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JANUARY 1956

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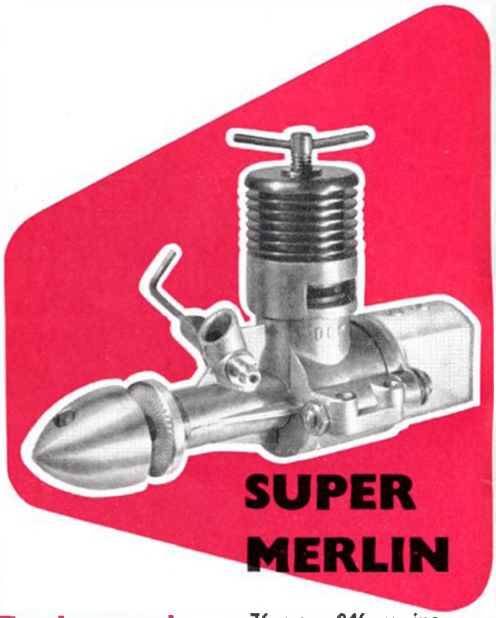

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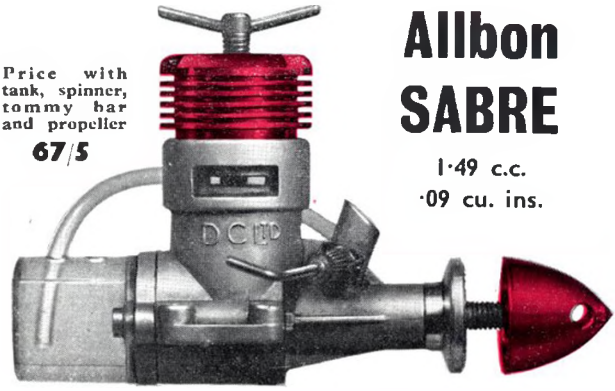

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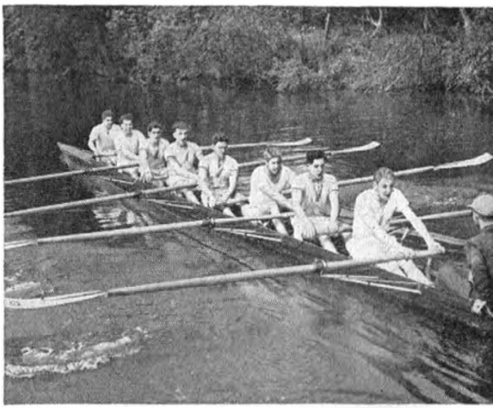
RESPONSIBILITY Here, huskies at Resolute Bay in Canada, welcome R.A.F. aircrew en route to the North Pole . . . during a routine training flight. Their next assignment might well find them equally at home on the Equator.



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Another bright Rupert Moore painting heralds *Aeromodeller Annual* 1955/56—this year the new BEA South Bank Helicopter service is featured. Cover appears inside as a permanent frontispiece, and there is also a page of helicopter types in full colour, with an article on their markings. A really magnificent feast of reading for aeromodellers includes P. E. Norman's Ducted Fan Model Aircraft, Les Wright on Radio Control, Jim Waldron on Models without Pylons, the new A/1 Glider is treated in detail by Just Van Hattum, Ron Moulton writes on Combat Control Line, George Cull deals with Our Ultra Lights for the fullsize enthusiast, then we have a wealth of articles covering an aeromodeller's spring balance, trouble-shooting charts, area calculations, metal construction, C.G. position, slots and flaps, basic airfoil characteristics, and of course the usual bevy of plans from all over the world of new, interesting, curious or record-breaking models. Specials amongst them include P. E. Norman's Mig 15, a scale seaplane the Heinkel Hansa (He5), a pseudo-jet by Peter Holland, and hosts of others covering every class of model. Finally, there are the regular features such as Engine Analysis, Contest Results, Records, etc.

PRICE **10/-**

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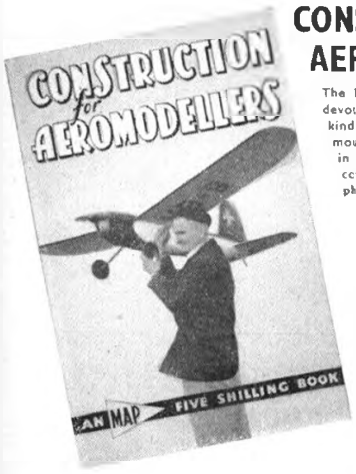

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AERO MODELLER

"Covers the world of Aeromodelling"

VOLUME XXI
NUMBER 240
JANUARY 1956

Managing Editor - - C. S. RUSHBROOKE
Editor - - - - - H. G. HUNDLEBY
Assistant Editor - - R. G. MOULTON

★

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AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:

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Editorial and Advertisement Offices:
38 CLARENDON ROAD, WATFORD, HERTS
TELEPHONE: GADEBROOK 2351 (Monday-Friday)

SPACE STORY

NO, WE ARE NOT (yet) contemplating regaling our readers with stories and pictures of Dan Dare gadding about the universe, though we admit a sneaking liking for the more serious "space" literature available, and in recent weeks even the thought of food has not succeeded in prising us away from the T.V. set until the current instalment of "Quatermass II" has flickered off the screen!

As far as this magazine is concerned, the battle of space is connected with the constant effort to provide a balanced content of editorial material, and coping with the Aegean task of satisfying as many people for as much of the time as is humanly possible. That we never reach the object of our aim is not for want of trying, but we are encouraged by the knowledge that our efforts are invariably appreciated by the majority. That we occasionally drop a "clanger" is inevitable, for who hasn't?

The foregoing is stimulated by a recent letter to the Editor, in which a rabid contest fan takes us to task for not devoting more space to detailed contest reports, and suggests we produce "special" issues to provide the necessary pages to accommodate lists of contest results, etc. Let us say immediately that way back in our own contest-absorbed days we might have thought along similar lines, but the years have brought closer contact with the multitudinous aspects that have little or no concern with the competition field, and this knowledge, coupled with the economics of magazine production, confirms our opinion that we give adequate service and coverage to the contest fan. In fact, a greater proportion of space to his leanings is provided than is equitable with the percentage of readers which the competition men represent, though we are always conscious of the great contributions made to our columns by this comparatively small, though extremely keen, section of the aeromodelling public.

Our "form-following" correspondent should know that complete lists of National contest results are sent out to all S.M.A.E. affiliated club secretaries, and his thirst for knowledge of the also-rans can be satisfied very quickly—provided he is not a member of one of those unfortunate clubs where the Hon. Sec. conducts a closed shop where such literature is concerned!

Our endeavour for the forthcoming year of 1956 will be to cover all aspects of the aeromodelling sphere as far as possible, and in as equitable a manner as time, space and material allow. Our policy has always been, come hell or high water, to be on the spot at every event of importance in the game and to give our readers a complete picture of past, present and future happenings in the world of aeromodelling. May 1956 see a more complete realisation of that ideal than we have achieved to date.

On the Cover

The rasping whine of its Pratt & Whitney engine driving a high r.p.m. propeller would have been at peak sound when the photographer captured this Harvard view. Trainer of tens of thousands, and an aircraft which continues to see service in many of the World's Air Forces, this product of North American Aviation is drawn and described on page 22 of this issue.

Heard at the HANGAR DOORS

The Unfinished Aeroplane

With the announcement that the elegant Vickers V.1,000 project is to be abandoned because of ths increase in weight over the original estimation, we are reminded of the beautiful model (seen above) which was displayed on the Vickers stand at Farnborough.

Whilst television viewers have been shown the bare hulk of the full size fuselage lying in its framework of jigs, and photos have been published in the National Press, one cannot gain a true impression of the sheer beauty of this frustrated project without sight of the display model. Which is yet another excellent indication of the value of model making to the industry not only for dynamic research, but also for portraying "ghost" aeroplanes before they take on their full size shape.

Aeromodeller Index, 1955

Once more we offer our free service to readers in providing a four-page complete index to Volume 20 of "AEROMODELLER" for the past year. All we ask is for a stamped addressed envelope measuring 9½ in. x 6½ in. so that we can send it back to you with only a single fold. Indices are, of course, included in all bound volumes of "AEROMODELLER" as detailed in the advertisement on page 52.

New Subscription Rate

Following Mr. Butler's inroads on aeromodelling pockets with increased Purchase Tax, Dr. Hill, the P.M.G., has decided to increase postage rates commencing January 1st, 1956. We regret that this will raise the price of "AEROMODELLER" Subscriptions from 21s. to 22s. 6d. per annum, but emphasise that this figure includes the 12 copies at their net retail price plus postage, which does ensure regular delivery through your letter box.

Crystal Future ?

IN NEXT MONTH'S Radio Control Notes we shall be describing a crystal control receiver and in a later issue the accompanying transmitter. The design has been developed by Mr. McQue, of the Bletchley and District Model Engineering Society, and is one of the best and most practical outfits yet seen. It is, however, not for these attributes alone that we draw readers' attention to the equipment at this present stage. We visited Mr. McQue in his workshop and whilst examining his interesting radio gear were handed a list of eleven Bletchley Club members, including R/C boat enthusiasts as well as aeromodellers. Against each name on the list was appended two numbers, one for the receiver crystal, the other the transmitter crystal, also the spot frequency of the member's individual equipment. Further examination showed that the spot frequencies at ·03 intervals between the official G.P.O. frequency limits of 26·96 and 27·28 m/cs gave exactly eleven frequencies, leaving the actual limit figures as safety margins!

Non-technically-minded readers may well ask, "What does all this mean, and of what interest is it to me?" The answer is that we are witnessing for the first time in this country a practical scheme for *independent operation* of eleven radio outfits. In other words the Bletchley Club can be sailing five radio controlled boats and flying six aircraft all at the same time, and have in fact already flown two aircraft simultaneously from their local flying field with complete success. As Mr. McQue wryly pointed out, it has not been the radio side that has prevented simultaneous operation of more than two models to date, but the practical considerations of getting modellers and models assembled on the same occasion!

Golden Wings at the Schoolboys Exhibition

The unqualified success of the "AEROMODELLER" Golden Wings Contest, staged during 1955, has brought to light the fact that there are many thousands of junior enthusiasts in Great Britain who are not catered for by the existing Model

Aircraft Clubs. In some cases the local club does not encourage members under 15 or 16 years of age—a most misguided policy in our opinion—but in the majority of cases would-be model builders are not in a position to join up with others in their locality and thus lose much of the enjoyment of the hobby of aeromodelling.

For this reason we invite all readers, particularly those under 16 years of age, to visit the "AERO-MODELLER" stand at the 1956 Schoolboys' Exhibition which is open from 10 a.m. to 8 p.m. daily, from December 31st, 1955, to January 14th, 1956, excluding Sundays, at the New Horticultural Hall, Westminster. Members of the Editorial staff will be in constant attendance and will be pleased to assist readers with their aeromodelling problems wherever possible. At the Exhibition we shall be launching the "AEROMODELLER" GOLDEN WINGS CLUB, which is open to all aeromodellers under 16. Full details of membership are given on page 36.

Sid Allen Memorial Fund

As promised in our last issue we are giving below a list of contributions received to date which reach the somewhat disappointing total of just over £20. We appeal to all aeromodellers and members of the aeromodelling trade to support this Memorial Fund to ensure that, irrespective of what form the memorial takes, it will be a worthwhile reminder of an outstanding radio control personality.

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Peter Readman	2	0	0	H. Cuckson	10	0
Model Aircraft	5	5	0	Rico Neidhart	15	0
Model Aero-nautical Press	5	5	0	M. Rutherfoord	10	6
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R. S. Clarke ...	2	0	0	Leigh Model Aero Club	10	0
W. Neild ...		10	0	A. W. Kerridge	5	0

Fed by the Fed

The well-known Horseshoe Hotel accommodated a brand new function on October 14th when the Federation of Model Aeronautical Manufacturers and Wholesalers staged their first social activity as a change from their more functional business meetings. Some ninety members of the trade and their guests enjoyed a very pleasant evening, which proved most encouraging to the organisers.

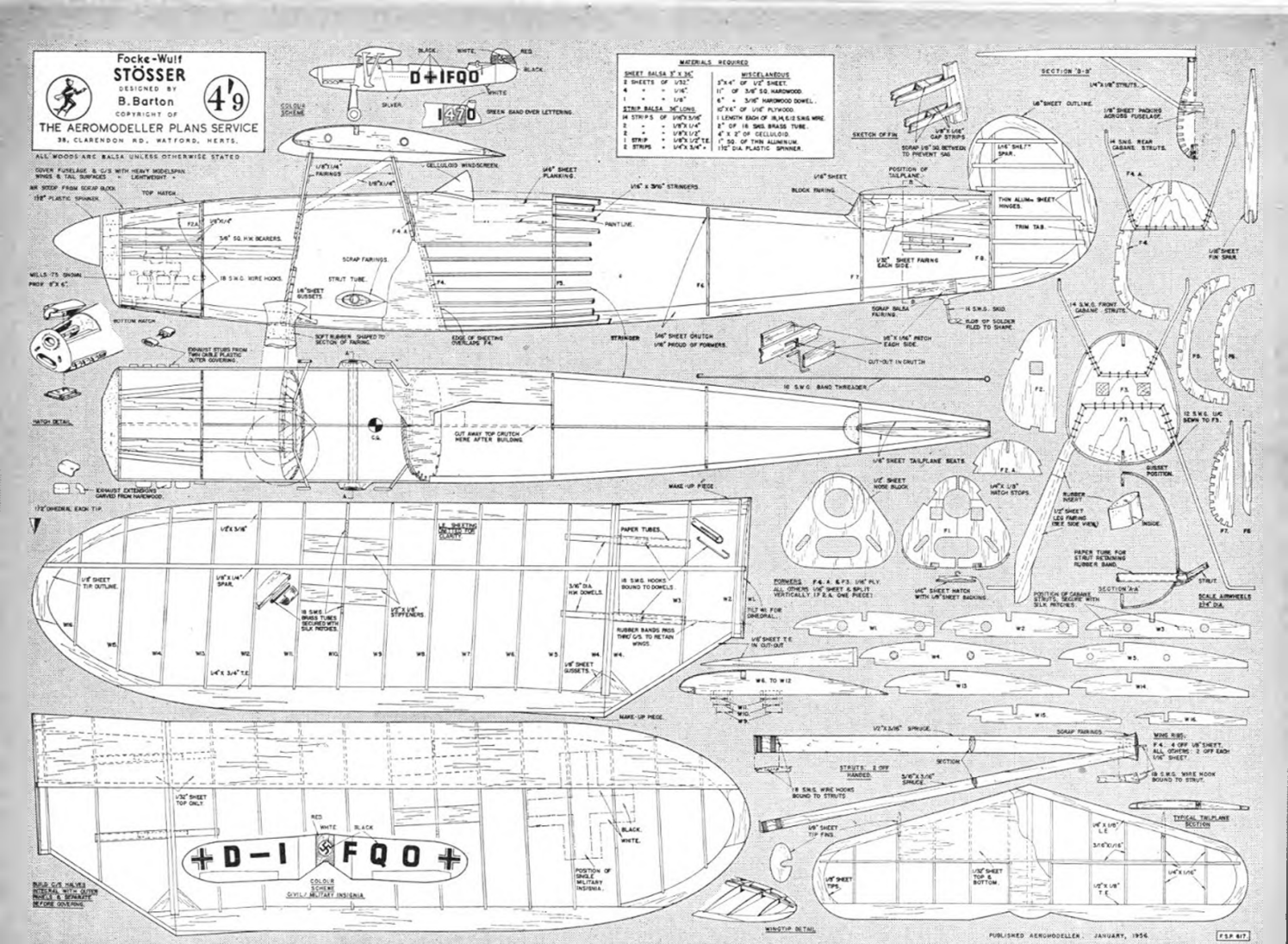
Special guests of the evening were Mr. A. F. Houlberg, Chairman of the S.M.A.E. and President of the F.A.I. Models Commission, and Mrs. Houlberg. In his speech Mr. Houlberg appreciated the continued liaison between the trade and the administrative group, and voiced his firm opinion that the imposition of Purchase Tax was a short-sighted policy by those who desired an air-minded youth in Great Britain. Dancing and general merriment brought to a close an inaugural meeting that indicates "repeat performances" in future.

The new trophy shown at right is the AERO-MODELLER WATERPLANE TROPHY, donated by the proprietors of this magazine to the All Britain Rally, held anually at Radlett. 1954 winner, P. T. Taylor, was succeeded in 1955 by Reg Boxall of Brighton.

New Aeromodelling Film

We were fortunate enough to see the preview of "Easy to Fly", a really first class "short" on aeromodelling produced and photographed by Mr. Frank Gardner. The photography is excellent and the sequence and commentary show an unusual appreciation of the subject. *(See photos below.)*

Well-known aeromodellers from different facets of aeromodelling are featured including personalities such as Mike Gaster demonstrating V.T.O. with a vengeance; Ray Malmstrom with some of his flying oddities; John Coatsworth and some beautiful flying shots of his ducted fan Boulton Paul III; and George Redlich doing some excellent closed circuit radio flying amongst the trees in Richmond Park. Epsom Downs form the background to many of the flying sequences including the first flights of a Keil Kraft "Bantam" which you see under construction from the moment of pinning down the plan. Team Racing at the All Britain Rally provides the thrills with a very hectic and obviously unrehearsed fire in the pits. Mr. Gardner said he thoroughly enjoyed making the film and would like to thank the many aeromodellers who co-operated. Film will eventually be released for circuit showing and we strongly recommend readers to look out for it.


Focke-Wulf
STÖSSER
DESIGNED BY
B. Barton
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
38, CLARENDON RD., WATFORD, HERTS.
4'9
MATERIALS REQUIRED
SHEET BALSA 3" X 36"
3 SHEETS OF 1/32"
4 " " 1/16"
1 " " 1/8"
STRIP BALSA 36" LONG
14 STRIPS OF 1/8"X 3/16"
2 " " 1/8"X 1/4"
2 " " 1/8"X 1/2"
1 STRIP " 1/8"X 1/2"T.E.
2 STRIPS " 1/4"X 3/4" "
MISCELLANEOUS
3"X 4" OF 1/2" SHEET.
11" OF 3/8" SQ. HARDWOOD.
6" " 3/16" HARDWOOD DOWEL.
10"X 4" OF 1/16" PLYWOOD.
1 LENGTH EACH OF 18,16,& 12 S.W.G. WIRE
2" OF 18 SWG. BRASS TUBE.
4" X 2" OF CELLULOID.
1" SQ. OF THIN ALUMINIUM.
1½" DIA. PLASTIC SPINNER.
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
COVER FUSELAGE & C/S WITH HEAVY MODELSPAN
RINGS & TAIL SURFACES = LIGHTWEIGHT =
AIR SCOOP FROM SCRAP BLOCK
1½" PLASTIC SPINNER.
TOP HATCH.
WELLS '75 SHOWN
PROP. 8"X 6".
BOTTOM HATCH.
HATCH DETAIL.
EXHAUST STUBS FROM
THIN CABLE PLASTIC
OUTER COVERING.
EXHAUST EXTENSIONS
CARVED FROM HARDWOOD.
1/2" DIHEDRAL EACH TIP.
COLOUR SCHEME
BLACK. WHITE. RED.
D+IFQO
SILVER.
WHITE
1470
GREEN BAND OVER LETTERING.
CELLULOID WINDSCREEN.
1/16" SHEET PLANKING.
1/16" X 3/16" STRINGERS.
1/16" SHEET BLOCK FAIRING.
POSITION OF TAILPLANE.
THIN ALUM. SHEET HINGES.
TRIM TAB.
1/16" SHEET FAIRING EACH SIDE.
SCRAP BALSA FAIRING.
14 S.W.G. SKID.
BLOB OF SOLDER FILED TO SHAPE.
1/16" X 1/16" PATCH EACH SIDE.
CUT-OUT IN CRUTCH.
1/16" SHEET CRUTCH 1/16" PROUD OF FORMERS.
STRINGER
PAINT LINE.
SCRAP FAIRINGS.
STRUT TUBE.
18 S.W.G. WIRE HOOKS.
1/16" SHEET GUSSETS.
SOFT RUBBER SHAPED TO SECTION OF FAIRING.
EDGE OF SHEETING OVERLAPS F6.
3/16" SQ. HW BEARERS.
1/8"X 1/4"
1/8"X 1/4"
F2A.
F4A.
F4.
F3.
F6.
F7.
F8.
C.G.
CUT AWAY TOP CRUTCH HERE AFTER BUILDING.
16 S.W.G. BAND THREADER.
1/16" SHEET TAILPLANE SEATS.
F2A.
1/2" SHEET NOSE BLOCK.
F1.
1/4" X 1/2" HATCH STOPS.
1/2" SHEET LEG FAIRING (SEE SIDE VIEW)
RUBBER INSERT.
INSIDE.
RUBBER POSITION.
PAPER TUBE FOR STRUT RETAINING RUBBER BAND.
STRUT.
SECTION 'A-A'
SCALE AIRWHEELS 2¼" DIA.
1/4" SHEET HATCH WITH 1/8" SHEET BACKING.
UNDERCUT OF CABANE STRUTS, SECURE WITH SILK HITCHES.
SECTION 'B-B'
1/4" X 1/8" STRUTS.
1/8" SHEET OUTLINE.
1/8" SHEET PACKING ACROSS FUSELAGE.
14 S.W.G. REAR CABANE STRUTS.
1/4" SHELF SPAR.
1/16" SHEET FIN SPAR.
14 S.W.G. FRONT CABANE STRUTS.
12 S.W.G. U/C BENDS TO F3.
F5.
F6.
F7.
F8.
MAKE-UP PIECE.
1/2" DIHEDRAL EACH TIP.
1/16" X 3/16"
1/16" SHEET TIP OUTLINE.
1/16" X 1/4" SPAR.
18 S.W.G. BRASS TUBES SECURED WITH SILK HITCHES.
1/2" X 1/8" STIFFENERS.
1/4" X 3/4" T.E.
L.E. SHEETING OVERLAPS TOP CENTRE.
PAPER TUBES.
3/16" DIA. HW DOWELS.
18 S.W.G. HOOKS BOUND TO DOWELS.
RUBBER BANDS PASS THRU' C/S TO RETAIN WINGS.
1/16" SHEET GUSSETS.
W1.
W2.
W3.
W4.
W5.
W6.
W7.
W8.
W9.
W10.
W11.
W12.
FORMERS F4.A. & F3. 1/16" PLY. ALL OTHERS 1/16" SHEET & SPLIT VERTICALLY. 17 P.S. ONE PIECE.
TILT 4G FOR DIHEDRAL.
1/16" SHEET T.E. IN CUT-OUT.
W6. TO W12
W13.
W14.
W15.
W16.
1/2"X 3/16" SPRUCE.
SCRAP FAIRINGS.
WING RIBS:
F4. - 4 OFF 1/8" SHEET.
ALL OTHERS: 2 OFF EACH 1/16" SHEET.
STRUTS: 2 OFF HANDED.
SECTION
5/16"X 3/16" SPRUCE.
18 S.W.G. WIRE HOOKS BOUND TO STRUTS.
18 S.W.G. WIRE HOOK BOUND TO STRUT.
1/8" SHEET TIP FINS.
TYPICAL TAILPLANE SECTION
1/16" SHEET TIPS.
1/16" SHEET TOP & BOTTOM.
1/4" X 1/16" L.E.
3/16"X 1/16"
1/4"X 1/16"
1/8" X 1/8" T.E.
BUILD C/S HALVES INTERNAL WITH OUTER PANELS & SPINNER BEFORE COVERING.
+D-1 FQO+
RED
WHITE
BLACK
COLOUR SCHEME
CIVIL/ MILITARY INSIGNIA.
POSITION OF SINGLE MILITARY INSIGNIA.
BLACK.
WHITE.
WINGTIP DETAIL.
PUBLISHED AEROMODELLER: JANUARY, 1956.
F.S.P. 617

A FREE-FLIGHT SCALE MODEL FOR ·8cc ENGINES

The Focke-Wulf STOSSER

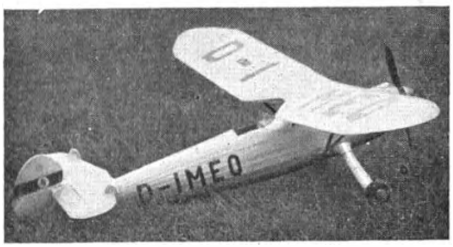
DESIGNED BY B. BARTON

WHEN WE LOOK for a subject for a flying scale model the order for selection usually comes under the sequence of proportions, attractive appearance, novelty, and colouring. The Stosser combines all of these features, and with a Mills ·75 diesel makes a splendid little sports flyer.

Mr. Barton's own model carries the plain silver and black colouring of a 1938 aircraft. During 1939 the dash between letters was converted to a Latin or "Iron" cross on the fuselage sides and a "Staffel" number superimposed over the centre two identity letters. Civil registration was carried across the top of the wings with the addition of two crosses on either side, and these details are included on the drawing opposite.

Construction.—Build the fuselage over a flat centre keel of $\frac{1}{16}$-in. sheet over which half formers are added. Lift the keel from the building board, add the other halves and straighten the fuselage in plan elevation with a pair of master stringers on either side from F4 aft. The undercarriage is bound to F3, and F1, 2, 2A and 3A added complete with engine bearers. Fit cabane struts and tail skid, sheet the nose back to F4 and add rear fuselage stringers. The backbone keel is removed at the cockpit section and cut away after sandpapering.

Build the centre section halves integral with the outer wing panels. The c/s halves are butt-joined at the dihedral angle with 1¼ in. under each tip and then bound to the cabane struts. Now separate the outer panels from the centre section, cover the underside of c/s with stiff paper, add strut fairings, wing strut tubes to under-surface, and make struts to adjust for correct dihedral. These are from $\frac{3}{8}$ in. x $\frac{3}{16}$ in. spruce, carved to streamlined section and take all of the flyng and landing loads.



Tailplane and fin are conventional and eventually cemented secure to the fuselage after flight trimming.

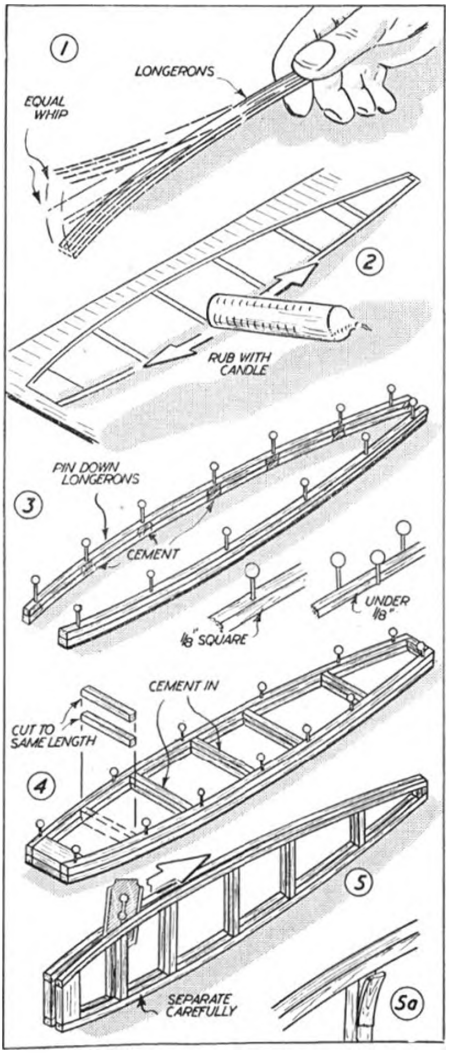
The undercarriage fairing which is a characteristic of the Stosser should be carved to fit the curvature of the fuselage and has a piece of soft rubber inserted in its upper section to take care of distortion when landing. This is made from an ordinary eraser and held in place with rubber solution.

Retain the tailplane with elastic bands for adjustment during the initial glide tests and trim for a left turn both on the power and glide. When fitted with a Mills ·75 a little ballast will be required to bring the centre of gravity forward, and this can be placed in the nose compartment. Try a hand launch glide over long grass to check the wing and tail settings—and if it stalls violently, add more nose ballast to compensate, bringing the C.G. forward. First power flights should be with low revs, and if the turn is tight, use right thrust offset on the engine to open up the turning radius ready forfull power. When satisfied with the power trim, cement the tail surfaces firm and you are set for many happy flights.

With parasol wing mount, stringered fuselage and novel high tail position, the Stosser is a nice subject for flying scale. Full size copies of the ¼-scale reproduction opposite can be obtained price 1s. 9d. post free from Aeromodeller Plans Service

Aeromodelling Step-by-Step

COMMENCING A NEW SERIES OF SKETCH ILLUSTRATED STAGES IN CONSTRUCTION



TO BUILD a true box fuselage, you need to start with four matched longerons. Select strips of equal weight and appearance and check that each is truly *square* (unless rectangular section longerons are called for). In cutting, some square section strip is slightly larger one way than the other, so eliminate these in your initial selection.

Now check the four selected longerons for equal springiness. This can be done by holding them between the finger and thumb in a bunch, and whipping them up and down—**1**. Properly matched longerons will "whip" an equal amount. This test also shows up faulty wood—e.g., if cracked or brittle the strip will break when whipped.

To protect the plan, the method usually recommended is to cover with waxed paper to prevent parts sticking down. However, an equally effective, and much simpler method, is to rub over the parts of the plan affected with a candle—**2**. This wax coats the paper surface so that cement will not adhere to it.

The next step is that of pinning out the longerons directly over the plan. Both sides should be laid down at once, i.e., two longerons erected on top of each other.—**3**. In most cases it is possible to bend the wood to the curvature required without softening by steaming or wetting. If sharp curves are called for, then it is best to hold the part of the longerons concerned in the steam jet issuing from the spout of a boiling kettle.

In the case of $\frac{1}{4}$ in. square longerons (or larger) pins can be pushed right through the wood to secure over the plan. With smaller longeron sizes, space pins either side of the wood. In both cases, use thin pins and be sure to lay down the longerons equally matched. Then coat over each spacer joint position with a thin layer of cement.

Spacers should be cut by measuring off directly against the pinned out longerons. Cut one to exact length and use this to cut a second identical spacer. Work along the length of the fuselage in this way. Take care to get the right angle on the ends of the spacers to butt flush against the longerons—**4**. All spacers are cemented in place and left to set. It is best to work from one end of the fuselage, cementing in each pair of spacers as they are cut.

When the fuselage sides are removed from the plan they will be stuck together. The next job is to separate them carefully by running a razor blade between them—**5**. Work the blade along slowly, keeping it flat against the longerons so that it does not cut into the wood. Work down one side and back along the other side. Do not try to *pull* the sides apart when partially separated. If the spacers have not been accurately positioned, or are not dimensionally accurate in cross section, you may find that you have cut away part of some spacers in separating the sides—**5a**. This does not matter a great deal, but clean off the spare wood.

The easiest way of joining the sides is to cut the four widest cross spacers and assemble the two sides on these—**6**. Most box fuselages are parallel at their mid-section, so all four spacers can be cut

to identical length. Use pins and plenty of cement to hold this assembly and true up right away. You can use a set square, books, etc., to prop up the sides at right angles to the building board and also to check that the assembly is square.

Pull in and join the rear of the fuselage—**7**. This will automatically align the fuselage sides. Then cut and add the nose cross spacers, using pins to hold until set. Check the nose for squareness and sight the fuselage over the plan view on the drawing. When satisfied with the alignment, leave the assembly to set.

To complete the basic fuselage it is only necessary to cut and add the remaining cross spacers. These should be cut to the *plan* dimensions (in pairs) if you particularly want to duplicate the drawing shape, e.g., with a flying scale model. Otherwise, you can cut the cross spacers by measuring off against the partly finished assembly, starting from the position nearest the widest spacers already fixed and working forwards and backwards to nose and tail respectively. Cement in each pair of cross spacers as you go, and preserve the natural curve of the longerons—**8**. Sight along the longerons to make sure that you have not pushed out one side or disturbed the true alignment in any way. Also make sure that each cross spacer is assembled square and flush with the top of the longerons.

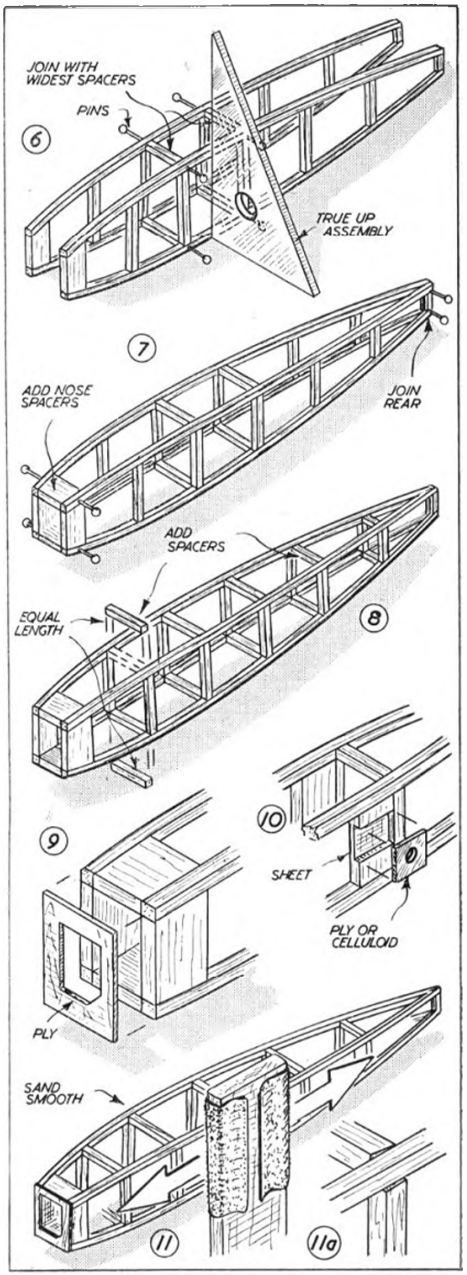
Other parts to be added then depend on the type of model you are constructing. In the case of a rubber model fuselage, a nose former is essential, except in the case of very small machines. This is best made of ply (1 mm. for up to 24 in. fuselage, $\frac{1}{16}$" ply above). The front of the fuselage must be properly squared up and the ply former cemented securely in place—**9**.

Sheet balsa fill-in is often specified for the rear rubber anchorage, which is not really man enough for the job. Here again, a ply inset (or thin sheet celluloid) will give a much stronger job—**10**. By inserting the ply or celluloid flush, a smooth side is maintained, whilst the small amount of harder material used adds very little to the weight. The anchorage plate should be drilled out for the rubber peg before cementing in place and matching holes through the balsa backing formed afterwards.

Sheet fill-in in various places can usually be marked out for shape by holding the sheet against the outside of the fuselage and marking from the other side, tight up against the frame. Allow a little extra when cutting out and trim down to a perfect fit. Normally the grain is vertical on sheet fill-in panels, although a diagonal grain direction will be somewhat stronger. Do not use the grain parallel to the fuselage.

At this stage the whole fuselage needs cleaning up thoroughly. First remove any blobs of surplus cement which may have oozed out of the joints, slicing away with a razor blade or sharp modelling knife. This applies only to cement standing proud of the longerons. Cement fillets below the top line of the longerons can well be left undisturbed and will help strengthen the joints.

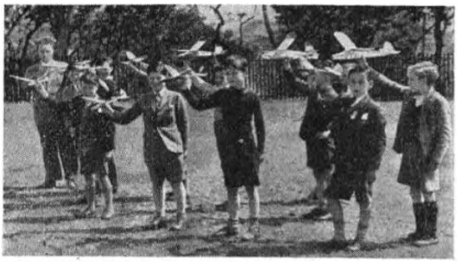
Continued on Page 19



(4) Projects requiring many weeks for their completion are preferable to paltry articles of the type capable of being produced in a single lesson. Patience, and the realisation of the value of sustained effort, have more opportunity to develop.
(5) Pupils must be able to proceed with the work at their own pace. The longer the project, the more important this factor becomes.
(6) Pupils must be able to profit from their mistakes without too much expense.
(7) As primary pupils have no handwork rooms, the work must be capable of being performed at the usual desks, without unreasonable mess or special equipment which would be costly or occupy space when not in use.

Aeromodelling in Education

FOURTEEN POINTS IN FAVOUR OF THE HOBBY AS AN AID TO EDUCATION, OUTLINED BY **J. A. BROWN**



WHEN TRANSFERRED from the Secondary department of the Sandhead J. S. School to the Primary department Mr. Brown was forced to consider activities for educational handwork for boys from 9 to 13 years. He was dissatisfied with some of the traditional activities for various reasons. Hexagonal cardboard ashtrays provide measuring and cutting practice but are sadly lacking in realism, and the pupil is unlikely, on viewing the finished object, to feel that his care and effort have been well placed.

Basic requirements of educational handwork for the age group were considered and the following list of essentials was made.

(1) The pupil must desire to possess the finished articles if enthusiasm and intelligent interest are to be maintained.
(2) The work should be *almost* within the pupil's capabilities. He must be doing all the work himself and yet require a little in the way of guidance from the teacher to ensure that his skill is progressing.
(3) The activity must occupy the fingers and the mind, producing dexterity and the power power of concentration.
(8) The activity must provide opportunity for the pupils to follow on at home. The activity should be capable of infinite development to permit the pupil who becomes an enthusiast to develop a lasting hobby. Here again, the limitations of expensive equipment and the type of mess produced must be considered.
(9) An ideal activity leads towards later school work.
(10) It ought to be economical, giving plenty of work for the pupils for a small outlay in materials.
(11) If the pupils are to be given the feeling that all their work has been worthwhile, it is advisable that a similar or superior article of the same kind, should not be available on the market for a few coppers or shillings.
(12) The activity should teach principles which hold in all work.
(13) The activity should provide scope for artistic expression.

Pupils are ready to learn how to make a model—especially in school time

(14) The pupils should be able to judge the success of their own efforts by some objective standard as well as by the teacher's subjective estimate.

Once he had listed the attributes of the perfect handwork activity for the particular circumstances, Mr. Brown started to consider activities in turn. It seemed unlikely that any activity would fufil all the requirements and he was ready to compromise. However, compromise was unecessary, for, in aeromodelling, he found what proved to be the perfect activity.

The boys chose kits from a selection suitable for their age, skill and purse. Experience has shown the small glider kits to be perfect beginner's models.

Where necessary, the construction of a part of the model should be demonstrated and when the pupils have constructed a part, it is closely examined. Any faults are pointed out and the pupil corrects as required.

Photos opposite show the author's class in progress, and the mass test in the school grounds

Other pictures here come from Belfairs High School, where the Science Master, A. S. Neale, is demonstrating the hobby with a KK Dolphin

. . . every stroke of the brush is closely followed with interest

Then when the models near completion, the rudiments of the theory of flight are taught and demonstrated with the aid of some "hack" models.

As an added exercise, after the models are completed and trimmed, each pupil makes outlines of fuselage and wings in white paper, and prepares colour schemes in the colours available. When he has submitted an acceptable design, he transfers it to the model. All this provides work for a session and the boy begins his summer vacation with a flyable model glider. His degree of success is obvious when he flys his model in competition with his class-mates.

The cost of all this works out at under 10/- for the session. The Technical teacher in the school Secondary department states that the informal acquaintance which the pupils make with plan and elevation drawings in the aeromodelling class is most helpful when the pupils come to formal technical drawing.

And what of the pupils? Many buy models of their own to construct at home in parallel with their schoolwork, and when a new class is given a choice of handwork medium, the choice is, enthusiastically, AEROMODELLING.

Aeromodelling Step-by-Step

Continued from page 17

The fuselage frame should then be sanded down carefully. This is best done by wrapping a piece of sandpaper around a six to nine-inch length of ¼ sheet balsa. Such a sanding block can be worked from end to end along each fuselage side without fear of catching and breaking out spacers, as might happen with a smaller block. Points to look for are bad joints between spacers and longerons where the spacers stand up proud—**11a**.

Sanding should be done with light pressure only, taking particular care not to remove too much stock from the longerons themselves. If the longeron section is on the generous side, it may be permissible to round off the edges, but this should not be done unless the plan specifies it. If you are unfortunate to knock out a spacer or two when sanding, this is really a reminder that your cement joints were not properly made in the first place. With really good cement joints, a spacer is more likely to break than for a joint to fail. Check, in fact, if you do knock out a spacer, whether it is broken and needs replacing with a new one.

Before covering you will want to add any further fittings required, such as undercarriage tubes (or the undercarriage itself, if secured permanently to the fuselage). Highly stressed parts of the fuselage can also be strengthened by binding. Thus a binding of cotton around the fuselage nose, well cemented, will add greatly to the strength in this region. Obviously, such binding must be left until the fuselage is prepared for covering, as it cannot be sanded over.

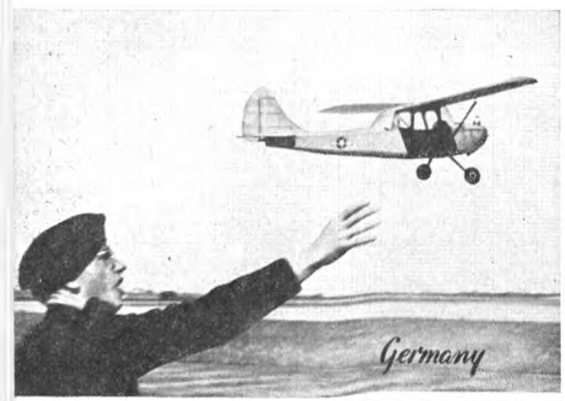
As a final check, just to make sure that nothing has broken loose during this further working, try twisting the fuselage gently, holding the two ends. Any loose joints will creak, and you can readily find their position and apply a further dab of cement to secure.

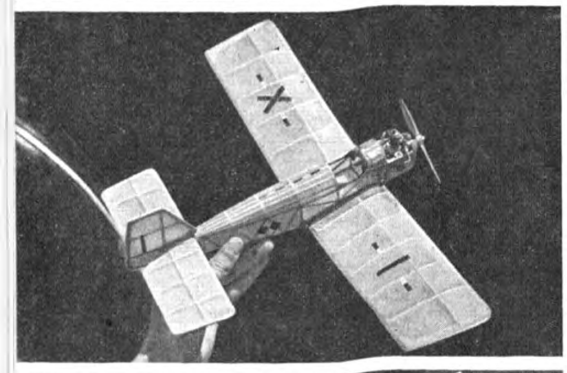
World News

Brazil HAS BEEN claimed to be the home of aviation by many people, having seen hot-air balloon ascents prior to the year 1709 and, of course, the brilliant work of Santos-Dumont whose "Demoiselle" was demonstrated in Paris in 1906. It is therefore only natural that there should be a keen enthusiasm for flying in Brazil and there are some 600 Aero Clubs scattered throughout the country, many of them having aeromodelling schools. There is an annual "Air Minister" contest held by the Aero Club of Brazil in Rio de Janeiro which appears to be based on team racing with a 120-lap race to find the winner. During the Preliminaries for the 1955 event the outstanding model was a pulse-jet powered scale Grumman F9F Panther weighing 5 lb. and with a length of 3 feet. As our correspondent says, "*Sure it made all hearts beat truly fast, and frightened a little the small fry which went there ! Handclaps echoed for a long time after the perfect landing of the Panther.*"

Poor weather spoilt the **Portuguese** Nationals, but did not apparently slow up the control-liners, for new records were set in 2·5 c.c. speed and team racing. The new speed is 185·56 k.p.h. with a Super Tigre and the results show the team race time for 10 kilometres as 3 minutes 37 seconds. Our tame slide rule works this out at an average speed of 87 m.p.h. including pit stops ! Forty m.p.h. winds completely spoiled free flying, but the 100 modellers enjoyed their meeting and we do not suppose that such conditions are normal in this country.

Interesting reaction to the result of the World Championships held in Germany comes from the **U.S.A.** One opinion is that it has thrown up its chance of running the meeting again, having handed over the Wakefield and Power to a U.S. base in Germany. It seems that air transport was laid on for the American team on the basis that they were holders of two of the three Championship trophies, and having returned empty handed in 1955 they will have to travel at their own expense in 1956. The expense of sending teams across to Europe may be too high for the financial resources of the American organisation.



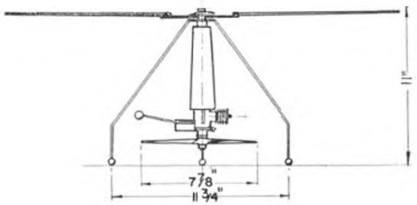


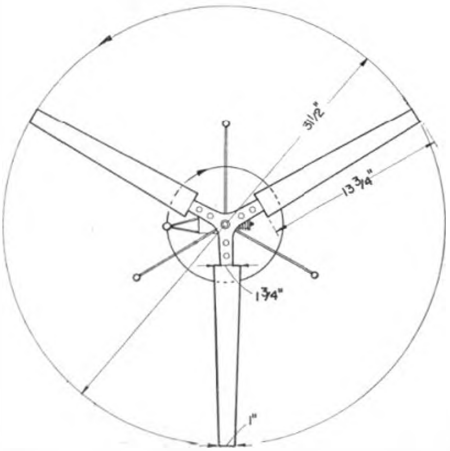
Dynajet powered Grumman Panther, was built in Brazil by brothers Johst and Hans Von Studnitz, aided by Jose Duarte. The Cessna Bird Dog is being launched by L. A. C. Hadley of the R.A.F., stationed at Sylt in Germany. Remember Walt Mooney's Tipsy in Sept., '55, issue? Pietro Frillici built one in Rome for his Bambi, mounted upright as at left. Also from Italy is Adriano Castellani's Piaggio P.148 controliner with flaps. Below is a superb 1/7th scale Bonanza by K. Yamagami—winner of a Tokyo control line contest. Engine is an Enya 63 and detail is accurate right down to aerofoil section.

Last month's photograph of the massive Czechoslovakian hot-air balloon brought forth a quick response from **Yugoslavia.** Apparently there is a regular balloon contest at the Yugoslav Nationals and it is restricted to youngsters of up to the age of 14. Balloons must be made of thin tissue and have a ring of wire around the mouth at the bottom. Across the ring is another length of wire on which the officials place a wad of cotton wool which has been soaked in 20 c.c. of de-natured alcohol.

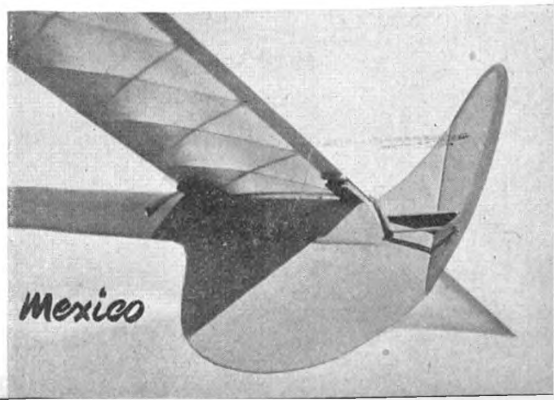
Soon after the cotton wool is ignited it heats up the air within the balloon and the ascent begins. Normal duration of the "fire" is a minute and the subsequent descent depends upon local thermal activity. Pity is that we can only have this type of contest in very calm conditions and the Yugoslavs are particularly fortunate in this respect.

With **Hungary** the winner of the 1955 Soviet International Contest there appears to be a strong revival of interest in that country, an indication of which is the unique helicopter shown below. This is a variation on the existing method of mounting the engine direct on to the rotor hub, but has the advantage of keeping the centre of gravity low and thus stabilising the machine with a pendulum effect. Dimensions given are for 1·5 c.c. Also from Hungary comes news of a new 2·5 c.c. competition engine known as the Alag X-3. A number of new Hungarian engines have appeared in recent months, but it is notable that all of the speed records are held with "Foreign" Super Tigre and McCoy motors.





George Curmi in Malta is proud of his veteran Stentorian R/C, now in its third year and with more than 200 flights to its credit. Engine is an E.D. 3.46, weight 6¼ lbs. Popularity of the A/2 class is increasing in the U.S.A., but the launch (above left) looks a little "dodgy". At right, a Yugoslav youngster has just released his hot-air balloon—see text Below, is Phil Guilmany's latest gimmick for A/2's, a low-fin, and high auto rudder.



AEROPLANE IN OUTLINE No. 41

North American

HARVARD

HARVARD I ADVANCED trainers were originally produced by the North American Company in California as the NA-16-1E with steel tube stringered fuselage and fabric covering. In the U.S. Army Air Force it was designated BC-1 (Basic Combat) and large orders placed for the R.A.F. in June, 1938, under the Expansion Scheme. The rasp of the direct drive Pratt & Whitney Wasp R.1340 was soon to be heard in Britain and deliveries continued from January, 1939, to mid 1940 when Lord Beaverbrook became head of Aircraft Production and diverted supplies to the Empire Air Training Schools, leaving shipping free for more vital fighting aircraft.

In Canada, Rhodesia and South Africa the later version, with re-designed tail assembly, wing tips and all-metal rear fuselage and known as the Harvard II, began to appear. This was the NA-16-3 or BC-1a in the U.S.A.A.F., later re-designated AT-6. Noorduyn Aircraft of Canada manufactured a variant, called the AT-6A, or Harvard IIB, which differed only in that the light alloy centre section tanks were detachable. This version suffered from manufacturing and equipment difficulties and was subsequently called the AT-16 or SNJ-3 in the U.S. Navy.

Perhaps the most significant change in structural design was in the Harvard IIA (AT-6C and SNJ-4) which was intended to forestall impending shortages of high alloy steels and aluminium. The rear monocoque fuselage and flooring was made in bonded plywood, while wing surface structure and fuselage side panels made in spot-welded low alloy steel. Some 1,246 lb. of aluminium alloy was saved by each aircraft; but fears of shortages proved to be groundless and the standard structure reverted to after 1943.

In the U.S. Army Air Force the AT-6C took on the name of Texan, and this has been maintained through to the AT-6D (Harvard III or SNJ-5) which has a 24-volt electrical system to bring it in line with British aircraft.

In all Harvards the instrumentation and radio were British, and the two guns—one over the nose cowl and the other in the starboard wing—only fitted in very special cases. Practice bomb racks were standard on all types, and used for attack in Korea and the Kenya campaign against the Mau Mau.

In all its guises the Harvard was a fine machine to fly—admirable for aerobatics and possessing a rapid rate of roll. It did not balk at the high altitude airfields in Rhodesia or South Africa, and was employed on training duties ranging from blind approach (with green diagonal stripes overall on the silver finish) to daily meteorological flights with a strut mounted air thermometer sticking 2 ft. vertically out of the wing gun panel.

For the ground crews, its large detachable side panels covering the cockpit length were a great asset; but many a harsh word was said for the multitudinous short-length bolts which hold the wings to centre section in a shrouded circumferential flange.

Then there was the "Harvard look"—to be seen on the face of any pupil pilot at first glance in the cockpit. The shattering sight of some 65 assorted instruments, controls, switches, etc., came as a formidable surprise after the simplicity of the Tiger Moth!

Retired in March, 1955, from training service in the R.A.F., the faithful Harvard will still be used for communications and other duties for some years to come. Three thousand were delivered to the R.A.F. during the seventeen years it was in service.

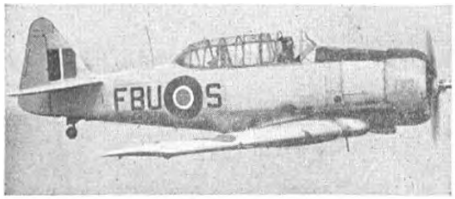
Dimensions.—Span 40 ft. 01 in. Length 28 ft. 117 in. Height 11 ft. 8¼ in. Wing area 253 7 sq. ft.

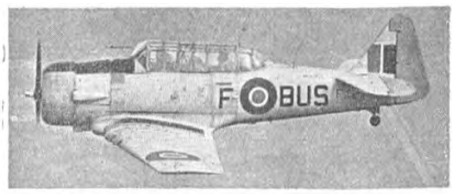
Weight.—Empty 4,158 lb.; loaded 5,300 lb. Wing loading 20.9 lb./sq. ft. *Engine.*—Pratt & Whitney R 1340-AN1,550 h.p.

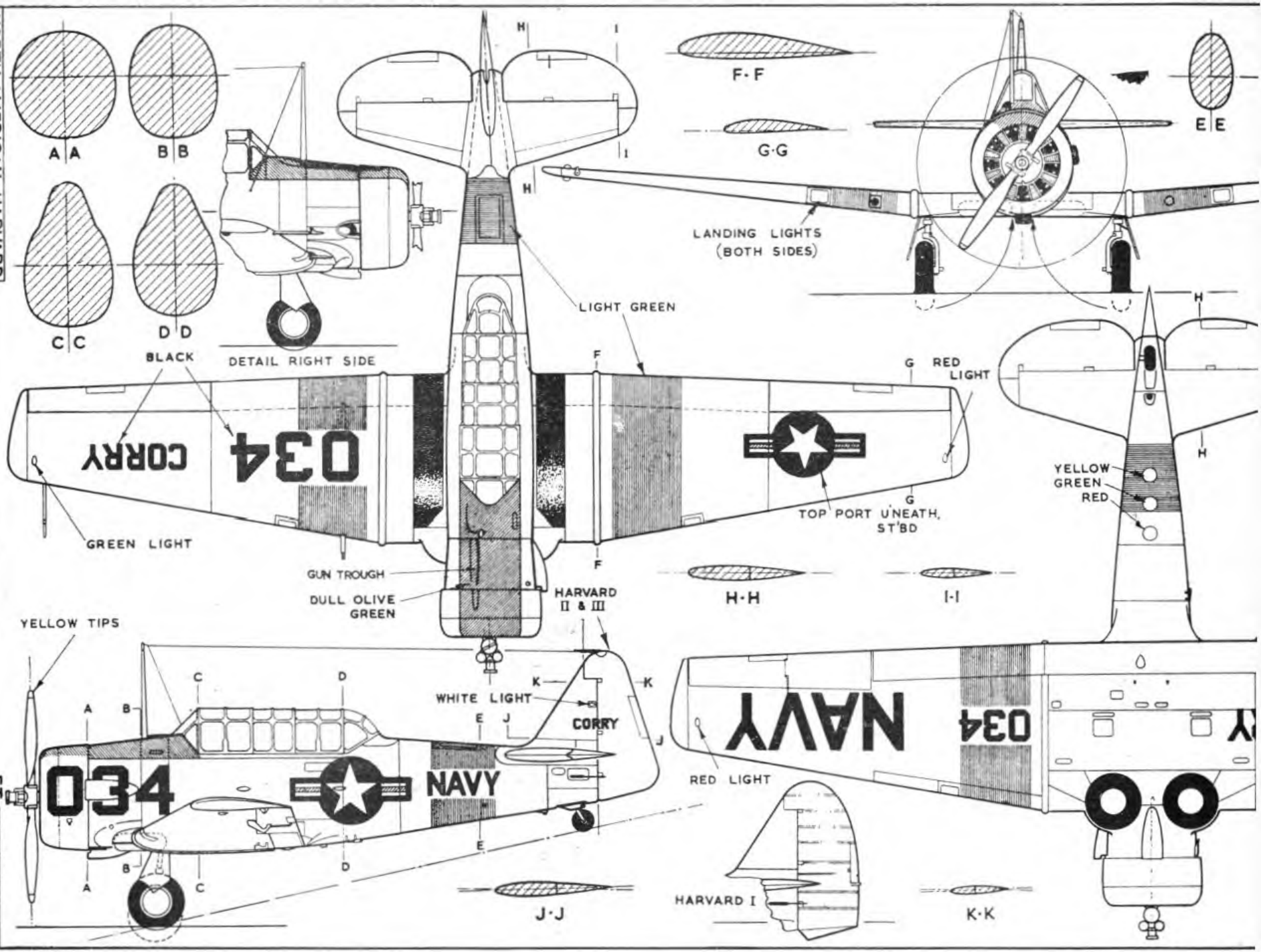
Propeller.—Two-blade Hamilton Standard Constant Speed.

Performance.—Max. speed at 5,000 ft. 205 m.p.h. Cruising at 5,000 ft. 170 m.p.h. Landing speed 63 m.p.h. Service ceiling 21,500 ft. Normal range 750 miles.

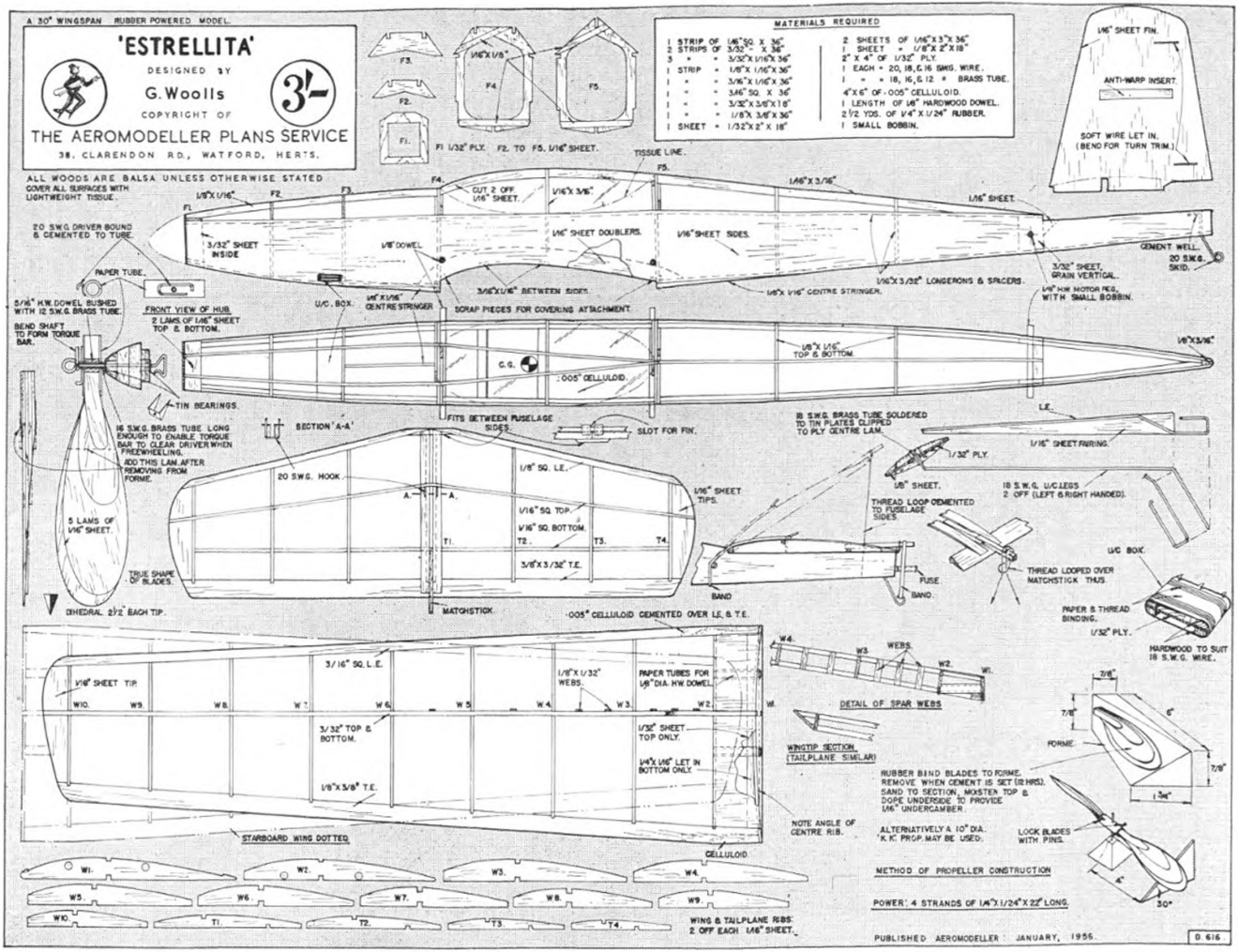
Heading photo shows Harvard I, the thirty-third to be delivered in 1939, camouflage in dark green and dark earth on top surfaces with trainer yellow undersides is broken by gun-detecting chromate patch in front of fin and red diagonal bar between cockpits. Below are both sides of a II A, showing 1942-type National markings and unusual disposition of school lettering—quite different to that of war-time squadrons. Opposite plan shows U.S. Navy training insignia







"F" TYPE 1/72nd SCALE REPRINTS OF THIS DRAWING AND MORE DETAILED "A" TYPE 1/48th SCALE UTILITY PRINTS ARE AVAILABLE PRICE 8d. AND 1/- RESPECTIVELY FROM A.J.S.



Estrellita

A 30 inch low-wing that will bring back fond memories for pre-war fliers, and makes a fine sport model for small field flying . . . By George Woolls

THIS LITTLE LOW WING, was developed in an attempt to get regular "fun flying" without too much cross country chasing. The comparatively low power, (half an ounce of rubber for an overall weight of two and a half ounces, and very modest by present day standards,) is however, sufficient to provide realistic take offs, fast climb, and regular flights of around the minute mark. Landings are a pleasure as they are "wheely ones" with the model remaining right side up—given of course a reasonable surface.

The youngsters who have never flown a low wing have a treat in store, while to our contempories, we say, "Why not revive memories of the old '*Kinglet*', '*Avis*' or '*Kingfisher*'?"

Use best quality medium balsa, golden white with straight grain throughout.

Cut the rib template from $\frac{1}{16}$ in. ply or thin metal, leaving out the slots for spars. Using this one template all wing ribs may be produced, by cutting to length from the back and producing a new straight undersurface. Positions of spars can be marked off from the plan. As Leading and Trailing edges are laid flat on the plan no difficulty should be encountered in wing assembly.

The tail ribs are produced in the same way as those for main plane using another template.

Cut the fin from $\frac{1}{16}$ in. sheet, and an anti-warp insert fitted as shown. The short lengths of soft wire cemented into slots enable the rear edge of the fin to be bent as required to produce flight turn. Stick scraps of gummed paper strip over the bottom edge to make a firm fit in the tailplane. This does away with the need for cementing, and so saves space in your model box.

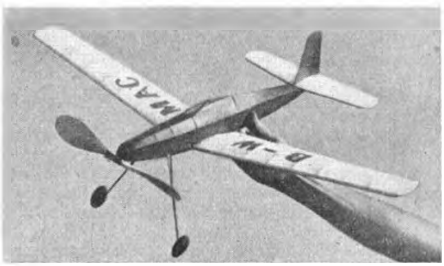
Cut the two fuselage sides from $\frac{1}{16}$ in. sheet, using the wing rib template for the wing mounting cut-out. Pin them together and lightly sand paper their edges to ensure their exact similarity. Cement on the longerons, spacers, wing mount reinforcement etc., making certain that you produce right and left hand sides. Cut out formers F.3 and F.5 and reinforce with $\frac{1}{8}$ in. x $\frac{1}{16}$ in. as shown. Cement sides to formers and when dry, draw the tail ends together. Cement on nose former, and then add remaining formers, cross spacers, stringers etc. Build up the undercarriage box from plywood and paper as shown. Bind with cotton well cemented in place, and assemble into fuselage.

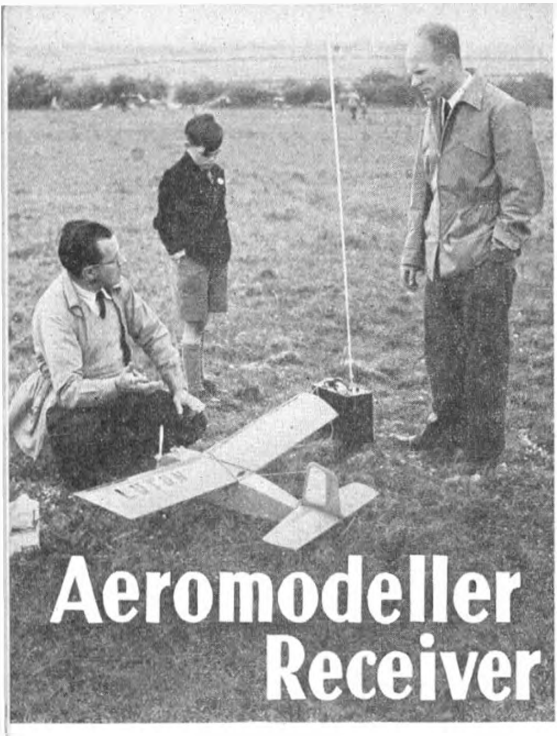
The undercarriage is pretty straightforward, just make sure that you make right and left hand units. Celluloid wheels can be used if desired.

The propeller blades are formed from four laminations of $\frac{1}{16}$ in. sheet, cemented together and left to dry bound to a twisted form. The blade is removed, the fifth lamination added to the back, and sanded to final section, plugged into the paper tube hub, set to correct pitch angle, and pinned. The hub is plugged with hardwood at the centre, bushed to receive the 16 s.w.g. tube which forms a shoulder and thrust bearing on the 16 s.w.g. wire shaft. Check that the hub can slide fore and aft sufficiently to permit the wire "driver" bound to the hub, to clear the torque bar on the shaft, thus ensuring free-wheeling.

Cover with lightweight tissue, water spray, and dope with thinned clear dope to which a few drops of castor oil has been added. Pin down wings and tail while drying.

Queries, with S.A.E. addressed c/o the Editor will be answered cheerfully.





Aeromodeller Receiver in Operation

The Aeromodeller Receiver was described originally in the May-June 1954 issues of Aeromodeller and since that date several thousand have been built and operated successfully by enthusiasts throughout the modelling world. The Editor does, however, receive the occasional letter from unfortunates who have been unable to obtain satisfactory results, and with these people in mind the following article has been prepared by Sid Miller based on queries received so far.

AS THE FAULTS appeared to be of two kinds, a few readers were asked to forward their receivers, thinking that perhaps a quick check and correction would put things right. In *all* cases a complete re-build of the unit was required, as component construction and soldering were far from satisfactory. Receiver 1 had the valve filament blown, the holder also being drilled badly causing a short between tag D and valve pin 7. The quench coils were wound on balsa formers, the ends being brought out to blobs of solder on the former faces. These bobbins were then fixed to the panel with a *tin* bracket § in. wide completely shorting the outer coil. No. 2 had been built back to front, the wiring passing "to and from" regardless, shorts being frequent. No. 3 had the tuning coil centre tags broken, it being twisted far too tightly. The break being inside the covering, was difficult to locate. In every case the soldering was far below standard, it being possible to pull a number of joints apart. The importance of keeping to the instructions in even the smallest detail cannot be over-emphasised, and please concentrate on producing good soldered joints.

The two main troubles experienced were: (A) a high standing current in the region of 4 or 5 m/a, and (B) the normal standing current, but refusal to drop on adjustment of the beehive condenser. A radio unit was received suffering from a 4 m/a standing current, with the second fault (B) appearing after correction of the first. Let us go through the method of checking and correction. On examination the receiver appeared to be a first rate job both in construction and soldering. The letter attached stated that the components were of the correct values and the quench coils "built and wound as specified". The valve was checked by trying it in the writer's own receiver. It passed O.K. although slightly down on standing current and requiring a shorter aerial. The current on signal drop was also less being .8 m/a on 45 volts H.T. The majority of modellers will no doubt be unable to exchange valves and will have to assume that all is well in this respect. If uncertain, a visit to the local radio stores for a valve test would be a wise precaution. The faulty radio was then plugged into the author's battery hook up, and a 4 m/a current was registered, As current was passed by the valve, a break or "open circuit" was not suspected. All the following items were tested for shorts. Relay winding (resistance was measured), tuning coil, H.F.C. and quench coils. All of these were O.K. It was not possible to check the direction of the quench coil windings as they had been neatly covered with Sellotape. Removal of Q.C.'s followed being replaced by a pair that were known to be O.K. Incidentally, when removing the coils, care was taken to ensure they remained together as found. A normal standing current was obtained with the new coils. The original coils were examined carefully and found to be working in *opposite directions*! They were re-wound with only enough tension applied to hold the turns in position. Upon replacement a standing current of 1·75 m/a was passed, this being raised to 2 m/a by means of the $\frac{1}{16}$ in. distance piece which is placed between the coils. It was then found that adjustment of the beehive condenser had no effect on the current drop even if the aerial was removed. No trouble of this kind had been experienced previously in any receiver constructed

by the writer, or by other Luton club members, and varying types of components have been used successfully. However, changing the quench coil condenser from .003 to .001 produced the desired result. Reducing the by-pass condenser value from .01 to .005 may help, although it did not have this effect on the above receiver. The aerial length finally came to 20 in. with the beehive about two thirds unscrewed. Separate the quench coils as much as possible although there is a limit to the amount. If spaced too far apart the beehive adjustment will show signs of backlash or overlapping. It will appear in this form. When the beehive is set to just drop the current it will have to be screwed up quite noticeably to make it rise to normal. This will make the sensitivity setting impossible to adjust with safety and the cure will obviously be to close up the quench coils. Make the alterations in progressive small amounts. The final operating details obtained on the test receiver were as follows: 20 in. aerial, 2.25 m/a standing current dropping to .9 m/a on signal.

Finally, to sum up—

1. Watch component construction and soldering.
2. Check assembly, particularly the quench coils.
3. Keep all wiring short as possible. This applies especially to the grid leads from pin 3 on valve base to condense rand leak, the other connections from these components going direct to their respective points.
4. Space out quench coils consistent with satisfactory operation.
5. Try .001 in place of .003 and/or .005 for the .01 as detailed above.
6. Shorten aerial, at the same time keep it as long as possible.

It is hoped the foregoing will assist the unlucky few who have been unable to achieve results so far. Once they have achieved normal receiver working they can be satisfied that they possess a really reliable outfit. The author's original unit is still going strong, being in its fifth year without a single component being replaced, which includes the valve—this in spite of several hearty prangs! One final point. Please do not forward receivers for checking as spare time simply does not permit.

Photos show Sid Miller with his latest model which is something of a cross between a "Sparky" and "Rohma". Span is approximately 50 inches and the power unit an E.D. 3.46 which gives the model a very lively performance indeed. Rumour has it that Sid takes a swig out of a special fuel bottle before putting model in a spiral dive! Model uses Sid's original AJM Receiver which has survived countless flights and continues to give reliable service

What's the answer!

Dave's new rubber job flew as if it was on rails. In fact, I don't think we have ever seen a more stable model in our club. In one of our first club contests of the year, too, he hooked a beautiful riser and turned in a 20-minute flight—which doubled our previous club record. Yet he has never got anywhere since with that model. It flies just as well as ever, but gets beaten time and time again by quite rough jobs which spend as much time stalling as flying level. One of these was built off the same plan as Dave's. It doesn't fly half as smoothly, but will always turn in a better duration. What's the answer?

What would YOU do in a case like this? Think a moment, then twist the page for the solution to the problem which is printed below.

Answer: Because a model flies smoothly it does not mean that it is trimmed for maximum performance. In fact, Dave's model is probably slightly undercambered—a very common trimming fault. If you want maximum performance from a model, it has got to be trimmed quite near the stall, particularly on the glide. Flying in turbulent air a model trimmed near the stall will often wallow, or even stall at times. Provided it recovers immediately, no harm is done. You can often double glide duration by fine trimming. If you want smooth flying, then under-elevate slightly.

Short Sherpa

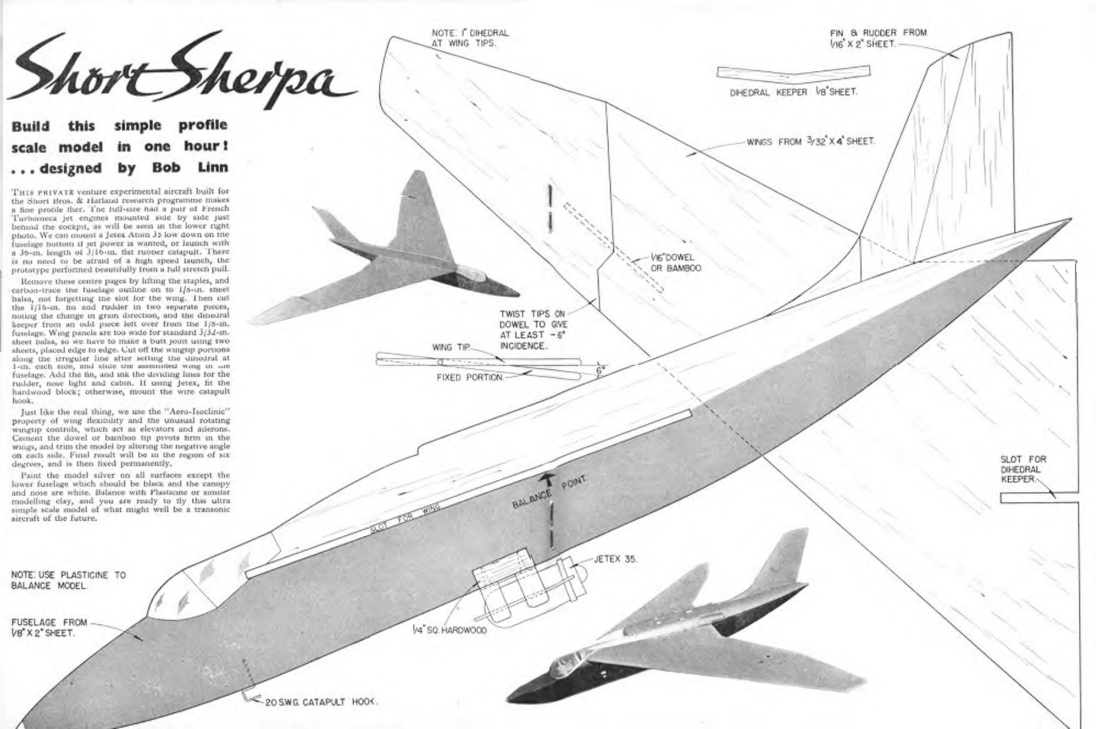
Build this simple profile scale model in one hour! . . . designed by Bob Linn

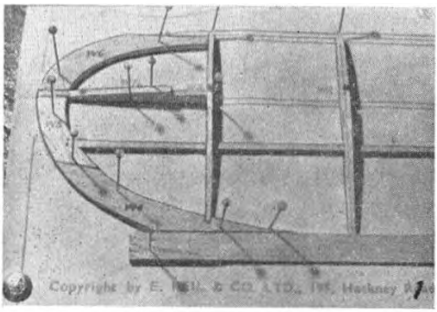
THIS PRIVATE venture experimental aircraft built for the Short Bros. & Harland research programme makes a fine profile flier. The full-size had a pair of French Turboméca jet engines mounted side by side just behind the cockpit, as will be seen in the lower right photo. We can mount a Jetex Atom 35 low down on the fuselage bottom if jet power is wanted, or launch with a 36-in. length of 3/16-in. flat rubber catapult. There is no need to be afraid of a high speed launch, the prototype performed beautifully from a full stretch pull.

Remove these centre pages by lifting the staples, and carbon-trace the fuselage outline on to 1/8-in. sheet balsa, not forgetting the slot for the wing. Then cut the 1/16-in. fin and rudder in two separate pieces, noting the change in grain direction, and the dihedral keeper from an odd piece left over from the 1/8-in. fuselage. Wing panels are too wide for standard 3/32-in. sheet balsa, so we have to make a butt joint using two sheets, placed edge to edge. Cut off the wingtip portions along the irregular line after setting the dihedral at 1-in. each side, and slide the assembled wing in the fuselage. Add the fin, and tilt the dividing line for the rudder, nose light and cabin. If using Jetex, fit the hardwood block; otherwise, mount the wire catapult hook.

Just like the real thing, we use the "Aero-Isoclinic" property of wing flexibility and the unusual rotating wingtip controls, which act as elevators and ailerons. Cement the dowel or bamboo tip pivots firm in the wings, and trim the model by altering the negative angle on each side. Final result will be in the region of six degrees, and is then fixed permanently.

Paint the model silver on all surfaces except the lower fuselage which should be black and the canopy and nose are white. Balance with Plasticine or similar modelling clay, and you are ready to fly this ultra simple scale model of what might well be a transonic aircraft of the future.





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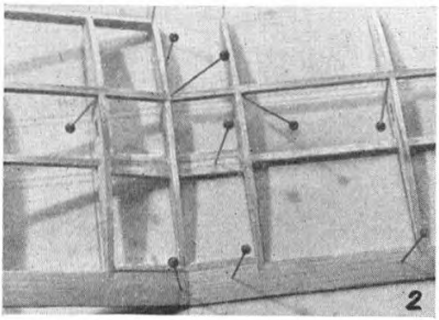
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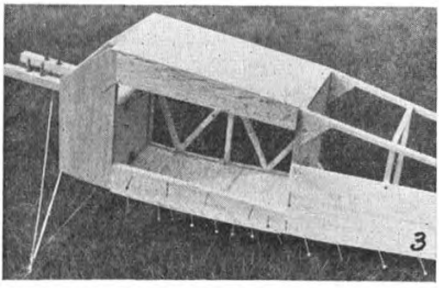
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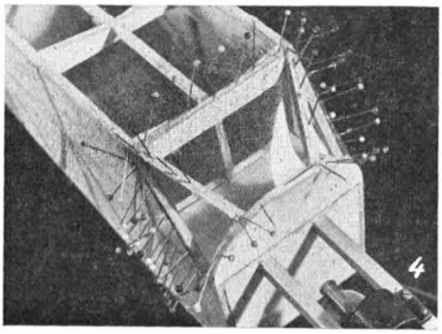
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NOWADAYS, newcomers to the hobby of aeromodelling are very lucky people. There is an unbelievably wide range of models to choose from, ready made, in kit form, or as plans; gliders, rubber models, or power models; jet, helicopters, and what-have-you. The best possible materials are readily available from any model shop, and building methods have been simplified and improved to such an extent that anyone with patience and a spot of pocket money can easily turn out a plane that will fly.

Especially for the

the use of pins, block wing tips

It is little more than twenty years ago that there was a vastly different picture. Then aeromodellers were counted in tens instead of thousands; gliders were practically unheard of, while the appearance of a power model (complete with a home-made petrol engine which might or might not run properly) was an event to be discussed for months afterwards. Balsa wood was being used, but its possibilities had not been fully realised, so that hardwoods such as spruce and bamboo were used far more than they are today. Building methods were both more complicated and less efficient than nowadays. Take wing tips, for instance, where the current practice was to steam a strip of cane into a semi-circle, or bend a length of piano wire into a loop, the ends of which had to be bound to the LE and TE of the wing.

Since those days it has been realised that the combination of balsa cement and balsa wood (with due care given to the direction of the grain) can give the same strength with greater rigidity, better protection for the tissue, and *less weight*. *Fig.*1 shows the modern method of construction for rounded wing tips. Notice how the curve is made up of three separate pieces of balsa with the grain running lengthwise down each piece for the sake of strength. The wood used in this particular case is $\frac{1}{8}$ in. sheet, which does not give a very great area of contact for the "butt" or face-to-face joints. However, the combination of cement and balsa wood ensures that such joints are strong enough, presuming that they are made properly.

Cement joints and the use of pins

It is quite true to say that if a cemented joint is made correctly it will often be stronger than the actual balsa, so that if too much strain is put on the unit the wood will fracture before the joint gives.

Three things go to make a perfect cement joint:

(1) The two surfaces which are to be joined must be cut or sanded quite flat so as to meet flush with each other.

(2) Both surfaces of the joint should be precemented.

(3) When finally cemented, the two faces should at once be pressed firmly together and held rigidly so (with no trace of movement) until the cement has set.

Beginner

By Rev. F. Callon

for power models and rib capping

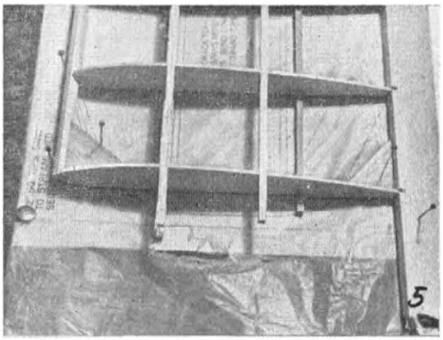
The last point is where beginners often slip up. They sometimes inspect the joint for a few seconds and then decide that one side is sticking up slightly and proceed to press it down into position, but a joint which has been disturbed like that will never be as strong as it should be; far better to take it apart and start again with more cement. Pins are a great help in keeping the parts of a joint from slipping or creeping apart. In *Fig.* 1 a pin has been pushed through the TE to hold it in place on the workboard, then the nearest section of the wing tip pre-cemented and re-cemented, has been jammed against the TE and pinned down. The second section is then cemented and pinned against the first, and so on.

And don't be in too much of a hurry to remove those pins, either. Cement dries much more quickly than ordinary tube glue because its solvent evaporates quickly into the air—presuming that it is exposed to the air. The outer rim of the joint therefore may dry off in a few minutes, but remember that the middle part is not exposed to the air, and it may take several *hours*, in the case of a large area, before this part of the cement becomes really hard. Joints like those shown in *Fig.* 1 should be left pinned down for a minimum of a quarter of an hour (much longer if possible), and even then great care should be taken not to knock or disturb them in any way.

Where to use pins

Pins should be used for any joints where there is a danger of the units moving before the cement has set, or where it is otherwise impossible to obtain a good, tight contact between the faces. Pushed vertically hard down into the workboard, they will hold the LE of a wing firmly against the ends of the ribs; and when you come to add the top spar of a wing across the ribs and you find that the spar slots have been cut too wide or too deep, pins should be pushed very lightly through the ribs and into the spar when the latter is being cemented in place—see *Fig.* 2. The point of the pin need only just enter the wood in order to keep the joint from moving. We dealt with sheet covering last month, but *Fig.* 3 shows pins being used to help with the sheeting in of the fuselage of a radio control power model. (The hole in the cabin side is for a hinged door to be added later, giving easy access to the radio.)

Pins are essential when cementing a celluloid windscreen onto a cabin framework, although you will not normally need nearly so many as are shown in *Fig.* 4. Looks like a hedgehog, doesn't it? As a matter of fact, this was an exceptional job—an awkwardly shaped cabin framework, extra stiff celluloid, and an attempt to cover the whole thing with a single sheet instead of several pieces.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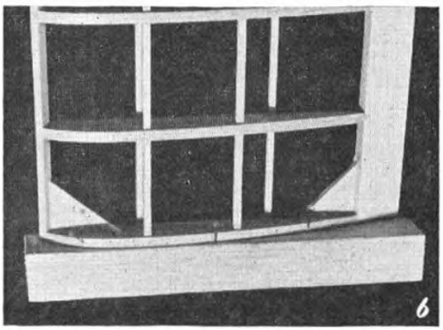
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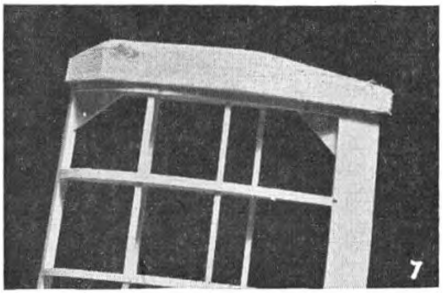
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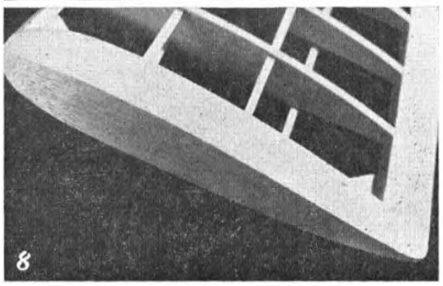
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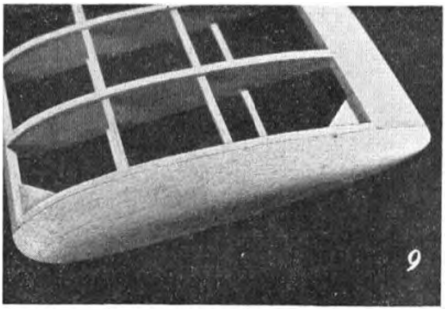


Block wing tips

The first flight with any model is always something of a breath-taking business, but with a free-flight power model it becomes positively hair-raising. Even though the job hand-glides beautifully, you never know *quite* what it is going to do under power. It all depends on the amount of turn put on the trim tab at the tail coupled with the amount of side-thrust built into the engine. A turn of about 30 degrees on the tab may give a fine wide circling glide, but it *may* be enough to spin the model into the ground under power. And the only way to find out is to try it! We can do one bit of remote preparation, however, and that is by giving the model some really strong wing tips, for the wing tips are the first thing to strike terra firma on a low-level spiral. On a power model which has square wing tips you could not do better than use block balsa.

While the wing is still pinned down, generous gussets should be cemented into the corners between the last rib and the LE and TE— see *Fig.* 5. The unit is then removed from the work-board, and the overlap of the spars trimmed off and sanded quite flush with the side of the rib. The block of soft balsa is cemented to this surface, secured with pins pushed slantwise through the end rib into the block itself, and left to dry for several hours—see *Fig.* 6.

What we are aiming at finally is the smooth, rounded contour shown in *Fig.* 9 but this is very difficult to achieve in a single stage; whereas it is much easier to visualize the various saw cuts and sandings needed to achieve a square-cut tip as shown in *Fig.* 8.

Most of the preliminary trimming can be done with a small hacksaw, and *Fig.* 7 shows where the cuts are to be made. The step between *Fig.* 7 and *Fig.* 8 is done with the sanding block, starting with very rough paper, and following up with a smooth grade. The tip should be held firmly down over the edge of a table while this part of the job is in progress. The square-cut outline shown in *Fig.* 8 is only one step in the process, it is true; but the more accurately this is achieved, the better will be the finished article. In fact, when I am doing block wing tips, I pretend that the square-cut stage is the final one, and try to get a really good finish on it.

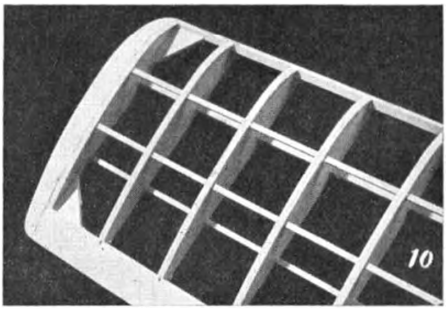
For the last stage, all you have to do is to round off the corners. A little light work with rough paper comes first, then some scrubbing with medium paper, a final polish with smooth paper, and there you are.

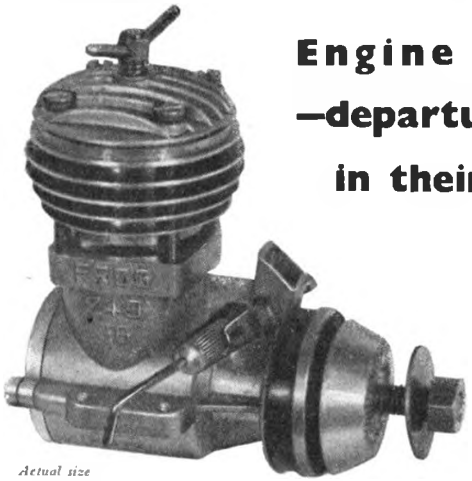
Capping ribs

Had it struck you that the ribs on this bit of wing looked rather thick? They certainly seem to have got thicker between *Fig.* 5 and *Fig.* 6, but actually in the interval between taking those two photographs I had "capped" the ribs with strips of soft $\frac{3}{16}$ in. x $\frac{1}{8}$ in. balsa. This is something you would not bother to do with a normal small glider or power model, but the wing in question was intended to support a payload of valves and batteries and things, added up to a total weight of about 40 ounces, so the construction had to be specially strong.

When ribs are capped like this, it gives them a cross-section like a "T", or if you cap them top and bottom, like an "H" laid sideways. An H-shaped steel girder will take far more strain than the same amount of metal in simple bar form, and capped ribs are just like that. *Fig.* 10 gives you some idea of a set of capped ribs. If you have occasion to do this sort of thing yourself, remember that the ribs will have to have $\frac{1}{8}$ in. trimmed off below the level of the wing section, and that they will have to meet the LE and TE leaving a $\frac{1}{8}$ in. gap for the capping strip. The material should be soft wood for the sake of lightness and because the strip has to be cemented all along the curve of the rib tops. If this curve is very sharp towards the LE it may be necessary to steam a curve into the end of each piece of strip to prevent it fracturing on application.

Bearing the above in mind, there should not be any difficulty in applying the capping. Cut each strip carefully to length, apply the cement, and start by pinning the LE end of the strip down onto the rib, then bend it down into contact all the way along, and use another pin at the TE end. Since the cover strips pass over the spars and stand only $\frac{1}{8}$ in. higher than them, it is a good idea to rub soap or candle wax along the uncovered tops of the spars before covering the wing. Otherwise at a later stage the dope may sink through the tissue and cause it to stick to the spars in between the ribs.





Actual size

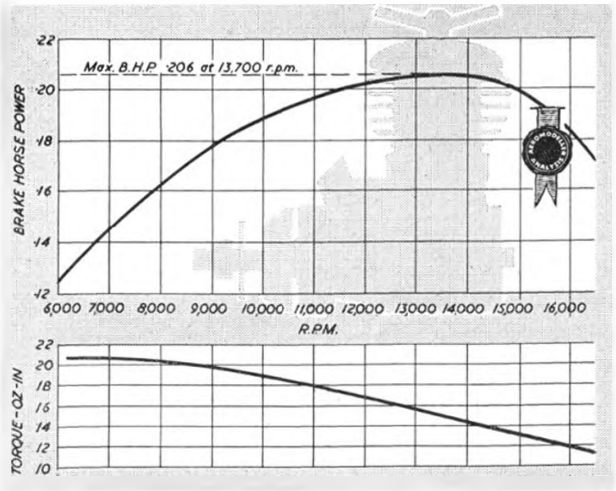
Engine Analysis No. 17 —departure in FROG design in their new . . .

249 BB

reviewed by **R. H. WARRING**

THIS NEW *Frog* motor is a completely original design (as far as any engine design can be "original" these days) intended to be put on the market in quantity at a reasonably low price and be at least comparable in performance with all but the out and out racing engines of similar capacity. It is the first of the "new from the start" *Frog* engines to be brought to the production stage by their new designer George Fletcher.

On test the 249 BB behaved so well that we took the opportunity offered to check out a further two or three engines straight from the production line. The consistency of these was quite remarkable, all reproducing similar performances after a minimum of running in time. After "passing out", each new engine has probably accumulated only a few minutes actual running. Still stiff, the 2.49 BB could be started and run on a small propeller equivalent to an r.p.m. level of around 13,000 without any trouble, excess friction—as shown by the hesitancy or reluctance to hold a constant running speed—disappearing in a matter of a few minutes. After that there is a slight, but only slight, increase in performance with further running in time, up to about half an hour. The tests were conducted on a well run-in specimen which, as a matter of interest, had actually been taken up to nearly 21,000 r.p.m. with a propeller load, hand started without difficulty with such a propeller.



FROG 2.49 BB Specification

Bore: .581 in.
Stroke: .574 in.
Displacement: 2.494 c.c. (.152 cu. in.)
Bore/Stroke ration: 1.01
Bare weight: 5.7 oz.
Max B.H.P.: .206 at 13,700
Max torque: 20.8 oz.-in. at 7,000 r.p.m.
Power rating: .083 B.H.P. per c.c.
Power/weight ratio: .036 B.H.P. per oz.

Material Specification

Cylinder liner: heat treated fine grain mild steel ground internally and externally, wet honed bore.
Piston: "Brico" cast iron (ground and lapped).
Contra-piston: cast iron (ground and lapped).
Gudgeon pin: silver steel.
Connecting rod: RR.56 light alloy forging.
Crankcase unit: LAC 112A light alloy, die cast.
Cylinder head: LAC 112A light alloy, die cast.
Crankshaft: 3 per cent. nickel steel. (Heat treated and ground)
Manufacturers: International Model Aircraft Ltd., Morden Road, Merton, Surrey.
Retail Price: £3 19 3d. inc. P.T.

PROPELLER-R.P.M. TEST DATA
(Mercury No.8 Fuel)

Propeller dia. x pitch	r.p.m.
11 x 5 (Stant)	6,500
9 x 8 (Stant)	7,750
9 x 4 (Stant)	9,800
8 x 5 (Stant)	11,200
8 x 4 (Stant)	12,600
7 x 6 (Stant)	13,300
7 x 5 (Stant)	14,400
6 x 4 (Stant)	17,000

Frog nylon propellers
(Frog Powamix fuel)

8 x 8	8,300
9 x 6	9,500
8 x 6	10,000
8 x 5	11,900
8 x 5 trimmed to 6¾ in. dia.)	13,300
6 x 4	20,000

NOTES: Running characteristics exceptionally good and consistent at all speeds up to 20,000 r.p.m. At higher speeds (e.g. above 12,000 r.p.m.) Mercury No. 8 proved a superior fuel to Powamix, presumably due to the nitrate content. Powamix used for high speed running could be improved by the addition of 3 per cent. amyl nitrate. (The latest Powamix fuel contains 2 per cent nitrite.)

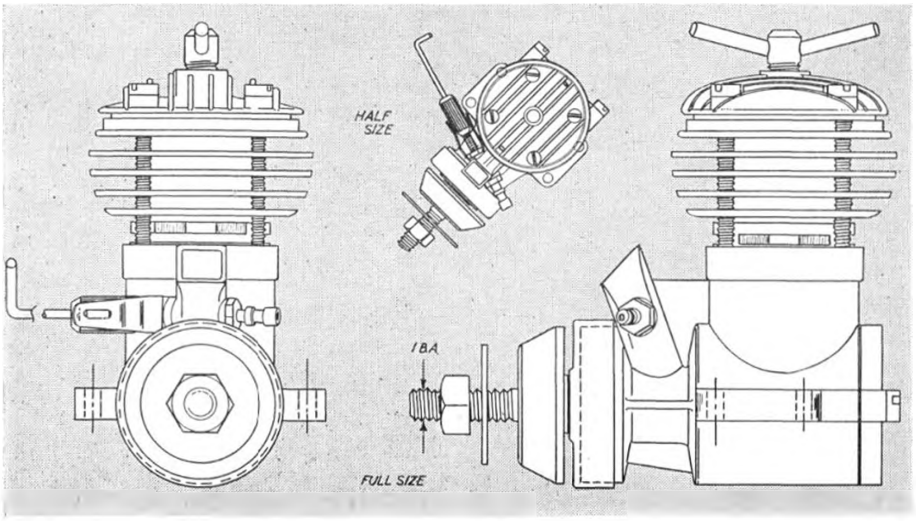
Propeller-r.p.m. figures obtained during the initial running period indicated that performance was pretty "hot" and subsequent torque-measurement tests confirmed this. Power output is that little bit higher than most of its contemporaries in the two-and-a-half size, except for the purely racing types which peak at higher speeds. The 2.49 BB peaks at just under 14,000 r.p.m. with an equivalent maximum brake horse power of .206, the horse power peak being substantially flat and above .2 for a range of speed of nearly 4,000 r.p.m. —e.g. just over 11,000 to just under 15,000 r.p.m. The rate of decrease of torque over the upper end of the speed range is almost linear and on this basis the "all out" speed of the engine (no load) would appear to be in the region of 24,000 r.p.m. What the life of the engine would be under such conditions is, however, a matter of conjecture. We rather suspect that the crankcase would pack up rather rapidly! In fact, in its present form we would not regard it as suitable for driving a flywheel.

Essentially the *Frog* 249 BB has been produced as a competitive general purpose 2.5 c.c. engine, both in price and performance, with power characteristics, confirmed by test, making it suitable for contest work in both the free flight and control line fields. The free flight designer may be a little put off by the relatively high weight—nearly 5¾ ounces—but this is the price paid for the general ruggedness and a ball bearing crankshaft (and one which most people seem willing to accept). In control line work, where engine weight is largely ignored, it should be most acceptable because of its ability to swing high pitch propellers at really high speeds. Fuel consumption does not appear to be excessively high, but an interesting running characteristic is that as the speed is pushed up (e.g. with progressively smaller propeller loads) the mixture requires richening for smooth running, i.e. the needle valve opened up rather than closed down. On the whole, in fact, the 249 BB prefers to run slightly rich at any speed.

Easy to start

Starting characteristics are excellent. Finger choking produces adequate priming with two or three turns of the propeller, after which starting should be instantaneous on the next flick or so. The compression control has quite positive "feel" and the needle valve non-critical, once it is opened up far enough. For starting with tiny propellers, a very rich mixture, a generous prime and compression slackened off half a turn produces quite "safe" starting characteristics, with plenty of time to re-adjust the controls to the optimum running setting.

The needle valve is angled back and nicely placed for handling. The compression control is of adequate size—perhaps it could have been slightly larger for comfort, since the cylinder head gets quite hot—and the relatively deep contra-piston gives a firm seating without making the control too stiff to operate.



Principal departures in FROG design are seen in the crankcase with two ballraces, thick walled cylinder with angled transfer ports and four stud system of cylinder retention. The square section intake blends to a circular hole at the needle valve position

Externally the 249 BB incorporates a number of unusual features—the most noticeable of which are the synthetic rubber oil seal over the front bearing housing (to keep foreign matter out of the bearing) and the square section choke tube. There appears to be no reason at all for the latter, except to make that part of the engine look a little different, particularly as the square section merges into a conventional circle at the spray bar position. The spray bar is drilled with two holes, incidentally, which makes it non-critical as regards positioning if withdrawn and re-assembled (a feature now common on many modern engines). The needle valve has a spring lock which gives one more confidence than the usual split sleeve and the needle itself is nicely tapered.

The oil seal

Without the rubber oil seal there is an appreciable leakage of oil through the front bearing, due to the generous tolerances employed. This has no effect on performance and the second duty of the seal would appear to be a psychological one as many people are apt, erroneously, to judge an engine on such points (another common fallacy is to assess the merit of an engine on its compression seal, which normally has the sole effect of governing starting characteristics). The rubber seal could, we feel, be something of a nuisance if slightly displaced and binding on the shaft and it has, in fact, been found necessary to fit it with an external locking ring.

We are told that although the seal rubs on the shaft when new and tends to slow the engine, one should not disturb the fit as it will bed down to perfection after 10 minutes running-in time.

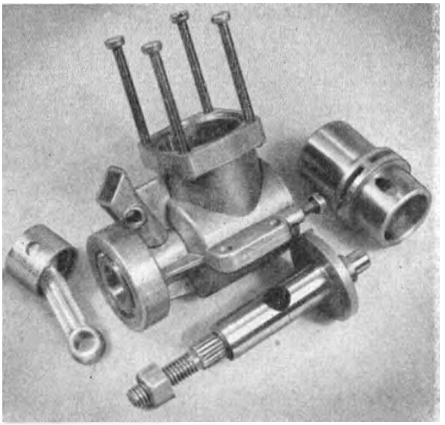
Construction

The propeller backplate is quite thick, conical in section and broached to lock onto a splined section of the crankshaft. The crankshaft thread is 1 BA size and a number 3 drill is correct for a clearance hole in the propeller. A standard nut backed by a $\frac{3}{8}$ in. diameter thin washer locks the propeller in place.

The crankcase casting appears quite massive but is actually reduced to about minimum section throughout with quite thin walls. The bulk of the weight, in fact, comes from the $\frac{3}{4}$ in. diameter crankshaft ($\frac{1}{8}$ ounce) and steel cylinder (1 ounce). The former, incidentally, is almost exactly balanced by machining the web to produce a crescent shaped counter-weight opposite the crank pin, but not counter-balanced against the weight of the piston and connecting rod.

The cylinder has a wall thickness of $\frac{1}{16}$ in. and is turned with a $\frac{1}{4}$ in. flange accomodating the four exhaust ports. The actual ports are of relatively small area and open quite early (about 100 degrees after top dead centre) Four by-pass ports are drilled upwards at an angle through the cylinder walls under the "solid" portions of the flange and open on a level with the bottom of the exhaust ports. Again the actual port area is fairly small.

The flange of the cylinder rests in a groove machined in the square top of the crankcase casting and is not positioned angularly in any way. It would seem good practice, therefore, having run the engine in to leave well alone and not remove the cylinder unless strictly necessary (and then mark the original position carefully before removing). The cylinder jacket is a dural turning topped by a separate cast light alloy head, the whole unit (cylinder, jacket and head) being held down by four 6 BA screws extending into the crankcase unit.

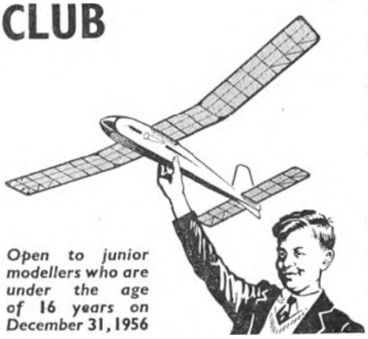


Crankcase volume is quite small, the backplate projecting almost $\frac{3}{8}$ inch into the crankcase. The mounting lugs on the crankcase are located forward and faired off into lugs to take the two screws holding the backplate in position. Both the cylinder and the backplate joints incorporate gaskets. The arrangement of the lugs and crankcase backplate would appear to be deliberate to discourage radial mounting which, even with a special backplate, would still have to rely on two small holding screws.

Summarising: the 249 BB would appear to be something of a new era in *Frog* engines. Frankly, the chief attraction of *Frog* engines in the past has been their relatively low price and they have seldom, if ever, been regarded as a threat on the contest field. This new *Frog*, on the other hand, should hold its own against them all as well as retaining pleasant starting and handling characteristics.

"Old Jones hasn't been the same since he took up PAAload."

GOLDEN WINGS CLUB



Open to junior modellers who are under the age of 16 years on December 31, 1956

JOIN NOW!

The Club is open to any Junior Modeller of 16 years or under. The only condition of membership is purchase of the "Golden Wings" Plan which includes free badge and transfers, also a membership card. The "Golden Wings" Glider is a first class design being simple to build and easy to fly. During 1956 the Aeromodeller will be organising special "Golden Wings" Contests at venues throughout the country and arranging visits of members to places of aviation interest.

POST THIS FOR FULL DETAILS

I apply for membership of the **AEROMODELLER GOLDEN WINGS CLUB**
I enclose P.O. for **2/6** No..... for the "Golden Wings" Plan which includes free badge, transfers, and Membership Card.
I have already purchased my "Golden Wings" Plan and wish to apply for my Membership Card.

(***Strike out section that does not apply***)

NAME (Block letters).....

ADDRESS.....

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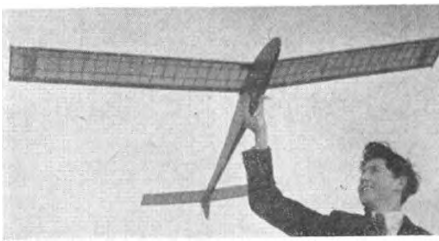

Winner of "Queen

Is the A/2 model becoming too complicated? This ultra simple approach scored top points at the Northern Heights Gala & club events

THIS MODEL WAS designed early in 1954, primarily as an open contest glider. The emphasis was placed on simplicity of lines and construction, cutting down both building time and cost. Even so the model had to be rugged enough to take hard knocks,—which it has done on many occasions.

During the '54 season this model flew consistently well and won for the Letchworth Club's "Open Glider Competition" which consists of three rounds, three flights per round. This success owed a lot to the towline stability of the model. Even in windy weather Omega could be relied upon to tow straight without any undue effort on part of the flier.

After the season had ended, it was decided to ballast the model with a view of flying in A/2 comps. Wing area was already just above the minimum permitted and so no alteration was made to the wings at this point.

Early in '55 a new model was built, this time with increased wing area and with a stronger, heavier fuselage to make up for some of the ballast on previous models. This model was entered for our club open glider comp. and in the two rounds enabled Don be slightly in front of his nearest rival. After this round extra ballast was added to bring the model up to A/2 weight, this appeared to make no difference to the flight pattern apart from increase in speed of glide. It was then decided to enter Omega for the "Queen's Cup"—which it eventually won. This success was followed by winning the final round of the club's Trophy in rainy weather. Thus clinching victory for second year running.

Unfortunately during the following week, it was lost out of sight, owing to a faulty D/T and the model was never recovered.

Omega BY D. ALDRIDGE

Elizabeth" cup 1955

Construction of the model is quite straightforward and only the fuselage requires a few points of instruction. A basic fuselage framework is built, afterwards covered with 1/16 in. sheet. Care should be taken over the position of towhook, which must be securely bound with nylon thread and smeared with a liberal coating of cement. The front ballast box should also be bound with a strip of nylon material to prevent it collapsing in the event of a hard landing. Underfin is made as per plan and then cemented in position.

Hold a short length of brass tube against the fuselage bottom with a silk patch and bend the 18-gauge auto-rudder trigger so that it is an easy sliding fit. Adjustment of the amount of rudder applied for the turn can be set by a small limiting block stuck to the fin at the hinge line.

The constant chord wing and tail surfaces are very simple to make, and the straight wing dihedral of 3½ in. lift under each tip will be appreciated especially by modelling beginners. The original has been flown with, and without, the tip endplates; but performance improves when they are fitted—in calm weather. For robust all-weather flying the soft block tips are preferable.

The fuselage should be given a coat of grain filler and three coats of thinned colour dope. Wings are covered in lightweight Modelspan and given two coats of clear dope and one coat of banana oil. The tailplane has one coat of clear dope and one of banana oil.

Make sure that the model balances exactly on the designed C.G. position. Trim to turn to the left on the glide as after many experiments this proved the more favourable way with the original.

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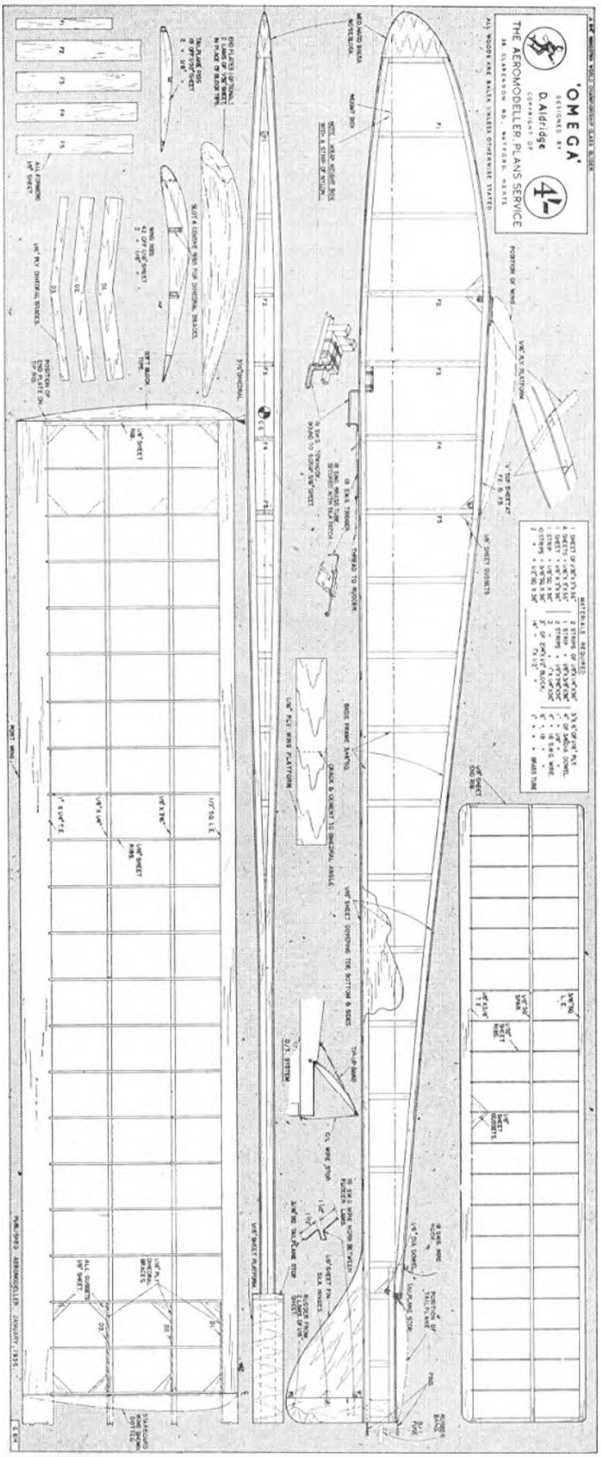
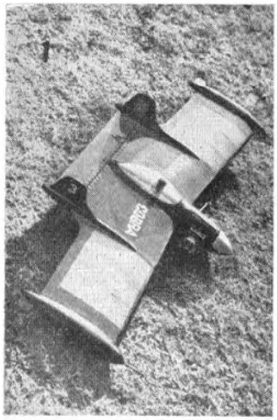
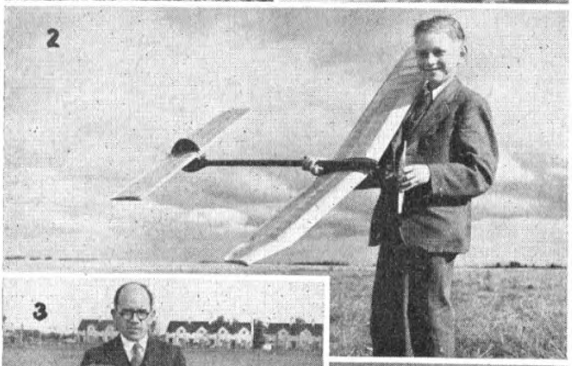


Model News





JUST TO REMIND you that the bright and sunny flying days of 1956 will be something to look forward to, we have a nice selection this month beginning with Mr. E. Johnson's unusual scale model which earns the title of "Model of the Month".

This is a 37-inch version of the glossy black Vickers Valiant B.2 powered with a pair of Jetmaster engines, having a total loaded weight of 8¼ oz. The Jetmasters are placed in the inside nacelles and the Wilmot Mansour type auto rudder takes care of unequal power output. Being a keen member of the Royal Observer Corps, we see Eric Johnson in uniform with binoculars "at the slope" and bet that his Valiant is accurate to the last detail.

In Bexleyheath there is a club with the unusual name of Cosmo A.M.C. and the tailless stunt model in **1** is their Cobra design for stunt and combat. Designed and built by 16-year-old B. C. Barnett, the Cobra has sweep forward, is fitted with an E.D. 2·46 and is reported to be rock steady for its 30-inch span. We particularly like the use of dummy wing tip tanks, one of which serves as a line guide.

Come out of that hole! The young Irish Leprechaun in **2** is 15-year-old Brian McMurty of Dublin M. F. C. seen with his rather unusual Webra Winner powered model. Span is 54-inches and the fuselage boom made up of two 36-inch lengths of shaped leading edge cemented back to back. Funny, but we always wanted to build one that way ourselves, but never got around to it!

Novelty is still with us in **3**. For it is a *team racer* that will raise many eyebrows. It is H. F. Wilde's Nimbus Class "B" model, from Chester, already a victor in the local club gallop and said to have a fair turn of speed and excellent stability. Big advantage of the pusher propeller is said to be that the pit man starting the engine has his back to oncoming models—you have a point there Mr. Wilde. Next stage is said to be a retractable undercarriage . . .

All the way from Pakistan **4**, where Rusi B. Mobed Founder and ex-Secretary of the Karachi A.M.S. is launching his A.P.S. Vulcan to the obvious enjoyment of younger Pakistanis. Those who find difficulty

in locating larger capacity powerful engines for big models will be pleased to read that this is a 7-footer, flying perfectly from hand-launch on a E.D. Hunter 3·46, although it will not take off. Mr. Mobed is designing a 14-ft. super Constellation for four E.D. Hunters which may be radio controlled . . .

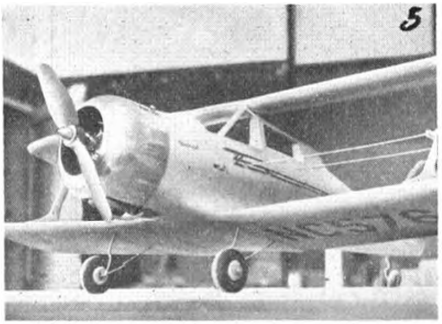
A nice cabin biplane with backward staggered wings in 5 is a controline Beechcraft 17, built by Fred Turner of Glastonbury when he was in the services with the R.A.F. at Castel Benito. The third line operates ignition control of the engine and the cockpit is fully equipped. Made from a kit where the cowling was provided we are reminded by this picture that a number of lightweight blanc mange or jelly moulds can be cut about to make similarly attractive engine cowls.

A power flyer who has had several near misses (including the Team Trials) and a win at the South Midland Area Rally was R. Draper of Coventry, who flies a very fast pylon line design known as "Criterion". In 6 we see John Hannay lighting the dethermaliser fuse, while Mr. Draper waits for the Okay to start flicking his Glowplug Super Tigre engine.

Ooh!—what a stretch for Peter Arnould of the Cambridge Club as he releases fellow-clubman Gordon Parker's A.P.S. "Corsair" at R.A.F. Station Debden in Essex. Seen in 7 the Corsair is rapidly on its way up in a very high wind and, true to type, it went to the top of the line for a perfect launch.

Realism in model photography is not easy to get, but G. Knight of Portsmouth has captured a nice angle of the P.Z.L. P.24 Polish Fighter in 8. The answer to success lies in the position of the lens. A low angle, equivalent to that of the normal eye-height when looking at the full size has to be reached in this one by lying flat along the ground. Note Mr. Knight's use of another model in the distant background to fill in where would otherwise be a rather blank gap. This happens to be a 14-inch Allbon Dart power half-A Team Racer and the P.24 is actually 4/5ths the size of the A.P.S. plan for the same motor. Although it has hit the ground rather hard after loops and other manoeuvres, the construction is sturdy enough to resist any crash and the model continues to put up a most realistic performance in the air.

Talking of photography, here are a few tips for the shutter bugs to follow before sending the results of their filming into the Model New Editor. Number one mistake is to use a confusing background. No one wants to see the back door, kitchen sink or Mum's wringer peeping through the wing struts, so choose a nice plain wall, or hold the model against the sky. Grass is a poor background, and the No. 1 photo this month is a lucky one, where bright sunlight has given deep shadows to pick out the outline. Number two mistake is poor focus. Check the distance by pacing out or tape measure. Number three is model display—let's see the unusual features on your model and keep it sharp.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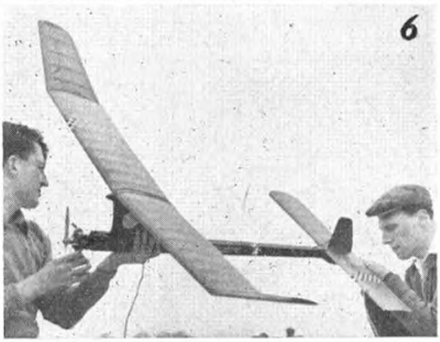
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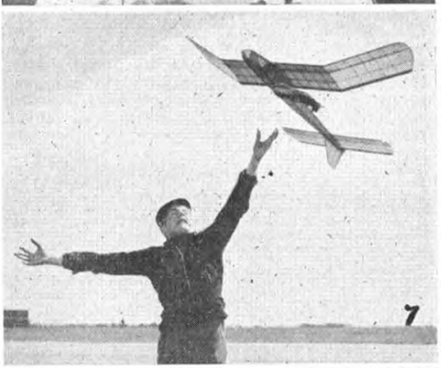
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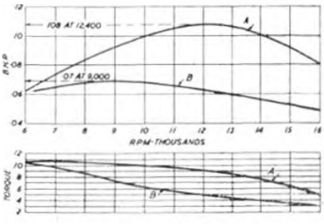
8

MOTOR MART

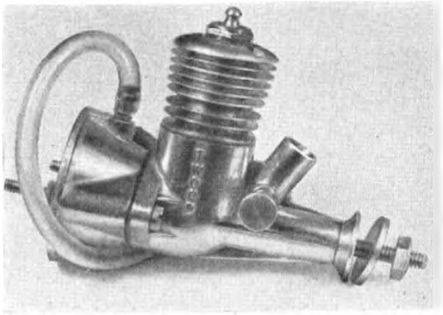
THE ACCOMPANYING graph shows the results of an interesting experiment investigating the power of slipstream effect in masking true torque readings on a reaction-type (swinging beam) rig. The rig was made as free as possible, accurately balanced (statically) and measured torque readings corresponding to different speeds achieved with different propellers plotted to give the graph curve B. At each stage, *i.e.*, with the same propeller and without stopping the engine or otherwise interfering with the rig, a flat shield was interposed between the propeller disc and the rest of the motor rig. This immediately unbalanced the weighing arm, (adjusted for unshielded balance), so that a new (higher) torque reading could be obtained by readjustment. At the same time it was also necessary to re-check the r.p.m. figure, this also increasing slightly with the shield in place.

The shielded curve (no slipstream effect on the rig) is plotted as curve A and a remarkable divergence between the two is noticeable. Calculated as equivalent brake horse power curves, the difference is even more remarkable. Thus it can certainly be concluded that slipstream effect, which we have mentioned before as a source of error with reaction-type beam rigs, is a very real factor.

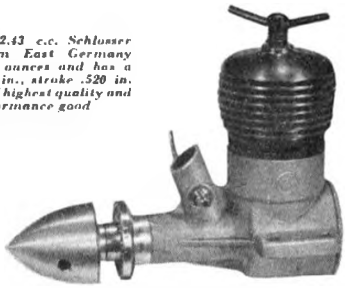


Slight modifications have been made to several of the **Mercury** fuel formulae to take full advantage of developments in modern engine manufacturing methods. Since engines are better made, and better finished, lubrication is rather less critical and so the extreme excess of lubricant commonly employed in diesel fuels can safely be reduced. R.D. fuel has been subjected to a formula change and should now show some appreciable increase in performance over Mercury No. 8 on well run-in engines.

Below: the Atwood .051 (.84 c.c.) glowplug engine was the most successful of the miniatures at the 1955 U.S. Nationals, winning many free flight events in models weighing 5 oz. all-up. Right: to indicate the technical terms found in this regular feature, we have identified parts of the E.D. racer with their proper names. Note, that the carburettor position of this engine must be at top right, with needle valve horizontal and not as illustrated in adverts



The new 2.43 c.c. Schlosser diesel from East Germany weighs 3.8 ounces and has a bore of .6 in., stroke .520 in. Finish is of highest quality and performance good



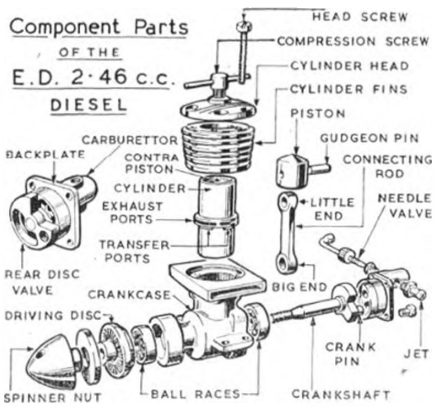
Experiments (not ours) with constant viscosity oils appear to indicate that an oil percentage of as low as 5 to 8 per cent. can provide adequate lubrication in model engine fuels with the virtual elimination of liquid exhaust waste. We hope to be able to get down to some facts and figures on this subject and report in due course. Possibly diesels should be better off than glow engines in this respect because of the lower cylinder temperatures involved, although glow engines, of course, are usually manufactured to more generous tolerances to avoid seizing at high speeds.

A tip to remember when assessing the "tightness" of a new engine is to feel how hot the main bearing is after a high speed run. The bearing is usually the main source of friction and ultimate performance will depend very greatly on how good is the main bearing after running-in.

Latest production version of the Frog "150" is to have a red-anodised head, a feature which will no doubt be continued with the new 1·49 model.

Copy out the following table for your workshop. It gives clearance size drills for various B.A thread sizes—for mounting bolts and drilling propeller hubs to fit.

B.A. size ...	0	1	2	3	4	5	6	7	8	10
Clearance Drill ...	"C"	No. 3	No. 11	No. 19	No. 26	No. 29	No. 32	No. 37	No. 42	No. 49



ARMCHAIR AERONAUTICS

GOOD READING FOR YOUR BOOKSHELF

THE AIRPORT VISITOR
(Penman Enterprises), 2s.

For the rabid aircraft spotting enthusiast, this civil register of types that visit British airports is both inexpensive and invaluable. If you want to know who owns the "Star of Iowa", a Lockheed Constellation L749A, you'll find it registered as N6023C and that it belongs to T.W.A. A thousand other refs. are there to hand in the Logbook.

AIRCRAFT RECOGNITION MANUAL *by* C. H. Gibbs-Smith (Putman and Co.), 10s. 6d.

Long in shape and full in nature, this authoritative work is now in its latest edition and forms a quick-to-hand reference with aircraft catalogued under sections like Large-fast or Small-slower. Thus we first judge our unidentified 'plane by its size and speed, then look it up.

AIRCRAFT BADGES AND MARKINGS *by* Harold B. Pereira (Adlard Coles Ltd.), 5s.

A cheap, full colour identity book for international insignia and airline badges. Some of them are misleading in proportion, and the colours a long way from correct shade; but the book forms a good guide if allied to photos of the real thing for authenticity.

AVIAN SOLIDS HANDBOOK
(Minikscale Ltd.), 2s.

Solids—how to make them, give them a good finish, and what material to use. This little handbook will be of value to all in the solid model fraternity, and the page descriptions of types, both historical and recent which are included in the Avian range of kits, will be invaluable to modellers making those particular aircraft.

ROTORCRAFT *by* Capt. Liptrot and J. D. Woods (Butterworths), 32s.

The technicalities of the full-size Helicopter may be a little beyond the scope of most aeromodellers, but for those engaged in this section of the aircraft industry this book offers a concise review of historical progress with Rotorcraft, and details Rotor Aerodynamics. The various Torque correction methods, rotor head designs, and approaches to control are covered, and the photographs are backed up by neat line drawings of the more outstanding types. Aeromodellers at the Westland, Hunting-Percival, Bristol, and Saunders-Roe establishments will probably find the work an aid to their studies.

SUPERSONIC AIRCRAFT *by* Roy Cross (Macdonald and Co.) 6s. 6d.

This is real value. Roy Cross only has six of his excellent aircraft drawings in this 64-page summary of the faster-than-sound types, but the selection of interesting photographs and informative text make this an ideal book for all air enthusiasts. We learn that the leading edge of the Lockheed F.104 is so sharp that it has to be felt-covered to protect ground crews; that Republic F.103 is aiming for Mach 3 with a ramjet which comes in after the Wright-built Olympus has taken the plane up to altitude; and that the F.105 is to be a 40-ft. Republic Delta. The story of supersonic flight makes very interesting reading, and Roy Cross has gone to some trouble to make sure that his work bears the stamp of authenticity.

FLIGHT FLY-PAST (Iliffe and Sons Ltd.), 7s. 6d.

A selection of 24 magnificent aerial portraits taken by "Flight" photographers John Yoxall and L. W. McLaren of latest British aircraft. The Canberra B.6, to be seen on the open page in our heading illustration, is typical and it is difficult to select which picture appeals most in this fine portfolio.

CONSTRUCTION FOR AEROMODELLERS, SIMPLE RADIO CONTROL AND AEROMODELLER ANNUAL 1955/56
(Model Aeronautical Press Ltd., 5s.; 5s.; 10s.).

Our modesty forbids that we should write of our own publications in glowing terms, but they deserve a place in any selection of good reading for aeromodellers. In particular we would like to single out our latest work, "Construction for Aeromodellers", as being the only book of its kind, with chapter upon chapter of revealing "gen". If you want to know about dethermalisers, geodetics, torsion bars, silk covering or floats—this is the book for you.

SQUADRON AIRBORNE *by* Elleston Trevor (William Heinemann), 13s. 6d.

So vivid is this fictional account of the activities of a fighter station during the Battle of Britain that Mr. Trevor has the reader almost smelling the odours of the flight shed, hearing the noises of the riggers and fitters at work, and anxiously scanning the rear mirror in the detached confinement of a Spitfire's cockpit. Rarely does one find such a human and realistic story of life in the wartime

ARMCHAIR AERONAUTICS

Continued from page 41

R.A.F. so splendidly supported by a factual and technically accurate background as in "Squadron Airborne". For ex-R.A.F. readers a must, and for others—the opportunity of experiencing the true atmosphere of those vital days of the "Few".

FLYING MODEL AIRCRAFT *by* D. J. LAIDLAW-DICKSON (Foyles). 2s. 6d.

This economic little handbook is essentially an introduction to aeromodelling, giving plenty of factual information without going into detail. To anybody enquiring "What is aeromodelling?" it provides an excellent answer and covers the generalities of the subject from A to Z, even to the extent of discoursing on model boxes and relations with farmers! It includes a complete chapter on the construction of a simple power model which has been designed so that the plans given in the book are easy to scale up. We do hope that the author did not follow his own advice on trimming which is to move the wing forward when the model stalls, and backward when it dives. Had it been control line and not free flight we would have said he had his lines crossed! Nevertheless, an excellent two and sixpence worth.

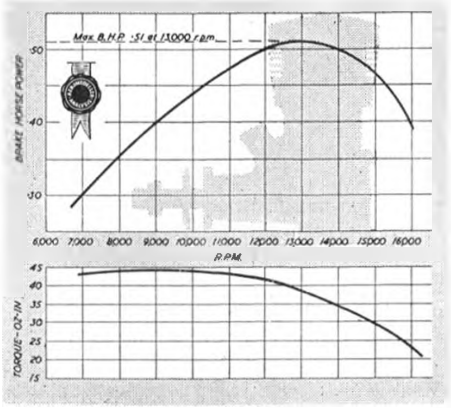
THE STARS AT NOON *by* JACQUELINE COCHRANE (Robert Hale Ltd.,) 15s. 274 pages, illustrated.

The forceful character of Jacqueline Cochrane made its first impact on us at a memorable meeting in America, when a brief but dynamic interview left us somewhat breathless yet greatly impressed by this diminutive feminine flyer. To read her full "rags-to-riches" life story was a thrill; for here is no pin-money girl taking flying lessons to relieve the boredom of the social whirl, but a downright character who worked hard and saved hard to get into the element that provided a challenge to her go-getting personality.

Holder of many air speed records, "Jackie" was the first woman to break the sound barrier, and was indeed the first woman to fly a military aircraft. Her account of the considerable war effort in organising women pilots is absorbing, and it comes as no surprise to learn that she needled more than one masculine brass-hat in the process!

Hubby Floyd Odlum undertook the task to "dress her thoughts in language that approached grammatical correctness"—but we are left with the sneaking longing to have read her story just as she told it.

C. S. R.



IN THESE DAYS anything as large as the K & B "35" (6 c.c. displacement) is regarded as a brute of an engine with a rather frightening performance. In confined spaces the K & B certainly lives up to this reputation—it is certainly not the sort of engine to test run indoors!

Before being "sent to the bench" for test, this particular engine was used for some Mono-line tests, to be reported next month and its power was more than ample for the model, showing considerable advantage over existing 5 c.c. engines although only .95 c.c. larger. Initially we found it difficult to start from cold, but once warm it would start with almost any propeller load at a single flick, after generous priming.

At speeds in excess of 13,000 r.p.m., vibration appeared quite high—usually sufficient to throw off the glow plug lead straight away, but with the motor continuing to run quite satisfactorily. This vibration produced considerable aeration of the fuel and some difficulty was experienced in maintaining an adequate flow from the tank on the propeller test rig. Otherwise the general handling characteristics were excellent, although we condemn the position of the needle valve as too near the propeller disc, and too short, to reach comfortably.

Good Power/Weight Ratio

The K & B "35" is typical of American glow motor design, quite light for its size (only 7¼ ounces) and with fairly tolerant crankshaft and piston-cylinder fits. The piston itself is relieved by "waisting" over nearly the bottom two-thirds of its length and is of lightweight construction. The cylinder is of special steel, machined with integral fins and held down by only two screws. The remaining four screws in the head merely hold the light alloy head casting onto the top of the cylinder.

Transfer and exhaust ports are diametrically opposed, the exhaust being collected over roughly 180 degrees and fed into a short stack cast in with the crankcase The transfer port overlaps the exhaust to an appreciable extent and has generous area. The piston has a baffle to guide the incoming gases up and away from the exhaust. Even so, there is still probably an appreciable amount of through flow and the fuel consumption is, in fact, enormous.

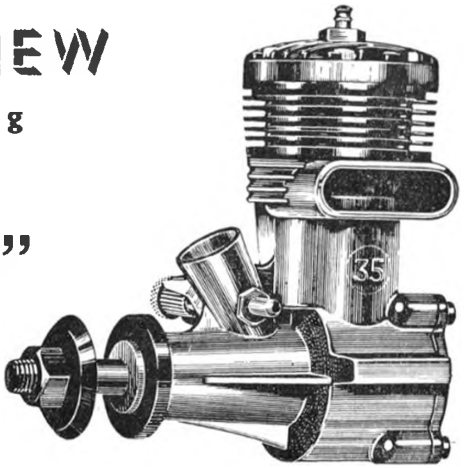
Crankcase clearances are quite "tight" to reduce crankcase volume to a minimum, even the backplate

ENGINE REVIEW

By Ron Warring

K & B ALLYN "35"

A popular American glowplug engine for r/c or c/l stunt



being specially shaped to clear the crankshaft pin and big end. The crankshaft bearing is unbushed with two longitudinal oil grooves running almost to the front. Bearing surface finish was excellent. By contrast the cylinder finish showed machining marks.

None of these features, it is thought, would have much, if any, effect on performance. Sloppy running fits are quite acceptable on glow motors, it being the balance of the design proportions which counts. And undoubtedly these are worked out to the optimum degree in the K & B. Design-wise it is excellent, the performance is first-class and the workmanship adequate. It is essentially a high-speed engine peaking at a speed of about 13,000 r.p.m. on test—although it would probably go higher on a heavily doped fuel—and as such will probably have a limited life. It is not fussy on the type of fuel it will run on, but for absolute maximum performance, there is obviously one fuel which will suit it best. Most new K & B racing engines are, in fact, "tailored" around a particular fuel.

The only trouble we experienced at all with this engine was blowing of the head gasket. Otherwise it appears pretty well foolproof, and for the big stunt model, or any radio design of earlier vintage calling for 10 c.c., this is a fine power unit, unfortunately restricted to dollar-owning countries.

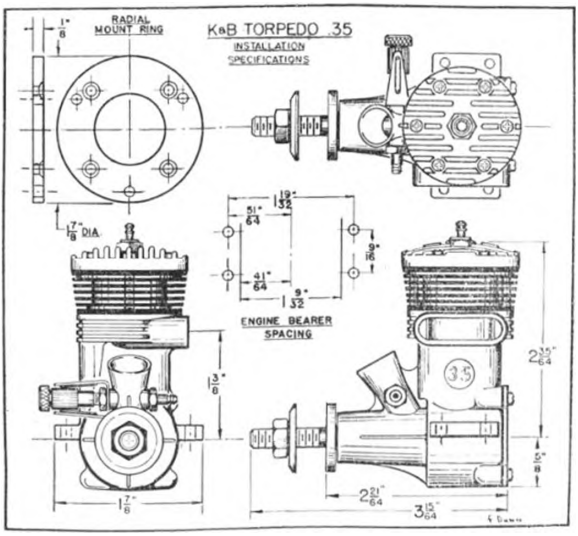
DATA

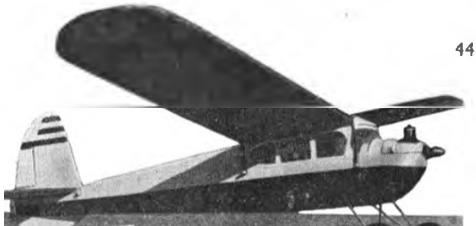
Bore: .79 in.
Stroke: .74 in.
Displacement: 5.95 c.c. (.36 cu. in.)
Weight 7¼ oz.
Max. B.H.P.: .51 at 13,000 r.p.m.
Max torque: 44.5 oz.-in. at 9,000 r.p.m.
Power/weight ratio: .068 B.H.P. per ounce.
Power rating: .086 B.H.P. per c.c.

Manufacturers:
K & B Allyn Co., 5732 Duarte Street, Los Argeles 58, California, U.S.A.
Retail Price: (U.S.A. only) $15 : 95

PROPELLER — R.P.M. FIGURES	
10 x 6 Nylon	11,750
9 x 6 Nylon	13,200
9 x 4 Stunt	12,900
8 x 4 Stunt	16,000

Fuel: Mercury No. 7

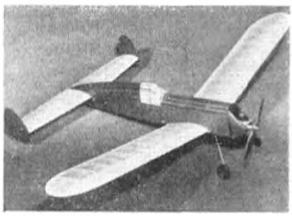




Radio Controlled version of Junior 60, now complete and tested. Verdict: a fine & sturdy flier.

THE WAVE of price changes due to the increase in Purchase Tax has, of course, affected a number of trade catalogues. **Contest Kits** announce that they are able to lower the wholesale prices of their products to meet the change, due to installation of the new machinery to print plans, balsa and ply, rendering their plant completely independent.

Constant appeal for authentic transfers of sizes suitable for flying scale models is not being ignored by **P. S. Fisher** of 6 Station Yard, Twickenham. Latest inclusion in his range is a 10 in. x 11 in. sheet which retails at 2s. 6d. and carries 1942 type R.A.F. markings with the additional circle and "P" for Proto-



Contest Kits Cresta is now fully tested—likes left-hand circuits.

type aircraft. Large roundels are 3 in. in diameter smaller ones 2¼ in. and fin flash 1⅞ in. x 1 ⅛ in., making the set admirable for a number of designs in the "AEROMODELLER" Plans Service.

Two suitable types would be the free flight Spitfire Mk. 14e and the popular D.H. Mosquito controliner.

A new cement is being introduced by **Messrs. Ferguson & Timpson**, 155 Minories, London, E.C.3, "MIXAFAX". Two tubes of this white high polymer cement are supplied for 5s. and the tubes are lettered A and B.

Contents of the tubes are mixed in equal proportions and each surface of the items to be glued together smeared with a thin coating.

We checked the adhesive powers by fixing a steel washer to a piece of hardwood and found that this is an unique cement in that it *definitely* adheres metal to wood.

Latest kit from **Mercury Models** is the Thunderbird Class "B" Team Racer. Retailing at 29s. 8d., the Thunderbird is completely prefabricated, even to the extent of having wing sections preformed. In consequence the drawing is a stage-by-stage illustration of assembly and building time is cut to a minimum.

We particularly like the long and stout engine bearers, the thick uncrushable cockpit canopy and the shaped fuselage top. With such a good contest record (the prototype placed second with 105 m.p.h. in that famous British Nationals Team Race last year), the Thunderbird is assured of good sales.

One of the latest models to be included in the very popular **Keil**

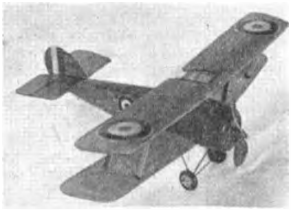
Two tubes of Mixafix are colour coded. Mixture will stick anything.

Kraft 3s. 6d. flying scale series is the Sopwith Camel, and we made this one up almost overnight for quick tests. The short nose needs quite a wad of plasticine to bring the balance point forward for satisfactory flight; but once balanced the Camel is a nice little flyer.

We are told that this and other kits in the Keil Kraft series are used *without alteration* to the construction as flying scale types for the **Allbon Bambi** diesel. The Camel should be particularly good for this with its plastic cowling and sheet fuselage.

Perhaps not quite in the model line, but noted in a newspaper advertisement were a series of collapsible wardrobes and chests in rigid corrugated fibre cardboard on sale at the **Civil Service Stores**, 425 Strand, W.C.2. One of them is known as an under-bed chest, and is 48 in. x 24⅛ in. x 9½ in. and sells at 21s. carriage paid. Although we doubt whether they would stand up to indefinite outdoor use as supplied, they would be useful for storing models in the house.

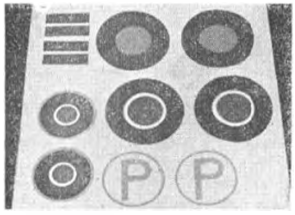
George Honnest Redlich and Bill Warne need no introduction to the majority of our readers; both are radio control enthusiasts, the former specialising mainly in aircraft and the latter model boats. To cut a long story short we should say that they have teamed up under one roof as **Radio & Electronic Products** and intend specialising in Tuned Reed equipment and all matters relating to the radio control of models. They an supply all the popular radio lines



Keilkraft Sopwith camel has a half wheel for cowling, smart plastic prop—and converts to Bambi power.

and many other specialised items, not forgetting very valuable advice born of long experience. Frequency checking service is also available at their new premises at 148 Nelson Road, Whitton, Middlesex.

Address correction for R/C specialist Chas. Young — who supplies Seimens Relays among other items is **102**, not 12 Holloway Head, B'ham 1.



Latest Fisher Transfer sheet is for scale models like DH Mosquito and Spitfire, are type used from 1942 to 1947.

Minikscale 1/48th scale transfer sheets are a boon to solid modellers, covering wide range of types.

This five-year-old "Fillan's Champion" was entered in glider in the 1955 Irish Nationals by D. Brown of Drimnagh A.M.

A QUERY ARISING from last month's introduction concerns the distance flown by a model, and the high winds experienced at altitude. If such high winds exist, how is it that a model can land back near to its point of release after a very long flight? The answer to this is that a 30 degrees change in the direction of the wind is frequently experienced at intervals of 2,000 ft., so that at 10 or 12 thousand feet a model will travel in the opposite direction to that which might be expected from the surface wind. Another condition, arising near the coast, is that during daylight the land is usually warmer than the sea, and an on-shore breeze develops. At night the land cools to a temperature below that of the sea, and an off-shore breeze occurs. Thus a model with altitude in hand at nightfall will almost retrace its steps.

South Eastern

Expanding membership and a series of talks and other clubroom activities make **EXMOUTH D.M.A.C.** a very contented club. An idea in this club that might well be followed by others for an interesting and informative half-hour or so, is to pin up a standard design and let everyone give his views on it.

More members would be welcomed in the **SIDMOUTH M.S.**, who had a good 1955 season, and expect to see plenty of radio activity in the coming months. Club nights are Wednesdays at 7.30; interested bods please contact J. E. Sleight, Myrtle House, High Street, Sidmouth.

North Eastern

A junior air week was recently staged by the Newcastle *Evening Chronicle*, and this was supported by an exhibition put on by **NOVACASTRIA M.A.S.**

Also active in this area is **TYNEMOUTH M.A.C.**, who put on six displays at various shows during last season. At long last a clubroom has been acquired, and meetings take place on the last Monday of each month (contact Dr. R. Nicholls, 151 Regent Terrace Street, North Shields). Two members journeyed up to Prestwick and managed a 3rd in A racing; at home, G. Oswal won the club stunt contest.

The first Friday in each month sees **SUNDERLAND D.M.A.C.** meeting at the Workmans Club, Harbour View, Sunderland, and all are welcome. The 26 members are primarily interested in C/L and sports flying, and fly their models at R.A.F. Usworth during the summer and on various more local fields in winter.

Midland

With a successful season behind them, **WOLVES M.A.C.** are concentrating on getting the last ounce out of indoor team racers, with some members experimenting with dural propellers in an attempt to reduce the mortality rate in props. (This is *rubber* team racing!) More conventional outdoor racing is attracting a good deal of interest with a considerable number of engines being acquired for this purpose.

Monkspath Vicarage must be quite a fair size, since **MONKSPATH M.A.C.** meetings are held there each Friday at 7.30, and the membership is already over 50! Two outstanding models are L. Tranter's *Vulton*, and W. Field's *Seraph*, which set a new club record on October 30th.

The winter rally held on November 13th by **LOUGHBOROUGH COLLEGE M.A.C.** attracted 66 entries from 16 clubs, and was favoured with reasonable weather. Winners were: teamrace A. L. Whitworth, Heanor, combat, M. Ullyatt, Garnston, glider, C. Wiggins, Warwick, power, P. Riches, Rugby, rubber, S. Wade, Loughborough, sport precision, D. Siddall.

South Eastern

The annual **BRIGHTON D.M.A.S.** seaplane contest was held on October 30th, in dull but calm conditions, which made take-off tricky, since the pond in use has steeply rising banks. Of the six entries, R. Boxall, flying a Wakefield, and I. Lucas, flying a 1½ c.c. power job, tied with triple maxs.; the power job won the fly-off by taking five seconds longer to go o.o.s. in the gathering gloom than the rubber model. The final position in the 1955 club championship showed a handsome win by Reg Boxall, with brother Fred winning the area championship. The club collected the area championship club trophy for the fifth successive year.

The Saturday evening lectures laid on by **SOUTHERN CROSS A.C.**, cover a wide field, and a new addition has been made to the club's private plan service in the form of a 70 in. A/2. Club champion for 1955 was K. Donald with a flight aggregate in the qualifying competitions of 51 : 33, against runner-up F. C. Smith's 36 : 49.

Western

SWINDON M.A.C. finished up their 1955 programme with a slope soaring contest, which was won by L. A. Rogers with 5 : 45, using an o.d. 6 ft. lightweight, and beating in the process a compass steered model. Club subscriptions have been reduced to encourage recruiting.

A variation on a popular design in **BRISTOL AND WEST M.A.C.** is D. Harris's BIPLANE *Rubberdub*, which flies extremely consistently, drifting downwind in very small circles. G. Woolf's *Estrellita* provides a contrast by persistently flying *upwind*. Area meetings at the Moravian Hall, Maudlin Street (second and fourth Thursdays each month) are bringing out microfilm models as well as a wide selection of R.T.P. types.

Membership drive by **SALISBURY M.A.C.** includes a monthly series of competitions, which include no fewer than ten different events, so that no-one has an excuse for not flying. In the first month (October) the most popular event, was a half-hour scramble in which winner R. Guntrip recorded nineteen flights with a Dart powered Canard. Despite the biggest turn-out for months, the other competitions received little support, but a great deal of flying was done, and great public interest was shown; reports and photographs appeared in three local papers, and membership increased by at least six.

East Anglian

1955 Club championship in the area was won by Thameside, with N. Willis of Anglia as individual champion. At a recent area meeting at Debden, members of the Brentwood club towed a 9 ft. glider behind a van, but at 22 m.p.h. there was still no indication of a climb. Suggested now is conversion to power—something about 30 h.p. being envisaged!

An unusual situation in **CAMBRIDGE M.A.C.** was a tie for top place in the annual challenge trophy, which will be held jointly by B. Lipscombe and D. Miller. Latest idea dreamed up is 1,000 lap racers using 1 c.c. motors and 15 c.c. tanks.

North Western

The **BLACKPOOL AND FYLDE M.A.S.** recently challenged English Electric M.A.C., and were lucky enough to have near perfect conditions. With power, rubber and glider times aggregated, the Blackpool club had a winning margin of just one minute. Activity is now centred on small scale electric r.t.p. models in preparation for exhibitions; past experience has shown that the public is much more interested in flying models than static displays.

Another Challenge match in this area was between **COLNE M.A.C.** and Blackburn M.A.C., the latter club taking the honours in rubber and power, but conceding first place in sailplane. A full programme of winter contests has been arranged, and any clubs or individuals interested in good day out, should contact K. McClane, 17 Slater Avenue, Colne, Lancs.

Ten competitions spread over 1955, gave **SHARSTON D.M.S.** member E. Hellwell the individual championship, control line champion being M. Cartledge.

After maintaining their standard of contest wins and high placings throughout the year, **WHITEFIELD M.A.C.** have now commenced to fly on a new field at Pilsworth. Combat, speed, and a precision event have been added to the free flight contests normally held in the winter.

Combat still remains first favourite in **LEIGH M.A.C.** predominating design being *Blue Pants*, with any of the hotter modern engines. One member is topping 96 with an Eta 29 racer, but still wants a little more before going into serious competition.

Incidentally, February looks like being a busy month for this area, with tentative arrangements being made for a general winter rally on the 5th, and the indoor Nationals coming up in the Corn Exchange, Manchester, later in the month.

South Wales

Still going strong is the **EBBW VALE M.F.C.**, who are once more spending the dark evenings night flying with control line models. A more mundane occupation, but a very laudable one, is the building of a new clubhouse to accommodate the increased membership.

London

That hardy annual, the Bill White Memorial Cup, and the Winter Glider Cup, will once more be held by **BLACKHEATH M.F.C.** on Epsom Downs on January 8th at 10.30 sharp. Pre-entry is requested, but is not essential; entries are 1s. per comp. or 1s. 6d. for both, juniors 6d. per comp., there is a special prize for the latter.

A new club has just been formed at Bifron's Youth Centre, Barking, meetings being held each Wednesday at 7.30. Workshop facilities are laid on, and membership in the club allows participation in the centre's other activities, which include everything from maths. to motor-cycling. Minimum age is 14 and there is no upper age limit; all branches are covered

The hall of Hatfield Technical College is quite suitable for small microfilm models, and **ST. ALBANS M.A.C.** have laid on interesting winter programme, including flying these models in the hall. Other attractions include the possibility of John Cunningham giving a talk to the club.

Wednesday evenings see **HAYES M.A.C.** meeting in Townfield School, Coldharbour Lane, Hayes. Unfortunately, no indoor flying is possible, but the meetings are made enjoyable by discussions, etc. The club finished up the year by being beaten on a clean knock-out by West Middlesex M.F.C. in the final of the L.D.I.C.C.

Winter activities in **NORTHWICK PARK M.F.C.** include a Brains Trust, and it is hoped that well-known modellers will accept invitations to give talks on interesting subjects.

East Midland

FORESTERS (NOTTINGHAM) M.F.C. took a day off to run the team race and combat events at Loughborough Rally, and applied their knowledge of processing to the extent that two-thirds of the entries required modification, one even going so far as to build a new tank on the field! Geoff Pike claimed that his radio model had lost control of the transmitter, and set off in hot pursuit, retrieving the job from a chimney stack!

Southern

J. Manville of **BOURNEMOUTH M.A.C.** won both power and A/2 Eliminators in the last contest of the year, which was excellently run at Larkhill by **SOUTHAMPTON M.A.C.** One outstanding model was R. Hirdes' German style A/2.

Club membership in **FARNBOROUGH M.A.C.** is on the upgrade, the total now being around 40 with a large proportion of juniors. Half a dozen members attended the Larkhill meeting.

South Midland

The film of past activities of **LUTON D.M.A.S.** is getting to be quite a length, since more is added each year. The latest edition, including 1955 activities, will be shown on January 26th, and an open invitation is extended to anyone interested. The programme of winter contests, held on the first Sunday of each month, is proving popular and well supported. Membership is near the 30 mark, and a sincere welcome is extended to any local modellers who would like to enjoy their hobby in good company. Full information can be obtained from the local model shops.

Northern

Quite an interesting idea in **HEANOR D.M.A.C.** is a "one night building competition" to build models for the local model shop. Competitors stand the price for the kit if anything goes wrong; points are awarded for time, finish and cleanliness. A larger clubroom is being sought, so that a spot of indoor flying can be indulged in.

At close of year contests D. Froggatt won power, and L. Whitworth class A; class B is still undecided, as no model reached the final intact. The club would like to take this opportunity of wishing all aeromodellers everywhere a very happy New Year . . .

. . . a sentiment echoed by

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BIFRONS M.A.C.
J. W. Lankester, Bifrons Youth Centre, Bromhall Road, Dagenham.

SECRETARIAL CHANGES

LEIGH M.A.C.
A Priddey, 487 Holden Road, Leigh, Lancs.

NORTHWICK PARK M.A.C.
E. de H. Rowntree, 36 Pinner Park Avenue, Harrow, Middlesex.

SELBY M.F.C.
M. Firth, 19 Staynor Svenue, Selby, Yorks.

REGENTS PARK M.F.C.
R. Dee, 15 Oakfield Crescent, London, N.W.5.

GRANGE M.A.C.
J. B. Hargrave, R.A.E. Apprentices Hostel, Farnborough Road, South Farnborough, Hants.

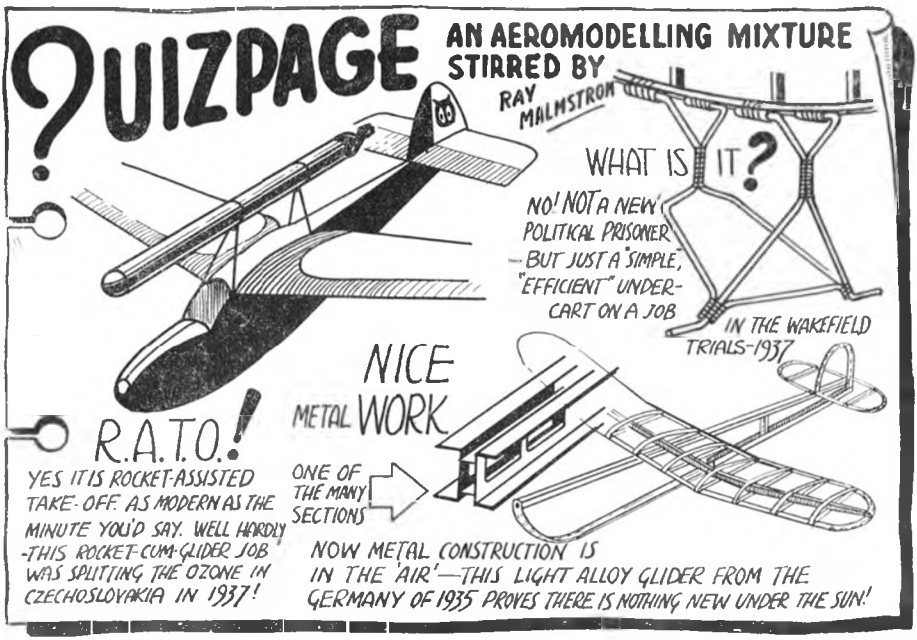
MONKSPATH M.A.C.
R. Nailer, 8 Slater Road, Bentley Heath, Knowle, nr. Birmingham.

SHARSTON D.M.S.
E. Helliwell, 10 Standcliffe Road, Sharston, Wythenshawe, Manchester.

SCHOOL OF ELECTRONICS M.S. (ex-Park View A.S.)
F. D. Hurlston, Park View Hostel, 33 Abbey Road, Gt. Malvern, Worcs.

NORWICH M.A.C.
K. E. Nash, The Stanley Arms, 33 Magdalen Road, Norwich, Norfolk.

NORTHERN AREA.
K. F. P. Rutter, 40 Lawrence Road, Leeds 8.



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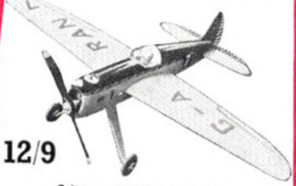

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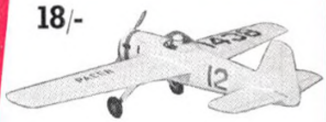

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