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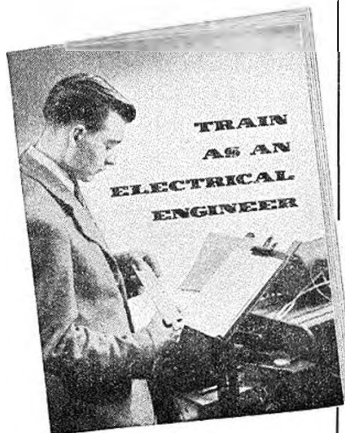
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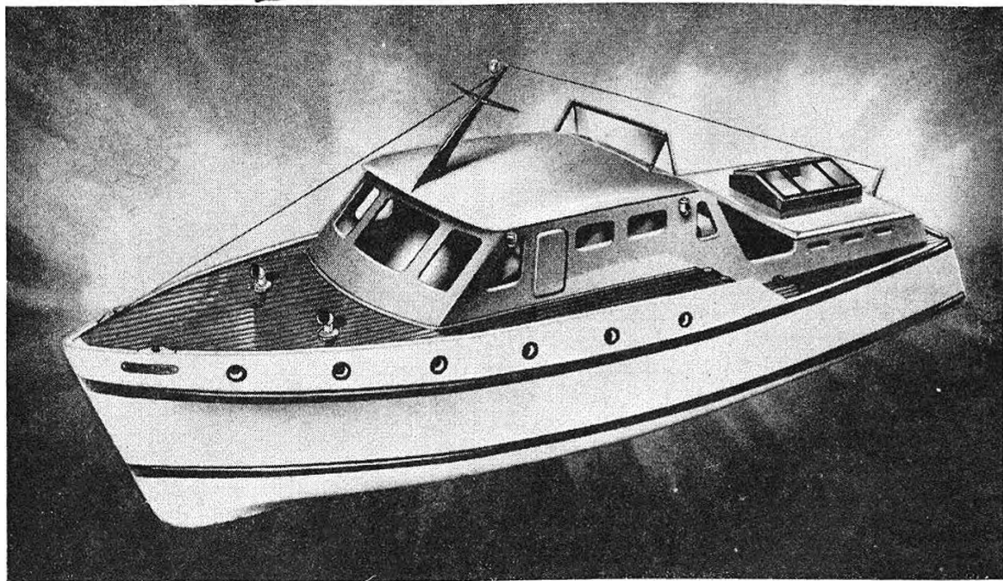
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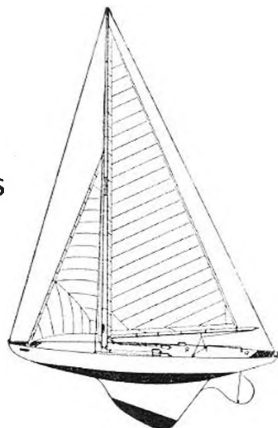
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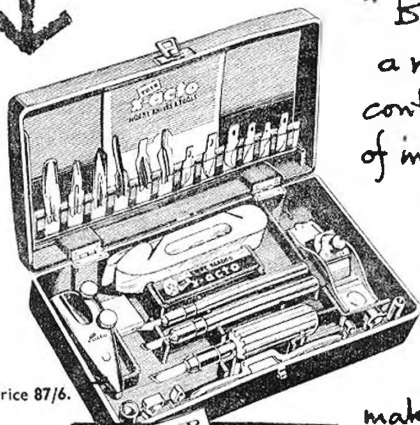
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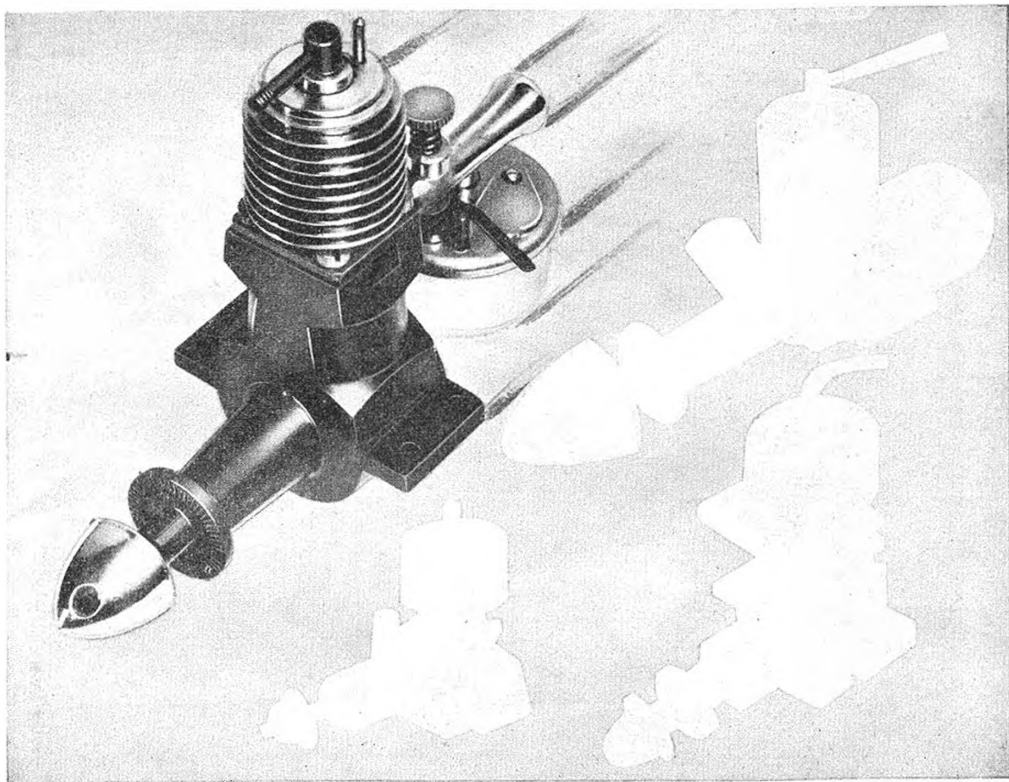
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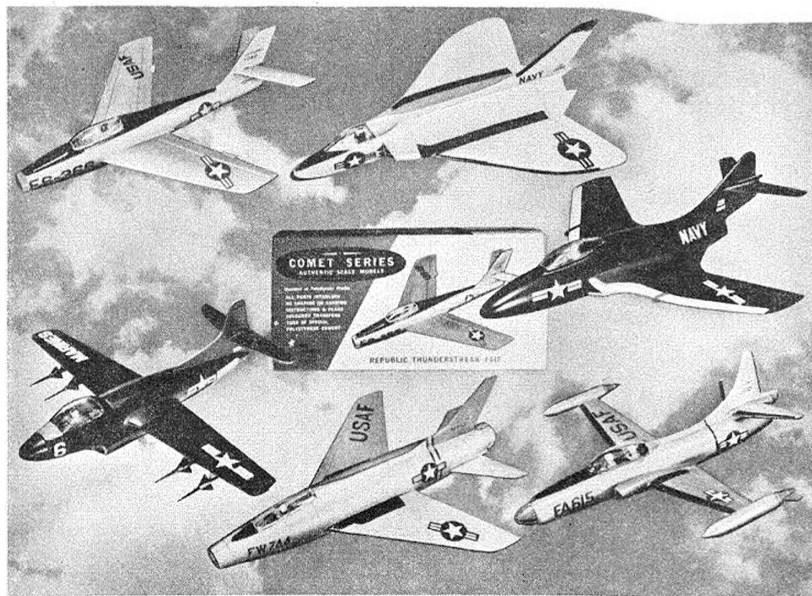
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VOLUME XXII
NUMBER 263
DECEMBER 1957

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AFROMODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:
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38 CLARENDON ROAD, WATFORD, HERTS
TELEPHONE: GADEBROOK 2351 (Monday-Friday)

I raise my glass!

DROPPING THE TRADITIONAL editorial "we" on this festive and informal occasion the Editor raises his glass, at least in spirit (*just a quick one, George*) to each of his 55,000 readers, and wishes every single one a truly happy Christmas with an abundance of modelling gifts, and a prosperous New Year, with balsa dust thick on the work benches and the best of flying weather in 1958.

I hope you all get as much pleasure out of this grand hobby of ours as I do myself, and trust you will enjoy this, our twenty-second Christmas Number as much, or even more, than its predecessors.

The AFROMODELLER Christmas issue has become an institution and 'tis said that by the time it goes to press our Assistant Editor and myself are the two principal inmates! This year we have suffered the additional ravages of the dreaded "lergy" during its preparation, which may account for one or two strange items that have crept in during our temporary absence in the sick bed, otherwise you will find normal rational editorial material within these eighty-four pages.

Yes! I said 84 pages for, thanks to the magnificent support of our readers and advertisers (*same again all round, George*) we have been able to increase the issue by a further eight pages as compared with 1956, and maintain the free plan which I am sure you will agree this year is the best yet. 'Tis in spite of increased costs which continue to deplete the Editor's beer money.

Having paid tribute to readers and advertisers, I would raise a further glass (*hic!*) to our contributors, who enable me to provide the really first-class material that makes AFROMODELLER the best in its field. It is impossible to name them individually, but I assure them that their creative efforts are really appreciated. Previously mentioned reductions in Editor's beer money does not enable him to send a crate of whisky to each (*fill 'em up again, George*), but any who stagger as far as Clarendon Road, Watford, are more than welcomed.

Let us not forget either our Printers (*a large double, George*) who have the unenviable task of producing this greatly increased issue with extra colours at that, in the same production period as a normal issue. May the stones in the composing room echo heartily to the clink of bottles on this festive occasion and all their literals be trivial ones.

Lastly, but not leastly (*one for the road, George*) I pay tribute and send greetings to the AFROMODELLER Staff, many of whom, at their drawing boards and typewriters, labour unseen but rarely unheard, to bring you this Christmas issue. (*What's that, George? The Staff are queuing up outside with glasses in their hands! Bolt the door, George!*)

And sho with the ghost of McGillicuddy. Shorry! The ghost of McGillicuddy lurking offstage. (Will the Maestro ever return?) I draw back the curtain on "CHRISTMAS AFROMODELLER 1957", the most entertaining aeromodelling show of the season!

(*Exit Editor in slow parabolic alcoholic curve beneath the editorial desk, clutching skilfully on the way at bottle of Johnnie Walker No. 8.*)



The Editor and Staff send Christmas greetings and best wishes for a prosperous New Year to all readers

Scouts Experimental 5a

The free-flight scale plan given away with this issue, and the "Famous Biplane" solid model description which occupies our centre pages reflect the result of the longest, most involved research ever undertaken by us on the subject of one type of aircraft. Four contributors, three of our staff and many renowned authorities were responsible for what we consider to be the first-ever accurate plans of the famous S.E.5a, and both George Cox and Doug McIlhard are to be congratulated for two excellent drawings.

As ever, colour details for the Mannoek and McCudden S.E.s were hardest to confirm, and as ever, the most needed photograph came to light after much of the work had been completed—we refer to that on page 357, showing the L.V.G. spinner. Because these famous aces flew a variety of different machines, each with slight modifications and changes of marking, it is extremely difficult to pin down the exact decor for any particular aircraft in view of conflicting reports, but one cannot dispute the data we include on the McCudden machines in view of the photo-evidence.

We do not have to emphasise the fine flying characteristics of Doug McIlhard's scale model for '8 c.c. Its fame is already renowned following displays at the R.A.F. Championships and the All-Britain Rally, where for realism in flight and excellent scale detail it was the top free-flight model in Concours d'Elegance and a source of admiration from all. The copious detail on the plan with stage by stage illustrations should enable any modeller with a little experience to duplicate the excellent performance of the prototype.

Slide Rule wielders wanted

It is most probable that the S.M.A.E. will be responsible for running the Wakefield and International Power events at Cranfield in '58 and the Technical Secretary has issued an early appeal for assistant processors. Volunteers who have experience of processing or can undertake the work

efficiently should register their names and addresses as soon as possible with the Tech. Sec. of the S.M.A.E. at Londonderry House.

High Flight

Now on general circuit throughout the British Isles, the Warwick Film "High Flight", telling the story of R.A.F. Flying Training at Cranwell, and Hunter service, includes many outstanding air-to-air acrobatic shots which should not be missed. We were particularly pleased to see that models made in the film company's workshops of the Vampire T 11 from APS scale plans were of a standard that made them difficult to distinguish from the real thing. In the course of a year we co-operate with many film producers where models are needed for crash scenes, etc., latest being the forthcoming "Dunkirk" story.

Decor Detail

Reader reaction to our most recently introduced feature to aid scale modellers, launched by Peter Gray's authentic data on World War I German Aircraft colouring, has been quick to approve our choice. It may be of interest to know that the tone drawings of the Albatros used thus far are to 1/72nd scale, and that the series will continue with more data of the same exclusive and authentic flavour on all types of aircraft likely to be of special interest.

Perhaps you have a photo in your own collection depicting a unique squadron marking or colour scheme. If you can provide the actual colour detail, and loan us the negative, we can undertake to provide a free enlargement, and if suitable for reproduction, pay 15s. for the copyright after publication. Don't forget the stamps for the reply!

Postal Charges

Recent increases in British Postal rates have obliged us to revise our retail trading terms for AEROMODELLER Plans Service. All Plans orders up to the value of 10s. must now be surcharged 6d. to cover post and packing (orders over that amount are post free), and for Book Titles under 10s. the charge of 6d. is increased to 9d., while for Books

value 10s. or over, the charge rises from 9d. to 1s.

For example, a single 6s. plan must have a 6s. 6d. remittance to cover post and packing, while two 6s. plans in one order would be post free. *The Plans Handbook* remains at 1s. 6d. with no extra charge for postage.

Insurance

From the many enquiries received at AERO-MODELLER regarding model insurance it would appear that there are still hundreds of unattached modellers anxious to take full advantage of the S.M.A.E. Associate Member Scheme which automatically provides Third Party Cover. For details, write to the S.M.A.E. Ltd., Londonderry House, 19 Park Lane, London, W.1, this also being the address whence you should obtain such items as rule books, addresses of nearest local clubs and International Class specifications, etc., etc.

Value for Money

"Never had better flying for less expense than with Indora", states S. R. Sawyer of Felixstowe. He built the little indoor chuck glider from full-size plans in October issue and with outdoor catapult launches had many flights of over a minute. Then came a seven-minute thermal-assisted flight, the "Outdora" landing only 300 yards from the launch point. Mr. Sawyer recommends a catapult hook $1\frac{3}{4}$ in. back from the nose, $\frac{3}{4}$ in. fuselage, $\frac{1}{8}$ in. tail and fin, and no tip weight. Launch in a vertical bank to the right, cross wind, and have a left-hand turn trim.

Without Comment!

The following is quoted verbatim from the October issue of the Montreal Acromodelling Flying Club Bulletin:—

"As was anticipated, no official word has been received from the F.A.I. or its delegate, the Czech Aero Club, about Canada's proxy participation in the 1957 Nordic Championship. Thanks to the AEROMODELLER and *Model Aircraft*, we now have the full results, and this Club wishes to congratulate Mike Thomas of Toronto for placing 12th, a mighty fine achievement in such company. It somehow appears that the F.A.I. that most distant of nebulæ, regards proxy participation as a privilege, and that proxy participants are able to employ some subtle necromancy to find out how their models fared. On a more prosaic level, they are, however, expected to pay the full expenses of the proxy fliers appointed. It is becoming increasingly difficult to get a team of models from Canada's top fliers. We went down to tenth place for this year's Nordic team. As for the gooey adulation accorded every year to those heroes, the proxy fliers, we couldn't be less impressed—what modeller wouldn't jump at the chance of a grandstand seat at the World Championships? With expenses paid? You bet he will do his best with the model committed to his charge; who cares to look like a blamed fool among the world's best modellers, even when flying someone else's model? So with the rules all fouled up, we wonder

what interest will be shown here in proxy entry into the 1958 World (European?) Championships at Cranfield, England. In the meantime we feel that some official statement of policy is called for from the MAAC with regard to future participation in 'F.A.I.' events."

Finding the right Spot!

One of the most regular requests we receive from constructors of radio control equipment is that which asks for details of the nearest frequency checking service. In many cases we are unable to help due to the fact that few of the companies producing radio control equipment offer such a service. To send a transmitter through the post is a chancy business and there is always the possibility that, despite the best efforts of the constructor, it might not be in a working condition, which makes for unnecessary correspondence and which discourages most commercial concerns from offering frequency checking facilities. The time and trouble involved would necessitate a financial charge which the average home constructor would not be prepared to pay.

All of which still leaves our enthusiastic transmitter builder without a frequency check. We shall be publishing in our next issue details of an absorption wavemeter and Howard Boys has offered to calibrate the same for a nominal sum to cover postage. There must be, however, up and down the country a large number of experienced radio control enthusiasts who would be prepared to help people in their own district who are having a crack at radio control for the first time. Seeing that it is the season for goodwill and helping others, etc., and knowing that the average modeller will always assist a fellow enthusiast, can we prevail upon people with experience to send in their names and addresses. These can be kept on file here at the Editorial Offices, which will enable us to direct those in need of a little help of the right kind to the right people. Thank you!

Is there any justice?

A modeller in the Radlett district "treed" his model towards the end of the day, and as it became dark left the machine until the following morning.

On his return the model was missing, and the story ended in Watford Magistrates Court on Tuesday, October 29th, when John Alan Snelling of New Road, Radlett, pleaded guilty to stealing the model, worth £7 10s. He was said to have burned the fuselage, which carried the owner's name, and to have kept the engine.

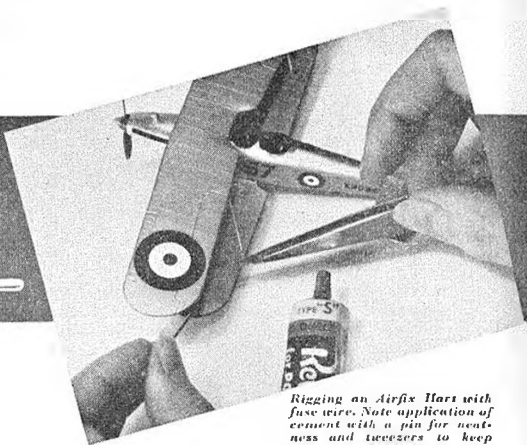
Snelling was placed on probation for 12 months and told to pay £1 costs.

And what consolation is there for the unfortunate modeller who at the best gets his engine back? Seems to us that Magistrates might well ensure that these aeromodelling vandals be more severely dealt with, for they certainly become more rife and at the least should be made to compensate their victim in full for his losses.

more on... PLASTICS

DURING THE PAST year, following our feature in the February and March issues, we have devoted much thought and experiment to ways and means by which the commercial plastic model may be improved by the builder. The plastic kit may also be used as a basis upon which to build a more detailed or complex model and thereby give the modeller considerably greater enjoyment in its construction and subsequent display. This article is intended to give a few more pointers to the many possibilities and to encourage the plastic buyer to become a modeller and not merely an assembler.

Much can be done to improve a plastic model with only a very modest selection of equipment. A sharp penknife or, better still, modelling knife is essential, together with various grades of abrasive paper. The "wet or dry" silicon abrasive papers are the most suitable for our purpose, the grades required being No. 400 (very fine), No. 320 (medium) and No. 240 (fairly coarse). A small roll of Sellotape will be useful and some high quality brushes, preferably sable, are a good investment.



Rigging an Airfix Hart with fuse wire. Note application of cement with a pin for neatness and tweezers to keep wire taut.

Only small sizes are required; one each of Nos. 00, 1 and 5 will meet most needs.

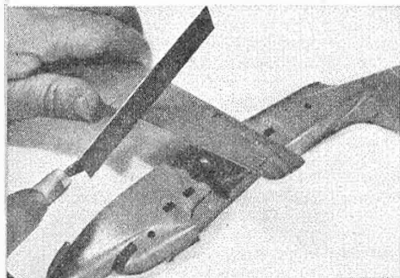
Cellulose balsa cements are completely ineffective used in conjunction with polystyrene and one of the special plastic cements must be employed. As these adhesives are a solvent of the polystyrene it is most essential that care be taken to prevent excess cement finding its way onto the outer surface of the model, as this will result in a roughened surface which is most difficult, if not impossible, to restore completely. The only remedy is to allow the affected portion to dry, and then carefully rub it down with moistened No. 400 wet-and-dry abrasive paper. Any fine scratches remaining after this operation may be removed with a little Brasso metal polish.

The smaller moulded parts are normally supplied attached to a plastic stalk or stem and they should be allowed to remain there until actually required for the model. These parts are usually so designed that by gently bending to and fro they will become detached from the stalk at the correct point; however, particularly with the extremely delicate parts, a pair of tweezers will be found useful to grip the moulding close to the separation point. Alternatively, a razor blade or sharp knife may be used to sever the piece. Whichever method is employed the separated part will need cleaning up in the area of the break and the wet abrasive paper is the neatest way of doing this.

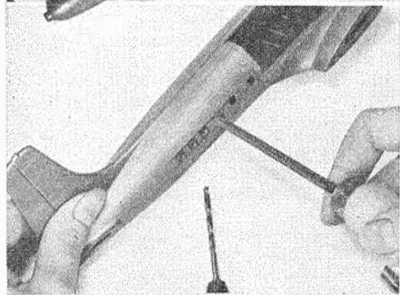
All plastic parts should be carefully checked for true mating before final assembly and any slight trimming carried out before cement is applied.

Up to this point we have been concerned merely with normal construction of a plastic kit. Now here are a few suggestions which are meant to indicate some ways of improving and developing your model.

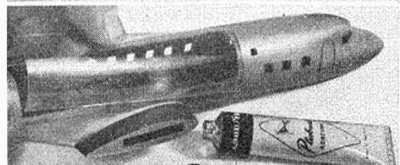
Although considerable improvement has been recently made to the reproduction of rivets on the models of metal skinned aircraft, many of them are still reproduced very much too large and if enlarged to full scale each rivet would be some two or three inches in diameter! This effect immediately destroys the scale appearance of the finished model and in such cases the rivets are best removed. The neatest way to do this is with a piece of No. 320 or 400 wet-or-dry paper well soaked in a solution of soapy water and wrapped around a small block of balsa. This is gently rubbed over the surface of the model with a circular motion until a smooth finish is obtained. If the rubbed down parts are to be painted it is unnecessary to carry out any further surface preparation, as the minute abrasions left by the wet-or-dry will give the paint a "bite" without impairing the finish.



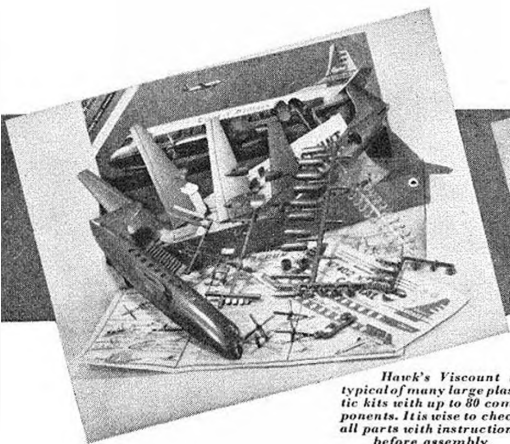
Monogram Albatross Amphibian is specially well produced. Use of Xacto razor saw permits realistic separation of control surfaces, prior to paint and transfer application.



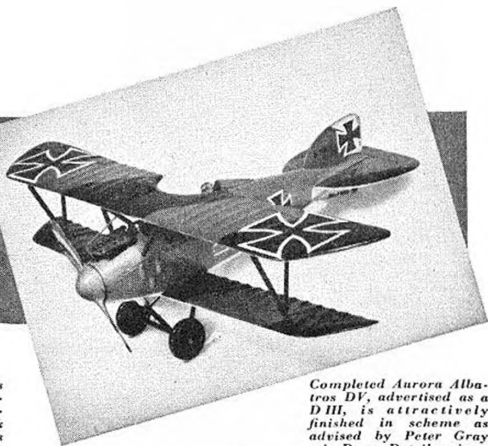
The Frog Douglas DC7C is an ideal subject for dissection. After marking window pieces from transfer sheet, drill, then file square. Also cut away centre roof portion preparatory for inside internal seating detail.



Clear acetate has been moulded to fuselage recess and fixed over fuselage roof with recess allowance made for jointing on each end. See Air-Line brochures for seating detail.



Hawk's Viscount is typical of many large plastic kits with up to 80 components. It is wise to check all parts with instructions before assembly



Completed Aurora Albatross DV, advertised as a D III, is attractively finished in scheme as advised by Peter Gray in Decor Detail series

If no paint is to be applied, the plastic may be polished with a little Brasso and a soft cloth.

Panel joints are sometimes represented by enormous ridges standing up from the surface and these are best removed as with the rivets. They are then incorporated with a sharp scriber or a darning needle using a piece of fairly stout celluloid as a ruler which may be curved to conform with the contour of the wing or fuselage.

After initial assembly it is sometimes found that rather unsightly gaps occur where, for instance, the wings are joined to the fuselage. These can be filled in (as may other unwanted depressions) with what may be called plastic plastic! This is prepared by taking the unwanted stem to which the small parts were joined and filling or sandpapering it until a quantity of plastic dust is obtained; this is mixed with a little polystyrene cement or solvent such as carbon tetrachloride until a putty-like consistency is achieved. It is then applied, a little at a time, with the tip of a moistened penknife to the gaps to be filled and allowed to dry. Smooth out afterwards with abrasive paper.

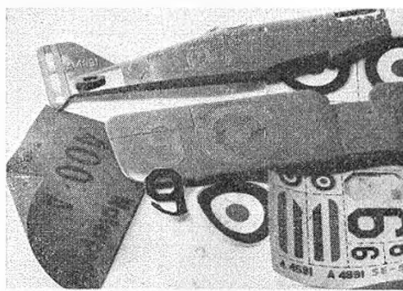
The nature of the manufacturing process means that very thin parts are usually moulded somewhat thicker than true scale. This applies to wing struts of biplanes, undercarriage fairings and struts, propellers, airfoil, trailing edges, etc. A great improvement in general appearance may be effected by thinning these parts down a little with our old friend the wet-or-dry paper starting with the coarse grade, wrapped around a small piece of wood, and progressing to the finest grade.

On biplane models the rigging is seldom included in the kit but the position of the wires is usually shown either on the instruction sheet or on the box lid. To leave the model devoid of rigging completely destroys its character. Cotton or thread which is the material usually suggested makes most unrealistic rigging. After all, full-size aircraft are not rigged with rope! A better job will be done with fuse wire. The wire must first have any kinks removed by drawing it over the finger nail. It is then fixed in place simply by cutting to length, bending the ends around the struts and giving a tiny dab of cement, applied on the end of a pin. This is far better than using the cement directly from the tube nozzle when only a very small amount is required.

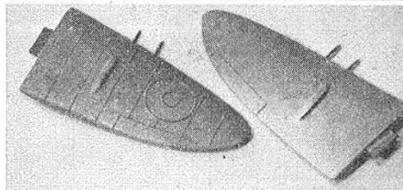
Many World War I aircraft had natural aluminium cowling and other metal parts. These areas on models are normally painted with silver paint or left natural plastic colour if the mouldings are of the silver/grey type. An infinitely superior effect is to cover these metal clad parts with very thin aluminium sheet in scale size panels. A suitable material may be obtained in rolls from

Woolworths, known as "Polyfoil". The best way to fix it to the model is first to cut to size, carefully position it matt side out and firmly rub into contact with the plastic surface with the back of the thumb nail. Double curvatures may be covered without wrinkles quite successfully in this way provided the individual panels of metal are fairly small. When you are satisfied that the metal is making good contact with the plastic over its entire area, carefully lift it away and apply a *THIN* coat of Goodyear Pliobond to both the plastic and the inside of the Polyfoil. Allow the Pliobond to become surface dry to the touch and then carefully lower the pre-formed metal exactly onto the required spot on the model. This is a first-time-or-never operation as the Polyfoil cannot be moved once the two adhesive films are brought together.

Merit S.E.5a with McCadden markings, prefix should be "B", showing separation of letters and roundels carefully cut from transfer sheets to avoid excess transfer around insignia. Note piece of 100 Wet and Dry paper for erasing large ridges

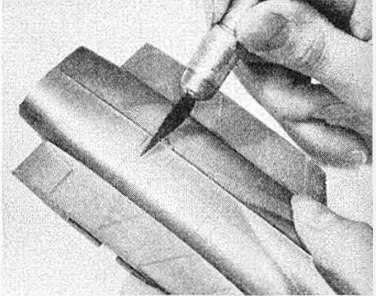
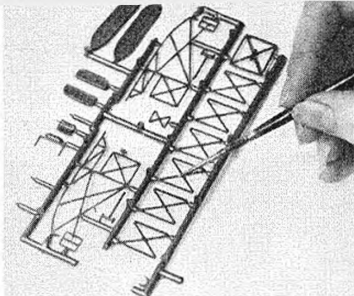
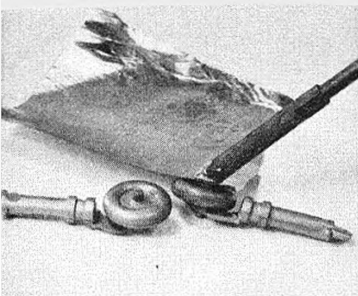


Fulcrum Spitfire before and after treatment with rubbing down paper to remove the non-scale ribs, and ridges for transfers



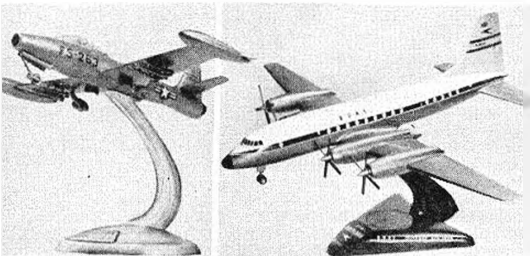
Always check for fit before assembly. Here, the Lincoln Hawk Supermarine S6B is being aligned at the wing/fuselage joints





Above, left to right: Wheels on the Revell Outcast can be riveted over the ends of the axles and using a heated iron with a thin foil insulator. Center: Kleenair miniature Wright Biplane comes in a complicated "tree" and we advise that all components be painted before breaking up. Colour in this case should represent varnished spruce.

Below: Frog Thunderjet with half-retracted life and Frog Britannia with extended life shows different mounting theme.



Below: stages of construction, the Lindberg Winnie Mae Lockheed Vega having large transfers applied showing how backing paper is removed by sliding away from one end. Note unremovable controls. Lindebu I also is modified with long range tanks and given first coat of white, always streaky, second coat covers. Below it, stages of Polyfoil covering. A showing plain Polyfoil. B after rubbing over the part to be covered, impression is left of the Merrit Camel. C resulting cut away from Polyfoil is ready for application with 50/50 Plibond/thinner.



Finished model, an Airfix Hart exactly standard except for Polyfoil covered cowling and fuse wire rigging



Be particularly careful when applying the adhesive to the plastic not to allow it to creep outside the area to be metalised or the surface will be destroyed just as with polystyrene cement.

When sufficient skill has been acquired with this process, it should be quite feasible to cover an entire model with metal in this way. If a high polish is required metal polish can be used when the Plibond has thoroughly set.

Much can be done to make your model "different" by studying photographs of other marks of the same type of aircraft and adding or modifying the appropriate parts. For example long range tanks may be fitted; fin to rudder shapes were frequently altered (Vampire, Venom); second cockpits were fitted to some wartime types, notably the Spitfire trainer. Wing tips were often clipped or extended; extra armament fitted—for example the 37-mm. tank-busting cannon on the Ju.87. World War I aircraft were noted for their seemingly endless variety of modifications. In every other picture of a particular World War I type it seems to exhibit new devices! Favourite items for mods. were exhaust pipes, cowlings, props, cockpit shapes and rudder outlines.

Wooden airscrews always look best when modelled in wood! Choose a close-grained piece of beech or similar material and after shaping and smoothing, give a couple of coats of varnish.

Small additional pieces may be filed up from the plastic stalks but larger parts may have to be made of thick acetate sheet or perspex. Aerial masts, arrester hooks, pitot heads and other similar delicately fashioned parts are best made from thin wire or pins.

Some of the larger airliner kits lend themselves to careful sectioning rather like their big brothers in the airline office windows. Coloured illustrations of airliner interiors are often obtainable from manufacturers or airlines operating the particular type of aircraft.

This is not the sort of task to be lightly undertaken, and considerable modelling skill is required to execute it successfully. It is nevertheless considerably simpler than trying to do a similar job with a wooden fuselage, and the resulting model could be really worthwhile.

There are so many different types of paint especially prepared for plastic kits, that the newcomer is bound to be rather bewildered by the variety. They may be roughly divided into two types—fast-drying and slow drying, the latter being chiefly oil base. Unfortunately not all the makes are equally efficient, some in fact, are almost certain to ruin any model no matter how carefully applied! The only answer is to buy a small sample quantity and try it out on some unimportant part or inside a fuselage shell, where it won't show. At first the prospective purchaser may be attracted to the fast-drying variety, but beware! Although some of these are extremely good, and certainly save a good deal of time, they can be inferior to a slower-drying finish where much fine detail painting is to be executed. Nothing is more exasperating than to have the paint start to thicken and the brush go solid with dry paint halfway through a piece of intricate decoration! One or two manufacturers produce their paints in matt finishes as well as glossy. It is particularly important to stir these well in order to obtain the true matt surface.

(Continued on Page 636)



Viscount 800
in B.E.A. markings

FROG



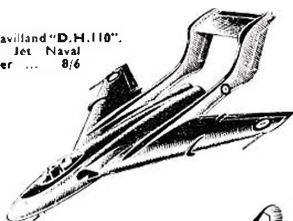
TRADE MARK

PLASTIC SCALE MODELS

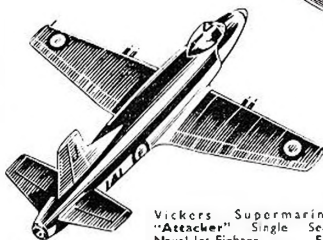
Features include window apertures with transparent moulded windows; fully detailed undercarriage with moving wheels; realistic engine cowls with revolving airscrews; authentic detailed interlocking parts. Kit includes attractive display stand; set of high quality body transfers; special cement and paint; comprehensive instructions and drawings.

PRICE 14/6

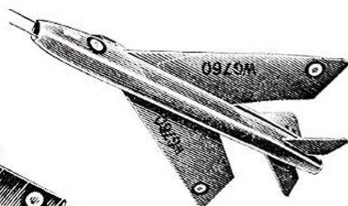
De Havilland "D.H.110".
Twin Jet Naval
Fighter ... 8/6



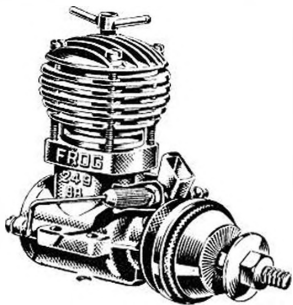
Fairey "Gannet". Three Seat Prop-Jet
Naval Submarine Spotter ... 8/6



Vickers Supermarine
"Attacker" Single Seat
Naval Jet Fighter ... 5/3



English Electric "P.1A" Super-
sonic Twin Jet Interceptor
Fighter ... 6/9



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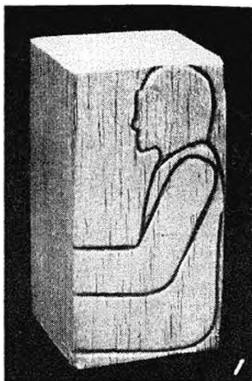
INTERNATIONAL MODEL AIRCRAFT LIMITED

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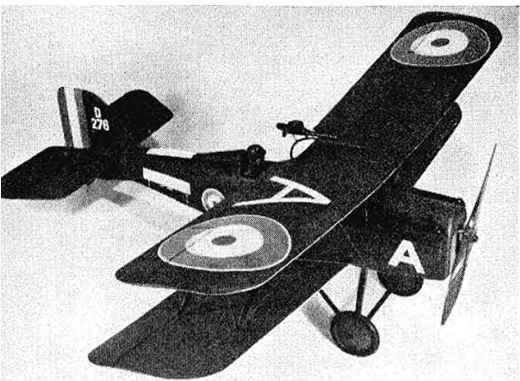
S.W.19

ENGLAND



Carve a PILOT for your S.E.5a.

described in
easy stages
by
J. D. McHard



PROUD S.E.5A OWNERS will naturally wish to complete their brand new model by including a scale pilot. Doug. McHard has therefore supplied simple stage by stage photographic instructions which made child's play of a job that oft baffles the scale builder. Although no claims are made that this is an exact reproduction of the famous "Mick" Mannock, we can assure readers that the gentleman is strictly "one inch to one foot"!

A soft balsa block $1\frac{1}{2} \times 1\frac{1}{2} \times 3$ in. is required on which should be traced the side elevation shown full-size above.

Cut around the outline being careful to keep fretsaw or coping saw vortical (see photo 2). Mark out and cut away $\frac{1}{4}$ in. each side of the head, $\frac{1}{8}$ in. deep under the arms and shaded area between the forearms. Carve away the sides of the chest to meet upper arms (as shown, photo 3).

For the next stages use a balsa knife with a pointed blade and cut with extreme care—many a surgeon has spoiled the job through over exuberance with the tool! Carefully remove corners from the arms and head, narrow down the cheeks leaving goggles (as shown, photo 4). At this stage also separate the chest from the arms by a groove and separate the legs. Carve away tunic and leave collar, and remove shallow layer from cheek to leave helmet in relief (photo 5). Delicately sand all over with fine grade sandpaper, but do not excessively round corners which should now be left as sharp as possible, i.e. the collar, front of goggles, edge of helmet, etc. Work on actual face using a mirror if you are in doubt about the shape, sand a few creases and wrinkles in pilot's jacket and cut away right hand slightly to form the overlap (photo 6). Carving is now complete and grain should be filled with sanding sealer. When dry rub down with No. 400 "wet and dry" paper used dry. Job is now ready for painting.

Jacket and helmet should be brown to simulate leather, using either silver for the goggles or black covered with pieces of celluloid. Flesh face can be produced by mixing white, yellow, brown and red. Pins form the tunic buttons, and do not forget the belt buckle. When dry realism can be improved by undercutting the helmet front and collar, also by a certain amount of "embossing" to simulate helmet straps, pockets, etc.



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Excelene Lubricating Oil,
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For the Handyman! For the Modeller! The "all-in-one" Humbrol Painting Kit, containing plastic enamels, metallic colours, and thinners, a paint brush, 2 mixing palettes, tube flattening agent for producing flat finishes, and a colour blending chart. It's the most versatile modelling and handicraft pack on sale to-day—it's the perfect Christmas Gift. **8/6 d**

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A 3572" SFAN SPORT MODEL FOR AP'S CODE B-C (1-46--87 CC) MOTORS

CHLOE



DESIGNED BY
R. Darr

3/16"

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38, CLARENDON RD., WATFORD, HERTS.

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

COIL WITCH FOR SCRAP BLOCK

ALBION DART? SHOWN (USE 4" x 4" AIRSCREW)

1/4" SPINNER

18 SWG. HOOKS

RUBBER BAND RETAINING HATCH

3/16" SHEET

1/4" DRAIN HOLE

1/2" AIRWHEELS

1/16" SHEET TOP ONLY

POSITION OF FIN

3/8" SHEET TIPS

1/8" SQ. L.E.

1/8" SQ. TOP

1/8" SQ. BOTTOM

1/8" x 1/2" T.E.

1/8" SQ. L.E.

1/8" SQ. TOP & BOTTOM

1/8" SQ. BOTTOM

1/4" x 1/4" T.E.

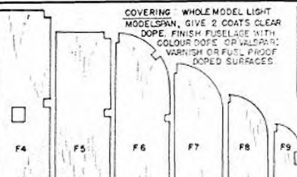
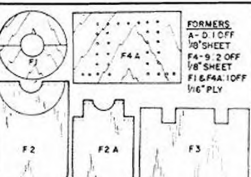
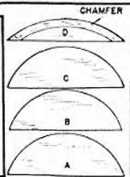
18 SWG. BRASS TUBE BOUND TO 1/8" SQ. FLUSH WITH BOTTOM

18 SWG. HOOKS BOUND TO F8 SQ. A

3/16" DOWEL

SECTION A-A

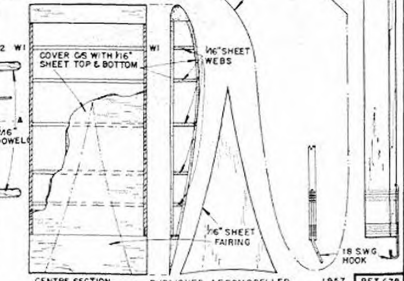
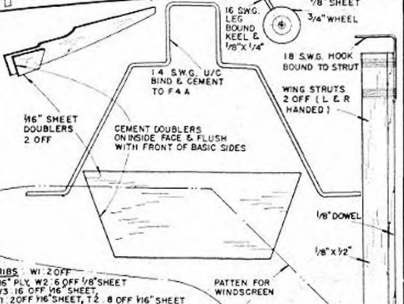
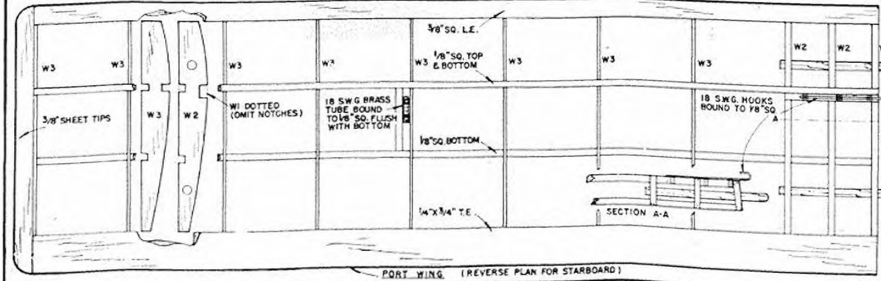
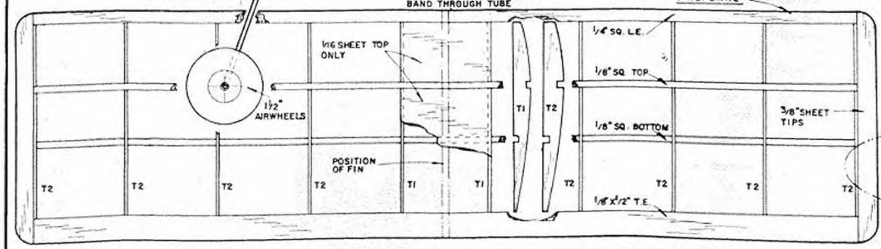
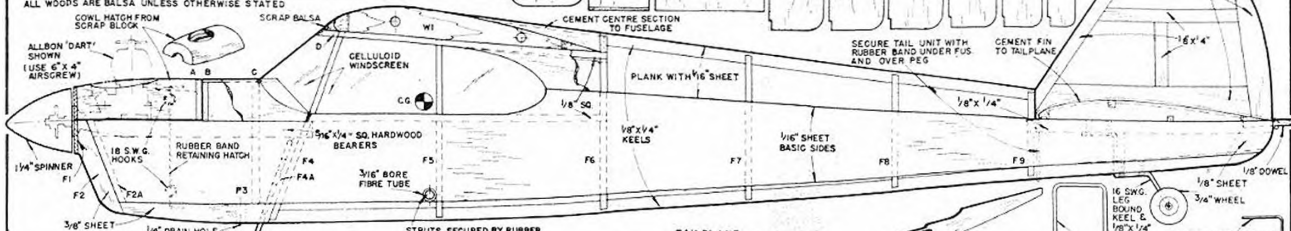
PORT WING (REVERSE PLAN FOR STARBOARD)



- MATERIALS REQUIRED**
- 3 SHEETS 1/16" x 3"
 - 1 SHEET 1/8" x 3"
 - 1 STRIP 3/8" SQ.
 - 1 STRIP 1/4" x 3"
 - 1 STRIP 1/8" x 3"
 - 1 STRIP 1/4" x 3"
 - 1 TE STRIP 3/16" x 3"
 - 1 TE STRIP 1/4" x 3"
 - 12" OF 5/16" x 1/4" BEECH
 - 1/2" x 3" OF 1/8" PLY
 - 1 PIECE 1/4" SWG. WIRE
 - 1 - 16 - "
 - 1 - 10 - "
 - CELLULOID, WHEELS, ETC.

FORMERS
F1-D 1 OFF
F2-SHEET
F3-2 OFF
F4-2 OFF
F5-SHEET
F6-F8 1 OFF
F9-1/16" PLY

COVERING WHOLE MODEL LIGHT
MODELLAN, GIVE 2 COATS CLEAR
DOPE. FINISH FUSELAGE WITH
COLOUR DOPE (IF AVAILABLE);
WINGS OR PLY. DOPE
DOPED SURFACES



AERO
MODELLER

640

December, 1957



CHLOE

*A nifty young miss
of 36 inches span for
the sport Model flyer*

DESIGNED FOR .5 c.c. MOTORS
By Ron Darr

HERE'S A MODEL designed for confined quarters and easy transport. Wings are two-piece with realistic strut retaining, the largest component being the fuselage (approx 24 in.), so it really is "suitcase size" Designer Ron Darr is an Australian modeller from Newcastle, N.S.W., who has been living in London for the last year or so, and fully realises the problems of the travelling aeromodeller. We think he has done well to get such original lines in what is normally considered a played out theme of high wing cabin sports design for small engines and are sure that Chloe will soon be achieving great popularity, particularly with modellers in the Services.

Make the basic fuselage keel outline over the plan from $\frac{1}{4}$ -in. sq. and $\frac{1}{4}$ x $\frac{1}{4}$ -in. strip balsa, bend the 16 s.w.g. tailwheel wire to shape and fix in position, then cut out the half formers F4-F9 (two of each are required) and cement in place on the basic fuselage. Add the $\frac{1}{4}$ -in. sq. strips which form the cabin outline and the $\frac{1}{4}$ x $\frac{1}{4}$ -in. strip tailplane seating.

Cut out the basic fuselage sides from $\frac{3}{16}$ -in. sheet and fit nose doublers. When dry, add to fuselage, fit former F3 in place. Bend the undercarriage wire to shape and bind with strong linen thread to F4A and cement in position.

Cement F1, F2 and F2A together and fit in place. Add engine bearers, top cowl formers B and C and cover with $\frac{3}{16}$ -in. sheet.

Build the removable cowling over plan from formers F1, A, $\frac{1}{4}$ x $\frac{1}{4}$ -in. strip and $\frac{3}{16}$ -in. sheet. Fit engine (it could be inverted if preferred). Add the bottom of cowl from

$\frac{3}{16}$ -in. sheet. Build the centre section of wing over plan and when dry, cement in place on top of cabin. Add former D, cut the piece of $\frac{3}{16}$ -in. fibre tube to length and cement across fuselage to take strut bands. Plan the rest of fuselage with $\frac{3}{16}$ -in. sheet and sand down to a smooth finish. Cover with lightweight Modelspan and apply two coats of clear dope. Cut and fit the cabin windows from clear acetate sheet. Finish with one coat of enamel or lacquer.

The lifting section tailplane is quite straightforward, the centre section being covered with $\frac{3}{16}$ -in. sheet on top only.

The fin is of flat section from $\frac{1}{4}$ x $\frac{1}{4}$ -in. strip and $\frac{1}{4}$ -in. sheet. Cement the fin to the tailplane after covering.

Wings are similarly straightforward and should present no difficulties. The wing retaining hooks are bent from 18 s.w.g. wire and bound with linen thread to a short length of $\frac{1}{4}$ -in. sq. hardwood and cemented in position. Strut retaining tube is bound to a strip of $\frac{1}{4}$ -in. sq. balsa, with linen thread and cemented in position, sandwiched between the wing rib and another strip of $\frac{1}{4}$ -in. sq. flush with the lower wing surface. Cover all tissue surfaces with lightweight Modelspan and give two coats of clear dope and one coat of clear varnish or fuelproofers.

Wing struts are all that need to be made to complete Chloe and should be made to the exact size specified.

Glide trim for a very gentle right-hand turn. On power it should climb in a left-hand circle.

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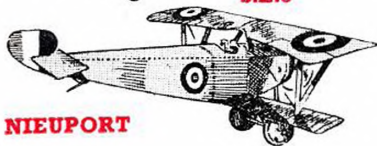
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D-8**



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BALSA STORY

This is one of a series of articles written by John Paterason, Managing Director of Solarbo Ltd., covering all aspects of Balsa Wood and its many applications.

PART 8

TROUBLES WITH FUNGUS ATTACK . . .

SOLARBO BALSA
IS USED IN THESE
LEADING KITS
AND MANY OTHERS

DAVIES
CHARLTON

FROG

Hobbies

VISCA

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VERON

YEOMAN

QUICKBUILDS



IF YOU HAVEN'T seen a tropical forest you can have no conception of the conditions. I have walked through a year-old banana plantation littered with felled lumber and it simply crumbles underfoot. Just imagine the concentration of fungus spores from such conditions! This process of the rotting of vegetation in the tropics is fantastic and you don't need to leave a Balsa log long before trouble starts.

Fungus likes both damp and warmth for "best results". Below about 18 per cent. moisture in the wood fungus is inactive, although the spores will keep alive almost indefinitely ready to start all over again should "conditions improve".

Below a temperature of about 50 degrees F, again they don't do much damage. They are most active at temperatures of the order of 70-90 degrees F, and thrive best in a moist atmosphere with stagnant air.

The most commonly known form of fungus attack is the so-called "Dry-rot", which is often found in the timber of old houses where there is no ventilation and where faulty construction allows moisture to creep in. The name "dry-rot" is misleading as I can assure you that you will never get it if you have a dry house. Incidentally, you can recognise dry-rot by the cubic formation into which the wood breaks up.

To the timber trade the most common forms of fungus attack are Blue Stain and Dote, and these are caused by two different kinds of fungi. Blue Stain does not destroy the wood cells, only discolours them. Dote actually breaks down the wood fibres in the cells and leaves a softened and generally unsightly material.

Coming as it does from moist, tropical conditions, Balsa is very susceptible to

fungus attack unless proper precautions are taken. Dote in Balsa shows as white patches, often with a black line round the edges.

These types of fungi with which we are concerned do not attack growing trees. If Balsa trees could be sawn and dried very quickly after they were cut the worst defects would be prevented. It is in the time between the cutting down of the tree and the final drying of the wood where the damage occurs.

The economy of any timber production rests equally on the efficiency of the logging methods and the conversion at the sawmill. My own opinion is that with Balsa the first is the most important—and the most neglected. I would say that there are no really properly organised logging operations in Ecuador.

In the big timber-producing countries the sawmill runs its own logging. In Ecuador, the sawmill buys its logs—generally in the river either at the mill or at some assembly point near where the Balsa grows. The actual logging—that is, the cutting down of the tree and its haulage to the river—is carried out by individual operators.

Immediately the tree is felled the bark is stripped off and it is cut into logs which are left lying until it is convenient to move them to the river. It may be convenient for a contractor to move them by lorry fairly quickly if he wants the money. On the other hand it may *not* be convenient for another operator to move them for some time—if he isn't hungry and doesn't want the money—or finds something else to do which attracts him more. So the time between the cutting down of a Balsa tree and the sawing at the mill may run into many weeks.

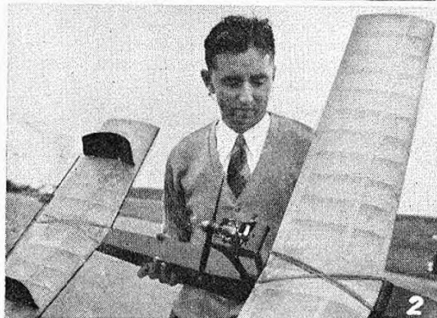
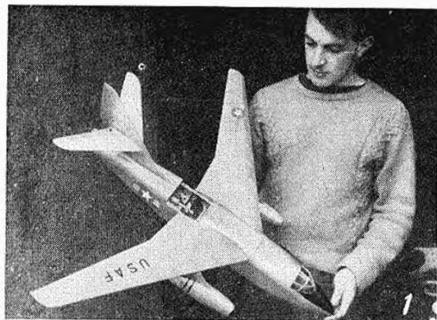
This being the Christmas issue, I would like to take the opportunity of wishing all our friends at home and abroad the Compliments of the Season

John Paterason

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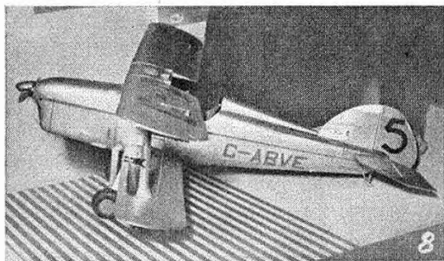


R.A.F.M.A.A. United

JUST AS NORTHERN HEIGHTS seem to be forever blessed with superb weather for their annual Gala so it would appear that the Royal Air Force Championships get the roughest and most unkind weather conditions year by year. For '57 the meeting was held at R.A.F. Debden, a hilltop 'drone' in Northwest Essex of reasonably large bounds though not large enough to contain a maximum flight in 24-30 knots of blustery wind. Well organised by an enthusiastic "admin" staff of volunteer Officers, the Championships were to have been the largest ever; but Asian flu bedevilled 22 per cent. of the original 425 entry. Nevertheless, the enthusiasm of those at Debden reflected the increasing interest in modelling, and the diversity of designs shows keen appreciation of latest developments. Certainly one need have no fear of having to forsake the hobby when in the R.A.F. with so many enthusiastic clubs at Stations in each Command.

In one respect the R.A.F. lads leave their civilian counterparts standing, and that is in the AA Team Racing section. Ten miles in 13 minutes is no small achievement by Apprentice Dicker's team from Halton especially when one considers the .8 c.c. capacity of its engine. Other outstanding performances were the entry in

(1) S.A.C. D. Styles of Shuabury (Flying Training) and Bob powered by an MV.10 with Veron fan clipped to 3-in. diameter. (2) Flt. Andrews of Cranwell (Flight Training) R/C winner with RB.8, E.H. 2.45. Rear disc is mated 90° for reverse running. (3) Stunt 1st and 2nd. Cpl. Barker and L.A.F. Dibb from Halton using BB Anco and Oliver Tiger. (4) Second in Concours. 3rd in open glider L.A.C. Pizey of 90 group. (5) Trop winning 3A TRK by Apprentice Dicker of Halton with Behra Piccolo. (6) S.A.C. Evered of Shuabury (Flight Training) entered almost everything, here in rubber and in Concours with Lightning (7)



Kingdom Championships

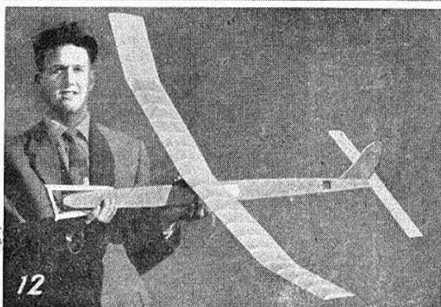
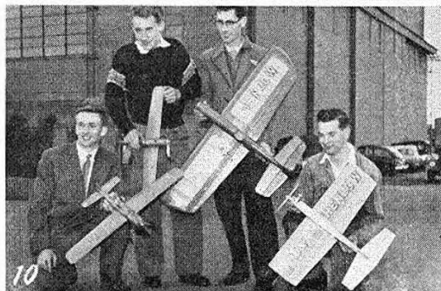
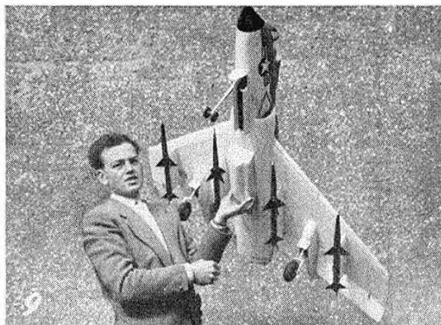
practically every event by S.A.C. Evered (Flying Training)—doing well in all of them, and the Scots sweep of controlling by J.T. Irvine (Transport) whose Arrow Active is one of the most impressive free-flight scale models ever seen, and who, as R.A.F.M.A.A. Secretary, was responsible for the smooth running of this important meeting.

The large number of events precludes us from publishing full results, the winners of all but Concours d'Elegance are quoted below.

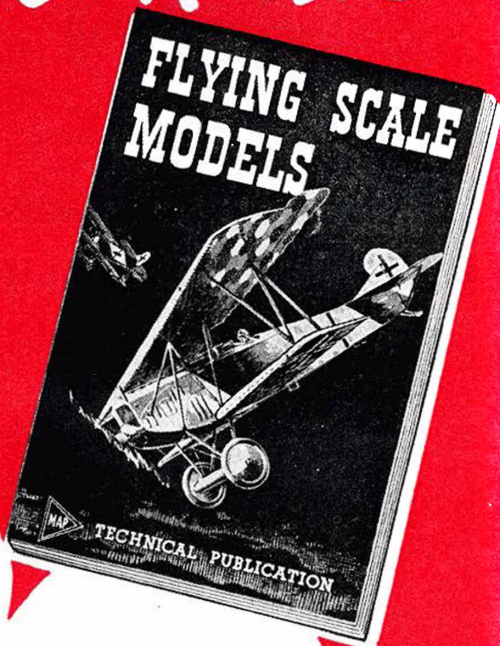
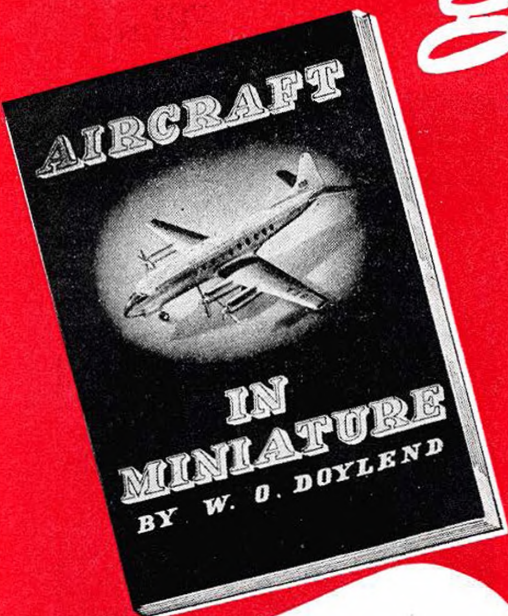
RESULTS

A/2 Glider Open Glider
P.O. McIntyre (Maintenance) 5:18 P.O. Whiteley (Flying Trg.) 7:08.
"Thurston" Wakefield Rubber and Open Rubber
J.T. Payne (Fighter Command) 5:55.
"Wilnot Mansour Trophy" Jetex
S.A.C. Evered (Flying Trg.) 4:58.
"St. Athan Trophy" Scale
F.L.T. E. Norman (Transport).
"Model Aircraft Trophy" Power and FAI Power
J.T. Mack (90 Group) 5:47.
C/L Aerobatics
Cpl. Tech. Barker (Tech. Trg.).
Team Racing
A.A.A. Dicker (Tech. Trg.) 13:13 A. J.T. Irvine (90 Group) 9:38.
B. J.T. Irvine (90 Group) 12:17.
"Malta Cup" Radio Control
F.L.T. Andrew (Flying Trg.).
Unorthodox
J.T. Brewin (Flying Trg.) Tailless. J.T. Irvine (90 Group).
Inter-Command Challenge Shield
Flying Training Command. 2nd. 90 Group. 3rd. Tech. Training.

(8) Magnificent Arrow Active by F.L.T. Norman (Colerne) gained him top prize. (9) Outstanding near scale Cutlass for pusher Aeneas 3.5 by P. O. Graves of Bridgenorth. (10) Victorious C/L group from Henlow (90 Group) includes Ron Irvine extreme right, winner of A and B ITR. (11) Scale Auster Agricola for Prop 30 by Cpl. Abber (90 Group). (12) J.T. Payne of West Malling (Fighter Command) winner of Thurston and Open Rubber. (13) J.T. B. Mack of Henlow (90 Group), power winner with enlarged Zoot Suit, AM.25



Gift books for Xmas



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WORLD NEWS

THERE'S JUBILATION IN **Belgium** for the notable Gobeaux family have now bagged the full selection of possible R/C power records. It's Jean-Pierre the son, who has now added an 8-1 mile distance and 4 hrs. 27 mins. 14 secs. duration records to his already ratified height (3,746 ft.) and speed (66-48 m.p.h.) F.A.I. records, and as each of the latest achievements was officially witnessed, there is little doubt that they too will go through for F.A.I. ratification. On Thursday, October 10th, the Gobeaux Equipe (Dr., Son, R/C Mech. Trigallet, and observer G. Libert) chased the 11 lb. model by car (with controlling son in attendant trailer) from Casteau lez-Mons to Chieuvres airfields, distance 8 miles and time 22 minutes, then on the Saturday they broke the duration record in dead calm weather.

Tusino airport, Moscow, was the scene of the Criterium of Europe for ff power on August 25th. There were quite a few surprises, among them the loss of some very good models despite Mil-2 helicopter searchers but perhaps the **Rumanian** individual victory, and **Finnish** Team win were greatest. Interesting point is that top **Czech** man, Jiri Cerny used a K & B 15. For being the only man to make five max's and win the contest, Moldavian was awarded a brand new K-125 motorcycle, Abramov (2nd) got a T.V. set and Cerny a Kiev camera.

RESULTS

1. Moldavian (Rumania) ... 900	2. Abramov (U.S.S.R.) ... 880
3. J. Cerny (Czech.) ... 873	4. Raulio (Finland) ... 864
5. Frestl (Yugo) ... 851	6. Stepanovic (Yugo) ... 850
7. Niemi (Finland) ... 846	8. Kucerov (U.S.S.R.) ... 818

Times: 1. Finland 2511; 2. Czech. 2486; 3. U.S.S.R. 2433.

Some astounding duration and distance flights have been made in **Denmark**. At the summer aeromodelling camp, one day the Wakefield record was broken twice at 18 : 36 and 26 : 44 by Hoyer and Nienstadt then Gunnar Nielsen made 24 : 30 and 49 : 46 with an A 2. One A 2 by Schiott was intercepted during a 45-minute flight at 2,000 ft. by an Olympia Sailplane which could not follow it upwards! June 9th was another remarkable day with strong westerly winds and thermals carrying away many models. Among them, a Hansen "Skymaster" A 2 by 15-year-old Ole Christiansen went o.o.s. and the loss notified. Several months later the model came to light through correspondence from **Sweden**. It had

Beautifully detailed Aero-45 from Czechoslovakia, has a pair of 2.5 c.c. diesels and 21 v. system to retract the life plus a completely detailed cockpit. Made by V. Bena, it is 1/10th and weighs 4 lbs. 8 oss.

From Finland two of the victorious European Championship team winners O. Niemi, also 2nd in Finnish Nationals and S. Pimenoff. Wonder where he got the inspiration for the name "Naughty Lady"?



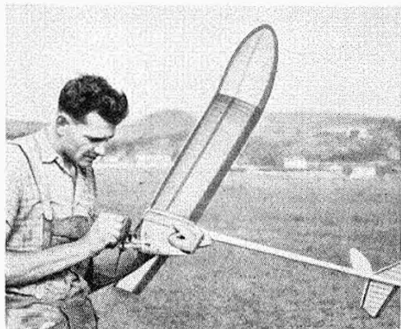
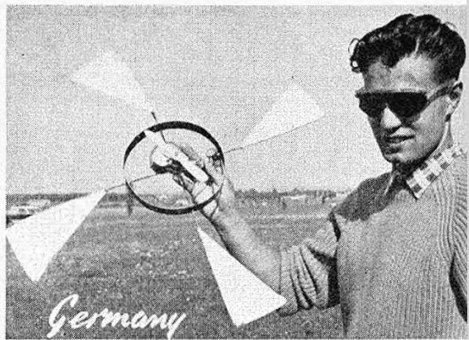
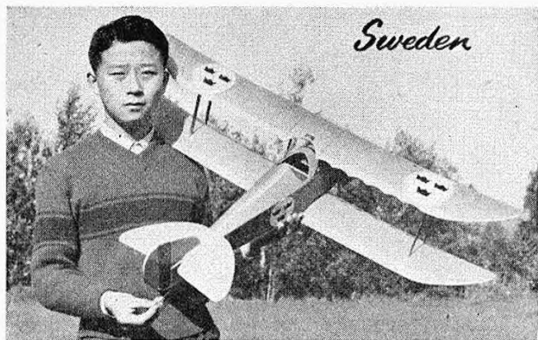
Argentina



Doctor Frederick Deis uses a British AM.25 for his King-Kinota R/C design with Lorenz Aristrol Receiver.



Finland



Hoh Fung-Chiu of Korlebo, Sweden, shows his Allbon Super Merlin Tunnelsa of 11 in. span true scale. Colour is all silver with blue and yellow rudder stripes.

From Germany, first a unique and robust helicopter seen at Nurnburg, flying to great heights. Next Nats. 1/2 winner Adelbert Fooker of Zwickbrucken, Saar, total of 1,672 secs. in 10 rounds. At end, Ewald Teuonkle of Backnang, nr. Stuttgart, top in the under 1 e.e. class with perfect 1,800 secs., total 10 mins.

Austrian models always have unusual ideas. For example, Fritz Zulek at left, with padded Wehra 1.5 and Ernst Hasehe with E.C. Racer. VTO design, uses central fin.

East German, Hans Neelmirer won the Hungarian Nationals with this elegant design (Schlosser 2.5). Features variable wing incidence as in "Aeromodeller" Annual last year. Uses 1 degree for the climb, 2 1/2 degrees for glide. At right, is Ordogh Laszlo with his design, built to 1956 rules for Wehra Mach 1, now being tested.

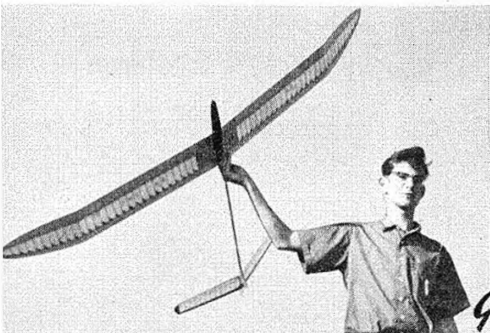


Polish solid scale Stormoviks, were made by S. Matlok of Libiaz, complete to pneumatic wheels.

Leading 1956 Wakefield design fliers in Hungary are George Benedek, K. Bathge and L. Azor, top man.

At Norwegian C.J.L. Champs., Bjorn Ellingsen flew full aerobatics with Fox 35 Spitfire in National colours, has retractable etc. At right, from Sweden is Rune Johansson's radio Ceana with Avon PH 3.5.





Germany



landed after a 722-mile flight across sea and land at Ugglarp near the Swedish coast, having crossed 68 miles of the Kattegat and probably creating an all-time record for over-water model flight. Incidentally in the '57 Nordic country Championships, Sweden took top placings in power, rubber and speed c/l, while Finland led in A/2. Contest was held at Norrköping, Sweden.

The **Hungarian** freeflight Nats were the scene of very high A/2 times, Otto Roser making a perfect 900 secs. and fourth place only 15 secs. behind. Wakefield was a new rule contest producing interesting times in view of the near perfect central European conditions.

- | | | | |
|-----------------------|-----|---------------------------|-----|
| 1. Ladislaus Azor ... | 841 | 2. G. Bohme (invited | 801 |
| 3. K. Bathge ... | 768 | from E. Germany) | |
| | | 4. G. Benedek (see photo) | 761 |

In power, one '58 rule model was seen: but this on test only. Event was won by invited **E. German** Neelmeijer's interesting timer actuated variable incidence model (Schlosser 2-5) using .5! for the climb, flicking to 2-5! on motor cutout after a system devised by Hank Cole (U.S.A.) with flaps and described in the '56 A/M Annual time was 881 secs. (See photo.) Second was Gasko's Webra Mach 1 design with 868, 3rd, Dr. Egervary (Webra Record) 851. Latter model made the astounding total of 2,700 secs. in three climbs prior to the Nationals.

The Western Province M.A.C. in Cape Town, **South Africa**, has the onus of running next Easter's S.A. Nats. and appeals for a total of £400. Sounds like a lot of money, and certainly it's many times the cost of the British Nats.: but the hire of a c/l stadium, catering and prizes absorb the difference. R/C combat resulted in a first-ever collision on September 29th when Fred Raubenheimer's Cruiser clipped the tip of Peter Duffey's o.d. Cruiser, flew on, and the o.d. was "shot" down—both streamers untouched! Map included

with W.I.P.M.A.C. newsheet shows no less than 5 model flying sites, farthest being 25 miles from Cape Town and three of them aerodromes—lucky people!

North, in **Uganda**, the Kampala based Model Engineering Society have a club magazine and a spirit of enthusiasm that puts many another more ideally situated group to shame. These lads depend almost entirely on the mails for supplies though they've obviously encouraged a few shops to carry modelling goods, and by all accounts they are having great fun finding out the finer points of aeromodelling. Takes us back to those halcyon days when modelling was to us city types just a little more of an adventure than the accepted pastime of today. On the Equator, and the shores of Lake Victoria—we can't imagine a more unique centre of enthusiasm than that at Kampala. **Swiss** c/l international at Basle, mentioned in September issue, drew entries from France and Morocco, but was won throughout by the host country. No outstanding times were established: but the first class B (5 c.c.) team race to our knowledge in an international was the event in which old friend Georges Vallet eclipsed the field with 15 Kilometres in 9 minutes using a Fox 29.

In Havana, **Cuba**, the c/l liners were suffering the usual chase from pillar to post finding flying sites over which to exercise their "35's" and when the last site was suddenly absorbed by home development, they thought "that was that". No so, for by invitation, the modellers were given free use of an extensive site just across the highway, specially cleared too. Reason being that with flying permitted from 10 till 2, the c/l would be a crowd stopper and draw attention to the new homes the landlords wanted to sell!

We also learn that in Dallas, **Texas**, the modellers have been given a vast area for flying, substantiated by generous backing from local officials—and with no trade ties or commitments—good show!



Norway



Sweden



THE OUTBREAK of World War I in 1914 played a two-way part in the lives of thousands of young men throughout Europe. This was particularly true of those of British stock.

Those who were born, say, 1895 had never had to face the prospects of war or the shackles of required military service. When Germany first ran roughshod over France and Belgium young men of the time took one of two views.

They either ignored what they honestly believed to be a local political wrangle, or like one Edward Mannock born in Wexford, saw the whole liberal spirit of his world menaced by Prussian militarism. If it triumphed, then Edward Mannock knew that the better civilisation, built up from the industrial shambles of the nineteenth century was savagely threatened.

Thus, handicapped by humble birth, lack of higher education and shackled by a physical disability but inspired by high ideals, he performed the impish deeds which earned him the title—"King of Air Fighters."

Major Edward Mannock destroyed 73 enemy aircraft in his wild and savage career. Britain was to award him the much coveted Victoria Cross, the Distinguished Service Order (with two bars), the Military Cross (with one bar). And so he tickled up what can be considered one of the highest decorations his government could bestow.

Major Edward Mannock was the son of one Corporal Edward Mannock, of the Royal Scots Greys. In 1881 when the regiment was stationed at Ballinaclog, Ireland, Corporal Mannock met and married an Irish girl named Julia O'Sullivan. Their first son, Edward, was born at the Preston Cavalry Barracks in Brighton, England.

Years later, when American fliers who became associated with Major Mannock, attempted to nickname him Mickey and place him in their popular category of the fighting Irishman, Mannock would not permit such familiarity. However, in his letters to his mother and Mrs. A. E. Eyles of Wellingborough, Northamptonshire—his closest friends during his adult life—he often signed himself Paddy, Murphy, Ed or Pat. With his associates at the Royal Flying Corps schools he allowed only a select few to address him as Mick.

Mannock was the last British aviator to win the Victoria Cross during World War I, but this was not gazetted until 1919. Only nineteen such honours were awarded during those four-and-a-half years of aerial warfare. When the official announcement of the honour was made, few people had ever heard of Mick Mannock.

"Who is Major Mannock?" the man on the street asked.

Few could tell him, for Britain's last V.C. was a comparative unknown—even among the service armien of that day. It took several years and the combined efforts of his few friends to unearth the amazing history of this unknown "King of Air Fighters."

Following the close of the Boer War Mick's father brought his family back to England from India where they had been living. Once the old trooper had then fought in Britain he deserted Mrs. Mannock and her five children. Then twelve years of age, young Mick had to go out and work.

Twenty years later the former Corporal Mannock turned up at Buckingham Palace to claim the medals and honours won by the son he had so faithlessly deserted, although Mick, who had been killed on July 26th, 1918, had willed his personal belongings to other relatives.

As a youngster, Mick worked in a green-grocery shop hunching carrots. He went from that to assist a barber, but eventually became a lineman for the National Telephone Company. By that time it was discovered that he was almost totally blind in his right eye.

In January, 1914, Mannock borrowed a small sum of money from Mr. and Mrs. Eyles and went to Constantinople "to make his fortune". He found work there with another British telephone concern and within six months had risen to be a district inspector. By August 28th the Germans were doing their utmost to induce Turkey to join the Central Powers. By the following November Mannock, along with his British associates in Constantinople, was a prisoner of war. However, Mick was induced to stay on his job and help run the telephone system, but, as can be imagined, he was like a tiger in a cage.

His guards used to taunt him by yelling "England is ruined!" and Mick would thumb his nose at them contemptuously. However, because of his faulty vision he was included in a group of exchanged prisoners in April, 1915. The Turks laughed and said: "An old crock like you isn't likely to give us much trouble." Little did they realise that they were releasing a fighting man who was to become the greatest of all air fighters and personally destroy the equivalent of several enemy squadrons.

On his arrival back in Britain Mick first joined a Royal Army Medical Corps regiment. His new comrades nicknamed him "Jerry", probably because he was continually expressing his loathing towards the Germans. When his particular group was transferred to the Army Service Corps as a special ambulance party Mick decided to make a change.

He was transferred to the Royal Engineers

By Arch Whitehouse

where he spent a few months learning the job of a sapper and turned out to be a good engineer. They looked to keep him, but Mick was reading about the deeds of Captain Albert Ball, then Britain's leading aviator and he applied for a transfer to the Royal Flying Corps.

"How are your eyes?" his Commanding Officer inquired. "Wonderful!" Mick lied.

How he wangled his way past the very intricate eye tests of the Royal Flying Corps doctors is a mystery, but months later he admitted he had put on a tricky double-shuffle bluff. However, it was not until August, 1916—two years after the war had broken out—that Mannock got anywhere near an aeroplane.

Like so many others who were to become star performers, Mannock was something of a dud pupil at flying school. Fortunately, he had an instructor who not only knew the business but who understood Mick better than Mick understood himself. This was the famed Captain Jinty McCudden who was to win the Victoria Cross. McCudden, too, was the son of a time-serving soldier. He, too, had been born in a military barracks. McCudden had been an aircraft mechanic in the R.F.C. before the war and rose to amazing heights before his untimely death in 1918.

Mannock was apparently good in the air, but terrible at landings. He was not a "stunt" pilot, but it must be remembered that during the war "stunt" pilots seldom displayed real courage in the face of the enemy.

Also Mannock was much older than his comrades and was considered very serious-minded; but in his training he exhibited a mixed pattern of scholastic impetuosity and veteran conservatism. Although few realised it he was actually working on a self-imposed drill of practice in which he aimed to perform every manoeuvre perfectly. Nevertheless, his loss shows he had more than his share of buckled undercarriages.

Mick did not get to France as a lieutenant pilot until March 31st, 1917, and not until April 6th was he posted to a fighter squadron—No. 40, flying Nieuport scouts.

The Nieuport Scout was hardly the mount for a beginner. It was not too big, tricky on the controls and, like so many French machines of that time, not too sturdy. Nevertheless Mannock seemed very pleased with what he called his "Silver hawk". Major Billy Bishop, the Canadian ace, was another star performer who seemed to prefer the Nieuport Scout.

The night Mannock arrived at the airfield he unwittingly occupied an empty chair which had been assigned to a Lieutenant Pell who had been shot down that afternoon. When this was pointed out to him, Mickey simply laughed as he had no fear of death and was in no way scared. Mannock's commander, recalled: "Mannock seemed very shy but somewhat impatient. Like a high-strung pedigree horse, I let him have his head, but his first efforts were very disappointing."

Mannock kept somewhat to himself, learning all he could and yet keeping a crupper on his own wild desires to get at the enemy.

He almost "bought it" on April 19th when his Nieuport threw a lower wing away while he was diving on a practice gunnery target. But Mick kept his head and brought it slowly to earth near his own landing ground. He was in no way perturbed but joshed his mechanic about the incident.

On May 9th Mannock had a frightening experience. A member of the morning patrol, he suddenly found himself alone and being attacked by three enemy armien. His engine failed and his gun sight oiled up and Mickey feared he'd had it. He nose-dived from 16,000 feet and his engine picked up



again at 3,000 feet, but by that time the enemy planes had left him. He climbed back to 12,000 feet where he immediately ran into a lone enemy Fokker. He later wrote: "I didn't have the pluck to face him. I turned away and went home with my knees shaking and my nerves all torn to bits."

Mannock was very honest and told the full story to his C.O. who turned out to be very understanding and kept Mannock off patrols for the rest of the day. Instead he sent him to St. Omer to bring back a new Niueport. Nevertheless, the story got around and for a time Mannock sensed that his comrades considered him "yellow" and he had no word in his own defence.

Frankly, Mannock was suffering from nerves, such as many imaginative pilots did in those days. During his first two months with No. 40 Sq. he was credited with only one questionable victory and still showed signs of being over-cautious during the air action. When he went into the air for practice he was accused of practising aerial gymnastics as a pretence of keenness.

"Mannock has cold feet," more than one airman inferred.

In his letters Mick wrote: "I am still alive, but we have had two glorious days of 'dud' weather when we couldn't fly, but this morning threatens to be fine—worse luck! When a fellow gets old, he is ruled out of 'society' apparently. Where, oh where are all my friends?"

No matter what Mannock did, nothing came off for him. One he had overcome his dread of combat and bravely tackled the Fokkers and Albatross scouts, nothing ever happened. He could pour a long burst smack into an enemy cockpit, but the Jerry ship simply nosed down gently and sailed home. Whenever he dived out of a balloon, the hundreds of rounds of incendiary bullets he'd hammer into it made absolutely no impression. The old kite just stayed up there as though nothing had happened.

But at last a victory rewarded his efforts. An enemy aircraft driven down out of control.

This took place on June 7th, 1917, just north of the industrial city of Lille. Mannock's patrol report read:

"When escorting machines N. of Lille, one hostile aircraft attempted to dive on one of the leading Fies but turned before diving. My Niueport engaged hostile aircraft at very close range and I fired approx. 30 rounds into pilot's position and engine of hostile aircraft."

Hostile aircraft turned upside down, nosed and spun, obviously out of control.

"Endeavouring to watch hostile aircraft crash, but was unable to do so."

"Signed . . . E. Mannock, 211."

The report was witnessed by Lieutenants Bland and Lemon.

This victory gave Mannock the required morale jump. The technique of the game was slowly and unconsciously revealed to him.

On June 14th he took on five enemy aircraft and sent two of them spinning down and on the way home somehow got a large piece of ant in his good eye and almost went blind. How he got down he couldn't say, but he had to go to the hospital where the foreign body was removed, "with much teeth-gritting and profanity," as his later wrote.

His eye gave him considerable trouble and his C.O., Major Tilney, decided that it

might be well to send Mannock on leave. Leave meant fourteen days in England.

The rest proved to be the turning point in Mannock's career. Strange how one had eye got him out of a prisoner-of-war camp. He had eye got him into the Royal Flying Corps. Injury to the one sound eye he had provided a respite when he most needed it. While he was in England he remained quiet and gave much study to the problem of tactics.

To his friend Mr. Eyles he said, "I feel my age is against me in this new and intensive form of warfare, but," he added, "I think there is room for brains in this game. I hope to balance the weakness of flesh by formulating a set of tactics. I've spent hours thinking out schemes for catching the wily Hun. You watch me bowt them over when I return."

Bowl them over he did. Soon after rejoining No. 40 Squadron he realised his theories with amazing speed. After each victory he evolved new tactics—until he became the supreme air-fighter tactician, pre-emptive and unchallenged.

On his return from leave Mick found the enemy fighters slyer than ever. After chasing them about the sky for a while he was fortunate to find an enemy two-seater on his own side of the line. (He promptly shot it down. That took place on July 12, 1917.)

The next day he destroyed another two-seater.

Mannock the once-despised airman, was coming into his own. He was the master of deflection shooting and surprise. His C.O. all along had recognized his soundness and keenness, recommended him for promotion and an award. On July 22nd Mannock was officially awarded the Military Cross and promoted to the rank of Temporary Captain which in turn made him a Flight Commander. In the medal citation it was further explained that in addition to his three destroyed aircraft Mannock had been credited with forcing down three kite balloons.

This was the beginning of Mannock's "Wild Irishman" period. Late one evening he came upon an enemy plane shelled by allied anti-aircraft. Without making a proper report Mannock went down on the unfortunate airman and poured thirty or forty rounds into him before he discovered it was a British plane being fired on accidentally by British batteries. Happily the poor devil got down safely and Mannock reflected on his fortunate bad marksmanship.

Now he began putting in extra patrols, often on his own or perhaps accompanied by one or two equally devil-may-care types. When he found an ambitious youngster Mannock often "took him over" and set up enemy aircraft for him to knock off. If the fellaing couldn't quite finish the job, Mannock cleaned up the mess after giving credit to the youngster—just to encourage him. Thus, many authorities stoutly declare that Mannock probably destroyed more than one hundred German aircraft, rather than the seventy-three in his official record.

On July 28th Mannock came upon a formation of gaudy Albatross scouts over Hein-Lietard and, adopting his surprise strategy, he attacked so swiftly that he drove them down from 10,000 feet to 2,000, destroying one on the way down. Learning from that he spotted an Albatross scout attacking some British balloons. There followed one of the classic duck-the-war, stacked at 1,000 feet above the trenches. Mick fired seventy rounds while the infantry in the slots cheered the exhibition. The Albatross caught fire and the German pilot, a lieutenant von Berran, had a fractured Pett Viny. The machine nosed over and the young German sustained a lanced left arm and flesh wounds. The Albatross was in fairly good condition, but before it could be removed the enemy shelled it to splinters.

On his return to his squadron, his C.O.

congratulated him on his continued success. Mannock replied: "Thank you, sir, but this isn't just luck. Before entering any scrap I meditate and try to foresee what could happen. It's not luck—just careful reflection and meditation."

Day after day Mick flew ungodly hours, but his score was rising and his status in the squadron rose with it. On August 15th, 1917, he hammered an Albatross out of control and two days later crashed a two-seater and chased another as far as Doull. He continued to suffer bad luck with engine failures and crashed on his own aero-plane; but crashes, forced landings and enemy anti-aircraft had no terrors for him. If he piled up one Niueport he slowly crawled out, jumped into another and took off again.

In his nightly chats with his fellow pilots Mannock held distinct views on air fighting. He argued that good marksmanship might come naturally to some and might be acquired by long practice by others, but he did not agree with the awarding of decorations merely for destroying enemy aircraft. Many of his comrades agreed for they all knew what the two-seater 3,000 feet with artillery-spotters and photographic reconnaissance airmen had to put up with. Mannock spent many hours pursuing this unusual (unusual for a fighter pilot) argument.

It was so unusual that No. 40 Squadron found its langars frequented by American newspapermen who wanted to learn more about this unusual Britisher. In all probability Mannock was better known in the United States than he was in Britain—at that time.

Mannock got his first "flamer" on September 4th, an event that really impressed him. It was a horrible sight," he wrote. "He went to two-seater 3,000 feet with streams of fire and smoke trailing behind him. He landed in our lines but there weren't many souvenirs from that mess. However, that makes it 13 for me now. See you can't fly."

We have no record of what Mick did on that leave but when he returned to the front the Hans seemed more timid than ever and it was some time before he could add to his bag. During the next patrol which opened on November 29th, No. 40 S. squadron roamed about the enemy lines attacking targets and took up the new sport of ground-strafing. It required plenty of low-down flying, many hours in the air, but rewarded with few air hits.

Early in December their Niueports were replaced by the savage little SE-5a scout. Mannock and his pals played havoc with the enemy with this new mount, since it was much faster, tougher and better armed than the Niueport. Nevertheless, the cold winter weather proved to be a new mean. "The single vickers gun and the one Lewis gun mounted on the top plane gave considerably stoppage to the crew. A more suitable lubrication could be devised.

Mannock scored his twentieth victory on January 18th, 1918, when he shot a German two-seater to pieces. The next day he was returned to England for a well-earned rest, leaving a memory of a great leader and an airman loved by every member of his squadron.

Mick was kept in England almost three months. After a month's rest he was posted to No. 74 Squadron which was in training at London Colney. They were also lying S.E. 5a which satisfied him, but he resented the time taken to train the newcomers.

One day General Henderson met Mannock in the R.F.C. Club in London.

"How long have you been home, Mannock?" the general asked.

"A month too long, sir."

"So," but you will have to remain another month or so."

Mannock said: "If I can't get back to France soon—with permission—I shall take a machine out of the langar one day and fly back to my old squadron."

The general growled: "If you do that,



Mannock, you will be court-martialled and shot!"

Mannock replied: "Death is better than the dishonour!"

Henderson laughed and said he would see what could be done.

Mannock spent the rest of the night trying to get the general to allow him to fly an S.E.5a at night in order to attack night-raiding Gothas. The general thought the S.E.5a was too difficult to land in the dark.

Meanwhile Mannock was kept busy giving air-fighting lectures to other squadrons. They were delicious dishes of the offensive spirit. It always began and ended with a snort he had invented. "Gentlemen, always fight from above, seldom on the same level; never underneath!"

No. 74 Squadron lived up to this motto and in its first eight months of aerial warfare it destroyed 140 enemy machines and sent another 90 down out of control. In that same time No. 74 lost but twenty pilots to the enemy.

On April 12th, 1918, No. 74 Squadron went into action on the British front and was headed by Major A. S. Dore, D.S.O. Mannock was given a Flight. Later Dore was returned to England and the squadron was taken over by Major Keith Caldwell, a famous New Zealand ace. "Grid" Caldwell and Mannock did much to bring No. 74 to its unusual peak of perfection. Mannock and Caldwell became inseparable, although they wanted the life out of each other and made grisly bets as to who would "frizzle" first.

Most historians declare that April 12th, 1918, was one of the most critical days in British World War I history. The enemy had attacked on a fifty-mile battlefield with an objective of severing the British from the French and taking the Channel ports in order to destroy the whole British army.

On that day No. 74 Squadron sallied forth to assist their comrades on the ground by fighting with equal determination and tenacity. They destroyed five enemy planes that day. Mannock, the individualist with No. 40 Squadron, now became interested only in the welfare of his Flight. Although he gained many victories for himself, it was due to his tuition and agency as their leader that the enemy suffered most of its casualties. In just over two months Mannock and his formations registered more than seventy victories with only one casualty. The fighting came so thick and fast that Mannock often did not trouble to report the action unless it affected the score of some youngster.

By now, too, Mannock's hatred for the Germans had reached an intensity which was never exceeded by any other Allied aviator during the war. This hatred was quite beyond the imagination of his mother and other relations who thought it inconceivable that a boy with such a quiet and kindly nature could ever develop so bitter and unmerciful a hatred for anyone.

His attacks were usually from a great height and he pounced like a hawk. He had wonderful eyesight—in his one good eye—and he was seldom surprised. He never flew low in a straight line. He argued that it was by flying straight for a long period that flight leaders were caught napping.

In attacking an enemy formation, Mannock always took the leader, in order to give his pilots who followed him a chance

of an easy shot at someone before the formation split up and a dog-fight began.

Mannock was soon awarded the Distinguished Service Order. He had forty-one Hunns to his credit and was secretly hoping to catch McCudden who was credited with fifty-eight. As a matter of fact, No. 74 was now flying with McCudden's Squadron (No. 56) for the honour of registering the first one hundred victories.

No. 74 Squadron won. The day they racked up their century Mannock was again home on leave.

On June 18th Mick was promoted to Major and given command of No. 85 Squadron. This was another S.E.5a outfit which Bishop had brought out from England only a few days before. Bishop had scored forty-seven victories with No. 60 Squadron and had been sent home to Canada wearing the V.C. and practically every other ribbon the Allies could give. On his return from Canada, Bishop demanded a squadron and another tour of active duty.

This was agreed to and he took out No. 85 Squadron with the understanding that he would not fly war patrols. Bishop ignored the agreement and in the next twelve days destroyed twenty-five more enemy aircraft, bringing his total up to seventy-two. With that, the Air Ministry ordered Bishop back to England and gave Mick Mannock his squadron.

He wrote to the Eyles:

"Just heard that I've been promoted (Major) and am taking command of Bishop's squadron. I'm not sure that I'm glad of the transfer, as I don't like the idea of leaving the old squadron, but it can't be helped now.

"Well, Cheerio, Pat.

"P.S. Keep it out of the papers."

He went home for a few days of leave on July 3rd and seemed very depressed and anxious. The Eyles became obsessed with the idea that he would be killed on his return to the front. He also talked of Bishop's score and wondered whether he might ever pass him.

On July 9th the British suffered a cruel blow. Major Jimmy McCudden, holder of the Victoria Cross, the lad who had climbed up from a 2nd class air mechanic to score fifty-eight victories was killed in an aircraft accident. McCudden had won permission to return to the front as a fighting pilot, from the Air Fighting School in Scotland. He flew a new S.E.5a across the channel and landed at a nearby airfield. After lunch he took off again and his engine cut out. He tried to turn back to the field, but the S.E.5a spun in from a low altitude and McCudden was killed.

This left Mannock as the second living leading British ace; but there was no joy in his camp. He knew and loved McCudden, as did everyone who knew him. Mick had also learned that the pilots of No. 85 Squadron were not too pleased with the news that this strange aviator, as they called him, was to take Billy Bishop's place. While Mick had a hundred friends in his own squadron he had made little effort to be loved or respected elsewhere.

On joining No. 85 Mannock immediately tried to impose many of his tactical theories on his new command, and strangely enough, they did not seem to work out. Bishop had collected a group of individual stunt merchants who resented fighting in tight formations or under definite planned arrangements. It was some time before all this friction was smoothed out.

Meanwhile Mick was putting on a remarkable show in the air. His deflection shots, his striking strategy and his uncanny sense of timing was running his score up into the seventies. Other than Bishop's twenty-five in twelve days' performance, nothing quite like Mannock's work had been ever recorded in British air fighting history.

One morning he encountered Douglas Inglis, a New Zealander who had recently joined the squadron. "Have you got a

Hun yet, Inglis?" Major Mannock inquired.

"No, sir," was the shy and almost ashamed reply.

"Well, come along then—we'll get you one," Mannock grinned.

Mannock got off the ground but Inglis discovered that the elevator-adjustment wheel was jammed and it was dangerous to attempt to fly that way. So Mannock went off alone and returned safely an hour or so later.

The next morning, July 26, 1918, Mannock found Inglis waiting at the Officers' Mess having an early breakfast.

"Up with the birds, eh?" Mickey said pleasantly.

"Yes, sir."

"Well, what about it?"

"Two early birds, eh sir?" Inglis grinned.

"Let's go!"

About 5.30 a.m. they came upon an enemy two-seater in the vicinity of Merville. "My instructions," Inglis explained later, "were to sit on Mick's tail, and that he would waggle his wings if he wanted me closer. Mick would waggle and the only thing I could do was to stick tight as he was flying along the lines about thirty feet up. Suddenly he turned full out for home, but climbing. I decided he had spotted a Hun, but damned if I could see one. We did a quick five and a turn and Mick was shooting up a Hun two-seater. He must have got the observer, for when he pulled up and I came in underneath him, I didn't see the Hun shooting. I flushed the Hun's petrol tank and just missed ramming his tail as it came up as the nose dropped. Falling in behind Mick again, we did a couple of circles around the burning wreck and then made for home. I saw Mick start to kick his rudder and realised we were fairly low.

Then I saw a flame come out of the side of his machine; it grew bigger and bigger. Mick was no longer kicking his rudder; his nose dropped slightly and he went into a slow right-hand turn—about twice—and hit the ground in a burst of flame. I circled at about twenty feet, but could not see him, and as things were getting pretty hot, I made for home and managed to reach our outposts with a punctured petrol tank.

"All I could say was, 'Poor old Mick' when I crawled into a trench, 'the infantry bastards shot my Major down in flames!'"

This is how the end came to Major Mick Mannock. Inglis' report was attested to by the British advanced posts, who saw the whole show and relayed the news back to No. 85 Squadron long before they knew Inglis was down in the front line area.

The man who had lived through hundreds of air battles. The man who hated every Hun on the Western Front. The man who had just scored his seventy-third official victory to lead all British fighting airmen, had to die from the bullet fired by a German infantryman huddling in a muddy trench before Merville.

So died Mannock, "King of Air Fighters", to be posthumously awarded on July 18th, 1919, Britain's highest honour, the Victoria Cross.

The British Graves Registration Unit spent years in searching, but to this day there is no accurate identification as to where he lies.

Mickey Mannock was unquestionably buried with the honours of war—by the guns and artillery shells of the men he had so long hated. He would have asked no more.



Armchair Aeronautics

Project Vanguard, by JAMES STRONG, B.Sc., A.C.G.I., A.F.R.A.E.S. (Temple Press Ltd.) 2s. 6d. 20 pages 8½ x 11½ ins.

With "Sputnik" well and truly in the news, and even our atom-bombing "lobbies" satiating us with satellites in this December issue, it is fitting that we should review the above title which is made up of a series of six articles originally published in *Aeroplane*.

Project Vanguard tells the story of the world's first man-made satellites, their construction, launching methods and purpose. It tells it in detail with admirable illustrations, including photographs of actual satellite models and constructional pictures of the satellite itself, that should be a great help to would-be model builders.

For those who wish to know more of the satellites than the sensational political angle given in the popular press these past few weeks, we can thoroughly recommend this concise and well illustrated technical report of man's first step towards the stars.

Radio Control Mechanisms, by RAYMOND SPYRK. (Data Publications Ltd., 37 Maiden Lane, London, W.9.) 4s. 6d. 64 pages 8½ x 5½ ins.

Model aircraft radio control enthusiasts will not find in this book the type of equipment that they might expect, having read the title and noted the front cover illustration which depicts an E.D. Mk. 11 escape-ment.

Most of the author's experience and equipment appears to relate to model boats where weight and complexity are of relative importance, for few items of aircraft equipment are dealt with in detail. The title is also misleading from another viewpoint as within the covers are chapters describing basic radio control systems, e.g. "Progressive Control", "Mark Space Systems", "Pulse Systems", "Modulated Systems", etc. These chapters are not too technical and very well written and for these reasons worthy of study. A chapter on relays gives working drawings and a detailed description of the construction of a balanced armature type sensitive relay, with a few notes on the adjustment of relays in general.

There is a chapter on escapements, including a lightweight version suitable for aircraft use but unfortunately without working drawings. From then on the book deals with selector mechanisms both complex and weighty, finishing with a chapter "Miscellaneous Mechanisms", which covers magnetic clutches for cars and hoars, touches on pneumatic systems *à la* Steinauer, and finishes with a general description of a barrel type throttle unit for model aircraft diesel motors.

As we say, more a book for the car and boat man and missing in its title, but which does nevertheless contain many useful items for the radio control aircraft enthusiast. We liked, for instance, the author's tip of using light alloy knitting needles for control rods, his neat air bleed type unit for delay circuits, and a design for a modulated transmitter for use with electronic filter receivers.

Boys' Book of Flight, by DAVID LE ROI. (Hilfe and Sons Ltd.) 12s. 6d. 160 pages 10 x 7½ ins.

Prepared in association with the staff of *Flight*, this excellent production sets out to explain to the younger generation the multitude of subjects in this modern age

Items of interest for your Aviation Bookshelf

covered by the general term aviation. Let us say at the outset that a grand job of this onerous task has certainly been made both from the literary and pictorial viewpoint.

Mr. Le Roi writes in an easy-to-understand language with free use of analogies, and has a particular skill in making the most technical subjects sound interesting and comparatively simple. Furthermore, he does not neglect a single facet of his subject that we could think of, his final chapters covering satellites, guided missiles and flying under atomic power.

Illustrations are profuse, including three-view drawings, cut-away drawings of both jet aircraft and jet engines, not forgetting a first-class selection of photographs contained in no less than 36 art plates, presumably gleaned from the pages of *Flight*. We particularly liked the snappy chapter headings, e.g. "From Cuttlefish to Jets", "Finding the Way", which explains navigation in simple terms; "Up and Down Aircraft", which covers helicopters, gyroplanes and flying bedsteads; "Lifeboats with Wings"; "Rockets that think"; and many others.

Aeromodelling dads who wish their sons to have a full appreciation of modern aviation, and who would like to give a worthwhile present this Christmas that will also be a useful source of reference in the future, need look no further than the *Boys' Book of Flight*.

British Aeroplanes 1914-18, by J. M. BRUCE. (Putnam, 42 Great Russell Street, London.) £12 12s. 742 pages 8½ x 11 ins.

What a magnificent chunk of aviation history this is and what a stupendous task has been brought to fruition by J. M. Bruce who needs no introduction to the 1914-18 enthusiasts amongst our readers.

We cannot begin to imagine the many hundreds of hours of painstaking research that produced this superb volume which must surely be recognised as the only worthwhile historical record of British aircraft engaged in World War I. Certainly no official records exist so complete and so detailed, and for this reason aeronautical historians owe Mr. Bruce a very great debt.

The book contains the fullest possible description of 286 basic types of aircraft, both operational and experimental, with full details of all known variants. Every conceivable detail relating to each aircraft, its performance, engines, manufacturers, armament, even the price of airframe and engine are all there in copious detail. Full details of squadron usage plus lengthy information on the numbering of individual machines are further items that will delight the modelling enthusiast. There are some 700 halftone illustrations, many of them depicting very rare birds indeed, and a few odd drawings where photographic illustrations

do not exist. It must not be imagined either, that the author's writings are but a dry textbook account of technical information relating to each aircraft. The history of the machine and the majority of worthwhile facts concerning its battle history are all recorded in lively style and without straying one iota from the truth. The latter subject has particular meaning for Mr. Bruce, and we quote here from his author's foreword:

"This book is a conscientious attempt to describe, in some detail, the British aeroplanes which gave some service or were designed during the 1914-18 War, excluding (reluctantly) only projects.

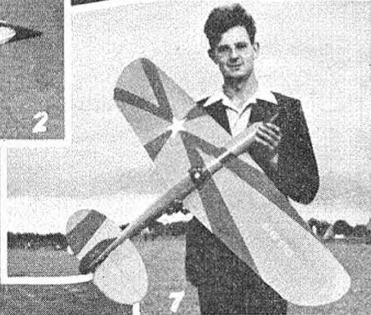
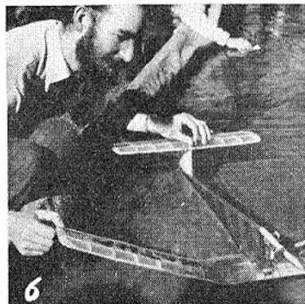
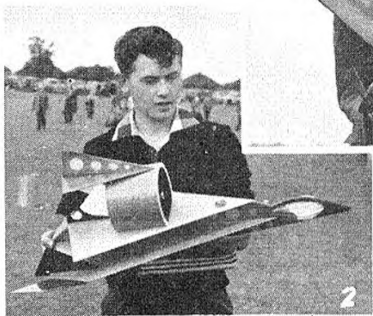
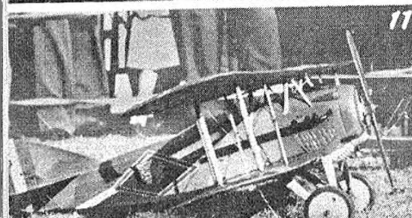
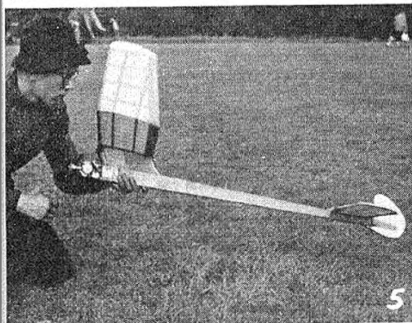
"The aircraft described herein were the weapons which were forged in the heat of the first war in the air. They were more—they and their crews were founders of a tradition which was to survive a later conflict of far greater aerial intensity; and they have a unique place of honour in the nation's history. Inevitably, many of them have come close to being forgotten. They have been badly served by writers who cared more for sensational effect than for historic accuracy, and by those whose belief in everything they see in print is unshakable.

"Perhaps this book may help to make amends. J.M.B."

The stories of Bishop and Barker, of Richthofen and Immoelmann, in fact all the famous names are all there without distortion; but it is with the pilots and aircraft not so well known that this book shines. How many of our readers, for instance, have heard of the Armstrong Whitworth F.K.8, of which over 1,500 were delivered to the R.F.C. and with which two intrepid airmen won the Victoria Cross. How many know that braking parachutes as used by the latest jets were borrowed happily from the rear ends of F.E.2a's in 1915; or that Captain Albert Ball the Nieupoit Scout exponent, designed a single-seat fighting scout, the Austin-Ball A.F.B.I., which was test flown in 1917. Its performance was described as "startling", but it never went into production. Equally startling from the performance angle was the Supermarine Night Hawk Quadriplane which carried a ton of petrol and could remain airborne for over 18 hours and which carried its own searchlight complete with 5 h.p. generator motor! It was also the first aeroplane to provide a sleeping berth to combat the dangers of crew fatigue. Then there were aircraft that were actually delivered to the Germans in error . . . but we could go on for pages quoting a multitude of facts relatively unknown about this fascinating era of air warfare which Mr. Bruce has categorised in such orderly fashion.

As a reference work it is unique, and although the price is high we know it will take pride of place on many enthusiasts' bookshelves as well as on the shelves of libraries throughout the world. H.G.H.





ALL BRITAIN RADLETT

SEPT. 22

(1) Capt. Carroll, USAF Bentwaters with one of two red/yellow radio models. This has a tilt, Fox 35 power, semi-symmetrical airfoil and semi-spherical tail. Other model was a modified Livewire Cruiser with E.D. 3.16. (2) "Mac" Grimmett of West Bromwich with his secret weapon, a triplane delta ducted fan (Albion Dart) and side by side cockpit covers for a cabin.

(3) A. C. Smith of Dagenham enlarged the APS Junkers B7 1/3 times for a 2 c.c. freeflight. (4) Bipe saucer with antennae off and semi-spherical cabin is the next latest Ray Malmstrom epic, see page 664 for latest. (5) Power winner with APS Creep, A. J. Straker from Spring Park starting AM 3.5. (6) Pete Holland had no time for a waterplane special so he inverted a pylon fuselage, put wing and tail other way about, and presto!

(7) Dave Platt's colour schemes from May issue were to be seen everywhere; here is R. T. Harlby's Frog 500 "Daven Star". (8) Auster by R. A. Chivrell is a Rally perennial, flies on a 2 c.c. E.D. Comp. Spec. (9) Hobbies kit for the "Champion" makes up most attractively as seen in this view of C. Read's interior equipped version. (10) A Frog 150, AM 10 and AM 25 power this near scale glider for J. Welham of Luton. (11) Capt. Cesare Milani's super SP4D XIII in full regalia took top honours in Concours d'Elegance, has Ohlsson 60.

Opposite page, top to bottom: S/Ldr. Hazelden, Chief Test Pilot of Handley Pages, Councillor C. F. Prece, Mayor of St. Albans, De Havilland's Chief Test Pilot, G/Capt. Cunningham and his assistant, Peter Bugge, admire a Cessna 310 built from APS plans. Prize-giving concluded at dusk, here Rally Champ "Josh" Marshall of Hayes collects the Trophy from S/Ldr. Hazelden, St. Albans' organiser, Sid Savage, in centre. Bottom two show first and second in the GOLDEN WINGS A11 contest, M. Ewart of Northampton and D. Greaves' model with helper.

A WET START almost spoiled this year's All-Britain Rally held at the Handley Page aerodrome, Radlett, Herts., by kind permission of Sir Frederick Handley Page. But the skies soon cleared and a brilliant sun created a beautiful cloud vista that prevailed for most of the day. In gusty conditions, free flight was handicapped by the small field width, only 90 secs. to the railway embankment and a high wire fence, and those who were unlucky enough to land outside were once more at the mercy of urchins young and otherwise demanding high ransom for safe return.

Radio was a crowd tease as usual. Lots of people trying to see nothing going on, and when a model did get away, the performance was not of the type to impress. A radio control pioneer of great renown said to us that he thought the standard lower than ever!

The water tank had no crowd barrier and many a good chance was wrecked by the proximity of heads or even babes in arms, and combat started so late that the result had to be a lucky draw.

What then, might we ask, was a success? Team racing, Concours d'Elegance, our own Golden Wings and Spectator catapult glider contests were well under control and fully supported. The Wharfedale team racers were particularly fast in Class A, but a flunked start spoiled their chance in a brisk final where Yeldham and Co. of Belfairs completed the 10 miles in 8:13, equalling the time of the Walker/Tutbill Class B winner over the same distance.

Our Golden Wings event attracted many well-built models, most of them well trimmed and some showing exceptionally good launching techniques bearing in mind the gusty conditions. Both 1st and 2nd lads, Eviatt and Greaves are keen clubsters and at present rate of progress should be a match for many seniors when they've tucked a little more experience in their model boxes.

Looking around the field we saw a large glider with 8 (yes, eight) Allbon Darts on the leading edge, some remarkable ducted fan designs, multi-engined c/l stunters, unique scale selections and the ever-present "Eastern Bazaar" club displays of models in all shapes and sizes. But oh! How we wish that the organising St. Albans M.A.C. would either share out the administration duties with other clubs or that they should contain the publicity within the bounds of aeromodelling, cut the prizes, and give everyone the freedom of field-space such an event deserves.

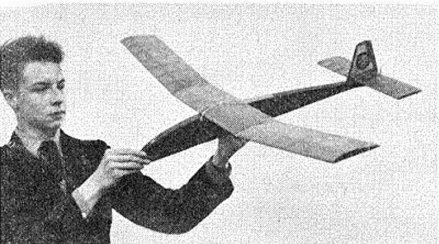
RESULTS

Open Rubber Duration	T. Chambers	Stockton	8:04
Open Glider Duration	R. G. Greygoose	Anglia	8:47
Open Power Duration	A. J. Straker	Springpark	6:56
Wakefield New Rules	N. P. Elliot	Men of Kent	6:54
Concours Scale	Capt. C. Milani		SPAD XIII
Concours Non-Scale	V. Lays	Surbiton	Gastove
Concours Unorthodox	G. Woolls	Bristol	Warren
			Young Wing
Scaplane Rubber and Aeromodeller Trophy	G. Walker	Birmingham	4:33
Scaplane Power	M. J. Dumble	Epsom	3:01
Tailless Rubber	J. Marshall	Hayes	3:19
Tailless Glider	P. Giggie	Coventry	6:39
Tailless Power	G. E. Fisher	Coventry	0:46
Team Race "A"	G. Yeldham	Belfairs	8:13
Team Race "B"	R. J. Tutbill	Enfield	8:13
Combat	F. Stevens	Littleover	
Radio Control Rudder	J. Soper	A.R.C.C.	
Radio Control Multi	F. Johnson	A.R.C.C.	
Glider Cargo	D. Poole	Birmingham	29 oz.
Rally Champion	J. Marshall	Hayes	

Number of Clubs competing: 105.

AEROMODELLER "GOLDEN WINGS" CONTEST

				Total	
1. Eviatt, M. A. C.	Northampton	76	57	32	165 secs*
2. Greaves, D.	Leamington Spa	41	29	73	143 ..
3. Stanley R. C.	Surbiton	27	45	57	129 ..
4. Martin, A.	Bedford	36	30	61	127 ..
5. Yover, D.	Rechester	22	46	51	119 ..
6. Rogers, C.	Reading	31	30	37	98 ..





The Royal Aircraft Factory

S. E. 5a



THE S.E.5 HAS always been a modellers' favourite. This popularity stems not only from its association with the great allied aces of the first World War but is in some measure due to the outward appearance of this delightful aircraft. Our susceptibility to shape rather than performance has been known and exploited for a long time by the manufacturers of everything from saucapans to cars, and in the S.E.5 we have a beautifully proportioned machine with more of the looks of a thoroughbred racehorse than a cavalry charger. Little wonder that this aeroplane with its long-legged aristocratic air has been the embodiment of our ideals of fighter design for so many years. It should be remembered, however, that the S.E.5 was, until the advent of the Snipe, the finest fighting scout we had during the last two terrible years of massacre in France.

Although developed from the S.E.4 which was a clean aircraft and aerodynamically a decade ahead of its time, a sacrifice of streamlining was effected on the S.E.5 in the cause of simple and rapid maintenance, and in this respect the S.E.5 had no peer. The blunt car-type radiator must have reduced the maximum speed by something like 4 per cent., but accessibility and serviceability on the ground made this sacrifice worthwhile.

The first prototype S.E.5, powered by a 150 h.p. Hispano-Suiza engine first flew in December, 1916, and it was not long until a structural weakness in the wings caused a crash in which the great test pilot Major Frank W. Gooden lost his life. Deliveries of the revised airframe in March, 1917, and the first squadron to be equipped, No. 56, left London Colney for France. Their early production aircraft had an external gravity tank and a transparent cockpit hood which proved so unpopular with the pilots because it impaired their forward vision, that the pilots refused to go into action until a conventional windscreen could be fitted.

Because of the higher altitudes which greater power made possible, some modification of the cooling system was found to be necessary, and it was at this point that shutters were fitted to the radiators. Greater trouble was in store, however, because faulty manufacture led to a succession of engine failures and it was this which instigated the design of the Wolsley "Viper" engine based on the Hispano. With this new engine the S.E.5a found its ultimate form and for the rest of the war it was one of our most formidable aerial weapons.

FAMOUS BIPLANES

NUMBER 12

By G. A. G. COX

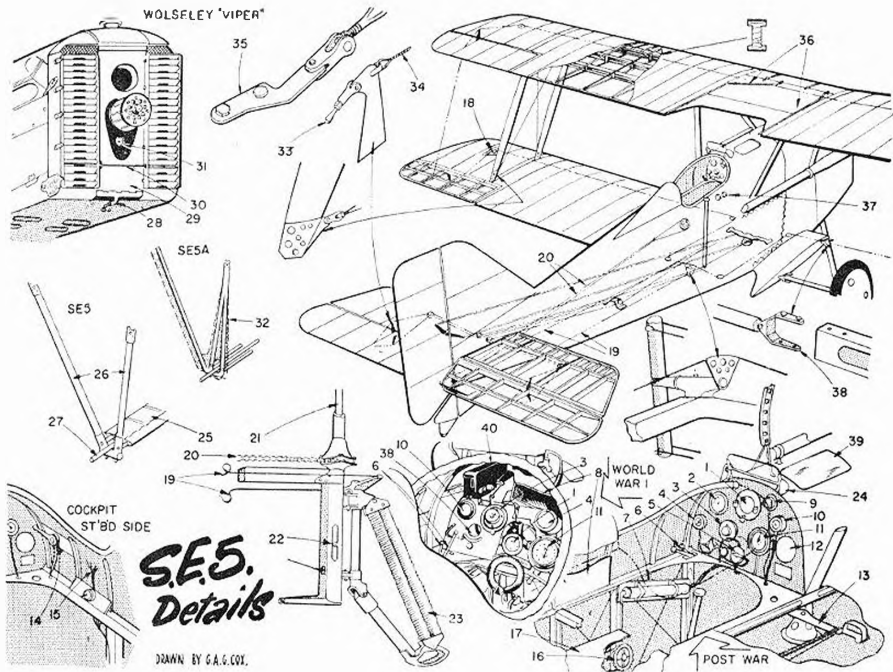
Major James Byford McCudden, V.C., D.S.O., M.C., M.M., was one of the outstanding exponents of the S.E.5a as a fighting instrument, and it was on various of these machines that he accounted for the majority of the 53 enemy aircraft with which he was officially credited at the time of his death in a flying accident.

One of the S.E.s was B 4863, featured in our drawings. The aircraft, a factory (i.e. Royal Aircraft Factory and not sub-contractor) built machine, was taken over on September 4th, 1917, at which time he was a captain and Flight Commander with the famous 56 Squadron.

McCudden went to almost endless trouble personally tuning and adjusting his aeroplane, sighting his guns, etc., to ensure that it would always give peak performance and possible have the edge on all other S.E.s of the unit for speed. His earlier experience in the ranks as a fitter served him in good stead in this respect. B 4863 was destined to give him considerable trouble before he got it going to his satisfaction; he writes: ". . . I spent the remainder of the morning working on my (Constantinesco) interrupter gear. For two whole days I tested my guns and could not get them to my liking". However, when he eventually got things to his satisfaction he was able to write: ". . . I saw a two-seater coming North over Houthem. I dived and opened fire from above and behind the D.F.W. I fired a good burst from both guns, a stream of water came from the centre section radiator and then the machine went down in a vertical dive and crashed to nothing". (continued on page 660)

KEY TO DRAWING

1. Compass mounting.
2. Altimeter.
3. Petrol switch.
4. Oil pressure.
5. Petrol switch.
6. Throttle and Compensator.
7. Trimming pump.
8. Map pocket.
9. Water pump.
10. Air pressure gauge.
11. Air speed.
12. Instrument position blanked off.
13. Aluminium rudder bar.
14. Radiator shutter control.
15. Four leads out to two switches.
16. Tail trim wheel.
17. Ply seat platform.
18. Pulley inspection window (also under top wing and on tailplane).
19. Skid steering wires.
20. Tail trim chain raises or lowers through worm gear the tube 21 at each end of which are tail bracing attachments 22.
23. Telescopic tubes inside springs prevent buckling.
24. Metal fairings to windscreen pivots.
25. Door hinged at front edge.
26. Streamlined steel tubes.
27. Axle held down by "Bunjee".
28. Radiator drain.
29. Flat metal panel.
30. Shutter operating rod.
31. Interrupter gear oil pump and drive.
32. Circular steel tube faired with wood.
33. Streamlined wire to elevator.
34. Stranded wire to joystick.
35. Tail bracing wire terminal.
36. Petrol expansion pipes.
37. Spar attachment.
38. Radiator temperature.
39. Window.
40. Vickers gun.



DRAWN BY G.A.G. COY.

Heading opposite: early production S.E.5 with external gravity tank, Foster gun mount, large cockpit screen and 150 h.p. Hispano Suiza. Profile is an S.E.5a with 200 h.p. geared Hispano Suiza, strengthened nac and long exhaust pipes (I.W.M. photo). At right, McCulloch machines B1863 and B1891. Both feature four bladed airscrews on improved Hispano engines, whilst 4891 has the famous LVG red spinner. Below, the famous ace with his pet dog, characteristic of his tenacity in air battles. (Air Ministry photos.)

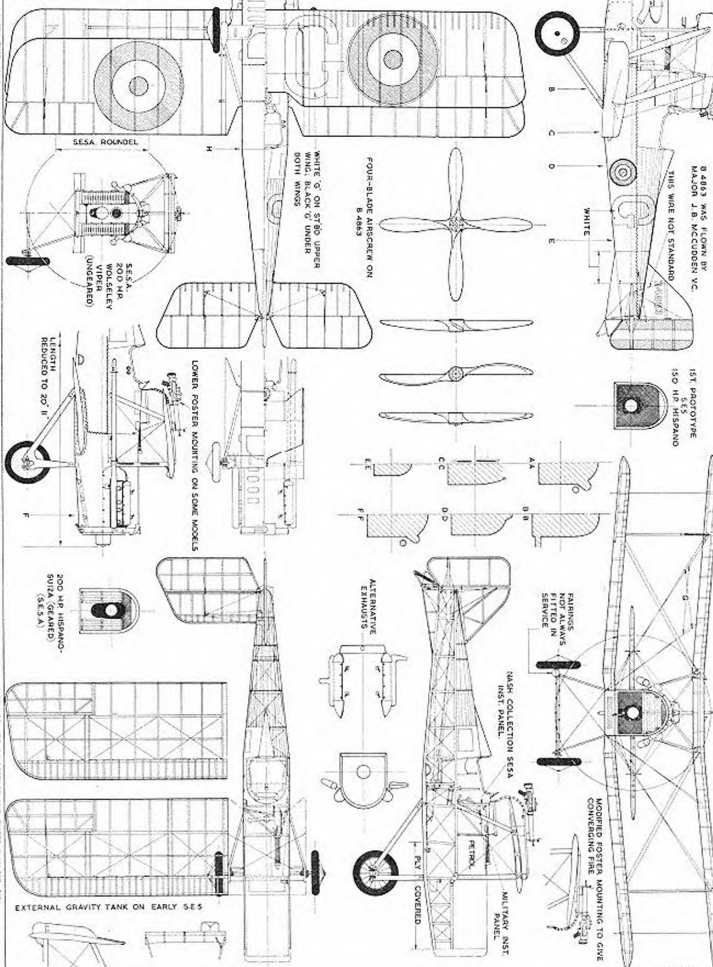


COLOURING

1. KHAKI GREEN OVERALL EXCEPT UNDERNEATH
2. WING & TAIL SURFACES CLEAR DOPED FABRIC
3. FUSELAGE UNDERSIDE FROM 'H' AFT "
4. INTERPLANE STRUTS VARNISHED SPRUCE

RIGGING

- ALL WIRES STREAMLINED,
WIRES 'G' DOUBLE



B 4883 WAS FLOWN BY
MAJOR J.B. MCCOYEN VC.

1ST PROTOTYPE
150 HP HISPANO
S 534

MODIFIED POSTER MOUNTING TO GIVE
CONVERGING FIRE

FABRICS
NOT ALWAYS
FITTED IN
SERVICE

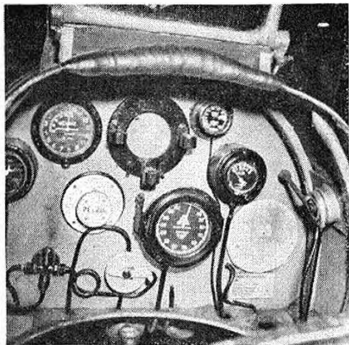
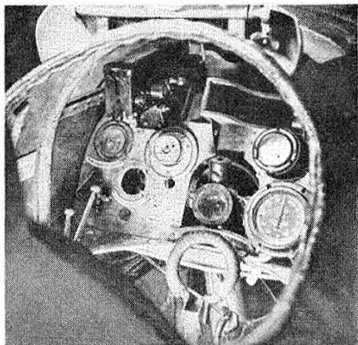
NASH COLLECTION SESA
NO. 1 PANEL.

MILITARY INST.
PETROL
FLY COVERED

ALTERNATIVE
EXHAUSTS

WITH THE "A" SCALE PRINTS AND WITH THE "F" SCALE PRINTS OF THIS DRAWING ARE AVAILABLE PAGE 11, AND 21, RESPECTIVELY FROM AERONAUTICAL PLANS SERVICE, ADD 44, PORTAGE AND QUOTE PLAN NO. 204.

At left, wartime S.E.5a cockpit shows proximity of the Vickers gun breech to the pilot's face. TWIN thumb triggers normally occupy centre of control column ring. Note the angle of the instrument panel to clear the gun. At right, postwar civilian version as used for sky writing and now held by the Nash collection and Science Museum. Instruments are redispersed, panel brought closer to the pilot and control column is a simple stick. See page 657 for instrument key.



This watchword was "efficiency", and no aircraft would just "do", he would ensure that it was, in fact, "right", which fact doubtless contributed to his invincibility in combat. Like Mannock, he was a student of tactics, and would spend many hours by himself on voluntary patrols patiently stalking high flying Hun reconnaissance machines in conditions of extreme discomfort to himself (bitter cold and lack of oxygen at altitude), inevitably sending them to destruction.

Other S.E.5a's flown by this redoubtable pilot were B 519, a Vickers built aircraft, on which he led his first patrol with 56 Squadron on August 16th, 1917. This machine went to the Repair Section when a Hun put an incendiary bullet through a longeron, and was followed by B 4863 "G" which was written off whilst he was on leave. He then took over a new Martinsyde built S.E. on October 10th, 1917, B 35, until a new factory built machine was acquired on December 3rd, this being B 4891, first to have a strengthened, faired u/c, and also featuring narrow elevators and a smaller fin.

When the war ended the inevitable store of unwanted aircraft piled up and a few of them flew again. The Royal Air Force retained several until the early twenties, but these were soon replaced by Snipes. Some found their way onto the civil register to be used mainly for skywriting, and one of these, formerly G-EBIC, is now in the Nash Collection. One more example, ex G-EBIB, may be seen in the Science Museum in London.

Data: S.E.5a (S.E.5 dimensions bracketed if different).

Span: 26 ft. 7 1/2 in. Length: 20 ft. 11 in. (21 ft. 4 in.). Height: 9 ft. 6 in. (9 ft. 5 in.). Chord: 5 ft. 0 in. Gap: 4 ft. 7 in. Dihedral: 5°. Power: 200 h.p. 220 h.p. Hispano Siza, 200 h.p. Wolsley Viper (150 h.p. Hispano S).

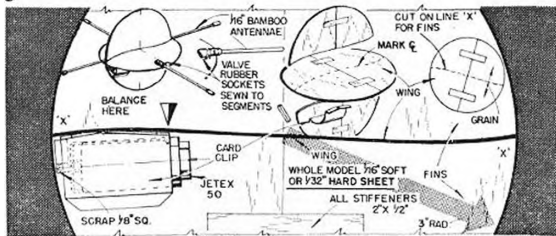
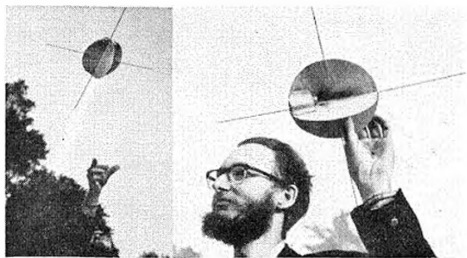
Armament: 1 fixed Vickers gun firing through airscrew disc; 1 Lewis gun firing over airscrew.

Speed at 15,000 ft. 121 m.p.h. with 200 h.p. Hispano (S.E.5 150 h.p. Hispano, 98 m.p.h.). Climb to 15,000 ft. 18 m. 50 s. with 200 h.p. Hispano (S.E.5 150 h.p. Hispano, 29 m. 30 s.). Altogether 5,205 S.E.5s and gas were built. In addition to production by the Royal Aircraft Factory, Farnborough, the type was sub-contract built by Austin Motor Co., The Air Navigation Co., Martinsyde Ltd., Vickers Ltd., and Wolsley Motors Ltd.

Pete's Bleep

Just to prove that anything will fly if it has enough power and wing area!

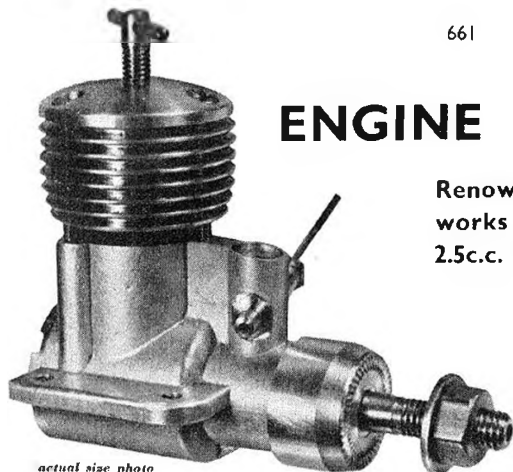
IT HAD TO HAPPEN. No sooner had the third stage of the Russian Sputnik rocket deposited its charge in outer space than those modellers known to all of us for their wayward tendencies were grabbing for balsa, cement and dividers.



That's all you'll need to make Pete Holland's version of the satellite . . . plus a Jetex 50 for thrust and some bamboo antennae. Sketch shows the essential detail and the action views above, including that of our untamed tracer in disdainful pose apparently disclaiming association with his design, show that it works! For the Malmstrom version, see page 664.

ENGINE ANALYSIS number 42

Renowned Macclesfield engine repair works produce a high-performance 2.5c.c. Diesel—the EIFFLAENDER



actual size photo

P.A.W. SPECIAL

reviewed by R. H. Warring

WHEN A MAN who has dealt with engine repairs, re-boring and servicing for a decade—and remained a power enthusiast all through—turns to the production of an engine, you can expect to find a lot of “know how” built into it. This, in fact, characterised the PAW “Special” which is, in effect, a custom built unit receiving rather more man-hours and individual attention than a normal production engine produced in greater numbers. For this, naturally enough, you have to pay, the PAW “Special” selling at some £2 more than its mass production contemporary. In return we can confidently say you get a very good engine right in the top class for 2.5 c.c. diesels and one which, because of its rugged construction, should outlast many a model.

About the only unusual feature of the design is the employment of a single ball race for the rear main bearing, coupled with a cast iron bush in the crankcase for the front bearing. This is a very logical arrangement, using a reasonable length of shaft (which the PAW Special has), but needs careful attention to accuracy of fit if trouble at the front end is to be avoided. There is often a tendency, for example, for the shaft to “rock”

if the main ball race is a little free and consequently the front end to bind. Such a possible failing appears quite absent on the “Special” and, in fact, Eifflaender goes to considerable pains to ream and lap the cast iron bush and lap the face for the ball bearing to achieve optimum running fits.

The crankcase unit is a substantial gravity die casting made from a typical simplified pattern (*i.e.*, none of the undercuts and embellishments commonly employed on pressure die-cast shapes). The cylinder (liner) is of steel, with $\frac{1}{16}$ in. walls fitting snugly into the crankcase to locate against a narrow flange, this lower section of the crankcase being turned out to fit. It is encased by the turned dural jacket and the complete cylinder unit held down by three 6 B.A. screws engaging in drilled and tapped holes in the crankcase unit.

Since the porting is symmetrical, the cylinder can be assembled in any position although the logical (and obvious design) position is with the pillars between the exhaust ports opposite the screws. This gives three alternative positions for re-assembly, should the engine be dismantled. On the basis that once an engine is run-in the cylinder position should not be disturbed

SPECIFICATION

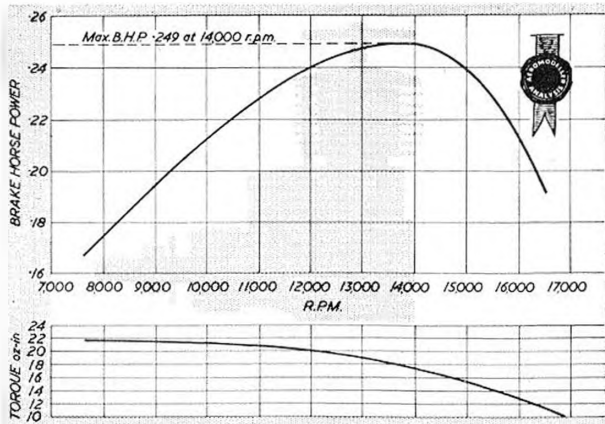
Displacement: 2.456 c.c. (149.8 cu. in.)
Bore: .597 in.
Stroke: .535 in.
Bore/stroke ratio: 1 : 1.09
Bare weight: 42 ounces
Max. B.H.P.: .249 at 14,000 r.p.m.
Max. torque: 22 oz-in. at 7,000 r.p.m.
Power output: .101 B.H.P. per c.c.
Power rating: .051 B.H.P. per ounce

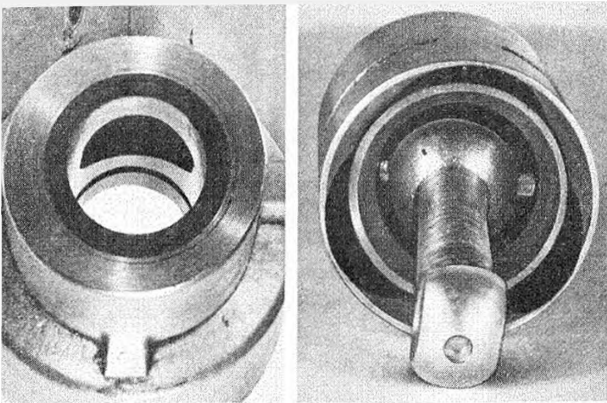
Material Specification:

Crankcase: gravity die-casting in light alloy
Cylinder (liner): Silver steel, ground and lapped
Piston: Brico cast iron, ground and lapped
Contra piston: Brico cast iron, ground and lapped
Crankshaft: high tensile steel
Connecting rod: Titanium RR 56
Bearings: rear, Ratson and Marles $\frac{1}{4}$ in. ball race front, press-fitted Brico cast iron sleeve
Cylinder jacket: turned dural
Back cover: turned dural
Propeller driver: turned dural

Manufacturers:

Progress Aero Works,
Chuston Road, Macclesfield
Retail price £6 10s. (including p/t.)





No puzzle pictures—these views show the main design features of the "Special", the large asymmetric induction part in the thick main bearing and the vast transfer port area at the cylinder base, with lightened piston skirt, oil hole in big end, and substantial "little" end

(circumferentially) it is a wise precaution to mark the cylinder before taking it out, so that it can be put back the same way round as before.

Whilst the exhaust porting of the "Special" is quite conventional—three milled slots in the cylinder wall, giving some 200 degrees effective opening—the three transfer passages are unusual in that they are wide and almost circular in form, but of relatively shallow depth. These are located staggered to the exhaust slots with their peaks (opening points) extending just above the bottom level of the exhaust. In effective width they are appreciably wider than the solid area between the exhaust ports (circumferentially). Presumably cut by a form of end mill, forming the transfer passages would appear quite a tricky operation.

Both the piston and contra piston are of Brico cast iron lapped to fit the silver steel cylinder (liner). Fit of the contra-piston was just right on the test engine—easy to move and "come back" for adjustment, yet positively locking at all speeds with the engine hot or cold. Piston fit in the cylinder was also excellent.

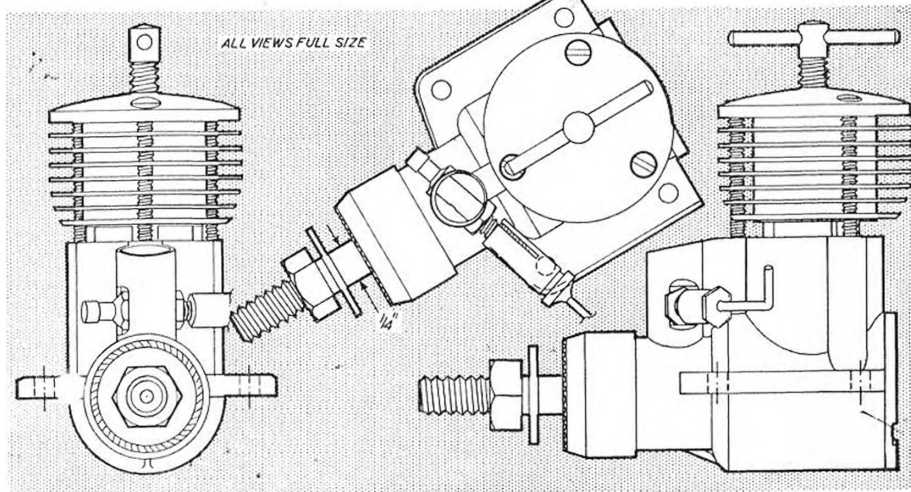
The piston is relatively shallow in depth, quite light and has a conical top. The silver steel gudgeon pin is press fitted, the turned Hyduminium RR.56 connecting rod having a ball shaped upper end and generous bearing area. The big end bearing is fed with oil through

a hole drilled in the con. rod, both big and little end fits being excellent and retaining this fit after several hours running time. Gudgeon pin diameter is 5/32 in. and crank pin diameter 13/64 in.

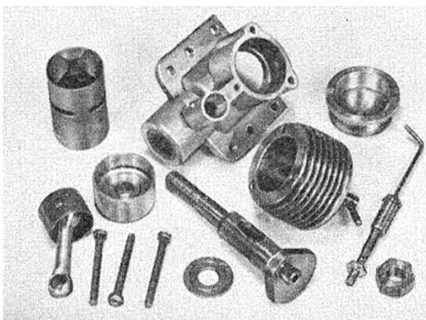
The crankshaft is of high tensile steel. 3/4 in. diameter stepped down to a 1/4 B.S.F. threaded length for the propeller nut. The web is 5/32 in. thick, angled towards the top to give a counter-balance effect, and the web diameter relatively small (13/16 in.). The crankpin is turned integral and partially drilled through. The crankshaft has a 7/64 in. hole drilled down its length slightly past the intake port, which is elongated in form 7/16 in. long and 3/16 in. wide. The corresponding hole in the bearing sleeve is appreciably wider and slightly offset against the direction of rotation to provide longer and better induction timing, taking full advantage of the thick bearing and long shaft port. The cast iron bearing sleeve itself is of substantial thickness (1/16 in.) as is the surrounding wall of the casting (3/32 in.).

The intake is a simple "straight up" tube, narrowing slightly internally to a throat. The top of the intake is barely angled off, the whole backed up by a really solid section which takes one of the cylinder hold-down screws. The spraybar unit is of brass, angled back to the left (which is a preferred position for side-mounted motors on control-liners).

The propeller driver is turned from dural, bushed with a split collet to grip on the plain part of the 1/4 in. diameter shaft length. Unlike the usual washer form for the driver, it is cup shaped so that it extends over, and covers, the front of the crankcase bearing—looking rather like a ball race housing but, of course, rotating with the shaft. The threaded length of shaft protruding is of sensible length to take a wide range of propeller pitches and the nut of substantial proportions.



The Eiffel tower Special in pieces. Note plain exterior to thick liner, long crankshaft part and near balanced crankweb. Extra mounting holes are not standard; but were necessary for the Eddy-Current Dynamometer



Starting characteristics are truly excellent for a high performance engine, finger choking being adequate to prime. There is no vicious bite even on six and seven inch diameter propellers, provided the compression is backed off and a generous prime is given.

Adjustment, we found, tended to become slightly critical with increasing speed. That is, above about 12,000 r.p.m., spot-on running needed fairly careful adjustment of the needle valve and compression to achieve. The "Special" ran strongly even if off the best setting, but not perfectly smoothly and giving its best performance. For example, it was readily possible to achieve around 14,700 r.p.m. with a 7 x 4 Stant propeller with the "Special" running strongly, but roughly. Very fine adjustment of the needle valve then brought this up to a steady 15,400 r.p.m. and a healthy note.

This characteristic is a little peculiar. It gives the effect of slight lack of compression, but advancing the compression adjustment does not cure, and indeed usually slows the motor. A slight addition of nitrate to the fuel effects an improvement.

The makers, incidentally, do not appear to place great importance on fuels used, but do specify the following for their standard test mixture—

- Castrol R. 15 per cent.
- Castrol XXL 15 per cent.
- Eso Blue (paraffin) ... 30 per cent.
- Anaesthetic ether 38 per cent.
- Amyl nitrite 2 per cent.

Mercury No. 8, as a comparable fuel, contains the same percentage of amyl nitrite, fractionally less ether and more paraffin.

Peak B.H.P. with the test engine was achieved at just on 14,000 r.p.m., the actual power output figure of .1 B.H.P. per c.c. being very good indeed and certainly well into the top performance class for engines of this size. Smooth running and high torque output are re-

tained well down the scale, so that the "Special" can equally well drive a large diameter propeller at moderate speeds, if desired. It is also capable of handling high pitch propellers for control line work, although in this field its fuel consumption is somewhat on the high side. For free flight, we would favour an 8 x 4, 9 x 3, or 8 1/2 x 3 1/2; and a 7 x 9 or 8 x 6 for control line.

One overall feature we can commend for control line work—a real ruggedness about this engine, with the widest and longest mounting lugs we can remember for its size. Also, we imagine, it will not be particularly critical about tank position for tight manoeuvres.

Propeller dia. x pitch	PROPELLER—R.P.M. FIGURES		Propeller dia. x pitch	r.p.m.
	R.P.M.	FIGURES		
9 x 3 (Eiger)	11,500		7 x 3 (Trucut)	16,400
8 x 4 (Eiger)	14,200		7 x 4 (Trucut)	15,400
8 x 3 1/2 (Eiger)	15,000		7 x 9 (Trucut)	10,400
6 x 9 (Eiger)	14,500		8 x 4 (Trucut)	13,500
			8 x 6 (Trucut)	10,200
9 x 4 (Stant)	10,300		8 x 8 (Trucut)	8,200
8 x 6 (Stant)	10,900		8 x 10 (Trucut)	7,700
8 x 5 (Stant)	12,400		9 x 4 (Trucut)	10,900
7 x 6 (Stant)	13,600		10 x 4 (Trucut)	7,900
7 x 4 (Stant)	15,000			

Fuel used: Mercury No. 8

what's the answer?

Last season our club was plagued by glider towing troubles. We have always understood that the main reason why a glider did not tow straight was lack of weathercock stability, but all we did to improve this got us nowhere. We ended up using detachable drouges and small parachutes released with towing, but never got a really stable set-up. In fact drouges and similar devices hardly helped at all. What's the answer?

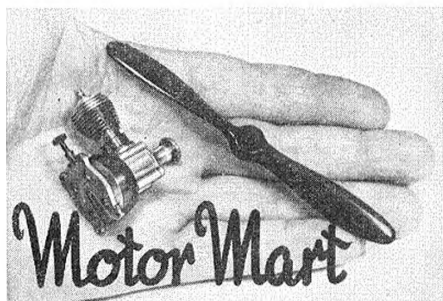


What would YOU do in a case like this? Turn the page for the solution to the problem, printed below.



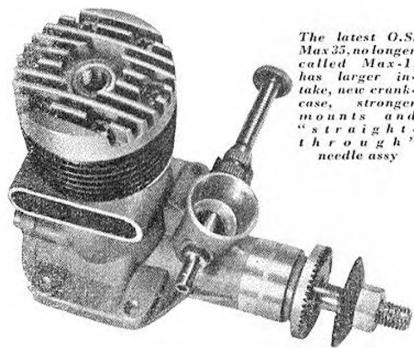
Improving the weathercock stability of a glider is not necessarily a cure for towing troubles. The fault may well be elsewhere and if this is so increasing the fin area, adding a drouge, etc., will have no beneficial effect. In fact, the use of drouges and similar "handwriting stabilisers" have proved of little help. Some of the contributing factors to towing instability are tow hook wrongly positioned (too far back or too far forward), lack of dihedral on the wings, uneven warps on the wings, heavy wing tips, warps and mis-alignment, balance in general, decreasing the tailplane incidence (adding negative incidence) helps to improve towing stability on a glider. In general, decreasing the tailplane incidence (adding negative incidence) helps to improve towing stability on a glider. In general, decreasing the tailplane incidence (adding negative incidence) helps to improve towing stability on a glider. In general, decreasing the tailplane incidence (adding negative incidence) helps to improve towing stability on a glider.





IT TAKES A LOT to create a surge of customer interest in a new engine these days, we have become so blasé over pressure fuel systems, voluminous intakes and screeching performance that the manufacturers are hard put to make a great impression. No so with the latest from Leroy M. Cox, whose Thermal Hopper has earned such renown for its superior .8 c.c. achievements, for the "Pee-Wee" .020 cu. in. (.3 c.c.) has swept the Americas with a sell-out first delivery. No wonder—we rate this tiny mite one of the most outstanding engineering achievements of the year. Physically it's no bigger than the carburettor of many a 5 c.c. engine, and it weighs a scant $\frac{3}{4}$ ounce complete with prop and ready to run (see photograph above). With traditional Cox precision, the reed assembly inducts through the tank centre via a $\frac{1}{16}$ -in. throat, and needle valve control is both conveniently placed and non-critical. It turns the $4\frac{1}{2} \times 2\frac{1}{2}$ prop at seemingly fantastic r.p.m., approaching 18,000, and there's no wonder why the first batch (produced at the rate of 1,000 per day) disappeared in the direction of small converted rubber models for the price is \$3.95—28/-!

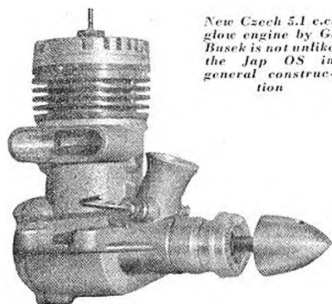
Another engine designer who is going to great lengths to produce something to please both the high performance addicts and those who want docility for radio control, is Yasuo Oishi of the O.S. Company in Japan. Whereas many another engine



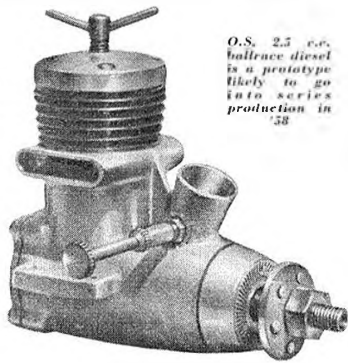
The latest O.S. Max-35, no longer called Max-1, has larger intake, new crankcase, stronger mounts and "straight through" needle assy

has been put into production after a bench test of several porting variations on cylinders for the same crankcase prototype, the new O.S. designs have been tested in models and are of widely varying shape and design. The diesel, centre, below, is typical and has been used in a heavy 1/c model. Another is the new Max-35 with fresh thought in the crankcase casting. Mounting lugs are more solid, carb. throat increased (with restrictors supplied) and in the exhaust stack, two lugs will permit screw-on attachment of an O.S. developed exhaust choke cum silencer with combined intake flapper valve.

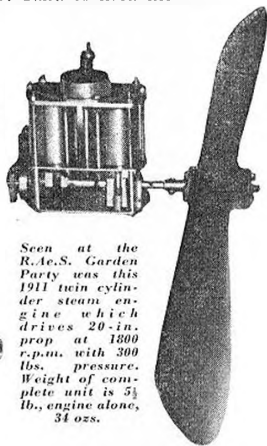
Another engine recently introduced in Germany is the Taifun Hobby RS version. This has a lengthy downswep rear induction carb. for clack valve, equipped with integral filter. The intake is above and clear of the exhaust gases, needle valve clear of the bearers and of course safely behind the cylinder and the earlier heavy drive boss which necessitated removal of too much prop hub on the first Hobby 1 c.c., is now small enough to cause no bother. What impresses us most of all is the presentation of this engine, especially for beginners. A well-produced beginners' ABC with numerous fine sketches covers all possibilities, and the test stand comes ready drilled and even with a pair of screw hooks and an elastic band to hold the tank in the space provided.



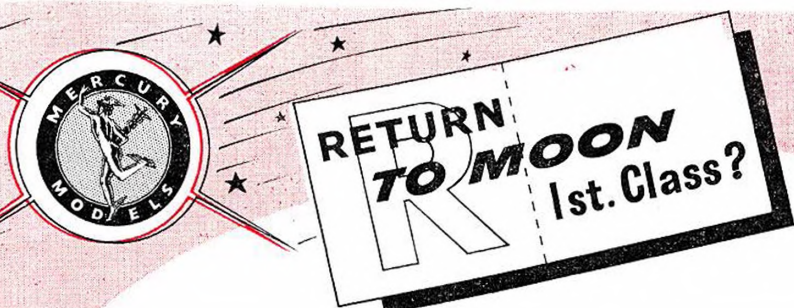
New Czech 5.1 c.c. glow engine by G. Busek is not unlike the Jap OS in general construction



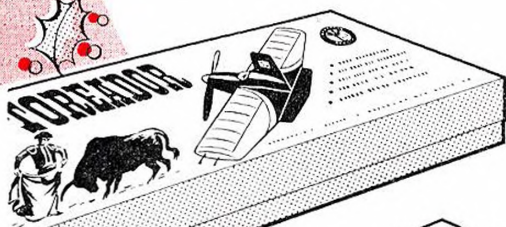
O.S. 2.5 c.c. ballrace diesel is a prototype likely to go into series production in '58



Seen at the R.A.C.S. Garden Party was this 1911 twin cylinder steam engine which drives 20 in. prop at 1800 r.p.m. with 300 lbs. pressure. Weight of complete unit is $5\frac{1}{2}$ lb., engine alone, 34 ozs.



- But you can give him
MERCURY
 models at Christmas!



The Scientists have not yet organized trips to the moon though there seems every possibility that they will do so sometime in the future.

We have no model of the Soviet Satellite in our range of kits, nor are we planning to produce one. But we **DO** claim that the very comprehensive range of Mercury Models is as up-to-date as the satellite.

THERE IS NO BETTER CHRISTMAS PRESENT FOR ANY MODELLER THAN A MERCURY KIT OR AN ALLEN-MERCURY ENGINE

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READERS WRITE...

Letters of interest selected from
our daily post bag

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

"My fault—BUT!"

DEAR SIR,

Ignorance of the law is no excuse, BUT if those who are the law of the country fail to *administer* or regard it, then anarchy will prevail. Therefore a great part of the guilt will be upon their heads.

In the past eight (?) years of S.M.A.E.-run R/C meetings in England when has a model, engine or radio even been checked to see if it complies with current international rules?

We all know, of course, that in the eyes of the S.M.A.E. radio control is one of these new-fangled things upon which time and money should not be spent. Our ruling of lumping multi and mono together was three years behind foreign model associations.

What has the S.M.A.E. R/C sub-committee done in the past five years? Does it ever meet? Do its members know anything of present day R/C flying? Do they even study the demands of the rank and file of R/C modellers?

The lead in R/C flying in England has been left to a few individualists who have had to fight against fatuous, man-with-the-red-flag S.M.A.E. rulings.

Correctly-run meetings based upon current international rules and *organisation* will materially help to produce an international team for the future. Mortlake, S.W.14. G. HONNEST-REDLICH.

(Mr. Redlich's letter follows our report in November issue of the fiasco concerning the British team at the King of the Belgians radio control contest. Whilst we hold no brief for his exaggerated remarks concerning the S.M.A.E., there is no doubt that a completely new outlook is required on the competition side of radio control.—Ed.)

Wanted—a speed engine

DEAR SIR,

It was with great pleasure that I read your Editorial comments on the part played by Great Britain in world speed flying. It has been the misguided policy of the S.M.A.E. Council over the past few years to discourage speed flying in this country and this, together with the total absence of suitable motors, has put us next to last in Team and 22nd in the Individual results—even this latter using a foreign motor.

In spite of these handicaps, it has been the small speed fraternity which has earned considerably more than its share of the International contest honours gained by this country. I think that it is not possible or even practicable to follow the lines

of your second proposal. The time has come when backing from the trade is necessary. Surely it would increase the home and overseas sales of several of our engine manufacturers were they to be associated, either individually or jointly, with such a project.

In view of the possible reintroduction of the World Championships annually, a decision must be made in the near future. As shown by Super Tigre's, it is possible to re-design and produce a special motor within nine months. Judging by the wide use of Japanese, American and Italian "Glow" 2.5 c.c. engines, a production motor in this class would have a good market.

Let us see some positive action by British manufacturers so that in 1958 and 1959 we may send a team of four potential winners and avoid a repetition of this year's humiliating performance. Sidcup, Kent. M. BASSETT.

Attention Engine Manufacturers!

DEAR SIR,

May I record my disappointment, although four years have now elapsed since J. Pannett made his sensible appeal for built-in cut-outs on engines (AEROMODELLER and *Model Aircraft*, November, 1953), no manufacturer has as yet shown the enterprise to add this important item to his range of products? Perhaps some are on their way to producing a new and radical attachment. That such things take time to develop, I do appreciate, and perhaps in intervals between brainstorming on the cut-out subject, they might want to consider the following suggestions to further advance their sales figures:

1. A friction damper for compression screws so that no matter how loose the threads, the screw never slackens off during a power run.
2. A range of plug-in carburettor throats with various air intake bores for speed, stunt or sport flying.
3. A silencer cum exhaust collector for sport flying diesels that could be retained by the screw-on cylinder fins.
4. Combination radial or beam mounting lugs on the crankcase and drop the leaky integral tank.
5. Standardisation of (A) shaft sizes and (B) bearer mounting holes in the various capacity classes—what a jungle exists today!
6. Angle the fuel feed line to give 90° change of direction.
7. Providing moulded rubber intake and exhaust plugs/covers to protect engines when not in use.

None of these ideas are original, in fact several of them are standard fittings on one Italian and two American and two Japanese makes, why can't we copy them, or think of something better ourselves? London, N.7. W. BROWN.

(The above reflects the sentiments of a large number of readers who have written on the same subject.—Ed.)



Fox Moths 'BVK' and 'G-ACEX' photographed in 1937 when operated by Pines Airways Ltd.—see letter below

Fox Moth background

DEAR SIR,

I was interested to note that B. Barton's Fox Moth in April "AEROMODELLER" was lettered G-ABVK. This and another Fox Moth, G-ACEX, were bought by my uncle in June, 1937, for Pines Airways Ltd., Porthcawl, South Wales, which he owned.

When war broke out Mr. Pine joined the Air Transport Auxiliary and strangely enough he was sent by the Air Ministry to commander and collect his own two planes. He understood that both the aircraft had crashed and were destroyed during the war.

The colour scheme was one shade of blue, and silver; all flying surfaces silver; and fuselage was dark blue with Pines Airways Ltd., Porthcawl, on the nose as in the photo. I enclose photos of G-ABVK and G-ACEX.

Since the war Mr. Pine has been flying from Blackpool, but he died suddenly this April, not long after the "AEROMODELLER" with the Fox Moth was published.

G. D. HODGKINSON.

St. Albans, Herts.

(We must also thank the many readers who continue to write informing us that contrary to our statement in the April issue that G-ACEJ "no longer exists as it crashed into the sea and was a total wreck"—is very active on Southport sands, apparently enjoying a new lease of life.—Ed.)

The Fokker Reputation

DEAR SIR,

In your issue for September of this year, Mr. P. L. Gray asserts that he has been supplied with material which would show that the Fokker D VII single-seat fighter was not designed by Anthony Fokker but by his designer, Reinhold Platz. The same would apply to other Fokker aircraft.

If this is true, then it would be nothing unusual for an aircraft constructor to be assisted in larger or smaller measure by a technical team, headed by his chief designer. Fokker, with much of his time taken up by many of the business affairs a manufacturer has to attend to, though he later delegated much to others, could not be expected to stand a full working day behind one of his firm's drawing boards. This is true of all aircraft constructors, who may have been Jacks of all trades at the start of their careers, but who had to call in technical assistance when their business grew.

Fokker, too, had a technical staff, headed first by Herr Palm and later by Herr Martin Kreutzer, killed in 1916 on the D. I Fighter he designed himself. When

Fokker adopted welding for the steel parts of one of his early aircraft, the Spider, other constructors had already used this new technique in aircraft engineering. Mr. Platz, however, was an expert in welding and could be regarded as an authority on the subject. He moved with Fokker from Johannisthal to Schwerin in the autumn of 1913, which proves Fokker's genius in spotting talent and making good use of it. It should be pointed out that in those days the title of chief designer did not exist in the Fokker works; he was simply known as the designer.

Fokker has never asserted that he himself entirely designed or worked out the aircraft his works made. But he did indicate the general line and layout of most of his products. And when we use the word "his", it is applied in the same sense as it would be to Sir Henry Royce's cars, or to Count Zeppelin's airships or, to come nearer to this day, to the excellent aircraft built under the name of Sir Geoffrey de Havilland. They all put their personal stamp on their products as head of a team.

However, building aircraft to a design is not all the story. In many cases aircraft designed in the Fokker drawing office had too short a fuselage, i.e. too small a tail moment-arm. Fokker, as a first-class pilot, could feel the defects before they could do harm, and had alterations made. He was never really satisfied with an aircraft; in his book, "Flying Dutchman", he writes: "No one has yet found as many flaws in an airplane of mine as I could find myself".

Aircraft should not only be built, they should also have good flying qualities. Fokker was the ideal test-pilot, who flew by feel and if he had not taken charge of this second phase, that of testing and altering until the plane was to his satisfaction, a job which he did all by himself until the beginning of the 'twenties, not so much would have come of the world-famous name. It was Fokker himself who was responsible for the non-stalling properties of his aircraft and which made them so safe and well-liked.

There is no doubt that Fokker and his designer mutually inspired each other, and the result is well-known. To unravel the past in order to find out just how much was contributed by the one and how much by the other, would be almost impossible at this stage, and, it seems to me, rather unfair to Fokker who is not here to give his views on the matter. Though it may sound crude, we would like to put the question whether his designers would have achieved as much without his leadership and guidance and whether Fokker would not have achieved the same with other collaborators, and the aircraft would still have borne his personal stamp.

To come out now with the discovery that Fokker did not completely design his aircraft himself, is about as sound as to suggest that a writer did not really create his work because he had research workers collecting and sifting data for him.

Royal Netherlands Aero Club,
The Hague, Holland.

J. VAN HATTUM.

D.H. Chipmunk



20-inch span. This control line scale model is an accurate replica of the actual training aircraft used by H.R.C. The Duke of Edinburgh. Authentic registration letters, roundels, etc., are included in a sheet of quality transfer and the kit is absolutely complete with wheels, prop and pre-shaped wing. All parts are accurately printed on top grade balsa and construction is made child's play by the systematic step-by-step instructions on sheet.

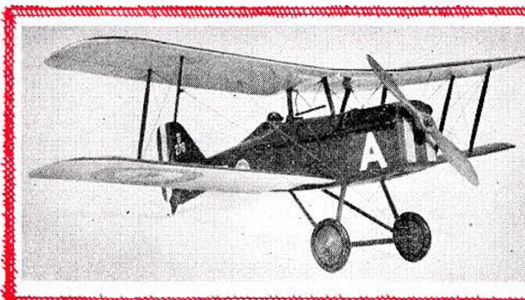
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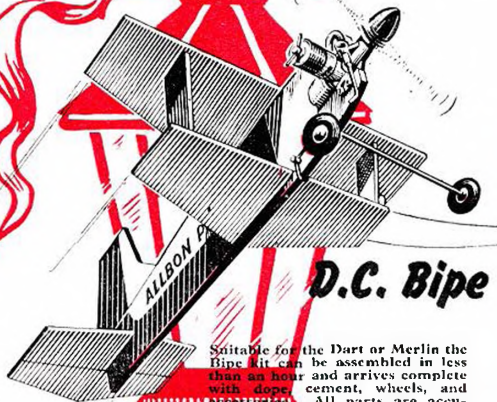
Ballerina

38-inch span. Fit this model with a Super Merlin and you have the perfect combination for a first power model. Construction is simplicity itself. The Kit includes accurate printed parts, shaped trailing edges, etc., all on satin smooth top grade balsa. Big feature of the design by Vic Smeed is its foolproof performance. Even the beginner will find it difficult to prang, yet snappy performance up to contest standard can be achieved if required. 16/6

Use a Merlin or Dart for



DAVIES CHARLTON LIMITED, HILL'S



D.C. Bipe

Suitable for the Dart or Merlin the Bipe kit can be assembled in less than an hour and arrives complete with dope, cement, wheels, and accessories. All parts are accurate, robust and the sturdy construction ensures a virtually crash-proof model that will provide hours of enjoyable flying. 12/0

Christmas Greetings to our Customers and



BAMBI

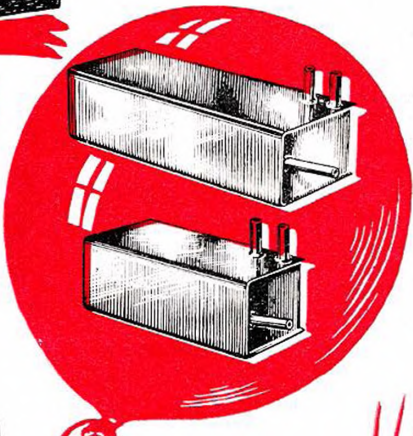
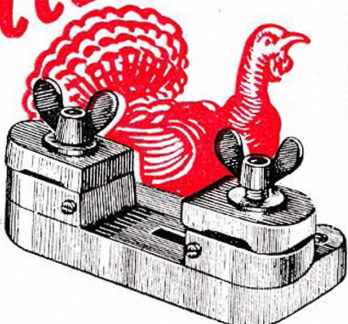


SUPER MERLIN



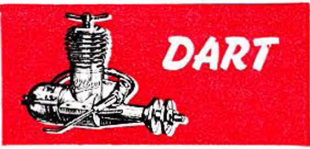
SPITFIRE Mk. II

ACCESSORIES

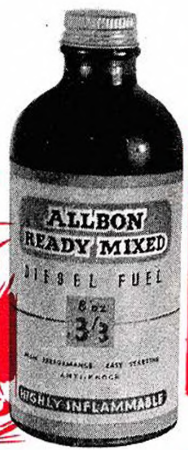


your "Aeromodeller" S.E.5a

Builders of this month's Free Aeromodeller Plan should note that the prototype model used a standard Merlin fitted with a one inch extended compression screw driving a 6 x 4 inch Trulflex propeller. The Dart is also suitable for this delightful scale model which is worthy of the best in motors.



AT YOUR LOCAL MODEL SHOP



MEADOWS, DOUGLAS, ISLE OF MAN

Trade Friends throughout the model world!



SABRE



RAPIER



MANXMAN

**SKYHAWK**

DESIGNED BY

L.E. Ellis

3/6

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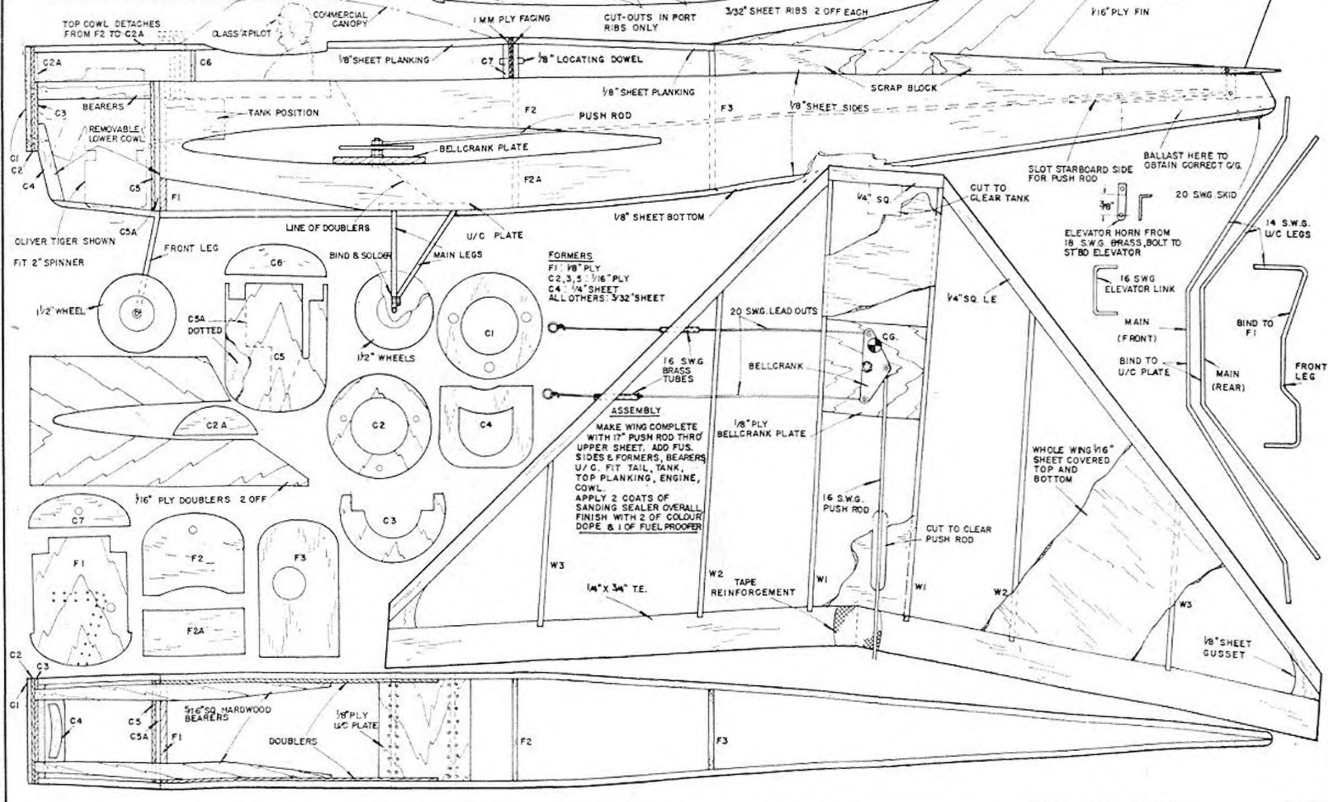
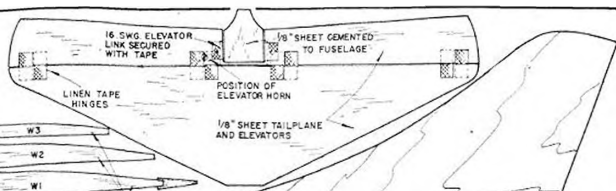
38, CLARENDON RD., WATFORD, HERTS

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.

MATERIALS REQUIRED

3 SHEETS OF 1/8" X 3" X 36"
1 SHEET = 3/32" X 3" X 18"
3 SHEETS = 1/8" X 3" X 36"
1 PIECE OF PLY 1/16" X 2' X 4"
1 SQ FT. OF 1/16" PLY
1 PIECE OF PLY 1/8" X 4' X 4"
12" OF 3/16" SQ HARDWOOD

18" OF 20 SWG PLAIN WIRE
18" = 18
36" = 14
3-1/2" WHEELS
1-2" SPINNER
1-6" COOPIT CANOPY
1-CLASS 'A' PILOT

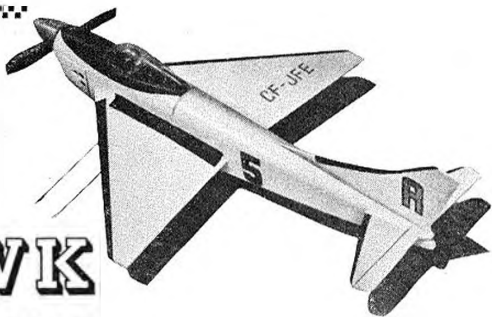
AERO
MODELLER

672

December, 1957

Jet lines provide a new look for Class A Team Racing and sport flying in Laurie Ellis's

SKYHAWK



Laurie Ellis enters the team race and sport flying field with this unusual design which has already hit the 85 m.p.h. mark in prototype form. Trike w/c, long fuselage and jet lines make it a real out-of-the-rut model, which will appeal to those who are looking for something quick to build with a robust crash-proof structure.

Anyone who has built a few powered models will have no difficulty with the construction and the model can be completed in about twenty hours of spare time.

The wing must be built first. Lay out the leading and trailing edge pieces flat on the table and cement together. Cement in the wing tip fillets. Do not bevel the trailing edge before assembly. When dry, raise the wing outline from the board and slide small pieces of $\frac{3}{8}$ in. balsa underneath at regular intervals. This raises the wingframe enough to allow clearance of the wing ribs. Cement all ribs in place and cover entire surface with $\frac{1}{8}$ in. sheet. The centre section is covered with the grain horizontal, the main body of the wing is covered with the grain running parallel with the leading edge. Note that the sheeting butts against the rear of the L.E. and the front of the T.E. When dry remove from plan. Make up bell-crank unit and fit to $\frac{1}{8}$ in. ply. Cement unit in place. Drill L.E. for brass tube line guides. Install lead out wires. Cover surface of wing with $\frac{1}{8}$ in. sheet. Cover centre section as well then cut out an elongated hole to allow access to bell-crank and installation of push rod.

The fin is made out of $\frac{1}{8}$ in. ply. Sand carefully, give two coats of sealer, then dope with two or three coats, sanding between each coat.

Make the tailplane from $\frac{1}{8}$ in. hard sheet. Sand to aerofoil shape. Install elevators with cloth hinges. Cement 18 S.W.G. elevator link in place and secure with small pieces of gauze. Bolt elevator horn in place on under side of right elevator. Cover stabiliser and elevators with lightweight paper and give several coats of dope.

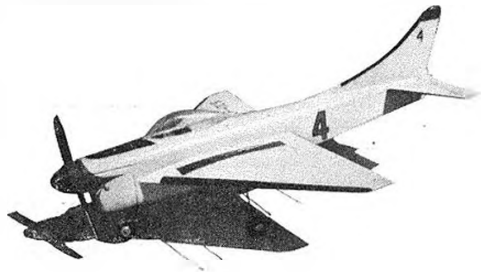
Cut out fuselage sides from medium hard $\frac{1}{8}$ in. sheet balsa. Mark position of formers. Cement doublers in place and cement hardwood engine bearers in place, spaced according to your engine. These should be secured with small brads. Sew front landing gear leg

to F.1. Slide fuselage sides on to the wing from each side. Cement F.1 and hold in position with elastic bands. Cement in F.2 and F.2A. Draw rear of fuselage together and cement. Cement F.3 in position. Now install push rod. Cement tailplane in position ensuring that the elevators are neutral when the bell-crank is central. Cement fin position and plank upper part of fuselage from F.2 to rear. Make up main undercart unit and sew to $\frac{1}{8}$ in. ply. Cement unit in position and don't be afraid to use lots of cement.

Make up the cowl at this stage, before the fuselage is finished. By means of small wood screws, secure C.1 in place on front of engine bearers. Cement a 1 mm. ply face to the front of the upper part of F.2, also cement a 1 mm. ply face to the rear face of C.7. Pin in position and drill for two small lengths of $\frac{1}{8}$ in. dowel cemented on C.7. Locate C.6 and hold in position with pins. Now plank upper part of cowl with $\frac{1}{8}$ in. strips. When dry, unscrew small screws at front and cowl will slide off.

Remove needle valve and contra-piston lever from engine and install in position. Be sure to allow sufficient clearance for prop and spinner in front of C.1 unit. Reinstall upper cowl. By means of a small wood screw secure C.3 in position. Slide C.5 unit in position against front of F.1. Plank in lower part of cowl. Sand down complete unit while still in position. Remove cowl and give two coats of sealer, cover with lightweight paper and give three or four coats of dope.

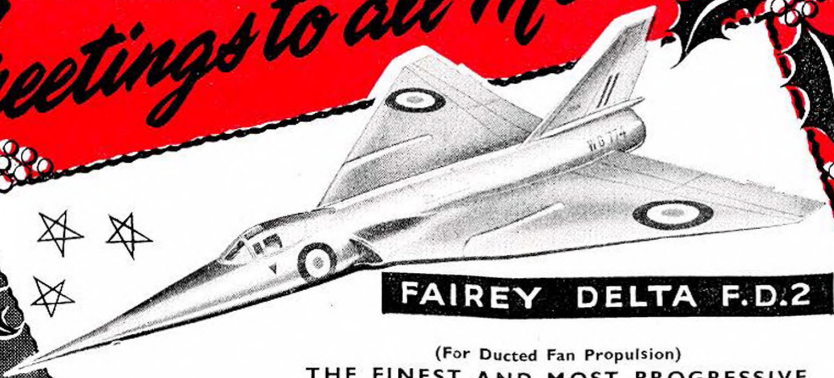
Now install tank and cover underside of fuselage. Give all wood surfaces two coats of sealer and cover with lightweight paper. Apply three or four coats of dope and then colour to suit individual tastes. The original model is coloured all white with black trim. This gives a very striking finish even if white is an awful colour to apply.



Resemblance of the Douglas lightweight A4D Skyhawk Fighter is no coincidence. No. 1 at right is an actually larger, Class B version. Laurie retains the same lines for his reduced size Skyhawk as drawn opposite (No. 5) which is Oliver Tiger powered as seen in the heading. Tri-cycle undercarriage is a rear prop-swept

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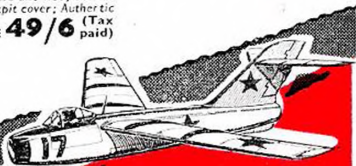
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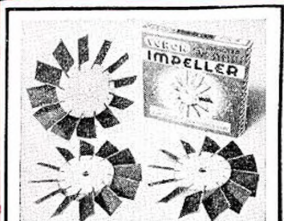
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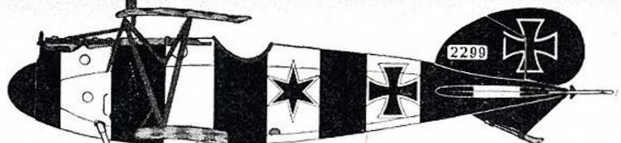
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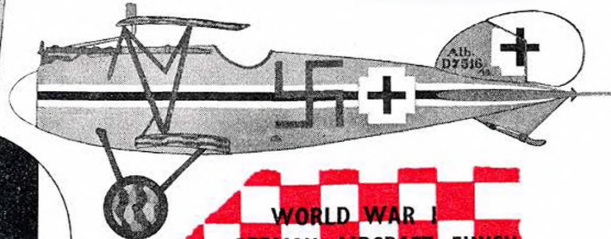
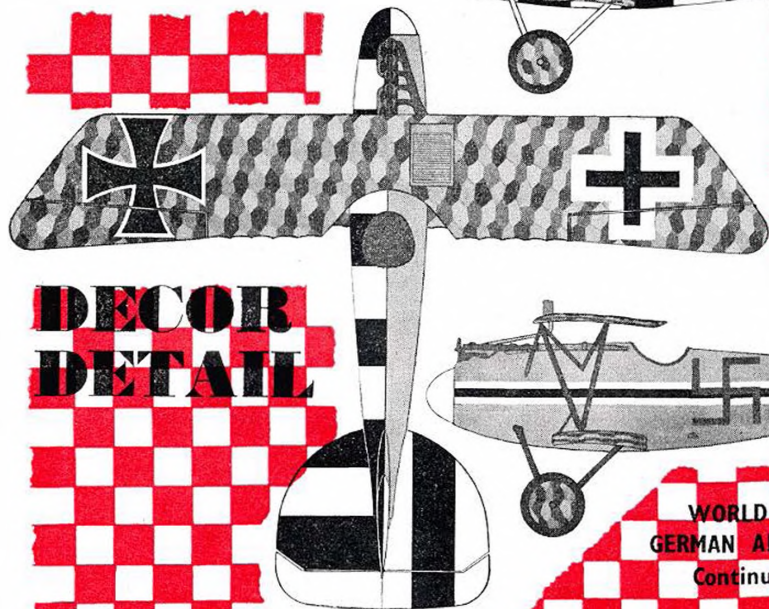
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By P. L. Gray



Below, and starboard side of plan view, Albatross D Va captured in Palestine during the closing stages of the war. Varnished ply fuselage and fin, white rudder. Black and white tailplane. Fuselage stripe black and white, seatika and spinner green. Wings standard losenge fabric, with non-standard insignia



Above and part side of plan view, Albatross D Va as flown by crack German pilot Bruno Looser. Whole fuselage and tail decou in black and white. Wings were covered with losenge printed fabric

DECOR DETAIL

AS FROM July 15th, 1917, aircraft not destined for the Front were not to be painted, in order to save oil and paint. After firms had used up their existing stocks of paint, the cost of painting each aeroplane was deducted by the Government, from the bill!

Plywood covered fuselages of two-seaters that had no fabric covering were painted over, some almost meticulously to match the pattern of the fabric, others were, to quote an Allied report on a captured Halberstadt CL.II "covered with a scumble of colours arranged in indefinite areas and shading into one another. The colours used are cloudy yellow, dark and light greens, brown/purple and light blue. The belly of the fuselage is coloured yellow throughout." Fuselage of the single-seat Albatross D III and D V A types continued to be natural wood with clear varnish. Metal interplane struts

were painted dark green, wooden struts were either painted or wrapped with losenge fabric.

There does not seem to be any hard and fast rule about the date of the change over from shaded to losenge camouflage, obviously aircraft would not be stripped of fabric and re-covered needlessly. It was a case of new aircraft replacing old or written off machines, therefore the change was gradual during 1917 and for a time aeroplanes with both types of camouflage may have been seen in the same unit.

The same remarks regarding National Insignia, serials and operational markings apply as in the case of "shadow" camouflaged machines.

The only further major alteration in the markings of aircraft of the German Air Force came during the Spring of 1918, when the National Insignia was changed from the Patec cross with its curved sides, to the straight sided Greek cross (Balkonskreuzes). The change-over has been variously reported in the past, as taking place in January, March, April and May of 1918, but it can now be stated conclusively that April, 1918, was, in fact, the date. It is thought the quoting of the orders pertaining to the introduction of these crosses, and their subsequent modification, will be of unique interest and self-explanatory.

Official German orders

"20th March, 1918. To improve the recognition of our aircraft the following is ordered:—

1. All aircraft are to be equipped with a straight lined Iron Cross on the tips of the top surface of the top wing and the lower surface of the bottom wing. On both sides of the fuselage behind the pilot's seat (the cross should not have curved sides as the old type cross) with 15 cm. (approximately 6 inches) white stripes edging the cross.

C.VII.3540₁₆ *Albatross C type serial style, actual serial of C.VII*

D1941₁₆ *Albatross D type serial on fin. This is Udet's actual Albatross D III additional digits below.*

235678

Halb CLIV (Ro) 817₁₈ *Sub-contract type of serial, i.e. L. F. G. Roland licence built Halberstadt CL IV*



2. Rudder to be painted white with Iron Cross imposed upon it. Other recognition marks are not envisaged. This alteration is to be carried out by **15th April, 1918**. The carrying out of the order at Home should not influence the dispatch of aircraft. Machines loaded for dispatch can be altered at the Front. Manner in which order to be speedily executed: (see illustration)."

"13th May, 1918. Ref. to phone talk between Meyer and Faldenhahn re new marking of aircraft:—

1. The wings—the black verticals of cross are to be from leading to trailing edge.

2. The white bands are only to be painted alongside the long side of the cross so they will appear as four right-angles and do not enclose the whole cross. The ends of the cross are free. The ratios of the cross to be: Length of vertical bar to horizontal bar=5 : 4. Width of horizontal and vertical bar=1 : 1. Width of bar to length=1 : 8. Width of white stripe to width of bar of black cross=1 : 4".

"16th May, 1918. Markings as given above are to be applied to all aircraft ready for the Front without, however, causing any delay in their dispatch".

"25th June, 1918. With ref. to order 43650 the Iron Cross dimensions are altered and will be as follows: The length of the vertical bar and horizontal bar will be equal=1 : 1. The alteration on aircraft for the Front should be carried out forthwith. Aircraft for the Home Command can be delivered in the original form of cross".

"4th June, 1918. Crosses should be painted as far out on wing tip as possible (no exact measurement is given). The black cross is square and the lengths of the arms=to chord of wing. The black stripe width= $\frac{1}{8}$ of the length. The white border $\times \frac{1}{4}$ of the black width. Same proportions apply for fuselage crosses (i.e. depth of fuselage sides instead of chord of wing, etc.). The same rules apply to rudder marking and, when applicable, to fin".

Two further self-explanatory orders pertaining to the colouring of plywood fuselages are quoted for their interest value. It will be noted they were issued during the closing weeks of the war.

"20th September, 1918. CAMOUFLAGE OF FRONT LINE AIRCRAFT. Circular 111/9, 18. Experience at the Front has proved the dark coloured fabric for the top of the wings and lighter coloured fabric for the bottom of the wings.

The bright yellow, or likewise bright colour of those parts of the fuselage which are made of plywood, has an adverse effect. One should try therefore to paint back and sides of the fuselage in a colour which blends with the dark fabric on top and the lighter fabric on the belly.

To obtain this without increasing the aircraft weight, and to save oilpaints, the Flugzeugmeisterei suggests painting the plywood before applying the lacquer. Experiments by the Albatros firm have proved that colouring the fuselage—plywood parts—is possible without an increase of more than 50 kilograms in the

Aviatik C.I shows "white aeroplane" appearance of natural linen fabric covering before the introduction of any camouflage schemes. Note crosses underneath top wing, also that there are crosses on the wheel discs. "Real Photo's" copyright

all-up weight. Therefore I ask that plywood parts, as described above, are coloured when the aircraft are delivered. Struts and undercarriage should also be painted in an appropriate dark camouflage colour".

"October, 1918. Order 1111/9, 18 (above) does NOT apply to 'D' type aircraft fuselages (i.e. single-seaters). These plywood fuselages are weatherproofed to save weight and paint".

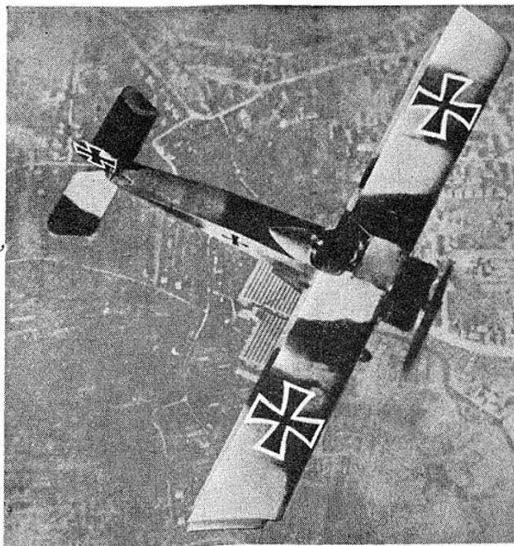
Exceptions to the foregoing general rules appear to have been the Junkers aircraft which being metal covered, had to be painted. Reports on captured machine, read as follows: *Junkers J.I*. "The machine is thinly painted in matt colours. The upper surface of the planes has irregular masses of the usual green and mauve tints, while the underside is painted a bluish-white colour. The struts and wheels are green as is the armoured portion of the fuselage, the rudder is white".

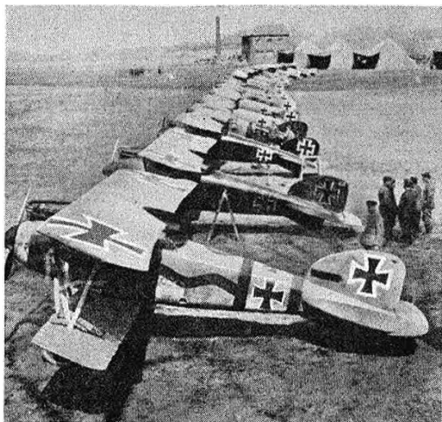
Junkers D.I.—"The body is painted as chocolate brown colour, except underneath, where a white pigment is applied. The wings are painted a pale green with irregular patches of light mauve on top, they are white underneath. The tailplane and elevators are white above and below. Junk D.I had been painted on the fuselage side but was obliterated by the chocolate paint".

Two other types of production aircraft which do not seem to have adhered to the general scheme of camouflage were the Pfalz D.III and Fokker Dr. I triplane. Nearly all the Pfalz machines were finished all over with aluminium dope. The Fokker triplanes were doped a dark olive green over the white linen fabric and this was then brushed out in streaky patches, underneath they were the usual sky-blue. Later machines from the production lines were covered with the losenge fabric.

to be continued

Genuine air-to-air W.W.I. photographs are fairly rare. This one of a Fokker D.II, said to be flown by Lt. Kissenberth, shows the camouflage pattern to good advantage. Chas. Donald photo





Albatros D III scouts of Jasta II, commanded by Manfred von Richthofen, with various decor. The aircraft in the foreground has a small additional cross facing vertically upwards on the white band painted right round the fuselage.

TABLE OF COLOUR DETAILS FROM THE WRITINGS

Aircraft	Given Colour Description	Date
Fokker Dr. I	Nose and tail, red, fuselage and wings black.	12 Apr., 1918
Pfalz D III	Black fuselage, white tail; upper surface of top wing black and white checks	23 Apr., 1918
Albatros	Two-seater, greenish black	17 May, 1918
Pfalz D III	Pale green	17 May, 1918
Pfalz D III	Yellow and black aircraft, also green and black aircraft	17 May, 1918
Hannoveraner	Silver	17 May, 1918
Albatros D Va	Green fuselage, black tail	26 May, 1918
Albatros	Two-seater, silver	27 May, 1918
Single-seaters	Twelve single-seaters, silver ('Probably Pfalz D IIIs)	31 May, 1918
Pfalz D III	Black and white checkered aircraft	31 May, 1918
Pfalz D III	Seven dark camouflaged aircraft with white tails	1 June, 1918
Halberstadt	Silver	1 June, 1918

Above from "Tiger Squadron" by "Taffy" Jones

Albatros D III All black with white crosses. 19 Aug., 1917
Lt. von Bertrab

Alb. D III or V Aircraft red, blue, green and yellow 7 June, 1917

Above from Mamech diary quoted in "King of Air Fighters" by "Taffy" Jones

LIST OF AUTHENTIC SERIALS WITH PILOT AND UNIT WHERE KNOWN

Aircraft	Serial No.	Pilot	Unit	Date
Fokker Dr. I	Fok. Dr. I 121/17	Pastor	Jasta II	31 Oct., 1917
Albatros D V	D 5222/17	Adam	Jasta 6	15 Nov., 1917
*Albatros D V	D 2161/17		Jasta 11	4 Dec., 1917
*Albatros D V	D 4628/17		Jasta 11	
*Albatros D V	D 5315/17		Jasta 11	
Pfalz D III	D III 4059/17	Riensburg	Jasta 10	18 Jan., 1918
Pfalz D III	D III 4223/17	Linsinger	Jasta 11	24 Jan., 1918
*Albatros D V	D 4565	Barth	Jasta 10	30 Jan., 1918
Fokker Dr. I	Fok. Dr. I 155/17	Wolff	Jasta 11	3 Feb., 1918
Pfalz D III	D III 4283/17	Kleen	Jasta 10	19 Feb., 1918
Fokker Dr. I	Fok. Dr. I 110/17	Just	Jasta 11	1 Mar., 1918
Pfalz D III	D III 4042/17	Stauradgum	Jasta 4	8 Mar., 1918
*Albatros D V	D 4566	Osten	Jasta 4	28 Mar., 1918
Fokker Dr. I	Fok. Dr. I 591/17	Scholz	Jasta 11	2 May, 1918
Fokker D VIII	Fok. D VIII 294/18	Goring		18 July, 1918
Fokker D VIII	Fok. D VIII 5125/18	Goring		
Fokker D VII	Fok. D VII 309/18	Friedrichs	Jasta 10	15 July, 1918
Fokker D VII	Fok. D VII 2063/18	Bender	Jasta 4	16 July, 1918
Fokker D VII	Fok. D VII 4253/18	Udet	Jasta 4	26 Sept., 1918
Albatros D III	D 1941	Udet	Jasta 15 or 37	
Albatros D Va	D 2859	Von Richthofen	Jasta 11	
Albatros D V	D 2108	Von Griem		
Fokker D VII	Fok. D VII 286/18		Jasta 11	Aug., 1918

* May have been D V or D Va

Austro-Hungarian O-Aviatik Berg D I with "ear" type radiator displays interesting markings on fuselage. The curved "flat plate" tailplane section is unusual, also the amount of wash-out on the ailerons appears to be considerable. The significance of the Series Number on the fuselage is explained in the text. Below, captured Halberstadt CL II has interesting identity device on fuselage in form of Roman numeral III. Attention is drawn to the striped tailplane and elevators and the fact that a straight-sided cross is painted on the rudder whilst all the other crosses are of the pale design.

All photos, this page from Imperial War Museum



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AUSTER AUTOCAR

British lightplane

Authentic civil registration on all-blue colour scheme. Rib details, etc., all shown. A grand flyer.



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PUSS MOTH

British old-timer

Orange and white colour scheme with authentic civil registration letters. Makes exhibition or flying model.



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CESSNA BIRDDOG

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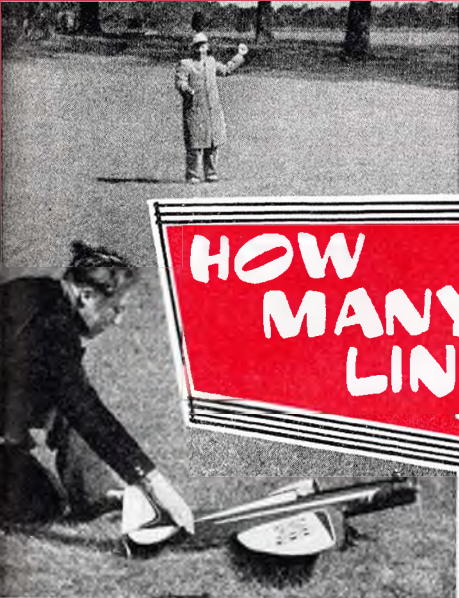
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by
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seen releasing
Bob Palmer's
model of left

1957 MARKED THE Tenth Anniversary of control-line flying in Great Britain, and those who thought it a "passing phase" back in 1947, with sourly biased comments implying a "brick on a string" complex, surely ought to be ready to eat their earlier words. After a decade of activity one *might* well be excused for expressing the view that "there can't be anything new".

We are always slow in Great Britain to take up initiative in free-lance design. There are exceptions, of course, but reflection on any class of free-flight or C/L model will illustrate American or Continental influence in some form or other. Our A/2 slabiders and scale free-flyers alone show some degree of enterprise. In control-line the same attitude persists.

Single and two-line control became popular in the U.S.A. during 1939/40-41, but naturally enough the world conflict disrupted any thoughts of taking up the "new" flying method in Great Britain.

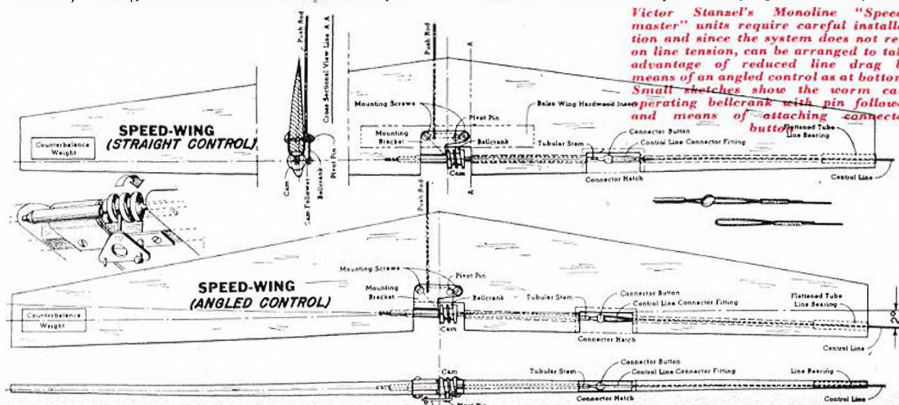
Allowing for the wartime delay, our acceptance of C/line in seven years was not over-long, bearing in mind the lack of suitable engines, which did not begin to arrive in numbers until 1947. There always remains, however, a regular unwritten two-year-acceptance-

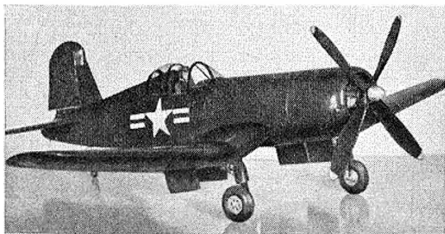
period of delay between nation-wide distribution of a new item in the U.S.A. and eventual experiment, this side of the water. Such is the case with Stanzel *Monoline* and will be with another equally outstanding form of control known as *Plight Control*. These are single and triple line systems one most useful for speed, the other for sheer fun or serious carrier type contests as organised by the U.S. Navy or "Zoom, Lob or Loop" bomb-dropping as to be introduced by the U.S. Air Force.

Reverting to the first mentioned **Monoline** which was used for the first time in a British contest by M. Mendham of Watford at the 1957 Nats, it is quite surprising to note the seemingly inhibited resistance of some of our most experienced speed men to take up single line control. They have the equipment, and we hope to see it in use for the 1958 season, for quite certainly it offers great advantage, if perhaps a little less instinctive, in control. F.A.I. ruling, commendably published over two years ago in September, 1955, AEROMODELLER and emanating from the Models Commission report of June that year, allows .34 mm. single line to replace a pair of .25 mm.s. In British terms this means a single 29 gauge wire, while for the U.S.A. it is current practice to use 27 gauge (.0164 in.) for the .15 cu. ins. class, this being a better diameter to transmit torsion from the handle to the model. (System described in detail, AEROMODELLER, February, 1956.) Other U.S. regulation wire diameters are for up to 1.6 c.c. (.099) .010-in. wire; for 5 c.c. (.29), .018-in. wire and for 10 c.c. (.60) or Jet .024-in. wire. The jump in record speeds (108 m.p.h. with .8 c.c., 154 m.p.h. with 3.25 c.c. for example) illustrate the terrific advantage of Monoline with line drag reduction for speed flying.

Flying Monoline is an experience any control-liner would relish as it really does call for good co-ordination of the hands until one reaches the "natural flying" stage of instinctive action. Using our Monoline trainer (Frog 500 power), with the spiral cam control (unlike the speed system illustrated) we have introduced single-line flying to a number of enthusiasts who have shown sufficient interest in the subject. Pete Wright was a "natural" flier, likewise Mendham; others have flown well for a few laps, then got themselves into oscillations of zoom and dive which tend to make it *seem* very difficult to fly. This is certainly not the case. Everyone who has flown the Monoline Trainer confirms the view that once the positive elevator action, so different to two-line control, is demonstrated to the operator, flying is then easy. We

Victor Stanzel's Monoline "Speed-master" units require careful installation and since the system does not rely on line tension, can be arranged to take advantage of reduced line drag by means of an angled control as at bottom. Small sketches show the worm cam operating bellcrank with pin follower and means of attaching connector





Bob Smurthwaite's Corsair with Flight Control has retractable undercarriage complete with wheel doors, and interconnected rudder for slow speed flying, actuated by the 3rd line system. Handle at right illustrates the midway position of the 3rd control which can be moved by the joystick at top or fore-fingered trigger. See sketch below

have the assurance of experienced U.S. fliers that it is far more easy to use the Speed Master worm cam in a speed model than the spiral cam in a trainer, but it is the experience of the trainer which best introduces one to Monoline.

There are views that whipping is possible with Monoline, but anyone who states this is leaving himself wide open to ridicule for his sheer ignorance of the system. Unless the twisted Archimedian screw can project from the handle (normally held in the pylon with the left hand) in a direct line to the model, one cannot operate the control knob in the right hand, and centred along the length of the twisted screw rod. If enthusiasm runs away and one tries to whip with the right hand, the result will be a bent control rod, and no control! Of course, one could push the knob to the full "down" position and whip from the control rod extremity, but to do so in a speed circuit, using a pylon, would be so blatantly obvious that it could never bring any advantage. Monoline is fair and logical, only the biased and ignorant seem to resent its appearance and, as is so prevalent in our hobby, these people are all too garrulous and influential.

From one line for speed to three lines for sport, our next subject is **Flight Control** as manufactured by the J. Roberts Model Mfg. Co., Baker, Oregon, U.S.A. Not since we managed our first loop (in the days when the handle had to be turned with the model as it was thought that control would be lost on twisted lines) have we experienced anything as full of fun as the fully compensated 3-line system. Three-lines have been used by a large number of enthusiasts, but the loose third line brings with it the complication of taking away some of the tension on the elevator lines, a fact which has been the downfall of many models.

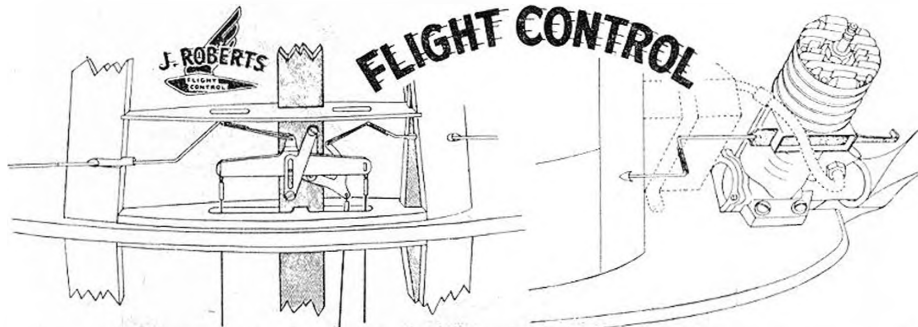
Flight Control installation shows midway position of bellcrank coinciding with handle in photo above, engine half throttled and bellcrank midway in floating slot. At right, a Fox 35 with slide restrictor is shown fully choked for slow speed flying

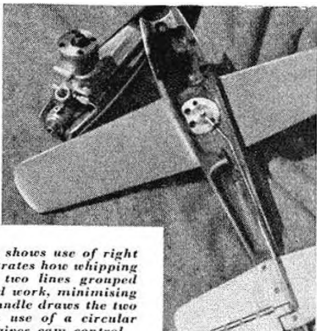
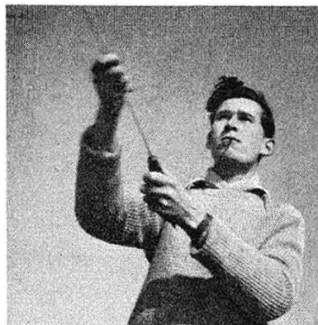


Flight control uses a *floating* bellcrank to which is interconnected another crank for third line control. In designer Bob Smurthwaite's own scale Corsair model, this operates a fully retracting u/c, carrier hook, rudder for low speed (about 15-20 m.p.h. with engine throttled) and full speed at 75 m.p.h. with all "up". Through all third line control movements, the bellcrank gives a full range of elevator motion, and at any stage of the third control, one can leave the line (even have the u/c half-up) and leave it there while looping or carrying out any stunt.

That is the revelation of Flight Control. We fitted a D.C. Manxman 3-5 c.c. diesel with crude flapper choke over the very convenient downdraught carb. It was in an American Sterling Super-Ringmaster (identical in almost all respects except fuselage to the British Mercury "Monarch") and the engine was arranged to run rich with choke (using a 1/16-in. hole for intake) and fast when the flapper lifted.

Take-off was quite normal, the model fully aerobatic and the lines wound up through five loops when slow speed was tried. The forefinger is slipped into a trigger ring and pushed forward. The engine slowed, airspeed was too low for the windy conditions and third control was pulled to rev-up. Time lag was negligible and various intermediate throttle positions tried. Then it was realised that the throttle could be set and left anywhere! One does not need to touch 3rd control, it remains static, as set, by virtue of the fully balanced and seemingly complex apparatus which is duplicated both in the neat plastic handle and well-made bellcrank assembly. Exhaust choke is to be preferred on any motor with a slide stack and the sketch shows one application. Later findings have indicated an improved slide form





At left, Pete Wright flying with Monoline shows use of right hand to operate the control knob and illustrates how whipping is impossible. Above, Olle Ericson uses two lines grouped together with this special handle for speed work, minimising the line drag. Central wire outrigger on handle draws the two lines together. At right, Czechoslovakian use of a circular pulley with eccentric push rod pick-up gives cam control

as shown in fig 7A, page 358, July issue. We feel that F/C is in its infancy. There will be a natural sales resistance in trying to get the 2-line men out of their groove, but the applications of the system are limitless. Just imagine the novelty of a landing between manoeuvres in a stunt contest! In Navy carrier events, F/C won two of the three classes at the 1956 U.S. National contests, and as an illustration of the basic possibilities, we can do no better than quote a letter from Bob Smurthwaite of the J. Robert's Company, who states: "I made 45 take-offs and landings in four minutes (with a trike u/c Cobra design (Fox 35) using slide exhaust choke). Each landing had a ground run of at least quarter lap before I gunned the motor for another take-off. The model could be kept in the air at just about 12 miles per hour and could be accelerated to over 75 m.p.h. within one full lap. This is an entirely new "Life" for model plane flying. It is so simple and easy to install and the flying is endless for new variations of things to do".

We can thoroughly endorse the designer's remarks, and add that if anything was worth the effort of a little extra thought required for installation, a Flight Control unit more than repays the extra strain on the modeller's grey matter.

Third on our list of innovations is the **Pulley Control** used by Czechoslovakian speed modellers, and said, for some unaccountable reason, to be responsible for "gyroscopic stability". In brief, the normal 2-line bellcrank assembly is replaced by a pulley and the push-rod pickup point is eccentric. First and obvious advantage is that the lines are at a constant position as they leave the pulley and do not vary back and forth as they would with a bellcrank. Further, it is possible to

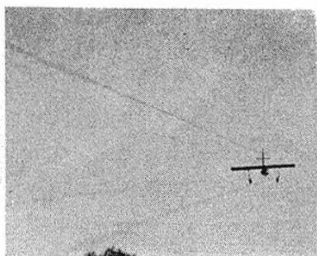
shift the pickup for the push rod giving a greater range of variables, and also one can use the flying wires for lead-outs. This saves considerable drag, avoiding the use of connecting links at the wingtip, and the lines join instead around the pulley, locking in a set position.

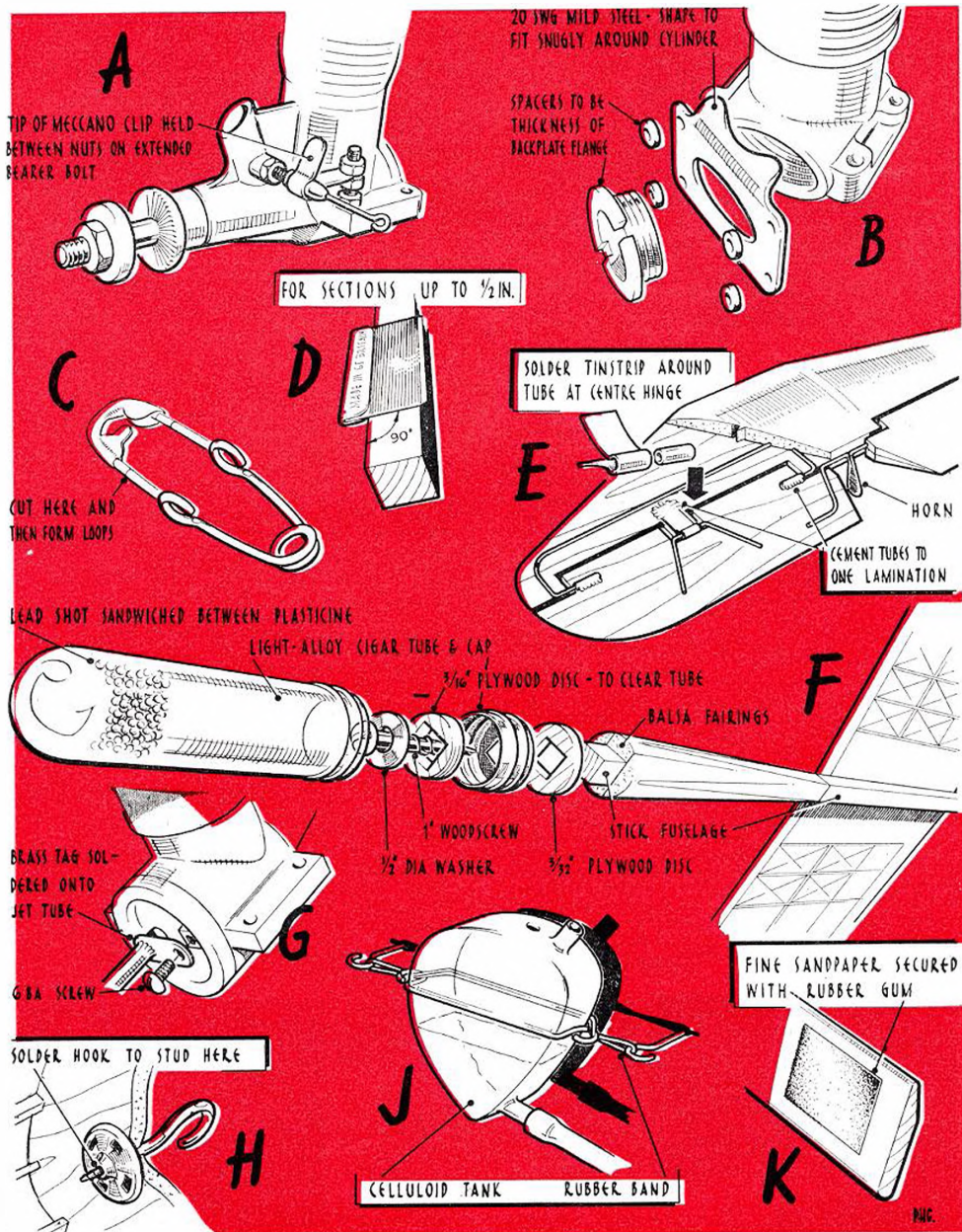
Are these advantages worth while over the conventional bellcrank? Of course they are if they add even $\frac{1}{2}$ m.p.h. to the model speed by reducing drag, and to judge by the way Sladky can fly at 130 m.p.h., not looking at the model, but pirouetting in true head-flicking ballet style at the pylon, then there must be something useful in the pulley system.

Fourthly, a real novelty from Barcelona, where a keen group of control-line enthusiasts have devised a **Car-Control** novelty guaranteed to clear the highway, but not recommended for British roads! Take one flying wing, put a big fin on the fuselage and join three lines, one to the fin top, one each to the wing mounted u/c legs. The other ends are attached to a Joystick arrangement on top of a Citroen "Deux-Cheval" and the model motor is started up. It won't pull the car—even a 2CV; but the "model" will respond to "up" and "down" as the angle of attack is altered and will fly in any set position (even up over the top and out back inverted!) if the car speed is not too great! See the photos for proof that it works. Inventor of the strange device is Dr. Jorge Prats Trian, and he promises any modeller a lot of friends(!) in the police force if one dares to try the scheme on town streets.

Next month we shall be reviewing personal flight impressions of the world's leading control-line stunt designers, including those of the U.S.A., European and British Champions, with revealing notes of their own pet approaches to perfection.

Spanish Adventure! Three line control is seen near Barcelona. At left, front view of the approach, centre, view through windscreen, and at right, inventor Dr. Jorge Prats Trian. Lines pick up at the fin and extremities of the two undercarriage legs. We commend the system to film producers!





GADGET REVIEW

CHRISTMAS ISSUE wouldn't be the same without this feature, and we must apologise for the lack of Reviews during the past year: but pressure on space for contest reports, new features, and, of course, the latest designs has kept the unfortunate Gadgets in the background. However, here's a selection to help you with your aeromodelling, and as usual, there is something for everyone.

Rotating needle valvitis is a common disease. On some engines one can either plier squeeze the needle thimble until it's so tight it threatens to undo the whole assembly, or else it ruins the threads, so the best bet is to leave it alone and either fit a wire spring clip as suggested before in this feature, or a Meccano clip as in **A**. G. Keighley of Wakefield used it on a Frog 50, where the nearness of the mounting bolts is convenient. For larger engines one can solder a tin extension to reach the bolts.

Then there's the problem of a plan for a radially mounted Elfin, and as we know too well, those lovely plain bearing engines aren't made any longer. However there are several excellent rotary crankshaft valve motors and with the mild steel plate shown in **B**, radial conversion is simple. The slight reduction in crankcase volume has little if any performance effect, and spacers make up the thickness of the sump cap flange. Pete Holland thought this one up for an Elfin 1-49.

Now an "oldie" worth reviving. M. Hosker of Manchester discovered it not knowing its widespread use pre-war. Simply take a safety pin, snip off the end as in **C**, curl the ends and you have a tensioning spring for a propshaft. And for something simple, yet a time and patience saver, use a backed razor blade as a set-square as in **D**, says W. Kitching of Middlesbrough, and cut across the strip wood with a second blade to get neat square ends for joints.

Hidden elevator hinges for controliners are easy, especially if non-scale when the hingeline runs from tip to tip. But on a scale type like the Boeing F4B-4, with inset horn balance and rearward hinges, one needs more support for the small projecting pieces. So, in **E** W. I. Barrett of Urmston uses the wire hinges to strengthen the tail, sandwiched between two sheets.

There will be plenty of those neat light alloy cigar casings thrown away this prosperous Christmas, and we must confess that we have often wondered how they can be used in modelling. B. Mann of Welwyn Garden City comes up with a fine suggestion in **F**, where the screw cap is retained by woodscrew on a solid stick glider fuselage, and the alloy

canister used as a super streamlined detachable weight carrier for lead shot secured in Plasticine. By the way, these cans could also be well employed for holding fuse out on the field on a damp day. They fit conveniently in the pocket, and a hole could be drilled through the lid to snuff a lighted piece of fuse held ready for igniting the d/f, and projecting through said hole.

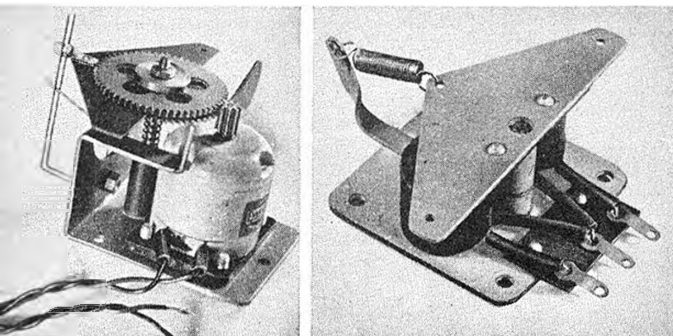
The taper fit of the E.D. Bee 1 c.c. diesel carburetor body in the crankcase does not always remain firmly *in situ* when the tank is detached. P. G. Tucker of Addington suggests **G**, which is self-explanatory, and also adds a thought for stopping the needle valve rotating by soldering an 18 g. wire "clicker" direct (and vertically from) the carb. body. Two items from Woolworths make up **H**, from D. W. Bennett of Birmingham, which is an ideal hook fixing for rear motor pegs on rubber-driven models, radio receiver suspension, etc. A large size press stud is fixed one side of a sheet bulkhead, and a screwed hook forced through. The thread of the screw locates tightly in the stud, and a spot of solder can be applied to "make sure".

Fuel metering is a popular method of engine timing for both sport and contest work, but the frothing that goes on in most transparent tanks does make it rather difficult to judge the fuel level exactly. T. Stoker of Richmond, Yorks, suggests the shock suspended tank in **J** where a made-up celluloid tank of ideal shape is held away from the fuselage side by rubber bands and hooks, which absorb all vibration. Novel point is that Mr. Stoker also graduates his tank by filling in scored lines with Indian ink on the outer face and this always gives him consistency for freighth engine runs.

A quickey in **K**, from Pete Holland again, who rubber gums a spot of fine sandpaper on the back of his rule to stop slipping when cutting strip or drawing. The fact that he uses the same rule for both jobs accounts for the wiggly lines in some of his designs!

Unillustrated

No need for sketches with the following ideas. R. G. Gowland of Birchington-on-Sea had to use a nasal spray for his nose, and the prescribed device was a "Neophryn Nasal Spray", which is perfect when quarter full, for water spraying tissue. Silk can be dyed to any colour, states Peter Valentine of Ealing, simply by dipping it into a concentrated Drummer dye solution and hanging to dry. Cover dry, with Dex paste as an adhesive. Quick rib marking idea by F. N. Dowson of Derby is to mark the airfoil on thin alloy sheet about .010-in. thick, and with a pointed instrument such as a scriber, go around the outline impressing small "pops" at close intervals. Then sandwich carbon paper between balsa sheet and the alloy, press, and the carbon applies a dotted rib outline. David Clark of South Shields has, like most of us, had bother reeling out new lines from those coils. Wedge the coil on a tapered garden flower pot and put a stone on top. That'll stop the wire from springing off as soon as your back is turned!



Speediac (*Top, left*)

Produced by Radio and Electronic Products, this unit which measures $2\frac{1}{2} \times 2\frac{1}{2} \times 2$ ins., weighs 2 ounces, uses an Ever Ready T.G.18E motor (1 ounce-inch thrust), operates at 3 to 6 volts and costs £1 10s. The motor is geared 7 : 1, the large double gear wheel "sandwiching" the paxolin bell crank; the whole assembly being tensioned by a spring around the shaft to provide a simple but effective slipping clutch. Limit stops restrict the travel of the bell crank and the clutch prevents the motor from stalling in the extreme positions. With this self-centring actuator which is for pulse operation, full signal or no signal give either "Left" or "Right" rudder whilst normal pulsing maintains "Neutral" aided by the centring springs.

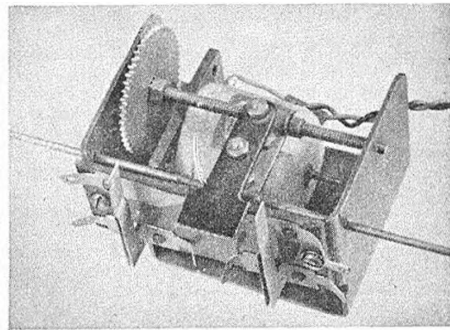
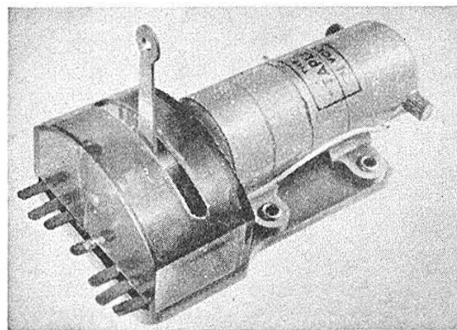
Solenoid (*Top, right*)

A powerful solenoid operated unit, again from Radio and Electronic Products which weighs $1\frac{1}{2}$ ounces, measures $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$ in., and costs £1 5s. It operates satisfactorily from $4\frac{1}{2}$ volts, but 6 volts are recommended for large control surfaces. Coil windings are supplied standard at 8 ohms each but can be supplied wound for any voltage, even to 2,000 ohms to run off the receiver high tension battery.

It is ideal for multi-channel work and when used for pulse systems it is worth remembering that the pulse frequency can be adjusted to the natural frequency of the centralising spring to definite advantage.

E.D. Taplin Universal Actuator (*Bottom, left*)

This uses the Taplin $4\frac{1}{2}$ volt electric motor with



RADIO CONTROL *Magnetic and Motor Driven* **SERVO UNITS**

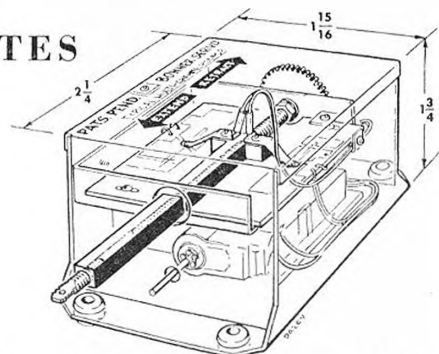
three integral reduction gearboxes of 11:76 : 1 giving a final ratio on the actuating arm shaft of 1500 : 1. The unit, which measures $4 \times 2 \times 1\frac{1}{4}$ ins., weighs $3\frac{1}{2}$ ounces and costs £3 15s. It should not have more than 6 volts applied and has sufficient thrust to move the largest of control surfaces. The actuating arm is provided with a spring-loaded clutch which protects the gearing and completes its movement from "Neutral" to extreme position in approximately 1 sec. It is designed to operate either with a reed or mark-space type of receiver and can be wired for self-centring or non self-centring operation, suitable circuit diagrams being given in a leaflet provided by the makers. Limit switches operated by the lower section of the actuating arm, which is cam shaped, ensure that no current is used whilst in the extreme positions.

Captain E. Carroll of U.S.A.F.E. who won the 1956 All-Britain Rally Radio event and who was flying a multi machine at this year's contest, see page 654, was using this type of servo with great success. He has an interesting and practical modification to the normal self-centring hook-up for this unit whereby the servo self-centres between the "Up" position and "Neutral", but is not self-centring between the "Down" position and "Neutral", thus providing instantaneous and self-centring "Up" elevator for loops, etc., with trimmable "Down" for flying into wind. With the elevator trimmed in an intermediate "Down" position one can neutralise almost immediately by blipping through "Up".

Servo owners with the manufacturer's leaflet may like the necessary modifications which are as follows:

Disconnect the purple bridge lead between tags 1 and

NOTES



7, also the lead between the back contact of relay 1 and the armature of relay 2. Take the brown lead that runs from tag 4 to the armatures of *both* relays only. Connect tag 1 to the back contact of relay 1. Other connections remain the same as existing circuit.

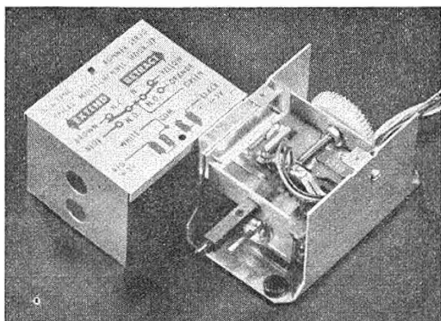
Uniac (bottom right, page 684)

This servo performs similar functions to the E.D. Taplin but weighs only 2 ounces. Power is much less being provided by the Ever Ready T.G.18E electric motor. Price is £2 5s. and voltage should be 3 volts for medium speed and $4\frac{1}{2}$ volts for fast speed and larger control surfaces. Gearing is as per "Speediac" with a "traveller" running along the threaded shaft which operates limit switches at the extreme control positions thus saving current. As mentioned, it can be used for single channel pulsed or mark/space ratio systems, or for multi-channel receivers as either progressive or self-centring operation.

A wiper on the "traveller" traverses two contacts which taper at an angle towards the central dead contact position which ensures an exact "Neutral". The wiper can be bent to produce either a return to dead centre, or a return from limits to a chosen amount of progressive trim. Suitable hook-up circuits are provided in a leaflet.

Bonner Servo (Top of page)

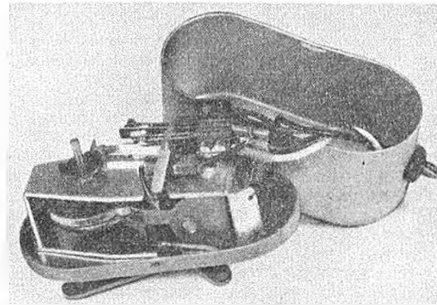
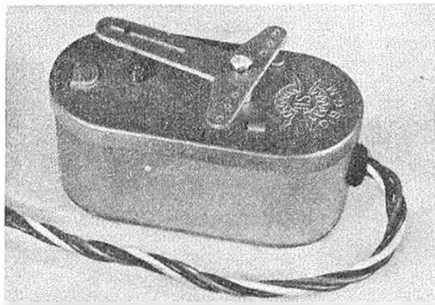
Produced by Bonner Specialities of California, U.S.A., and designed by Howard Bonner who needs no introduction to our readers this unit is used extensively by American multi-lliers. It weighs 2½ ounces, measures $3 \times 1\frac{1}{2} \times 1\frac{1}{2}$ ins., operates off $1\frac{1}{2}$ to 3 volts, and costs 14.95 dollars, i.e. £5 5s. which is a lot to Britishers, but



not quite so much to our American friends. The electric motor is a double Alnico type with ball bearings and split double brushes. A brass gear on the motor shaft connects at 5 : 1 to a nylon gear which gives exceptionally long life. The nylon gear is bolted to a threaded steel shaft which rotates in an internally threaded nylon rod which traverses backwards and forwards. At the protruding end is a threaded nylon screw for actual control rod adjustment. Attached to the rod are a pair of wiper contacts which pass over a circuit board with printed rhodium circuit. This board is anchored by two grub screws in elongated holes which permit the panel to be moved so as to adjust trim. The Bonner servo neutralises within plus or minus .007 ins. linear motion, and can be used for self-neutralising (circuit as on cover), trimmable or proportional controls, with circuits for all these given on a leaflet provided.

Telematic-Alpha (Below)

This unique servo produced by Graupner of Kirchheim measures only $2\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{2}$ ins., weighs $2\frac{1}{2}$ ounces and costs 29.75 Marks, which is near enough £2 10s. It uses an impulse motor which is, in effect, an armature driving a ratchet wheel, and has a very low current drain at its operating 6 volts, of only 70 millamps. It will be seen from the photographs that a cam on the ratchet wheel shaft operates changeover switches. By utilising the back contact of the relay, which is essential with this servo, virtually foolproof operation is obtained. Single pulses always produce full "Left" and two pulses always give full "Right". No current is used whilst the bell crank is in either of these positions. Control response is almost instantaneous, i.e. .3 to .4 seconds



Club News

CHRISTMAS—time for reflection and correction. Remember last month's heading photo showing the eleven birds with as many models in what I announced as being a model-night, Lanelly Club? Well the Lanelly and D.M.F.C. seem quick to deny that the likeness coincided with any of their members—evening assuming they could raise that number at a meeting! As a matter of interest they would like to know (a) who the birds are in the photo and (b) how did they manage to borrow all those models—so would I! Sorry about that, the actual L.M.F.C. has not yet identified itself, but I presume I will have a shoal of letters from all the "L's" when they read that there is fifteen bob awaiting collection by the photographer.

Now for the reflection. Was it a good or bad season? I have complaints from one or two rally organisers that they would have done better had the weather been kind, but I tend to think that on the whole, they were rather unlucky in what was otherwise a fine season. In fact for those who keep a weather diary, the last six months show brilliant days approaching perfection. June 23rd, September 6th and October 13th, which happened to coincide with rallies and national contests. There were also several periods of central England type calm (definitely not the political variety) between contests which should have enabled everyone to put in plenty of happy trimming time.

London

Keeping the flow of organised contests on the move through the winter, WANSTEAD A.M. announced a winter contest event on Wanstead Flats for January 5th. All classes of team racing, stunt and combat are on the programme. The standard of contest flying in FARNBOROUGH M.A.C. has improved throughout the year and although the lads filled a coach for the trip to Radlett, they did not return with any of the lot, but all had a good time including Alan Leeson, who demonstrated that polyhedra is not necessary for a fast stable climb. The October club camp was held in flat calm won by Duncan Sibbick's *Helioch*. Oliver powered.

October 13th was the date for the SIDCUP A.S. Stunt and Combat contest at Dartford. Due to the date not being fixed sufficiently in advance, we could not make any announcement for you. Combat was won by Copeman of Kenton, using an A.P.S. *Stunt* and the stunt cup by Chizlett of Dagenham. The Sidcup club have been attending most of the rallies throughout the year including Enfield, Northern Gala, West Hants Rally, Radlett and the London Area Team Race League, where the Class A and B's reamsters have been collecting regular places.

Closeness of the railway line at Radlett caused the EPSOM D.M.F.C. lads to stop contest flying where they found that one could only manage 40 secs. within the field, but K. Dumble managed a win in Waterplane power. In the South Coast Gala, Jones placed 5th in the closely fought power event. At the New Town of Harlow, the local club, HARLOW M.A.C. and a STORTFORD arranged a display at a Garden Fete only to find the proposed flying site was apparently the depository for lorry loads of top soil just before the event. However, they managed on 30 ft. radius and with some outside circle guid-

ance, indicating positions of telegraph poles and other obstacles, everyone was entertained. The club's regular flying field is said to be ideal for organisation of a controlling rally and Harlow hope to do something about this next season. CHINGFORD M.F.C. are pleased with Johnnie Hall's 150 m.p.h. in speed at the York rally, this being the sole success of the club during 1957, although radio control is coming along fast. Ray Groom looping his *Mezin Breathless* and a reduced size *Smog Hog* with Oliver Tuer (*Smog Prexy*) among the many other models, most of them using the AEROMODELLER No. 1 Transmitter and IBB Receiver. Regular meetings are held at Wellington Avenue Youth Centre on Fridays. KENTON Combat group has been very active. L. Burbridge being 2nd at Wanstead. Combat 1st at Dartford and the club's 1.5 combat trainers are in constant circulation. Winter talks have been arranged with aeromodelling personalities, giving the latest news on particular feature of the hobby. HATFIELD HEAD branch of Epsom fly centre on a field next to the Barford Bridge Hotel at Box Hill and during the year have taken in three flying displays, four static exhibitions and one decorated lorry float.

Southern

Interesting diversion in the PORTSMOUTH D.M.A.C. is the conversion of obsolete A/2 Sailplanes into E.A.I. power jobs and very smart they look too! Thoughts are turning to indoor flying with R.T.P. and small chuck gliders, and W. Tinker's flying boat featured in the AEROMODELLER ANNUAL this year has evoked some comment. WORTHING M.A.C. is getting a better attendance at their Friday night meetings, due to the R.T.P. activity and enlargement of the canteen menu (what's this—a club with a canteen?). Controlline, Stunt and Combat are at the current rage with wings most popular for streamer work.

South Eastern

A new club has been formed at RAMSGATE and anyone wanting to obtain further details should contact Mr. Nottingham at Modern Models, 56 Chatham Street, Ramsgate, Kent.

J. West of SOUTHERN CROSS A.C. has not only collected the Golden Championship once more for 1957 with a total of 43.42 in the Club event, but also collected the Halifax Open Power with four perfect 4 min. max.s., and 1st in the South Coast Gala at Ashdown Forest. Congratulations John—a well earned victory. The club's dinner will be fixed for late January or early February and the Christmas party which is before the festive date. Another novel diversion, was the club's cricket match. Seniors versus Juniors, each a full team in which the Seniors scored 62 for 5 and Juniors 47 for 7. One of the latter retired hurt, shame on you, Seniors! Had weather restricted the entry to the South Eastern Rally, Ashdown Forest and delayed the start until early afternoon, when conditions improved. Results were:—

Glider	Power
1. A. Morris Brighton 7:56	J. West Southern 7:32
2. D. Partridge Whitelate	Cross 7:32
3. C. Percival Spring Park 3:58	J. Mosley Enfield 6:51
	M. Green Croynon 6:50
Rubber	
1. D. Lister Men of Kent 8:31	
2. A. Elliott Men of Kent 8:48	
3. A. Evans Bromley 1:30	

NORTH KENT NOMADS M.C. held the C. H. Roberts Cup for rubber powered flying boats at Danson Park in October. It was won by A. Hall of the Nomads, whose best flight was only one second short of the British record, the model taking off and landing on water. W. Tinker travelled up from the South coast to compete with a version of the *Mercurian* as in the AEROMODELLER ANNUAL, fitted with return gears. The flight was won by R. Moore through bad weather and was held in perfect calm on Dartford Heath and with two-minute maximums enforced, the champions are A. R. Parker, Rubber, J. Durr, Glider; W. W. Ashdown, Power; and also Tailless, Chas. Cooper generously let his models to the club when he departed for America.

Western

Bath City's Football Ground was the scene of a controlling rally organised by H. Hopkins of BRISTOL and local model shop Inter-club Model Contest for the Bath Abbey Show was won by R. Moore of Bristol South and individual stunt by N. Higgins of Cheltenham. Concours d'Elegance included a Mustang, Tomahawk and Bristol Waylaker.

S. Midland

The Area Picnic was held on magnificent October 13th at K.A.F. Henlow and incorporated in the programme was the radio control event blown out from the August 25th Rally at Cranfield. In such calm conditions, the large radio entry were able to show their very best pages and all congratulations are due to G. Benson of HATFIELD, who must certainly be the first in England to perform controlled inverted turns with his massive multi-chamber Atwood powered cabin design. However, it was a course flying contest and for sheer precision, Webster of A.L.C.C. was outstanding, particularly for his fine steered take-off using a tricycle undercarriage on the K. K. Falcon.

THE HENLOW Club has been well in the fore in glider, Jim Waldron leading the area K, and M.A.A. times with 8:53 and the club also collected the "Model Engineer" on September 15th for their team glider performance with a total of 24.37. In the inter-club area event, COWLEY totalled 31:20 to snatch a narrow victory over APSLEY and of course, HIGH WYCOMBE lead in both Combat and Team Racing. There has been a suggestion that next year's South Midland Area Rally at Woburn Park should coincide with the Rally of the British Sun Bathing Association.

OXFORD METEORS report that they have been attending most of the rallies enjoying themselves with fair performances except perhaps at Radlett, where they disapproved of the 2-min. g.o.s. free-flight situation. A. Crisp has won the Club Glider Contest for the second year running, using his much battered *Seraph*. A note on the NORTHAMPTON M.A.C. newsletter refers to a B.H.C. Midday Music Hall programme on September 16th, when apparently an impressionist announced it will send you my impression of two small boys playing with their toy aeroplanes in the park.—as Northampton say. "Toys indeed!" Club congratulations go to Michael Fyatt for winning the AEROMODELLER Golden Wings Contest. Not had flying for a first attempt at big time contest work and we hope to hear more of him in the future. WELLINGBOROUGH M.A.C. had an inter-club event with Northampton and Kettering on October 6th. Rubber, power glider and a scramble, were planned but lack of entries voided the scramble. I gather that Ted Evans was out with his *Waldorf* and the highest climbing power winner (F. Harris) used a Torp 15 to get 3:36 just at dusk from a 14-sec. engine run. The *Seraph*, which won glider for D. James of Wellingborough, weighs 211 ozs.—must be the heaviest in the country!

For Your Diary

November 17th
Loughborough College Winter Rally.
All classes.

December 15th
Colne and D.M.A.C. Second Annual Winter Rally. F.F. R.C. Combat.

January 5th
Wanstead A.M. C/I. Contest. Wanstead Flats, A.A. B. Stunt, Combat.

East Midland

I was very pleased to have a note from C. Hickmott of Hull, which is a sequel to an announcement of a lost *Crep* at Waterbeach made earlier this year in these columns. Mr. Hickmott went down to pick up the model from the finder at Waterbeach and was greeted with hospitality and made most welcome. Incidentally, Mr. Hickmott is one of many who raise this point of 1958 power rules. There seems to be great confusion in the ranks. If you refer to the *AEROMODELLER* for January this year, page 11, you will find the proposed Swiss formula which was being adopted. Power loading 300 grammes/c.c. wing loading minimum 20 grammes/dm.²

Midland

STRAFFORD - ON - AVON and D.M.A.C. held their Rally at R.A.F. Wellesbourne Mountain on September 22nd, which was a great success with five area clubs in attendance. Prospective members for this club advised to attend meetings at the Central Chambers, Stratford-on-Avon on the first Monday of every month at 7.30 p.m. NUNEATON A.M. are all controlline and with six Oliver engines between them look forward to plenty of racing next season. Another predominately controlline club is that of DUFFIELD and D.M.A. and E.C., formerly known as Belper D.M.C.C., whose radio control is now coming into vogue. Two engine controliners are also appearing and with a commercial kit recently announced, it would seem that the twins have a strong following. BIRMINGHAM M.A.C. rounded off the season with a great success at Radlett in Seaplane Rubber and Clipper Carou by G. Walker and D. Poole, which the club team manage 47 mins 1 sec. in the Farrow Shield, although hampered by rather low clouds. Rex Lenton having the hard luck when this model went o.o.s. into cloud at the end of a motor run on his second flight. I suppose that by now they have heard the news that Crowden, in the summer south, eventually collected the Farrow, yet once more. LOUGHBOROUGH COLLEGE M.A.C. continue with a wide interest in all spheres with five of the club in A2 trials. The winter rally will be held on November 17th and all Midland clubs will have been contacted individually. The contest is open to all and it will go on rain or shine. Contact: D. Hull, 120 Leicester Road, Loughborough, for further details.

LITTLEOVER M.A.C. put up a very good performance in Combat at Radlett, D. Keeling coming 2nd in the lucky draw to decide the winner and in the free-flight side, B. Kirkham took third place in the records and has recently been topping 4 mins. with his A1 in poor conditions, while E. Spencer has been beating 100 m.p.h. with his new P14 Class B Racer. LEICESTER has had a most interesting fivefix when they meet at Catherine Street School on November 20th and December 4th, with R.T.P. flying, but no Jetex allowed. The Club's Gala Day was held in better weather after initial cancellation and J. Archibald won in Power and I. E. Canham in Rubber, D. Terrell in Glider and J. Ashley as best junior. Club champion is C. Rodwell.

Northern

For the second year running, STOCKTON and D.M.F.C. got into the final of the Northern Area Knock Out Contest, who were beaten into second place by BALDWIN by 20 secs. Times were lower than last year due to the weather, but Tom Chambers put up the highest individual time with 8 : 00 and was 1st in area rubber comp. Tom Chambers made the tie to Radlett and returned with 1st place in Open Rubber, and spent the next week in bed with flu. His very potent model is Wakefield size with low airframe weight, allowing 44 ozs. of rubber to drive the single blade propeller.

N. Eastern

Twin engine controlline models are popular in the THORO and D.M.A.C., the spate includes one *Lockherre*, *Aviation* two *Douglas Invaders* and a *D.H. Comet* on the way. High speed catapult gliders are also in vogue including a 90 m.p.h. 18 in. *H.I.T.* and a number have sent along one of their attractive transfers, a symbolic Pegasus leaping across a shield in black and silver finish. Most distinctive and attractive. They also sent me a clipping of a local press report in which Councillor George Howe of Hishop Auckland announced the fact that a model glider of 7-ft. span had needed among the plants in its garden. Although the model carried a legible address, letters were returned marked "come away." As a result of this press notice, owner John Tordella was able to contact Mr. Howe and collect his model which had flown seven miles.

North Western

Garden Party display can be profitable. The CHESTERFIELD SKYLINERS M.A.C. say that they have more money in the bank this year as the result of this form of revenue. This club was a founder member of the existing North Midland Association and they sincerely hope that they can play their part in helping the Association to achieve even more in the coming season. There is a possibility of the Chesterfield club moving into new club rooms, as they are losing their usual venue which has been generously made available by Miss Violet Markham for so many years, and in recognition of Miss Markham's work a cup to be donated for the annual glider competition.

COLNE and D.M.A.C. are holding their second annual winter rally at Colne on September 15th. Classes will include all free-flight plus radio and combi and further details are available from S. James, 140 Knotts Lane, Colne. Lanes—the venue is the same as last years. The North Western area meeting at Chetwynd on September 15th resulted in an assistant member, B. Butterworth leading the radio control event for the Salloway Trophy by a clear 58 points. Three WHITEFIELD lads, T. Jolley, L. Carley and M. Allen, tied for first in Combat and there was also a triple tie for controlline stunt. Whitefield lead the area team glider results for the "Model Engineer" with 20 : 04 and John O'Donnell was, as ever, at the top of the list for his performance in this contest and also for the power and rubber contests for the Routes Trophy at Tern Hill on September 29th, making no less than seven maps, during the day. I understand he used a six-year-old P14 Class B Racer.

CHEADLE D.M.A.S. Club Champs. were held during the same event at Tern Hill and R. Lawtlor topped power, W. Nield, Glider and P. Gibson, Rubber. The annual dinner and prize-giving will be held on December 13th at Parkers Gate, Raftery, whilst the area's A.G.M. and dinner is proposed for November. ENGLISH ELECTRIC M.A.C. did not have any trophies in their club but P. Smith and his two models topped the area results in Halifax Power with 10 : 14 and it was remarked that the rate of climb of these models was faster than anything seen before.

Ironing. Tom's connection with the English Electric P.1 was not only not surprised to see his latest disappear vertically. Replies from local clubs for the inter-club knock out contest are slow in coming forth, what about 11 lads? The HYDE M.A.C. report contains a lively account, in red ink too, of Ronald Patrick Wilson and a local bull which chose to interfere with his radio controlling activity. The incident included a field land and a transmitter active in maintaining the stability of the airborne model and a chamber over the gate with the bull a shortness's length away from the Wilson's posterior.

Last month I quoted verbatim from the WIGAN M.A.C. report, who criticised the size of the field used for a September rally and since this was quite obviously the HODDERSFIELD event, I invited organisers to say their piece in reply. The result was an explanation that due to last minute refusal of permission to use the David Brown airstrip, Huddersfield were obliged to transfer the meeting to a group of six fields, which gave about twenty acres for flying. The organisers provided everyone with a programme and of course, this revenue was returned to the competitors in the form of prizes. Apparently no complaints were made on the day of the event nor did there seem to be an explanation given to the competitors as to why the change of venue was made. Huddersfield members query how B. Talbot of Wigan could manage to win the coronas with 4-minute maps, and still complain, but overlook the fact that in making his flights he lost both models.

It would appear that Wigan failed to appreciate the fact that Huddersfield were making the best of a awkward situation following the last minute cancellation of their organised arrangement and that Huddersfield neglected to put the situation clearly to the competitors. One thing stands out a mile in the face, an complete lack of appreciation by Clubs from all parts of the country as to what is entailed in the organising of a rally and in particular on the economic side, in making the rally either pay for itself or run within the bounds of the finance of the organisers and not creating too much of a loss. When one stops to think of the low number of competitive aeromodellers who take their turn at contest administration, it often shudder to think what would happen if those stalwart types, who no longer fly, but continue to help, fell out of the game, for it is quite true to say that they are the people who keep the movement together.

In all fairness to Wigan, I must point out their venue for the 1957 rally was, when directing large A2 entries with seemingly lack of support from their Area. Both the above clubs have obviously been ailing in great faith and I hope that they will not be at disaster drawn in future. If any other organiser is subjected to the same inconvenience of having to fall back on an inferior site for their event, they should take note of this incident and be sure to explain the situation to all in attendance. WIGAN M.A.C. tell me that they have been sorely afflicted by the flu and this accounts for their 50 per cent. attendance at Radlett. Anyone interested in joining this club will be most welcome at the Clubroom, Wigan Wheelers, Moorefield Street, Springfield.

East Anglia

Radlett this year proved fruitful for NORWICH M.A.C. with B. Woodcock reaching the quarter finals in Combat and their only criticism of this event, was its late starting. I quite agree, it is high time that Combat was taken seriously by organisers for it is in particular a crowd pleaser and requires very strict administration.

Ireland

The MODEL AERONAUTICS COUNCIL OF IRELAND informs me that S.M.A.C. members are at last going to compete in the Irish Nationals, recruited last month, and would indeed be welcome for next year. In fact any visitor to Ireland is free to enter the contest provided he is registered with his own National organisation. Those who are not members of an organisation in their own country, can become a country member of the M.A.C.I.—a very happy situation which I hope will result in an international flavour at Dublin next year.

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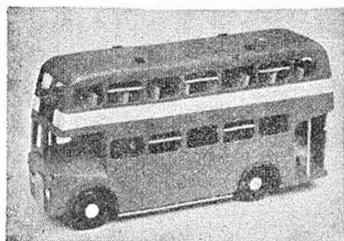
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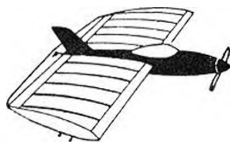
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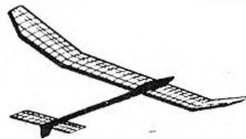
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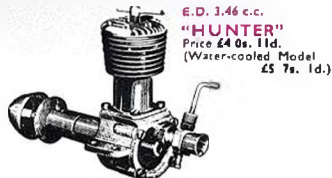


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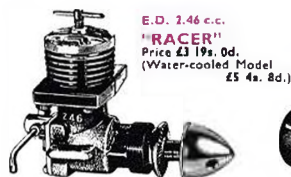
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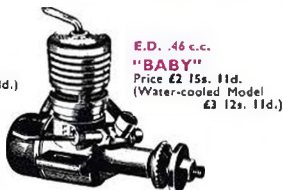
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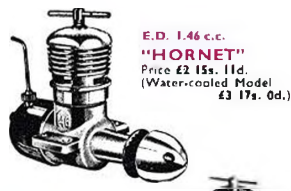
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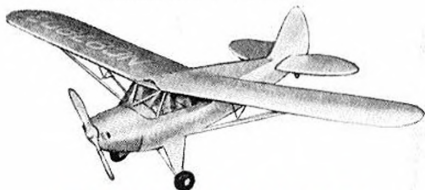
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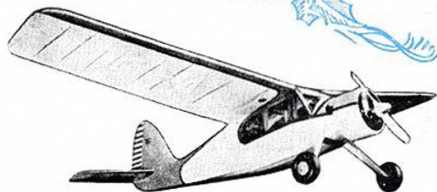
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