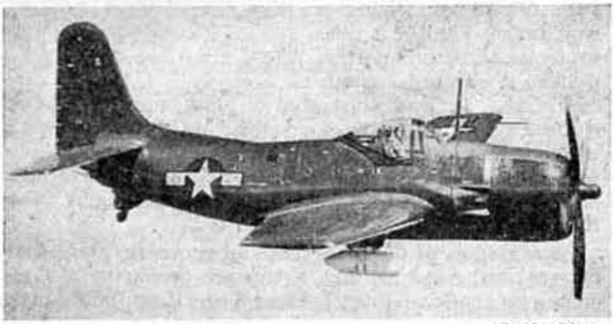
MONTHLY MEMORANDA

BY O. G. THETFORD

(British Official Photo)
AUSTERITY DICING. An Auster Mk. VI air observation post aircraft of No. 43 Operational Training Unit. Silver dope finish is now standard for all aircraft in the A.O.P. category.

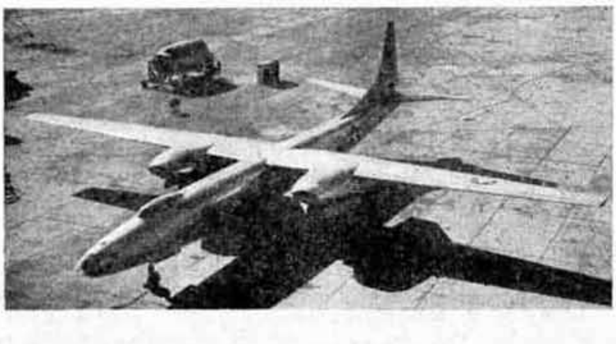


(British Official Photo.)
FROM A FAMOUS SQUADRON. A Gloster Meteor Mk. IV jet propelled fighter of No. 56 (Fighter) Squadron. No. 56 Squadron's letters have been changed from the well-known "US" to "ON."



(Curtiss Photo.)
LATEST FROM CURTISS. This Curtiss XBT2C is one of ten experimental bomber-torpedo aircraft being delivered to the U.S. Navy. It is developed from the well-known Helldiver series.

FLYING PENCIL. Below is the Convair XB-46 medium bomber fitted with four jets and having a wing span of 113 ft.
(Convair Photo.)



The Last Halifax.

Early this year the last Halifax left the Handley Page works. This Halifax, a Mk. A. IX, was delivered to the Airborne Forces for troop transport and glider tug work. Serially numbered RT 938, this Halifax IX was the 6,176th to be built since the Mk. I appeared in 1939.

Halifax RT 938 bears normal night bomber camouflage, with green and brown top camouflage and black sides and undersurfaces, and the serial number is painted white beneath the wings, which bear no roundels on the lower surfaces.

King's Flight Vikings.

The four Vickers Viking aircraft delivered for the use of the King's Flight are officially designated C. Mk. II and are generally similar to the commercial airline version but differ, of course, in the interior appointments. The King's Vikings are left natural aluminium finish on all surfaces and bear standard Royal Air Force roundels on the wings and fuselage. The R.A.F. serial numbers for the four aircraft are VL 246, VL 247, VL 245 and VL 248. The first two machines are the Royal aircraft, the third machine for the transport of staff and the fourth aircraft a flying workshop carrying maintenance material for the rest of the aircraft.

The serial numbers appear in black on the rear fuselage and beneath the wings.

Revised American Markings.

After a relatively lengthy period of stabilisation, the United States military aircraft insignia was once again modified last February. A narrow band of red now runs horizontally across the centre of the two white rectangles either side of star. The rest of the marking remains unchanged. This change applies equally to U.S.A.A.F. and U.S. Navy insignia.

U.S.A.A.F. Deliveries.

Figures for the deliveries of new aircraft to the U.S. Army Air Forces during 1946 have now been released. During 1946 a total of 1,010 aircraft was delivered, being just over 3 per cent. of the total deliveries for the last wartime year, 1945. The deliveries included 405 Shooting Stars, 4 Thunderbolts, 2 Thunderjets, 1 Airacomet, 14 Kingcobras, 5 Black Widows, 19 Reporters, 19 Twin Mustangs, 62 Superfortresses, 1 Invader, 76 Packets, 2 Skymasters, 2 Globemasters and a Constellation.

R.A.F. Re-equipment.

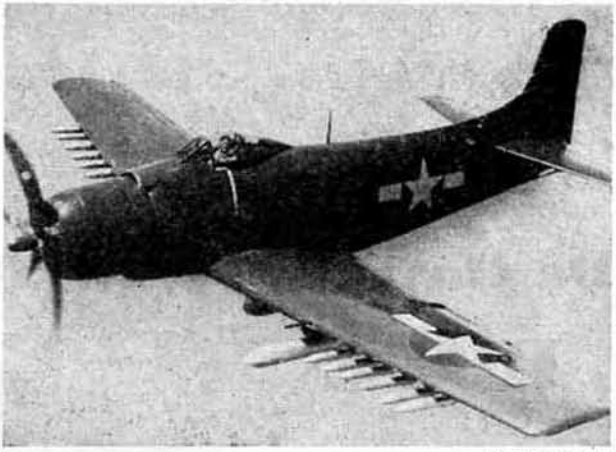
Squadrons receiving new equipment in recent months include the following :—No. 6 Squadron (Tempest VI) (code letters " JV ") ; No. 9 Squadron (Lincoln) (code letters " WS ") ; No. 19 Squadron (Hornet) (code letters " QV ") ; No. 20 Squadron (Tempest II) (code letters " HN ") ; No. 30 Squadron (Tempest II) (code letters " RS ") ; No. 45 Squadron (Mosquito) (code letters " OB ") ; No. 50 Squadron (Lincoln) (code letters " VN ") ; No. 54 Squadron (Tempest II) (code letters " HF ") ; No. 56 Squadron (Meteor) (code letters " ON ") ; No. 61 Squadron (Lincoln) (code letters " QR ") ; No. 65 Squadron (Hornet) (code letters " YT ") ; No. 66 Squadron (Meteor) (code letters " HI ") ; No. 74 Squadron (Meteor) (code letters " TM ") ; No. 91 Squadron (Meteor) (code letters " DL ") ; No. 100 Squadron (Lincoln) (code letters " HW ") ; No. 130 Squadron (Vampire) (code letters " AP ") ; No. 152 Squadron (Tempest II) (code letters " UM ") ; and No. 617 Squadron (Lincoln) (code letters " KC " and " YZ ").

Export Orders.

It is now announced that the British aircraft purchased by the Turkish Government for the re-equipment of their air force include 244 Spitfires and Mosquitos. Other military types to be exported include a large batch of ex-R.A.F. Tiger Moths for Holland and some Hawker Sea Fury X carrier-borne fighters for the Royal Canadian Navy.

Nene-Vampire.

Now undergoing tests is the prototype Nene-Vampire, fitted with the 5,000 lb. thrust Rolls-Royce Nene engine in place of the D.H. Goblin of the aircraft now in squadron service. There are no external changes of any note in the latest version. The Nene-Vampire has a faster rate of climb, shorter take-off run, and a maximum speed of 590 m.p.h. During trials, the prototype reached an altitude of 51,000 ft., which represents an unofficial altitude record for jet-propelled aircraft.

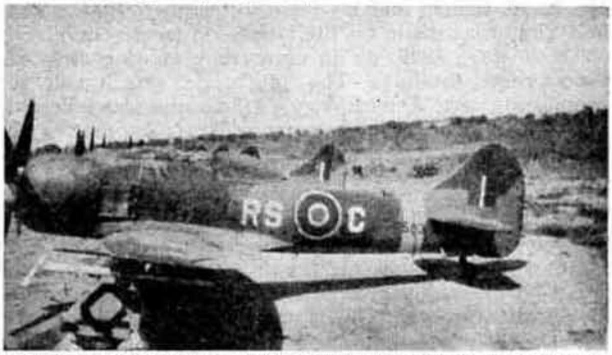


(Douglas Photo.)

ROCKETS GALORE ! The Douglas AD-1 Skyraider joins the Martin AM-1 Mauler as the standard " attack " aircraft for U.S. Navy carriers. Outstanding features include heavy wing armament and ingenious dive-brakes.

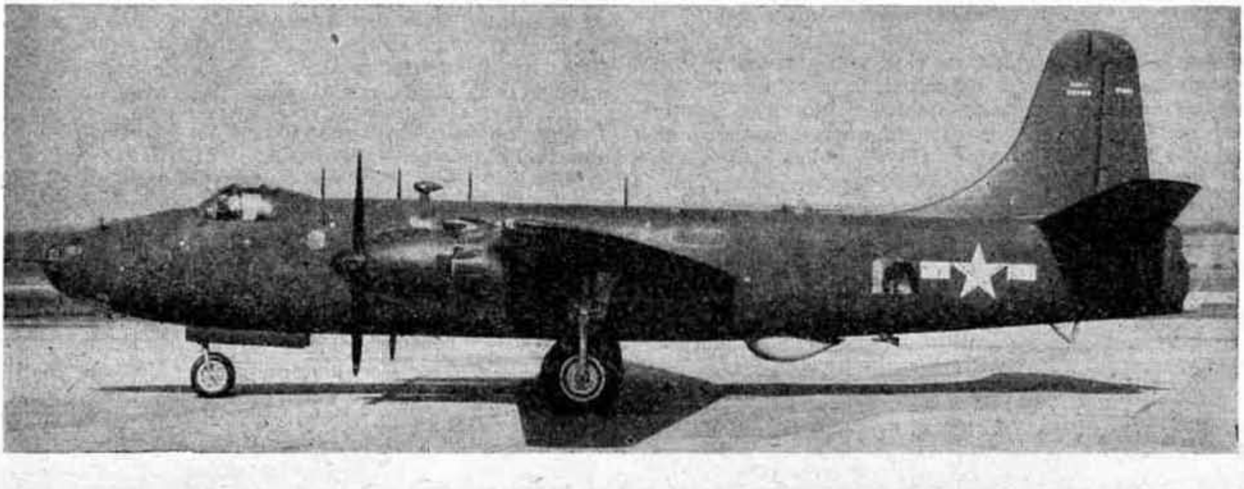
("Flight" Photo.)

FIGHTER COMMAND TODAY. A De Havilland Vampire II jet-propelled fighter of No. 130 (Fighter) Squadron, R.A.F., stationed at Odiham, Hants. The insignia just above the " A " indicates the Squadron Commander's aircraft.



(Above.) TEMPESTS IN AGRA. Hawker Tempest II fighters of No. 30 Squadron, stationed at Agra in India.

(Below.) IN THE FIREBALL TRADITION. Glen Martin's latest military type is this XP4M-1 patrol-bomber for the Navy. Spanning 114 ft. and weighing 78,000 lb. loaded, the XP4M-1 is fitted with two 3000 h.p. Pratt and Whitney R-4360-4 radials and two 4000 lb. S.T. Allison J-33-4 jet engines in the tail of each nacelle.
(Martin and Kelman Photo.)



AEROPLANES DESCRIBED XLIX

The De Havilland D.H. 108 DOVE

THE De Havilland 108 research aircraft is probably one of the most advanced designs now flying in Europe, possibly the world. The results of the tests now proceeding with the type will undoubtedly have profound repercussions on the future of British air transport design because the D.H. 108 is virtually a "flying scale" version of the projected D.H. 106 transport, a jet-propelled commercial airliner.

Design work on the D.H. 108 was commenced by Mr. R. E. Bishop and his team in October, 1945. The first flight was made by the late Geoffrey de Havilland on 15th May, 1946, at an emergency landing strip at Woodbridge, Suffolk. The prototype was taken to Woodbridge on "Queen Mary" trucks and was followed by a Dove and Proctor carrying D.H. executives to witness the first flight, which lasted 30 minutes and was without incident.

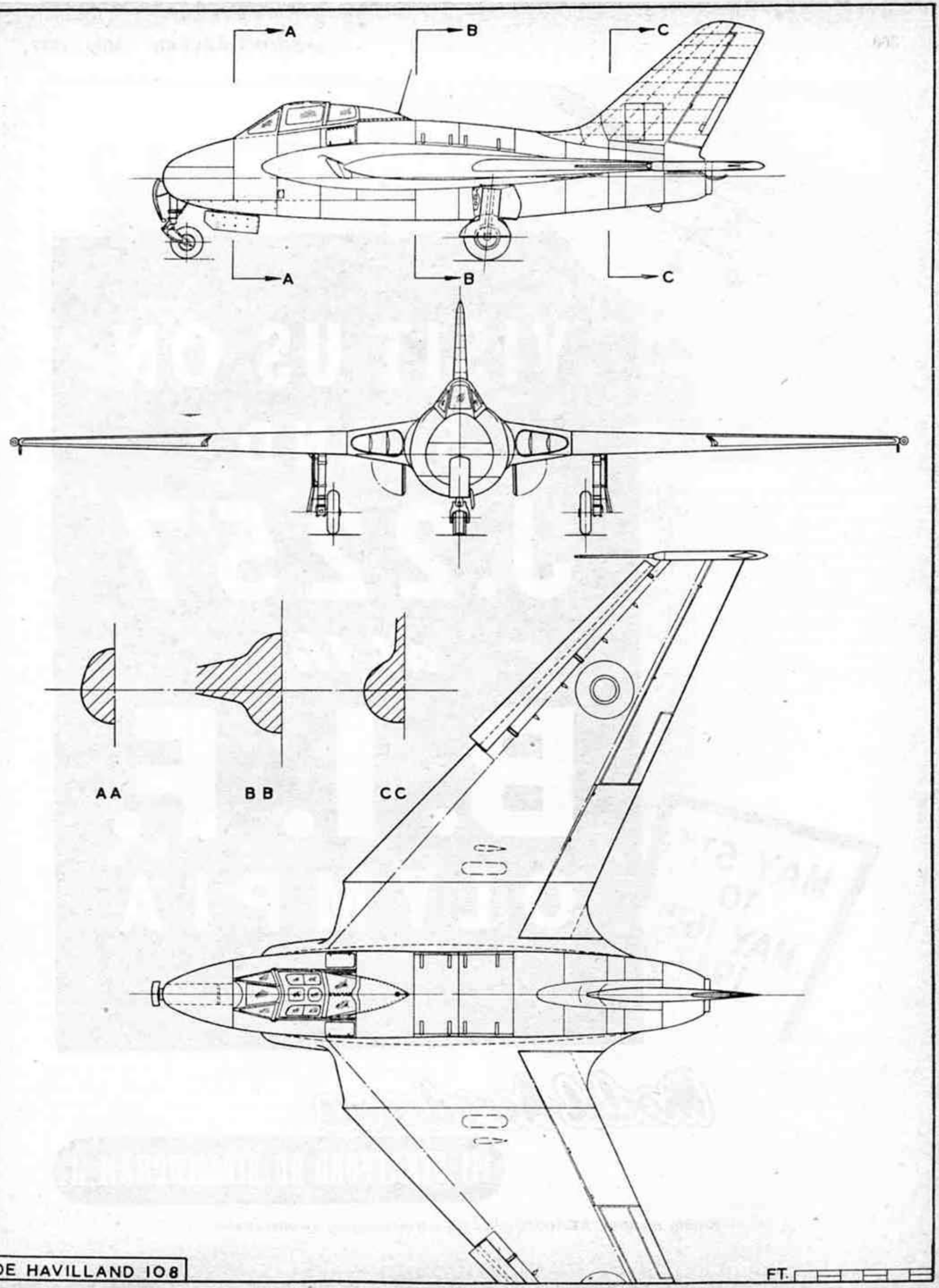
In essence, the D.H. 108 consists of a Vampire fuselage to which the swept-back wings are attached on the same wing root pick-up points. Oddly enough, the swept-back wing was chosen in the first instance to investigate low-speed flight characteristics before proceeding to the problems of ultra high-speed flight which are now in progress. Two prototypes of the D.H. 108 have been built and the first, TG 283, was fitted with fixed slots on the leading edge which limited its top speed to 350 m.p.h. The second prototype, TG 306, which was demonstrated so magnificently before incredulous spectators at Radlett in September, 1946, differed from TG 283 in having free automatic slots, enabling speeds of over 600 m.p.h. to be attained. This aircraft was being given its final trials prior to an attempt on the World's Air Speed Record when it met with the disaster in which Geoffrey de Havilland lost his life.

The advantages of the 45 degree swept-back wing for flight at high Mach numbers were first appreciated by the Germans, who had many experiments in this direction proceeding when the war ended. The use of the swept-back wing on the D.H. 108 removes the critical design feature at high Mach numbers to other parts of the aircraft, since the wing retains a normally progressive drag coefficient to Mach ·96. Features of the D.H. 108 wing include sweep-back on the leading edge of 43 degrees, a constant thickness chord ratio of 10 per cent., a symmetrical section and the absence of incidence and dihedral. As is usual with tailless aircraft, the "ailerons" also function as elevators when required.

The D.H. 108 has now been fitted with the new 5,000 lb. S.T. Ghost jet engine and the theoretical maximum speed with this power plant is 675 m.p.h. Even when fitted with the earlier Goblin II, the maximum speed was known to exceed the existing world record of 616 m.p.h. When flying at such high subsonic Mach numbers, the jet engine can develop its greatest efficiency and it is this aspect which is related to the commercial applications. The future career of the D.H. 108 is of the greatest significance and will be watched with close interest by the entire aviation world.

Specification: Single-seat tailless jet-propelled monoplane with tricycle undercarriage. Mixed wooden and metal construction of which full details have not been released. Either one 3,000 lb. static thrust D.H. Goblin II or one 5,000 lb. static thrust D.H. Ghost. Flying controls consist of "elevons," split trailing-edge flaps, automatic leading-edge slots and rudder. No details of weights released. Dimensions: Span, 39 ft. 0 in.; length, 26 ft. 9½ in.; wing area, 306 sq. ft.

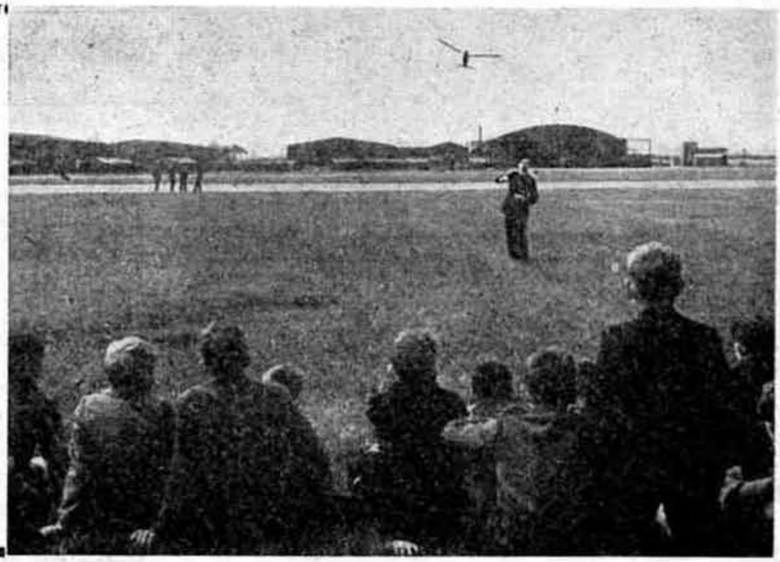
Photos: "Flight."



DE HAVILLAND 108

CLUB NEWS

BY CLUBMAN



Scene at n R.A.F. Station in Gloucestershire last year when a Model Aircraft Exhibition was held in aid of St. Dunstans. An interested crowd of youngsters is watching a flight demonstration.

As a result of my trip to America in March, club reports have piled up to an all-time high, and in order to get as many " mentions " in as possible, I am cutting down my usual preliminary remarks to the minimum. I know many of you will be interested in the details of this trip, but this will have to wait for the next issue, as time and space do not permit of a full survey this month. Sufficient to say that I had an extremely interesting time, and met with abundant hospitality and friendliness wherever I travelled.

Back on our own doorstep, we find an interesting letter from a reader in the Scottish Highlands. W. G. Archer of Tordarroch Cottage, Farr, Inverness-shire, was a member of the Ealing club before the war, and appreciates the benefits of intercourse with other enthusiasts. He now wants to see aeromodelling fans—of whom he is sure there are quite a number playing a lone hand in the far North—developing the club spirit to everyone's mutual benefit. Apparently the AEROMODELLER is the best means of contacting these lone hands, and I trust the current publicity will bring about some moves towards club life very shortly.

Whilst still North of the Border I should announce that the **SCOTTISH AEROMODELLERS' ASSOCIATION** is holding a Gala Day at Abbotsinch Aerodrome, Paisley, on the 29th June, when two events will be carried through, commencing at noon. Entry forms for the Clyde Model Dockyard Trophy (Wakefield types) can be obtained from G. Leask, Caledonia Model Co., 5, Pitt Street, Glasgow C.2, whilst forms for the Power event come from I. Mailen, 75, Walnut Road, Glasgow, N.1. First prize for the latter event is a flight to Amsterdam by K.L.M. Airliner. (Though not stated, I take it that this will be a " return " trip !)

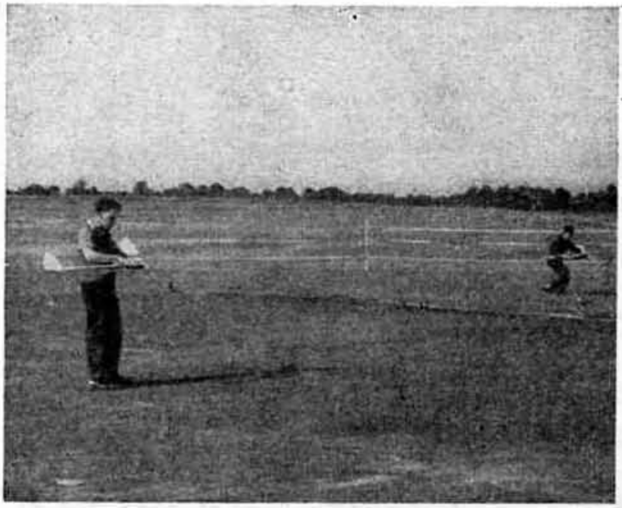
Welcome to the newly instituted **SOUTH WALES AREA S.M.A.E.** Council, which came into being on the 2nd March. Under the chairmanship of well-known " Bud " Morgan, and with W. Cope as Secretary, this group should do much to cement the club movement in that area, and with Cardiff (as senior club) providing the majority of officials at present, experience in all aeromodelling matters is ensured. Broadly based on the Midland constitution, with which all clubs should now be familiar, the wise step of incorporating all clubs within the area, whether affiliated or not, has been adopted, and I am sure that this will lead to many more clubs realising the benefits to be obtained from full linking up.

An Inter-Area Indoor contest was staged by the **NORTH WESTERN AREA** at Manchester on February 9th, when competitors from London, Scotland, the Midlands and locals competed for the " Daily Dispatch " Challenge Trophy. The weather (do I need to tell you !) was anything but conducive to travelling, and it says much for the stamina (much nicer word than " guts " isn't it?) of the competitors that four teams were able to compete. The result was in doubt up to the last flight of the N.W. team, and London once again ran out the winners by a narrow margin. Times were ;

London Area :—	
A. D. Hall	541 secs.
J. Knight	643·5 "
A. H. Parker	327 "
A. D. Hall	490·8 "
North Western Area :	
D. Hetherington	428 "
M. Hellewell	600 "
R. Musgrove	566·6 "
A. Green	230 "
Midland Area :	
S. Parham	285 "
S. Ward	383 "
T. Patrick	543 "
K. Thomas	573·5 "
Scottish Area :	
T. Weddespoon	478·1 "
H. Wardell	270 "
M. Malking	235 "
W. Watson	312 "

The **LONDON AREA** news-sheet for March mentions control-line flying—a subject on which I shall have something to say in my forthcoming article on American topics. Suffice here to say that there is a lot of fun in it, but I trust we shall not develop the speed mania which is spoiling the control liner in the States. An outdoor inter-area contest is to be staged on June 29th, at Gravesend Aerodrome, probably for teams of six.

February and March proved active months for the **MIDLAND AREA** chaps, with visits to Manchester, London, Coventry and Birmingham. A great improvement was seen in the times set up at the Area



Competitors at a tailless contest undergoing launching difficulties with the wind. In the foreground will be recognised Mr. Annenberg, well-known L.S.A.R.A. theorist, putting theory into practice.

Indoor Rally held at Perry Barr, as seen below :—

Class " A " R.T.P.		
K. W. Thomas (S.E. B'ham)	610	secs.
R. A. Godden (Coventry)	573·3	"
B. Roberts "	566·8	"
Class " B " R.T.P.		
K. W. Thomas (S.E. B'ham)	425·6	"
T. J. Patrick "	297·9	"
Free Flying, open.		
G. F. Bradwell (B'ham)	289·5	"
W. Dallaway "	236·2	"
A. E. Hares (Sth. B'ham)	180	"

A spot of overseas news is welcome occasionally, giving as it does some comparisons with our own performances, etc. The recently revived Canberra M.A.C. of Australia announces that a new glider record of 7 : 22 o.o.s. has been set up by G. R. Bennett, flying a 5ft. span model of 3·9 ozs. loading.

Rod Fergusson of 31, Morris Street, Yeppoon, Queensland, wishes to find a pen-pal about his own age of 16 years. Any offers ?

News of particular interest to me comes this month from the Manchester Area. The executive of the pre-war Lancashire M.A.S. met on the 24th March and handed over the considerable assets of the now defunct club to the Whitefield (Youth Movement) M.A.C., which will in future be known as the **WHITEFIELD M.A.C.** (incorporating the **LANCASHIRE M.A.S.**). Readers may remember that I was secretary of the Lancs. club for some years prior to my coming to Leicester to work on the AEROMODELLER, and whilst regretting that this well established club faded out, I welcome bringing back into circulation the trophies and other assets of this body.

A report of a most interesting flight is to hand from G. H. Pearce of Twickenham. On the 9th February, his 75-inch span sailplane maintained flight for 28 minutes, finally crashing from about 300 feet with some ¼ inch of ice on the leading edges of the wing and tail surfaces. The interesting point is that the automatic rudder control was frozen solid, thus putting the aircraft in a right-hand spin as soon as the ice reduced the flying speed. The model—which is a " bitsa " using A.P.6 wings and other odds and ends—wiped off the starboard wing-tip, but otherwise suffered no bad effects from its icing up adventures.

Mr. Taig, an up and coming member of the **BRISTOL & WEST M.A.C.**, won the club indoor speed r.t.p. contest, very nearly beating A. H. Lee's 1939 record of 39·32 m.p.h. A fast " push-puller " was much in evidence amongst other unorthodox types. Would all secretaries of clubs within a forty mile radius of Bristol, who are interested in the formation of a Western Area, please contact Mr. M. Ayres, 10, Wick Crescent, Brislington, Bristol, 4, giving particulars of membership, flying grounds, etc.

The **KIRKCALDY M.A.C.** will be holding a Grand Rally at Boreland, Kirkcaldy, on June 8th. Competitions, which will be open to all Scottish modellers, will comprise open rubber, glider and flying events. Full particulars from W. Robertson, 28, Bellfield Crescent, Kirkcaldy.

Inter-club activities can do a lot to keep interest up during the winter season, and the recent event whereby some twenty members of the **PORTSMOUTH & D.M.A.C.** travelled to the Eastleigh camp proved very enjoyable. The visitors carried off the honours in an r.t.p. contest, gaining 396 points against Eastleigh's 140. Flying was followed by a " quizz ", which proved hilarious—and some remarkable answers were given to some questions!

A club is being organised on the R.A.F. Station at Stranraer, and " local civvies " are invited to go along, as there is an abundance of tools, benches and what have you. Please contact the Hon. Sec., W. R. Lochrie, at the 'drome.

J. Blackmore of the **CARDIFF M.A.C.** has raised the club Stick Glider record to 3 : 47 o.o.s.—this despite snow-covered ground and zero conditions. A glider contest held in March was won by G. Ferrier flying a Korda modified to glider requirements. First round was for hand launch from a slight slope, the remaining two flights being normal launch from 50 ft. towlines.

Ferrier	: 19	: 45	: 47	1 : 51 agg.
Blackmore	: 07	: 25	: 45	1 : 17 "
Grist	: 12	: 24	: 31	1 : 07 "

North-Eastern news this month is sent in collectively, announcing that the **SEAHAM M.F.C.** won an r.t.p. contest, using outdoor models modified to indoor work. **EASINGTON M.F.C.** report good progress, and fine facilities in the shape of tip-top club rooms. A North-Eastern Indoor rally resulted in a complete win for boys from the **STOCKTON & D.M.F.C.**, first three places in both the A and B classes going to this club. Stockton records to date are glider, 4 : 26 by R. Robinson's " Aegeus ", and duration, 2 : 15 set up by S. Young's " Percy III ".

P. R. Newell of the **GREENFORD & D.M.A.C.** would appreciate news of his " Mick Farthing Sailplane ", lost after a flight of 20 minutes plus on the 2nd March. This now constitutes an unofficial record—if such an oddity exists!

BLACKHEATH M.F.C. launched an " Aeronautical Brains Trust " on a crowded meeting recently, a successful innovation that will be repeated at an early date. This club have the good scheme of contacting other clubs in the vicinity with a view to combining on Open Days, in order to try and cut down the great number of individual events that so spoilt last season.

The **CHINGFORD M.F.C.** report the possession of six Mills' Diesel engines to date, and Wellington Road School has rattled to the crack of these midgets on many a night recently. Popular instruction classes are continuing, and whilst several stalwarts have put in some outdoor work—one member clocking 3 : 30 whilst tuning a new Wakefield—emphasis is still on indoor work and flying.

LOST—in the sea off Calshot Spit . . . one 40 inch span model aircraft coloured red and white, powered with a Mills' Diesel. May be washed ashore between Lepe and Bournemouth. Finder please contact 3055444 C.A.2. C. Homan, c/o Education Centre, R.A.F. Calshot.

At the last indoor meeting held under the auspices of the Merseyside Regional Council, the events were contested by **MERSEYSIDE M.A.S.** and East Liverpool, with the following results :—

Class "A"		
R. F. L. Gosling	(Merseyside)	1 : 20
A. E. Burchell	(East Liverpool	: 57
D. C. Davies	(Merseyside)	: 40
E. A. Monk	(East Liverpool)	: 39
Class "B"		
W. Blanchard	(Merseyside)	3 : 03
W. A. Jackson	"	2 : 04·7
— Roberts	(East Liverpool)	1 : 47·5
— Collier	"	: 35·5

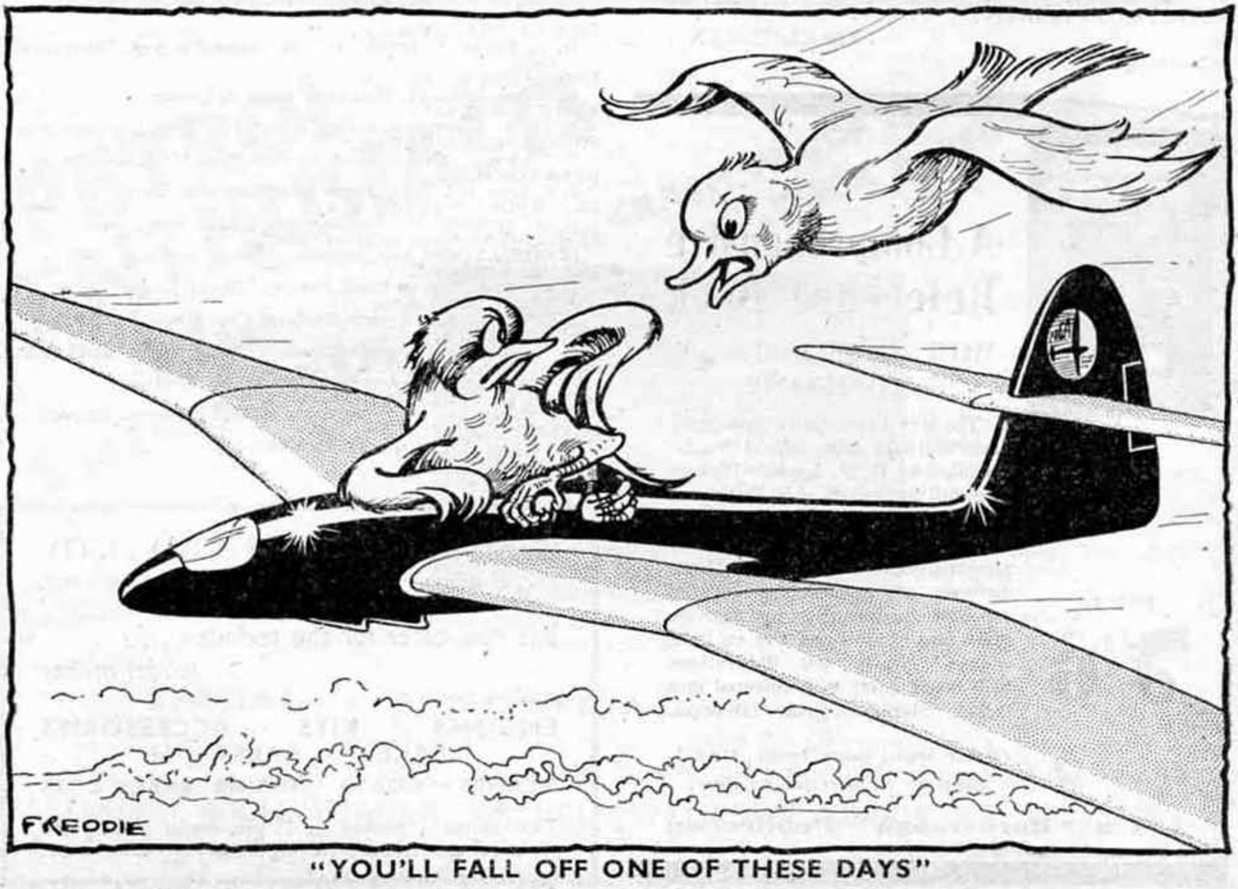
At a later meeting held at Warrington, Blanchard broke the Class "B" record several times, final time being 2 : 15.

Many R.A.F. Stations are taking up aeromodelling, two latest to advise of their formation being Jurby (Isle of Man) and Cottesmore. This is a good thing, and I have memories of standing on the perimeter of expansive aerodromes and thinking of what could be done with such flying space! However, modelling had to take a back seat in those days, and it was a case of back to the old sweat box—Link Trainer to the uninformed ! !

During lulls in the frost and snow, the **PEGASUS POWER CLUB** have had some good flying on a borrowed aerodrome. New models are progressing fast, and one job, too, successfully tested was that belonging to P. Robinson, which was lost on its maiden flight after clocking 5 : 30 o.o.s. from an 18 second engine run. Many members have designs on club records, but if reports of E. J. Horner's new model are correct, he looks like keeping the class B record which he holds with a time of 6 : 30 o.o.s. Interest in control line flying is being revived, and during the summer it is hoped to have a radio controlled model in the air. Also a scale Typhoon powered by a 12-cylinder engine of a members design, the model to be of 12 ft. span with fully retracting undercart ! !

The **DONCASTER & D.M.F.C.** r.t.p. record, which has been going up gradually, now rests with M. A. Hetherington with a time of 5 : 42, only 12 seconds short of the British record. Hetherington had bad luck at the Inter-Area meeting mentioned earlier, his model stalling at the commencement of his third flight and touching after 25 seconds.

Activity ceased with the **WORTHING & D.M.A.C.** during the war, but the club has now been revived to such good purpose that membership has grown from 14 in 1946 to 52 as at the end of January 1947, and there is every reason for hoping that the three figure mark will be topped this year. Aeromodellers spending their holidays in that town and wishing to sample the thermals



"YOU'LL FALL OFF ONE OF THESE DAYS"

of the South Downs should write to the Hon. Sec., Mr. R. Pearson, 9, Terringes Avenue, West Worthing (enclosing s.a.e.), for information as to club meetings, etc.

The **HAYES & D.M.A.C.** have won every one of their rounds in the London Area R.T.P. knock-out contest, with flight times rising steadily until the three minute mark is a regular thing. A comp. between club members and the Derbyshire Yeomanry M.A.C. proved yet another win for the Hayes lads, but the Army bods put up a good show with only one rubber motor between them, which finally gave up the ghost!

A very successful exhibition was staged in January by the **BARKING M.A.C.,** when nearly a hundred models were shown, including the experimental flying wing "Pegasus", designed and constructed by members of the club, and which won third prize at the Dorland show. Best model of the show was exhibited by R. S. Martin, the job being a finely detailed "Tiger Moth". Demonstrations of r.t.p. flying pleased the large audience, and the evening finished up with presentation of prizes, etc.

Three chaps would like to get aeromodelling clubs started in their districts, names and addresses being as follows: F. Hinings, Woodgate Cottage, Whatstandwell, Derby; J. P. Willers, 17, Winterbottom Ave., West View, Hartlepool, Co. Durham; and A. Polding, 2, Samuel Square, Gawber Road, Barnsley.

And this brings me to the end of this month's little lot, and let's hope that by the next issue the current unspeakable weather will have improved a whole lot. As I write this it is teeming with rain, and this on top of the snow is just about the limit. (Anyone short of water for R.O.W. work?) Till next month, tons of thermals and full model recovery.

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F. C. Rouse, 87a, London Road South, Lowestoft.
COTTESMORE M.A.C.
F/Lt. Williams, R.A.F. Station, Cottesmore, Nr. Oakham, Rutland.
SCARBOROUGH HIGH SCHOOL A.C.
C. Isherwood, Scarborough High School, Scarborough, Yorks.
POOLE & D.M.A.C.
J. W. Smith, 83, High Street, Poole, Dorset.
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D. Griffin, 7 Collis Ave., Basford, Stoke-on-on-Trent.
ILFORD & D.M.A.C.
T. J. Pitt, 45, Jarrow Road, Chadwell Heath, Essex.
BARNES & D.M.A.S.
S. F. Wincott, 12, Avenue Gardens, East Sheen, S.W.14.
BRADFORD M.A.C.
R. Calvert, 1, Highcroft Crescent, Almondbury, Huddersfield.
MOONRAKERS M.A.C.
P. G. Flower, "The Gables", Rowde, Nr. Devizes.
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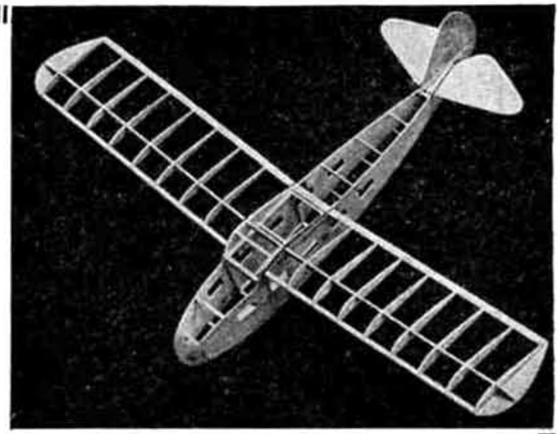

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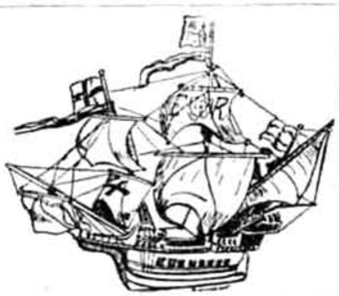

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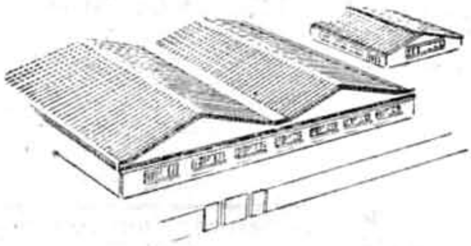

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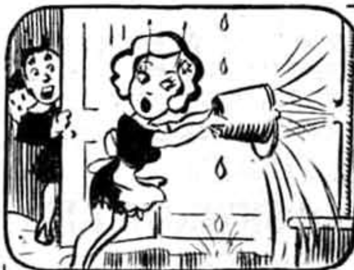

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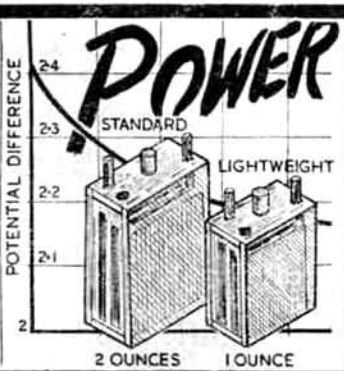

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