March 1973

Aero Modeller

MAP HOBBY MAGAZINE

15p USA & Canada 75c.

INCORPORATING
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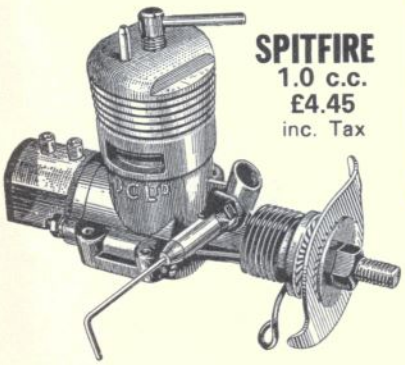

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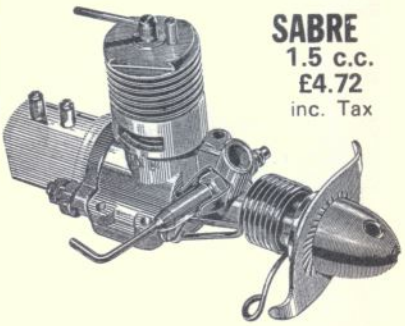

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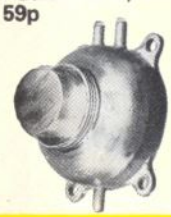

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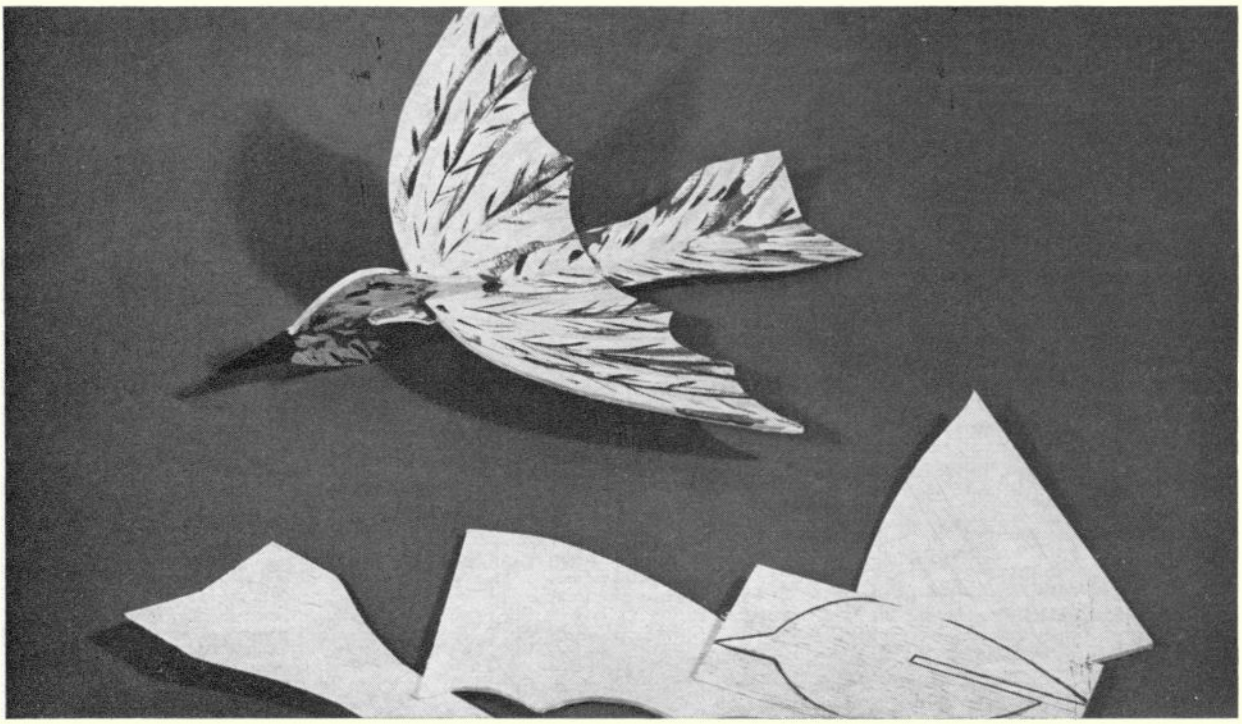

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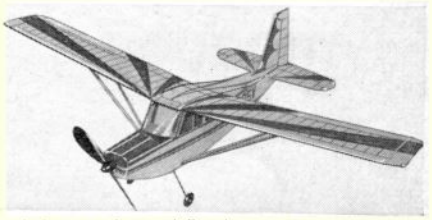

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

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COMMENT

Manufacturers' order books were bulging after the extremely successful British International Toy Fair at Brighton and the London Trade Fair in January. Business is booming in a big way. Every exhibitor dealing with the model side of the toy market was able to report a high percentage increase in demands for kits of all sorts . . . of all sorts that is, *except* those for flying models. For not a single flying model kit was on show at these huge trade exhibitions. Well over 100 new plastic scale kits illustrate the confidence enjoyed by all the large companies involved in the highly competitive injection-moulded styrene kit trade. In fact, we might even say that the forward production plan for 1973 is more exciting for plastic kit modellers than any previous year.
YET – not a single flying model kit!
Why? Model shop trading may not match the Toy shop volume, but it still accounts for a fair amount of turnover. And it also represents an equivalent enterprise in the preparation of new kits, accessories and equipment for a very live community made up of you – the readers of this and other modelling magazines.
Our answer to this situation is the 1973 EXPO at Sywell on Easter Sunday and Monday, April 22nd and 23rd. Promoted by Model and Allied Publications in conjunction with the Barnstormers air display, our Model Trade Show will provide an inspiring counterpart to the Toy Trade Fairs. Over 25 exhibitors, a first-ever Helicopter/Autogyro Rally, plus continuous flying demonstrations, Model, Full-size and Helicopter, will make Sywell a magnet for retailers and modellers over the Bank Holiday.

on the cover

Cathy and Jack Allen, best-known team of all the 'contest couples' through their many years of continuous activity in free-flight, with Jack's unusual high-tailed power model in vivid puce decor – at least, it cannot be confused with anyone else's!

next month

Vintage fans will be delighted with the plans of Jim Cahill's **Clodhopper** international winning Wakefield – a machine with real character. Our **Beginners' Series** continues with tissue-covering advice, while on a large scale, Chris Roper describes how he built the wings for **Jupiter** – his man-powered aircraft. Kit review of the Pegasus Models' **Minilord**, plus all the regular features (including **two free plans**) make April's another bumper issue – on sale March 16th.

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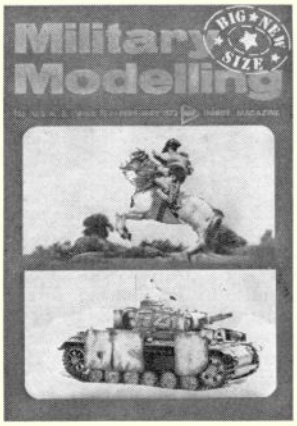

LOOK FOR THIS COVER!

Issue No. 2 (February, 73) of the new big size *Military Modelling* magazine is on sale from January 26th and maintains the exceptional quality of issue No. 1, which delighted so many military modelling enthusiasts. (Some 45,000 of them!).

Key highlights of 'Big issue No. 2' will be visits to Hinchliffe Models and Helmet Products, Figure Reviews for a new series of Gladiator models, Young Winston and an 'Algeria 1960' diorama, plus a review of U.S. Infantry Figures for model soldier fans, together with painting techniques described, the Napoleonic Wargame, Kit Reviews for Tamiya's 88 mm gun, M10-A1 Tank and American Jeep for military vehicle devotees and wargamers. In addition, there are 1/76th scale plans for a wartime Bedford Fire Tender, Readers' Letters, Pics of the Month Competition, International Plastic Modellers Society National Championships and a Desert Chevrolet Truck, plus all the regular trade news and reviews . . . and still only 15p! So look for this cover!

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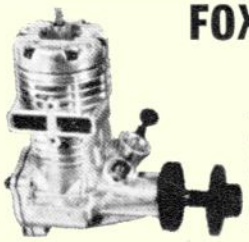
FOX STUNTERS

Control Line sport flying is essentially aerobatics – naturally, Fox engines, the 29, 35 and 36 have led the Control Line stunt field for so long that we've lost count of the many, many such contest wins achieved with these motors. But the record speaks for itself . . . for Control Line Stunt, use Fox!



FOX 35 STUNT £6.96

Wt.: 6½ oz. R.P.M.: 9,600
Displ.: 5.7 c.c. With 10 x 6 Prop.

January 1949 saw the first deliveries on the first Fox motor designs specifically for control-line stunt flying. The size, weight and running characteristics so successfully filled the need that over 50% of all stunt contest winners used Fox 35. Today, the Fox 35 is built to the closer tolerances and performs more uniformly, otherwise little has been changed from 20 years ago. It takes the B Size Fox Silencer.

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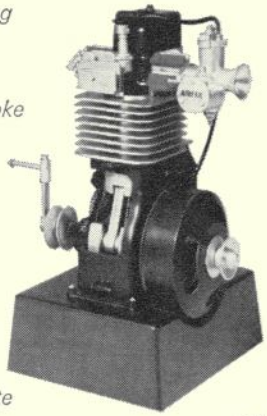
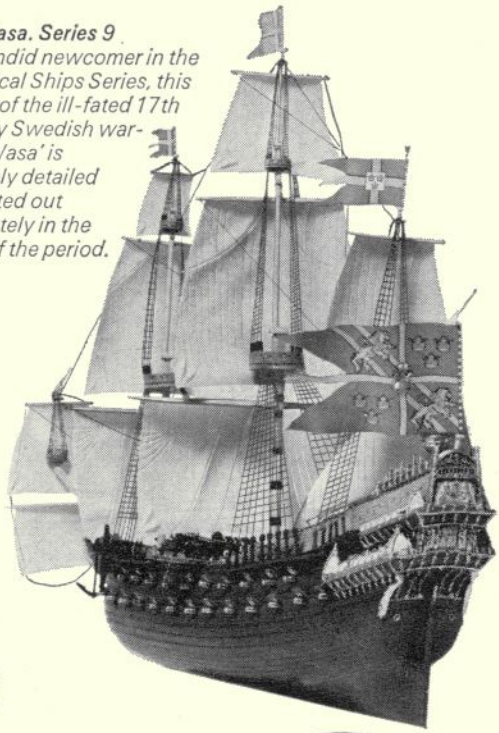
Four Stroke Cycle Engine. Series 7
This, the latest fascinating model in the Collectors Series, illustrates the principle of the German Dr. N. A. Otto's Four Stroke Cycle Engine of 1860.

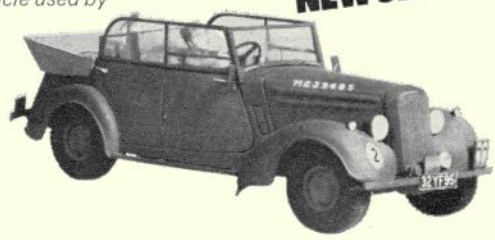


The Wasa. Series 9
A splendid newcomer in the Historical Ships Series, this model of the ill-fated 17th century Swedish warship 'Wasa' is superbly detailed and fitted out accurately in the style of the period.



32nd Scale Monty's Humber Series 5
This unique, personality car of World War II introduces a completely new Airfix V.I.P. series. The 133-part kit, complete with appropriate decals, builds the vehicle used by Field Marshal Montgomery in the later stages of the Second World War.

NEW SERIES



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Airfix magazine – *a 'must' for modellers, 15p monthly.*
Airfix books – *'HMS Victory', 'Mayflower', 'Spitfire' and 'Me 109' – all available now!*

AIRFIX

On a cold and rainy March day in 1945 the 335th Fighter Squadron attached to the 8th Army Air Force in England took off on a strafing mission against Prrezlau aerodrome, 40 miles from Berlin. The outward trip was without incident, but as the squadron swooped down on the aerodrome, Major McKennon's P51 Mustang was hit by flak. His Merlin engine immediately lost all oil pressure and as smoke wisped into the cockpit, McKennon realised that he would have to leave – and quickly.

Pulling the plane hard over into a glide away from the densely populated area, McKennon got ready to go over the side. He pulled the canopy release and tried to push himself clear. Partly in and partly out of the aircraft he found himself caught on the rudder pedals; the plane by this time in a dive. In desperation he tugged and finally tore himself loose and out; just missed the tail of the Mustang; pulled the ripcord and floated down into enemy territory.

He hit the ground and pulled the 'chute off – then raced for some trees on the far side of the field, but then McKennon noticed another Mustang trying to land in the same field he was in. After three tries the Mustang pilot managed to put the 'plane down– no mean feat on a fairly small hayfield, and in enemy territory; and began to make frantic motions for McKennon to come over. McKennon ran towards the aircraft and then recognised George Green, his wing man. Green got out of the cockpit and McKennon climbed in; Green then got into the cockpit on McKennon's lap, dropped the fuel tanks to lighten the load and revved the engine.

Whilst the McKennon pick-up was going on, German soldiers had been converging on the scene and were soon running across the field towards the Mustang, firing as they came. P51's from McKennon's squadron were circling overhead and, as soon as they recognised the new danger, screamed down

on strafing passes, forcing the Germans to run for cover away from Green's Mustang. Green taxied the 'plane to the end of the field and pushed the throttle all the way forward to the firewall and the Mustang started rolling and bumping down the field. The 'plane was double loaded, the field was small, the surface was by no means designed for aircraft landings and a row of trees dominated the 'plane's take-off path. When it looked as though the Mustang must smash itself into the trees, it leaped into the air, undercarriage scraping the top-most branches.

On the homeward trip there was very heavy rain and poor visibility low down, forcing McKennon and Green to climb to 15,000 feet before reaching the channel, and the two pilots had to take turns with the only oxygen mask to keep them from blacking out. Less than three hours after leaving the Berlin "airfield" Green's Mustang landed at Debden with both pilots safely aboard.

The P51 Mustang was one of the "bravest" aircraft used in the Second World War and fought in a number of historic air battles over France, Germany and in the Pacific. This small, highly manoeuvrable 'plane was regarded as a friend to most pilots who flew in them – and they were given highly individualistic names, especially by American pilots. The 'plane became most famous as a long range escort fighter for day-bombing over Europe, though it showed its excellence during every operation that it undertook.

Revell produce three models of the P51 Mustang, two in 1/32nd scale and one in 1/72nd scale. The 1/32nd scale aircraft are the Malcom Hood P51 and the Mustang P51B. The 1/72nd scale aircraft is the P51D with the bubble canopy which was used in the later stages of the war. These are just three of over 230 models produced by Revell, the largest manufacturer of model kits in the world.

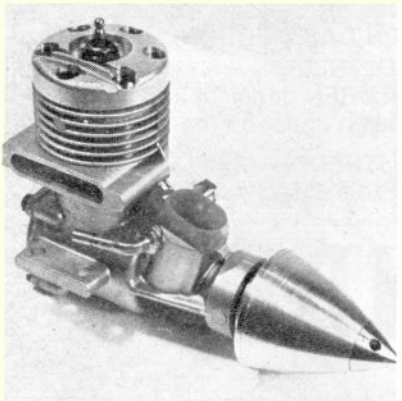
SUPER Tigre Choice of Champions!

THE NAME THAT STANDS FOR SPEED & POWER

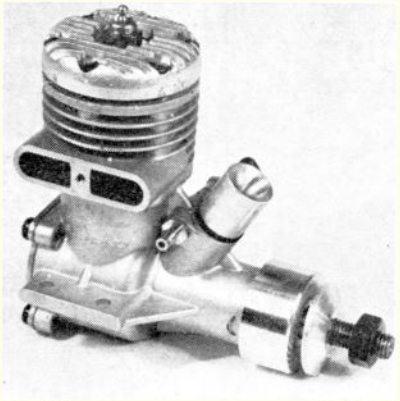
Firstly, some good news; in last month's (Feb.) advert, we indicated a price increase was imminent from our Italian supplier, a recent phone call has now advised us that there will be no change in prices until June '73 at the earliest, so all our current prices will remain unchanged.

We have had many requests concerning deliveries of the new X.15 motors, and we hope to have precise delivery date when we return from the Nuremberg Toy Fair, 8th February. What can be said is that a whole new series of top-class competition motors is under development in .15, .29, .40 and .60 cu. in. clases and that these will meet the very high standards required for the coming competition seasons.

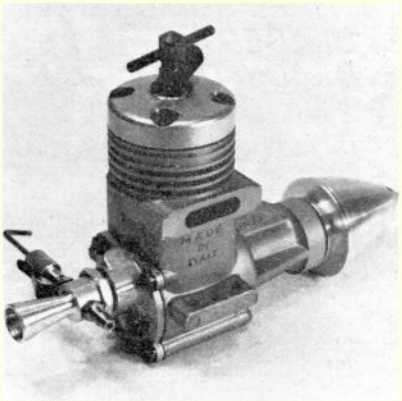
One more development is a new generation of quiet venturi silencers – 10 Dbs less than current type. The first of these to appear will be for the G60 Bluehead about the end of January. The latest G40 pylon engines are now in stock. Ross Twins and Ross 4-cylinder motors stocked.



G.15 F.1 GOODYEAR **£13.52**



ST.35 **£11.35**



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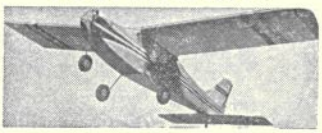

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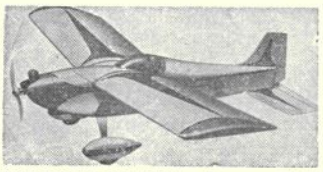

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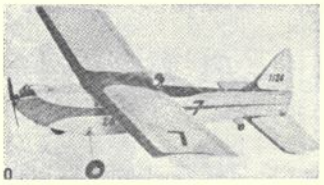

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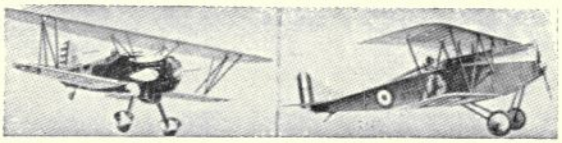

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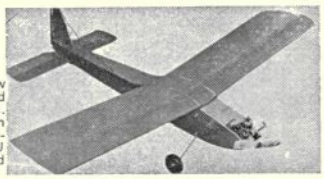

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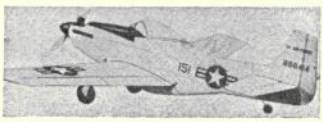

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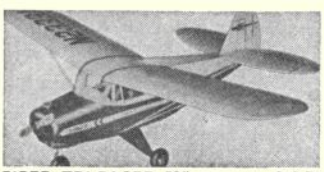

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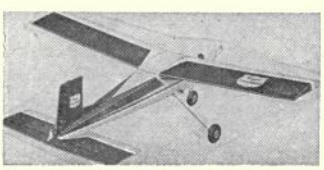

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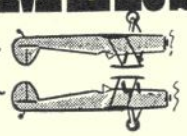

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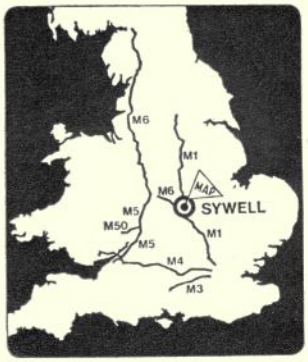

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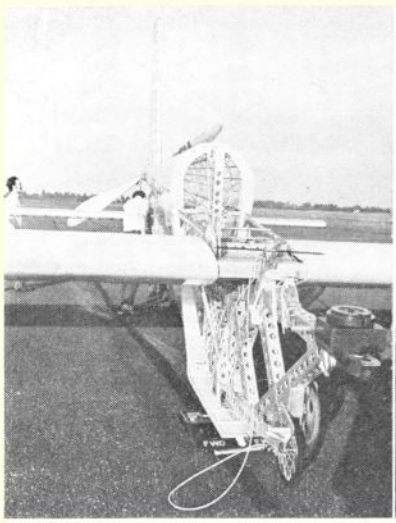


Heard at the HANGAR DOORS

ISSUE No. 66 of the S.M.A.E's newletter *Model Flying,* was a very important one, so a special distribution was made to all 1972 members, even those who have yet to rejoin for 1973. If you were missed out, contact the S.M.A.E. Newsletter Editor at 26 West Drayton Park Avenue, West Drayton, Middlesex UB7 7EA.

In addition, should any overseas clubs or organisations wish to receive copies of *Model Flying* on a regular exchange basis, they are invited to write to the above address.

TOUCON, the world's first two-man powered aircraft made three flights on December 23rd at Radlett Airfield, Hertfordshire – the longest covering a distance of 68 yards and rising to a height of 2 ft. Pilot was Bryan Bowen, his crewman Derek May – both of whom provided power for the tail-mounted pusher propeller.

Construction of the 123 ft. span machine began in 1967 by the *Hertfordshire Pedal Aeronauts* – a group formed mainly from engineers of the now defunct Handley Page Aircraft company. Materials used are balsa, spruce, plywood, and expanded polystyrene while the crew are supported by a light alloy box-type structure. Unladen, *Toucan* weighs 210 lb. Lateral control is by slot-lip ailerons, pitch control via the all moving tail. Minor modifications have now been made for flight trials, which it is hoped will then culminate in attempts to win the Henry Kremer prize.

1972 BIC Model Making Competition winner was Laurie Burrows of Catford, London – a keen aeromodeller. His winning entry, a traction engine constructed entirely from discarded Bic ball-point pens, earned him a silver plated tray plus a cheque for £250. Biro Bic have been sponsoring this model making competition during the past year and have awarded quarterly prizes of £25 to the three best models from each quarter entering the 1972 National Championships.

MODELLERS' ACCIDENT PROTECTION INSURANCE, operated by *Aeromodeller* and its sister magazines, is arranged as a reader service for *individual* members who are prepared to place a regular order for these M.A.P. Hobby Magazines. We re-emphasise this because a misunderstanding appears to have developed and some modellers obviously regard M.A.P. as a cut-price insurance broker. Applications for membership *must* be made on current forms as included in recent editions of the magazines and and accompanied by the membership fee. Clubs wishing to enroll all members in the M.A.P. Scheme must ensure that *EACH* Club member submits the appropriate application for entry into the M.A.P. Scheme as an individual. Incidentally, it is because the scheme is based on individual membership that it provides indemnity for any member against claims made by other members.

V.A.T. price adjustments come into effect on April 1st and inevitably they will cause confusion. Some modelling items will reduce, where V.A.T. replaces P.T., others will go up in price as V.A.T. is added, for example to radio control equipment. Since, at the time of going to press one can only *assume* that V.A.T. will be 10%, it is impossible to issue precise changes in advertisements within this issue. As there will be a degree of imbalance between prices, the *Model Hobby Trade Federation* has decided that its members will show inclusive charges on stock items, and will not endeavour to separate the basic charge and V.A.T. on the price tag. Readers are reminded that V.A.T. affects other items too – such as membership of any large *National* body, for example the S.M.A.E. As membership of the latter is on a calendar year basis, prospective members would be wise to join prior to April 1st!

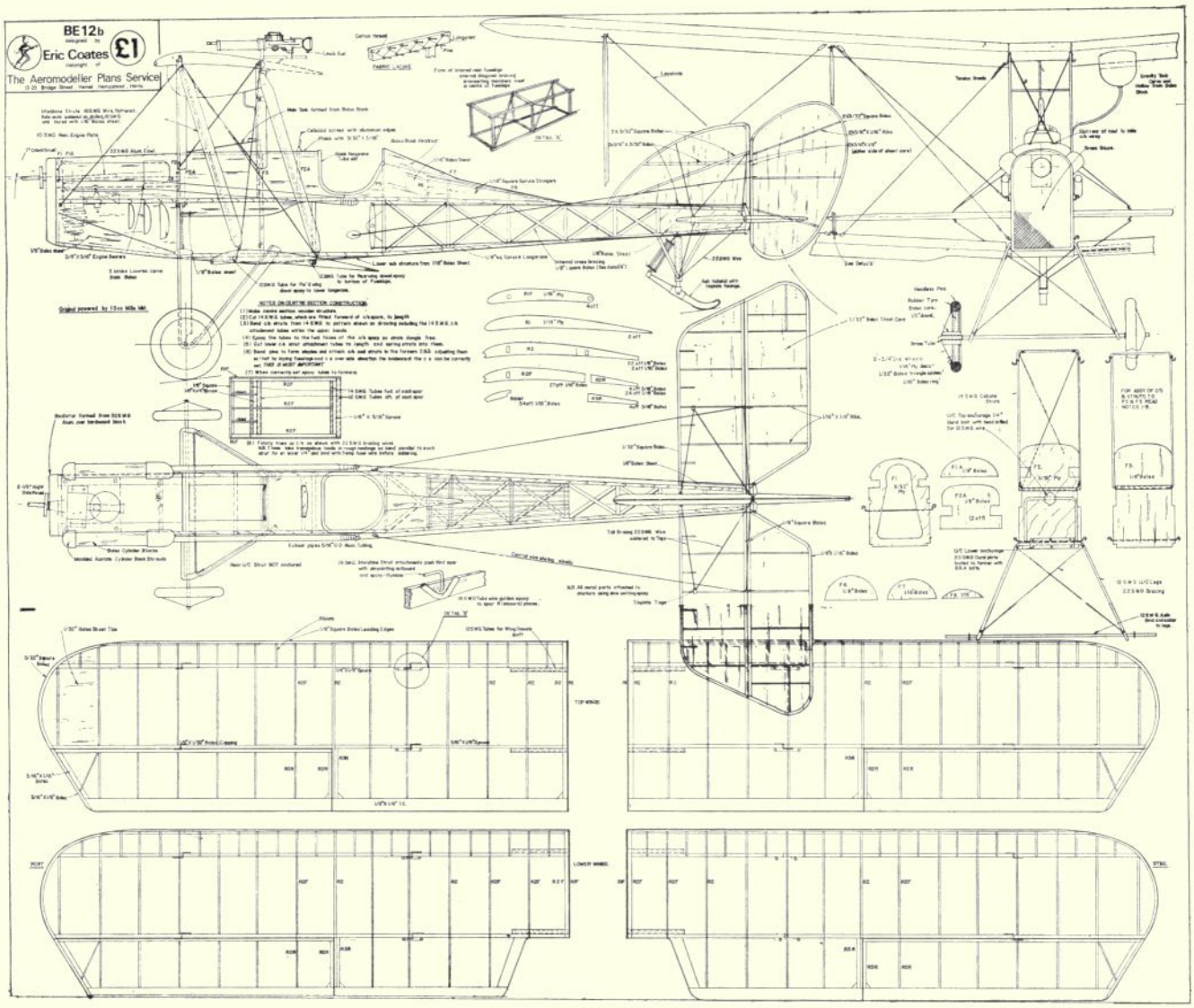
Above: Led by Martyn Pressnell, the Herts Pedal Aeronauts have strong aeromodelling connections and have clearly produced the 'biggest model' ever in TOUCAN.

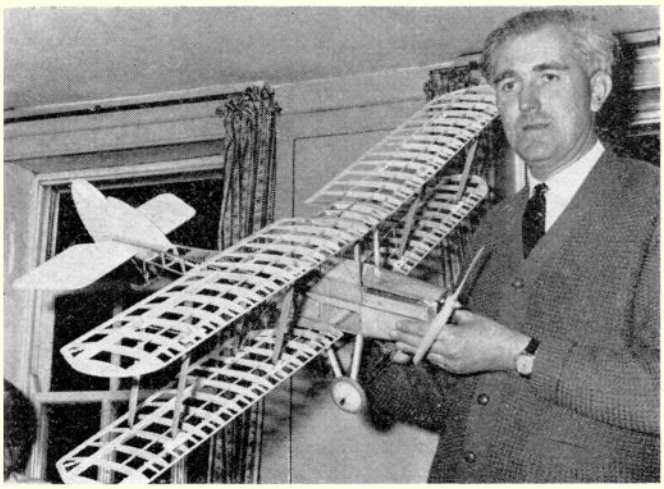
Right: Bic prize-winner Laurie Burrows, better known for his Wakefield and Cd'H. models, with M.A.P. director 'Dickie' Dickson (left).

BE12b

by Eric Coates

At last! Plans for our scale columnist's superb free-flight version of the World War I fighter





THE B.E.12b was the ultimate development of the remarkable B.E.2 series of aeroplanes whose original design stretches back to before the commencement of the 1914-18 war. It is also just about the least known of the series, being produced in relatively small numbers as a home defence single-seat fighter to counter the Zeppelin raids. It was a proper hybrid. The wings were the equal-span four bay surfaces, used on the B.E.2c, to which was married the smaller tailplane of the later B.E.2e. The single-seat fuselage of the B.E.12a was employed, but the R.A.F.4a engine was replaced by the 200 h.p. Hispano Suiza engine used to power the S.E.5a. So crude was the modification that the fuel tank used on the B.E.12a, which possessed a dorsal wedge-shaped fairing to align with the air scoop, fitted between the cylinders of the R.A.F. engine, was merely turned round; to reduce wind resistance presumably. It certainly could not have improved forward visibility!

Armament consisted of either a single or a pair of Lewis guns mounted above the centre section. All night fighters of this era had high mounted armament to prevent the nozzle flash blinding the pilot. In addition, bombs could be carried from racks beneath the wings – presumably to bomb airships; in the unlikely event of a B.E. managing to climb above one!

Irrespective as to how effective this mongrel mixture of components was as a night fighter, it certainly makes a very stable flight model for day time flying. All B.E.s from the 2c onward are stable subjects, but it is virtually impossible to completely hide a model engine effectively in any of the R.A.F.-powered machines; however, almost any inverted engine can be hidden in the 12b. I used a 1947 vintage Mills Mk. 1 1.3 c.c. in mine which is the perfect power unit for this type of model with its long stroke ability to swing a large-scale diameter propeller and rear induction allowing easy choking and needle valve adjustment. Alternatively, if one of these old masterpieces is not to hand, one of the current production 1-1.5 c.c. diesels may be fitted. Unfortunately these are nearly all front induction engines, therefore arrangements will have to be made to choke them and the needle valve will have to protrude through the cowl sides. The engine is not mounted directly to the bearers but on a 10 s.w.g. light alloy plate in order to allow trimming adjustments to the thrust line to be made.

General construction is quite straightforward, and follows along the lines detailed in my recent *Flying Scale Models* series – in fact this model incorporates most of the features mentioned in this epistle. It is not, however, a model for the novice and potential builders should have previous experience of building such models – while it is regretted that back numbers of this magazine containing the aforementioned series are no longer available. For the benefit of builders who may not be familiar with my constructional methods, I will highlight one or two of the less common features.

Fuselage

The fuselage itself is rather more simple than the plan at first suggests – being composed of a simple box shape, spruce longerons forming the basic shape, with sheeted areas at the nose and a simple fairing behind the cockpit. The cross section aft of the cockpit becomes rather small, while the large tail imposes high torsional loads in heavy landings, so to overcome this, internal diagonal bracing laid 'diamond fashion' is fitted where shown to stiffen up the rear end.

The front end is a most distinctive feature, and is bent from 22 s.w.g. aluminium plate in three pieces – the horseshoe-shaped main section, the bottom section and the plate behind the airscrew driving disc. These are quite easily bent to shape over a hardwood former and the pieces then assembled using epoxy resin. The brass gauze is held up flush to the front face by means of $\frac{1}{8}$in. balsa side cheeks epoxied in place. The top cowl is simply bent to conform to the upper contours of formers F1A and 2A and trimmed to be a close fit around the engine banks and shrouds. It is held in place by means of a large

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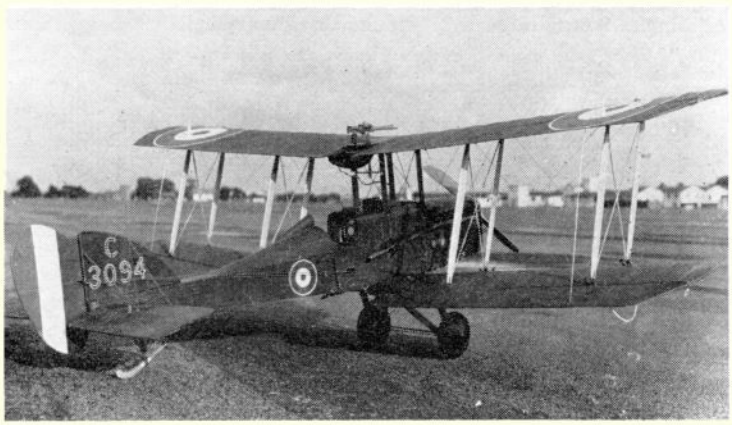


How can you resist this beautiful one-twelfth scale model, especially when it looks so realistic parked upon the tarmac? Will perform smooth take-offs, too.

press stud, both halves of which are first soldered to pieces of tinplate before epoxying respectively to the underside of the top cowl and a suitable $\frac{3}{8}$ in. balsa former bridging the engine bearers.

The whole appearance of this front fuselage is improved if all the metal panels are represented by very thin aluminium plate, such as certain types of stencil plates, epoxied to the wooden base structure. After painting, a light rub over with fine wet and dry paper just scratches the edges of the metalwork in a most realistic manner.

The undercarriage itself is a torsion bar unit bent from a single piece of 12 s.w.g. piano wire – in order to allow the torsion bars to work correctly the rear struts should *not* be anchored but be allowed to move freely backwards. The $\frac{3}{32}$ in. sheet fairings are epoxied to the rear of the 12 s.w.g. legs after the spreader bars have been bound in place with fuse wire and soldered securely.

Tail surfaces

These are made by first making the position of all spars and ribs onto medium 1/32in. sheet then cutting the sheet to match its outline shape. The profiles are then turned over and the structure again marked on the opposite side – this is best achieved using carbon paper between the plan and sheet; just tracing over the drawing. The structure is then built up on either side of the sheet and then sanded to section. This method of construction may appear strange to some people but I recommend it to be well tried; no other method will produce such a strong, warp free structure, with very small section edges and scale thickness. The curved edges can best be produced by nicking the inside edge of the strip at about $\frac{3}{32}$in. intervals with the thumbnail.

Wings

Centre disposed spars are used so as not to spoil the appearance of the fabric surfaces. The ribs are slid onto the two spars 'on block' and then moved to their respective stations before pinning the spars down, onto the correct height of packing on the drawing. The ailerons should be built as separate items, then glued to the wings afterwards. Bind and epoxy wing tubes and strut mounts securely in position.

The only awkward part of the wing construction concerns the centre section (although this is really part of the fuselage to all intents and purposes) Again, this is not difficult, but great care must be taken to ensure accuracy when bending the various wire parts to length – and check and recheck that the wing incidence is as per plan, and that the whole assembly is 'square'.

Covering

The whole model is covered with lightweight Modelspan tissue clear doped and then covered with lightweight silk. The upper surfaces are then doped khaki. I have not shown a great deal of detail on the drawing as this is best interpreted from contemporary photographs. Imperial War Museum photos Q67262, Q67332, Q67261 and Q6733 are particularly good examples.

Rigging

As an alternative to that which is shown on the plans the interplane struts can be made from $\frac{1}{8}$in. sheet slit at each end and small pieces of tinplate epoxied in.

Stranded control line wire is used for wing rigging (landing and flying wires) while shirring elastic is used for all the control wires and incidence wires. Twenty-four s.w.g. piano wire is employed for static tail rigging and this latter is essential to brace the thin sectioned tail surfaces.

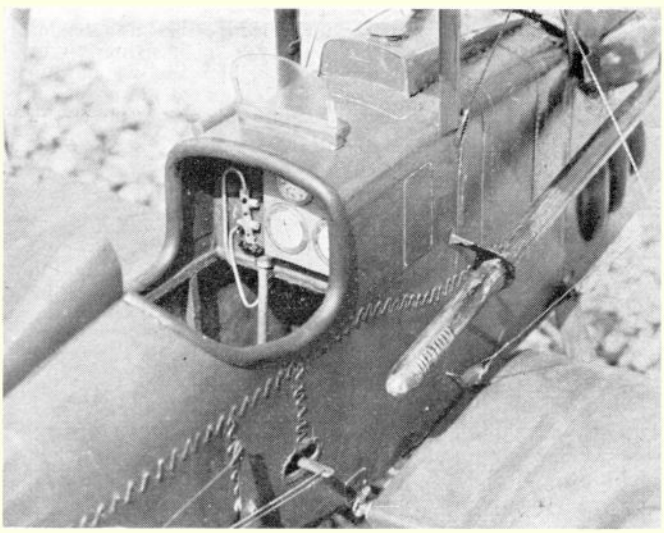
Flying

The 'B.E.' is a very stable model and as far as scale models go, is relatively easy to trim. The elevators and rudder are attached to their respective fixed surfaces by tinplate hinges which should be stiff enough to prevent the surface moving due to landing inertias. The surfaces are very large, however, and therefore very powerful, particularly the rudder. It is essential to make adjustments in very small amounts; measuring and recording the position of each surface using a straight edge and rule all adjustments are measured along a predetermined rib at the trailing edge.

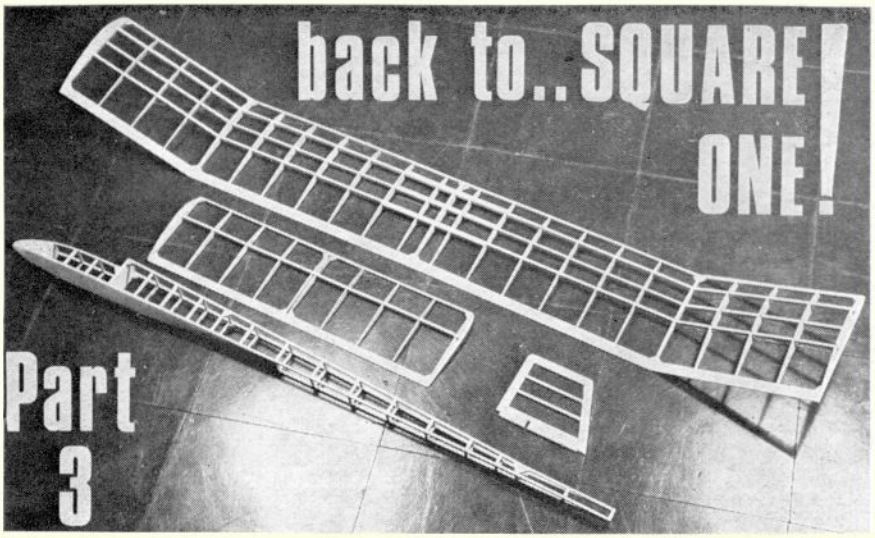
First ballast the aircraft to balance at about 50 per cent chord on the upper wings. The model is first tested for a straight level glide over long grass.

Low powered flights are then made, again preferably over long grass. Aim for a wide left-hand turn on power; the glide can be either to the left or right. When trimmed, glue the elevators to the tailplane, but leaves the rudder freely hinged. If the model turns over when it lands it will knock the rudder, and it is, therefore, paramount that the rudder setting is checked before *every* flight.

The original takes off from tarmac beautifully – a straight run of about 40 feet is followed by a fairly steep straight climb out before settling into wide left hand circles. This is one of the few scale models which will allow turns to the right under power without winding in – such is the stability, which does make it forgiving during trimming. However, I don't recommend it as standard trim as I feel, one is always courting disaster when turning in this direction!



That's detail for you – and helps explain why Eric has had so many contest successes with this model. Build one and beat him! This model incorporates most of the features discussed in his recent series 'Flying Scale Models'.



back to..SQUARE ONE!

Part 3

Our beginners' series continues with building the flying surfaces of the Mercury Swan

THE WING, not surprisingly, is the most important single item on an aircraft, and thus the accuracy with which it is built will be a direct reflection on its ultimate performance. So beware – if the wing is made badly, the model itself can hardly be expected to fly well. However, do not despair, even if this is the first wing you have built – with a truly flat building board and a little patience, you should have no difficulty.

The **Mercury** *Swan's* wing is very conventional in its structure, and thus the remarks made concerning this item will apply to most glider wings – the main exception perhaps being in the manner of making the ribs – some kits will include die-cut ribs, in which case much of the following work will be unnecessary, while those building from plans will produce their ribs from templates, but that is another story, and will be dealt with at a later stage.

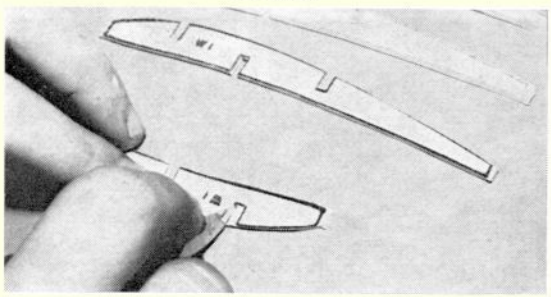
Ribs for this model are printed on to sheets of balsa, so the first task is to cut these out. This should be done with a sharp modelling knife, held vertically, and cutting slightly oversize – in fact, cut to the *outside* of the black printed outline. Leave the ends of the ribs at least $\frac{1}{8}$ in. oversize at this stage. When the ribs have been cut-out, the spar slots should be made – this time cutting to the inside of the lines indicated, and checking that the slots are a tight fit on to the spar material ($\frac{1}{8}$ in. x $\frac{3}{16}$ in.). This done, the next task is to ensure that all the ribs are of exactly the same dimension. To do this, select the ribs necessary to make the wing centre panel (12 of W1, 4 of W2), stack them together and then place three short pieces of the spar material into their respective slots. Make sure that the ribs are aligned to one another and that the stack of ribs is 'square' in all directions, then pin together from either side to prevent them from moving.

Now, taking the sanding block once more, carefully sand the ribs down to the inside edge of the black line evident on one of the exposed ribs – check that the block is sanding the stack equally and squarely without chamfering the ribs. Perform this task slowly and carefully, checking for accuracy. When satisfied, unpin the stack and trim the *leading edges* to the exact length indicated. The reason for not trimming the ribs to the exact length before, is that when sanding it is all too easy to 'round off' the extreme corners. In this case, these corners are scrap anyway – so it matters little! The same applies to the trailing edge, although this will be trimmed to length at a later stage.

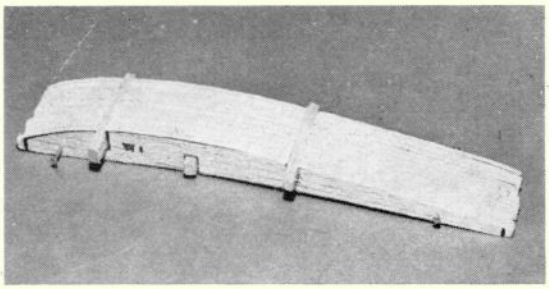
Attention is now reverted to the building board once more – and, as before the plan should be taped in position and covered with polythene. Cut the leading and trailing edges to length, together with the spars, which should be joined together at the centre with braces cut from the same material. One point here – you may find that the $\frac{1}{8}$ in. x $\frac{3}{16}$ in. sizes stated for these spars is a nominal size only, some of ours were definitely thicker, so choose similar sectioned wood for the lower and upper spars. The wing features an undercambered section (i.e. the lowest surface is concave), so the lower spar must be raised accordingly – in this case pin scrap $\frac{3}{16}$ in.-thick wood at various stages along its length to support it. Pin the spar in position.

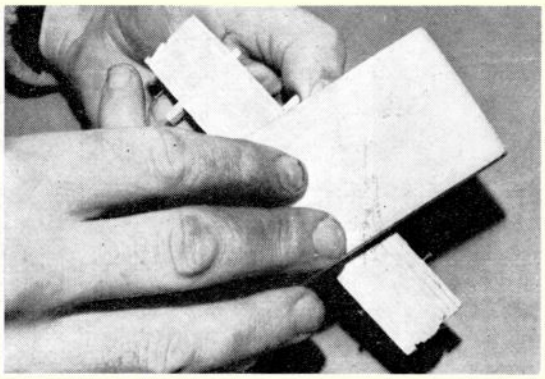
The instructions provided state that the ribs should now be added, followed by the leading and trailing

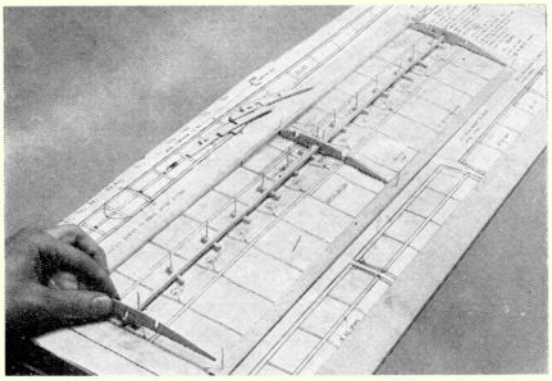
When cutting out the ribs, cut to the outside of the die-printed line, and leave overlength. Take care when cutting out the spar slots, especially the rearmost, that the rib does not break.



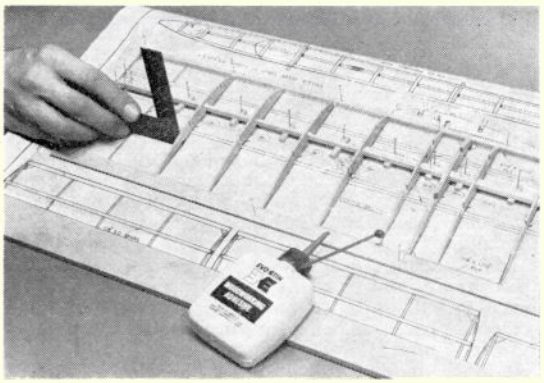
A set of ribs ready for sanding – note how scrap pieces of spar material are used to locate their positions, while pins hold them all together.







Above, a set of ribs being sanded with the aid of a sanding block. Work slowly and take care to sand the ribs squarely. Above right, three ribs are used to check the spacing of the spar/leading/trailing edges. Note how the spar is raised 3/16 in. off the building board to suit the undercamber. At right, a square is shown being used to check that the ribs are vertical. Trim each rib to exact length before gluing in position.



edges. While this procedure could be pursued, we preferred not to, as this is not the easiest way to produce a good wing. Why not? Simply try it – you will find that no matter how carefully you have trimmed the ribs to length, there will be some slight variation (the printed outline is not that accurate) and consequently some ribs will touch the L.E. and T.E., while others would not. Instead, we prefer to pin these components to the plan first, and trim the ribs to suit.

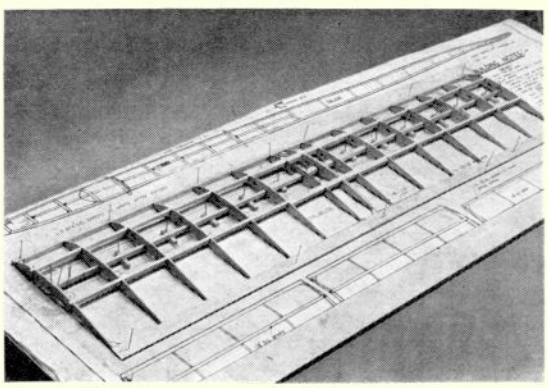
Therefore, the L.E. and T.E. were both pinned in place, the two halves being joined together with the $\frac{1}{16}$ in. ply reinforcement at the centre section. If the $\frac{3}{16}$ in. x $\frac{3}{16}$ in. L.E. is not too hard, then one may pin directly through it – otherwise, place pins either side, as with the fuselage construction. Check that the spars plus leading and trailing edges are in their correct relative position by testing with ribs at each end and at the centre. When satisfied, they may be pinned securely in position.

Now add the ribs, trimming the trailing edge exactly to length, and checking that the slot fits the spar correctly – not too tight, as this may cause it to split, and not too loose either. Use P.V.A. glue for this operation, as the combination of balsa cement and a loose fitting rib on a spar would cause distortion as the glue shrinks on drying. When gluing the ribs in position, check that they are vertical by means of an engineer's square – or in an emergency a match-box will suffice.

All that remains to complete the centre section is to glue the two top spars in place, together with the six gussets at the tip and centre ribs. When completely dry, remove this panel from the board.

The tip sections are now added: note how they are raised up, or given a dihedral angle – a term which will be explained later. As with the centre sections, all the ribs are cut out and sanded to sec-

The centre section is completed by adding the top spars – which should have been joined together with their doublers beforehand. Wait until the glue has completely dried before lifting the structure from the board.



Building on one of the tips. When raising the centre panel to suit the dihedral angle, check that this and the tip are still in line. Construction is otherwise exactly as before — but leave the top spars overlength.

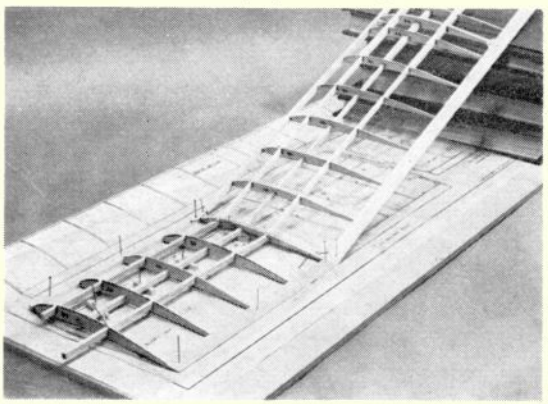


FIG 1

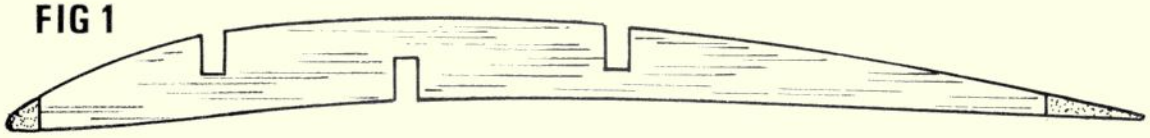


FIG 2

tion together. In this instance, the tips are built on to the previously built panel, thus the procedure is slightly different.

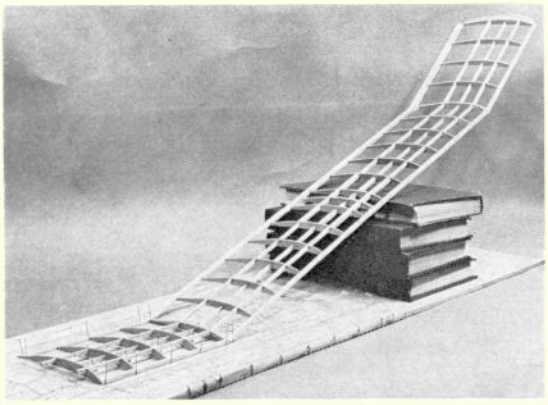
Firstly, glue one rib to the end of the centre section, then line the centre section up with the drawing of one of the tips, but raise this panel so that one end is $9\frac{3}{4}$ in. above the building board – use a block of wood or some books to achieve this. Pin the end to which the tip is to be added to the board when certain that the centre panel is directly in line with the tip – check with a straight edge. Now repeat the building sequence exactly as before, except that the spars and leading/trailing edge must be chamfered to suit the necessary angle – and leave the top spars overlength for the moment. When dry, remove from the board and repeat for the opposite tips – again lifting the centre section tip $9\frac{3}{4}$ in. above the building board.

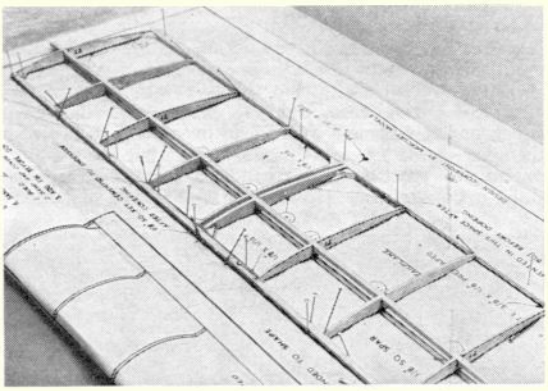
After allowing for the glue to set, cut out the tip pieces, chamfer their lower edges with the sanding block, bevel the ends of the spars to suit, and glue them on at an angle of 45° – holding in place with pins and tape. Again when dry, with the sanding block level this tip plate off flush with the upper surface of the ribs, then finally sand the leading edge to a smooth rounded shape (figure 1), taking care not to damage the ribs.

It is advisable to support the wing by lying flat on the edge of the building board when sanding is in progress. Finish off by sanding the whole wing smooth with very fine glasspaper glued to a block.

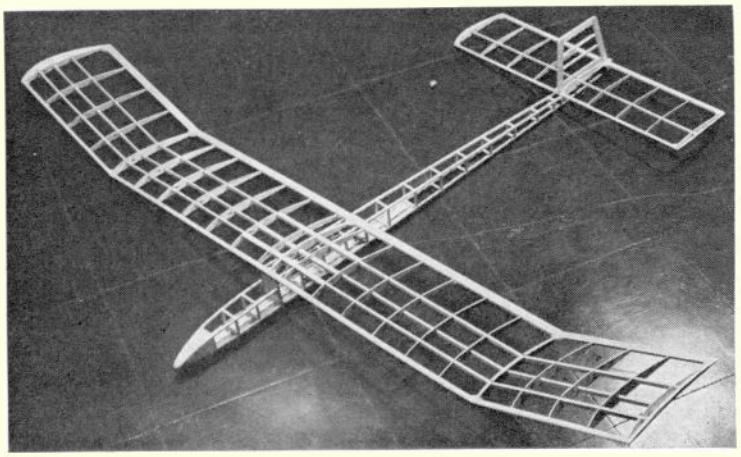
The tailplane is built in exactly the same way as the wing, i.e. sand all the ribs to shape in one block, pin down L.E. and T.E., add the ribs and top spar, followed finally by the top spar. Again sand the L.E. to the section shown (figure 2) and sand lightly all over to remove any roughness. The only point to check here is that the two centre ribs are exactly $\frac{1}{8}$ in. apart so that the fin (which is built directly over the plan from strip balsa) may later be glued in place. You now have all the basic woodwork finished – not so difficult, was it?

Next month: *Covering and doping.*

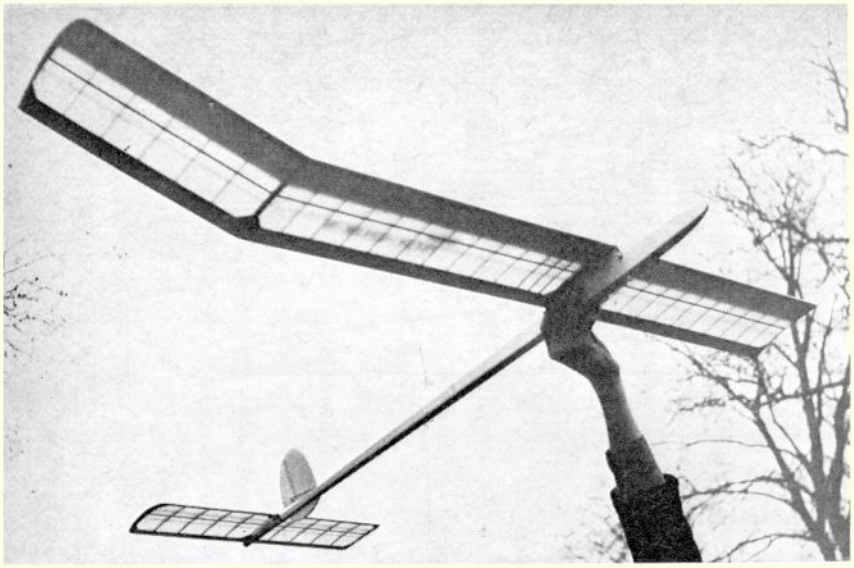




Above, the second wing tip panel is added on in the same way as the first. Make sure that the items used to pack up the centre panel are parallel with the ribs and do not remove this packing before unpinning the wing, as this would strain the wing unnecessarily. Below this is shown the tailplane, which is very simple to make – using the same techniques as employed on the wing. Make sure gap between centre ribs is exactly $\frac{1}{8}$ in. to suit the fin.



All finished bar the covering! When sanding the leading edges to section, support the piece in question flat on the edge of the building board – otherwise the whole wing will 'move' and you will probably damage the ribs. When sanding the tips, support the remainder of the wing to avoid stres



Flying the KEILKRAFT

AQUARIUS

in which Peter Freebrey concludes his review of the latest A/2 glider kit

FLYING the **KeilKraft** *Aquarius* proved to be really quite a pleasure, particularly as the test model had no noticeable vices at all while it also flew 'straight off the board', as in our case no adjustments were needed to obtain the optimum glide trim. Naturally, it is important that the C.G. of the model is made to conform to that shown on the plan, and while we found more lead was needed than was supplied with the kit, there was ample space in the nose to house the necessary ballast without altering the fuselage shape!

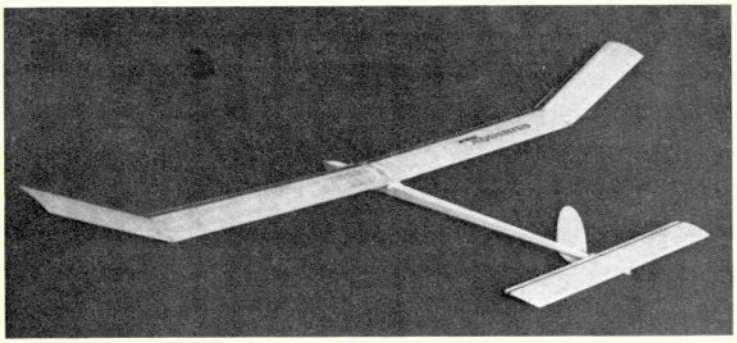
As stated last month, the 'all up' weight of our *Aquarius* was 19½ oz. which includes some 6 oz. of lead in the nose – quite a weighty model and one might expect the performance to suffer in consequence. However, *still-air* times obtained with this model were around 110 secs. which compares favourably with a predicted time of 118 secs., using the formulae and graphs given by Alnutt and Kaczanowski in their article published in the 1970-71 *Aeromodeller Annual*.

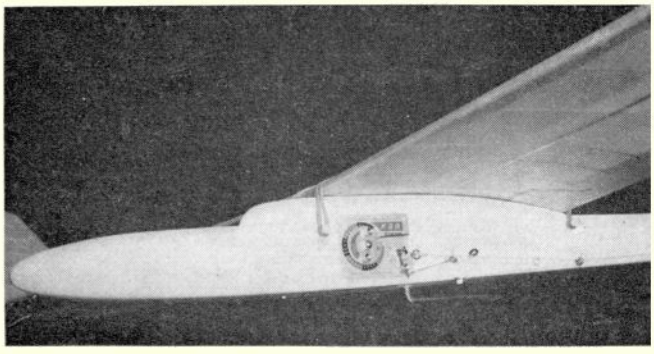
One tip might be given to those builders who choose to build a two-piece wing – it was found that following a landing, one often had to 'dig-out' the rubber bands from between the wing halves, these having slid apart due to the wings not being a very tight fit on the wire dowels. This also meant that sometimes one ended up with anhedral on the inner panels as the piano wire dowels also rotated. This was overcome by using a 1/32 in. ply plate size 1½ in. by 6 in. placed over the join and underneath the retaining rubber bands. Another point to watch is whether the wings have moved backwards or forwards on their mounting, the wooden wing mount dowels are placed a little too far apart and do allow slight movement of the wings. And as this can alter the trim slightly it might be worth while having a small wing stop made from a scrap of 1/8 in. balsa, so that the wings can always be placed in the same position.

We suggested last month that one could uprate the *Aquarius* by substituting balsa ribs for the plastic ribs in the tailplane, so we felt somewhat obliged to try this out! A new tailplane was constructed using the same layout but with balsa ribs cut from a sheet of balsa 1/16 in. by 3 in. by 36 in., weighing ½ oz. – the 14 ribs required weighed about the same as two plastic ribs and the total tailplane weight came down to around 3/8 oz. This meant a reduction of lead in the nose of just over 1½ oz., thus resulting in a model some 2 oz. lighter overall

The performance was, perhaps, slightly better as the model seemed to lose less height when stalled-off the tow line and seemed to flick into thermals a little more swiftly – this last point being a very appealing characteristic (!), somewhat reminiscent of the A.P.S. *Floridian*.

Comparisons between the lightened model and the original are somewhat subjective as to be more exact it would require two models flown many times in similar weather conditions. However, we think that one can safely say that for a small amount of work, i.e., cutting out 14 ribs using a plastic rib as a template, there is a gain in performance; but whichever model is flown the *Aquarius* is a model that is reliable, easy to tow, easy to trim and should never, never be flown without some sort of dethermaliser!





Above, two views of the completed model reveals its simple yet elegant lines – finished in white tissue with red tissue trimmed wings and all white fuselage. At right is shown the KSB dethermaliser timer which Peter fitted – he favours the popular approach of having the timer started as the tow line is released.

JUPITER

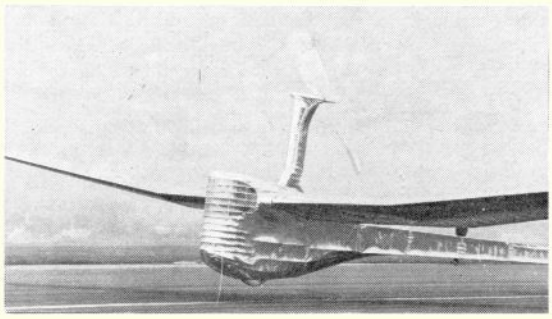
Story of the World Record holding Man-Powered Aircraft (1171yds 2ft 10ins) by the designer — CHRIS ROPER

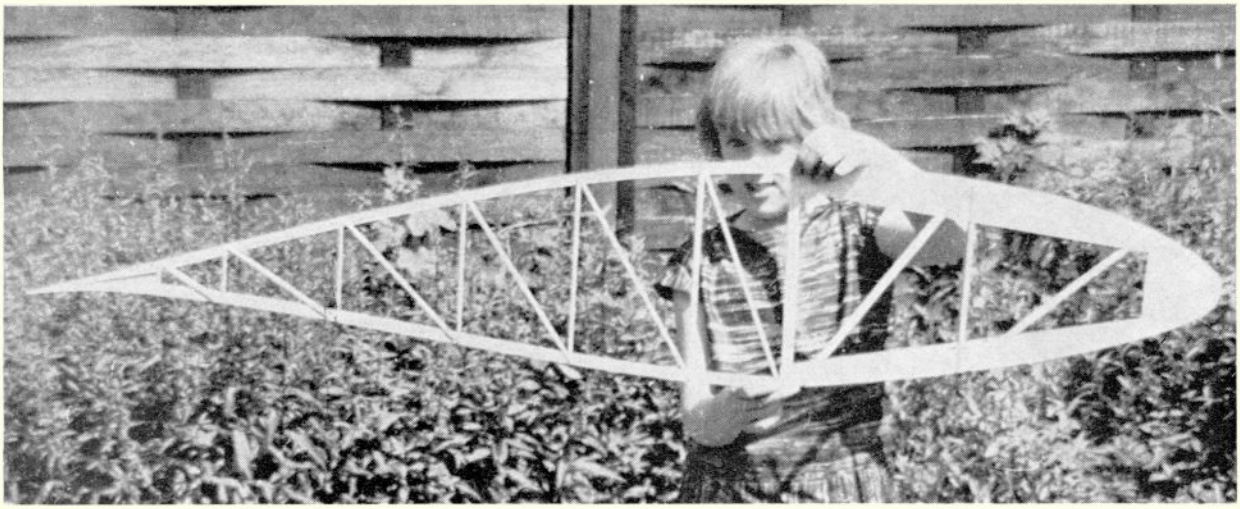
AS AEROMODELLERS, there is no need for me to describe the thrilling moment when your creation first becomes airborne – nor is it necessary to explain that a lot of patient preliminary work is essestial. In the case of *Jupiter,* this meant nine years on my part and a further eighteen months by John Potter and his team. I am often asked *'What made you start to build a man-powered aircraft?',* although a far more relevant question would be to ask what kept me going once I had started. Beverly Shenstone, the father of man-powered-flight in this country provided the answer to the first question when he said that to build and fly a man-powered aircraft is the only great thing still remaining that one man alone can do. Only a hundred years ago, there were things like television and the aeroplane to be discovered or invented, but Baird and Sir George Cayley have accomplished these now and research today can only be accomplished by large concerns with expensive equipment. With a few exceptions – and to build and fly an M.P.A., in other words to leave the surface of the earth using only muscle power, was one such exception. It still is, because not only has no-one taken the Henry Kremer prize yet, but neither has any one person yet seen a project through on his own.

Jubilant designer Chris Roper runs alongside John Potter in the Jupiter (above) as the man-powered aircraft wafts slowly down the runway at R.A.F. Benson. At right, just airborne, the Jupiter breaks ground after a 400 ft. run at a speed of approximately 22 m.p.h.

I got close to it, but in 1970 was obliged for domestic reasons to hand the project over - and I could have found no better man than John Potter to continue this work; his flight performance shows that. For accounts of other individuals who got close to achieving this goal, Dr. Keith Sherwin's book *'Man Powered Flight'* (published by Model & Allied Publications Ltd, price £1·75) is highly recommended.

So, hearing of the attempts being made by Hartman and Perkins, I accepted this challenge, considering that it would be worthwhile doing for its own sake. This was a dream that lived with me – like I might one day hitch hike around the world – but when Henry Kremer offered his prize, I forgot about world-trekking; no-one was offering





Example rib, a view which illustrates the section and the structure. Nose area is sheathed with $\frac{1}{16}$ in. balsa skinning as described in the text. No wonder the wing is light!

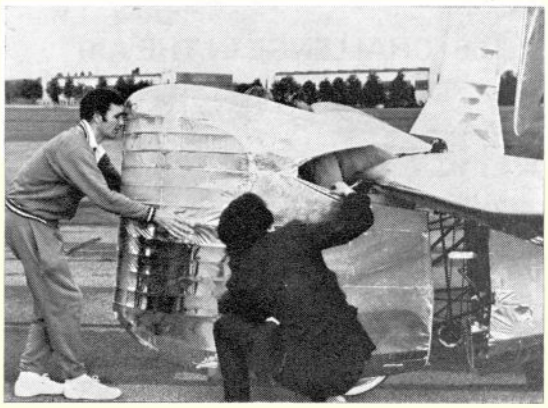
a prize for that! As for the second, and more important question, what kept me going once I had started? One of the ways in which I kept myself 'at it' was to see the various intermediate landmarks; it was almost as big a moment for me when the transmission was completed and that nine foot propeller moved as a result of turning the pedals, as it was when so much later *Jupiter* created a new World Record for man-powered-flight last year.

To appreciate the amount of work involved, let's just examine the propeller. It had to be designed to produce greater thrust per horse power than anything yet flying, namely at least seven pounds thrust from an input of just half one horse power – even fit men like John Potter and Ernie Moore, the two pilots who have taken *Jupiter* into the sky, cannot produce more than that for prolonged periods. And remember, at the time I had myself in mind as pilot, and I am no athlete. It is useless saying that 'when the time comes' you will produce that little extra effort and get the thing off the ground, you have got to prove with proper calculations before you start building that the power required is so much, and that the power available is a little more. Then you can hope, that when the time comes, it will be a lot more!

The propeller was in fact the first component I made and like the rest of the aircraft it had to be lightweight. Now to produce a complex shape, lightweight, yet with a good measure of strength and stiffness means that balsa wood is the first choice material. I said good measure of strength. The propeller was designed to take twice the peak thrust – a factor to allow for vibration as you have to remember that at times the pilot will pedal very hard indeed. NACA 2412, a development of the Clark Y was selected as the airfoil section for the propeller, and the first task was to cut out these ribs from 1/16in. balsa sheet. Each of these was then jigged at the correct angle. Since each blade was made independently in order to allow for pitch adjustment after initial flight trials, the root rib was taken as datum and the others lined up relative to it. In practice we never adjusted the pitch and I think an integral two-bladed propeller would have been just as satisfactory. I reckoned to work to an accuracy of one quarter of a degree, which means four thou per inch or in practical terms just under a sixteenth of an inch over the 14in. chord of the prop. Being more accurate than that is pointless as it soon starts to warp after building. Next, $\frac{1}{4}$ x 1/16 in. spars were let into notches in the ribs, and then the 1/16 in. sheet skin panels were glued on, the temporary jigging rib supports being cut away as the structure was progressively made rigid by the boxing-up effect of the skin panels. Solarbo made a special leading edge section for me, and when that was assembled it only remained to smooth off the profile and provide a good finish.

I put a good deal of thought into how best to acheive a good finish with the minimum of weight, I was not reckoning on achieving complete waterproofness, and of course no fuel proofer was necessary – perspiration proofer perhaps! The only treatment that it received was lightweight tissue plus one coat of dope, although later the prop was covered with Melinex polyester film, along with the rest of the aircraft. It certainly looked good in the silver coloured Melinex when the sun is

Followed by the Press, Flt. Lt. John Potter takes Jupiter majestically down the Benson runway with the slow revving propeller holding an airspeed of 20-25 m.p.h.



Chris Roper in foreground assists the R.A.F. Halton team in 'sealing' the canopy of Jupiter over Pilot John Potter. Once in the 'greenhouse' John has to hold a crouched position in conditions of increasing temperature.

shining and it is turning slowly. The propeller was never tested for efficiency, we only have the performance of the whole machine to judge it by.

The propeller complete, the next job was to make a wing test specimen, that is to make a full size model, using all the correct materials of a typical part of the wing, i.e. the wing correct in chord but only three foot span and not eighty. This was just to prove the feasability of the wing design, and in fact I made three of these before I found one that was satisfactory. The first could only be described as a mess and in particular it was inaccurate in the shape of the nose, since a smooth (I can use the word correctly here for once) streamlined shape, is important to achieve low profile drag. When having to pedal to overcome that drag, you do all that you can to make it small, especially as you're going to have to push eighty feet of it through the breeze! The second wing specimen was of the nose only and this time it was good. The technique used was this: first, the ribs were set at three inches pitch, this pitch being used on the wing at the root where the nose is blunt by model standards, having about one inch radius, and all along the wing, and also on the tailplane where at the tip the leading edge radius is the same as the skin thickness, so the rib is actually pointed. These ribs were assembled to an accuracy of 0.02 inches to one another – this sounds difficult but cotton stretched taut along the leading edge position makes 0.02 in. look like a mile. Next the skinning stage. Three sheets of 1/16 in. balsa were prepared, one to wrap around the very nose, and the other two to be top and bottom panels immediately behind. The framework was draped in polythene, then the three sheets were soaked under a tap until saturated. They were then placed on the wing in the position in which they were eventually going to be glued, and held there by rubber bands. Next morning, the sheets were dry and curved to exactly the right shape. The polythene which had been keeping the framework dry was removed, and the nose panelling glued on. I found it easiest to cut the three panels to correct width and length before the soak treatment, and when gluing the first one on, took care to prevent glue getting onto the outside edge of the ribs where the other panels are going to go, although this proved nearly impossible! Cascamite was the adhesive used throughout, being an excellent glue for all wood, its only drawback being that you cannot make a second gluing operation on top of the first glue once it has set. It is certainly a very good gap filler which is important when you come to fit the next two panels because the front of the second panel never fits the back of the first, even though they were both straight lines before warping, thus a little work with the sanding block and a little help from the gap filling quality of the glue is needed here. The sanding block was the most important tool next to the lino knife, being just a block of wood with 100 or 240 grade, glass paper (I used nothing finer) glued onto it with contact adhesive. You will never catch me using glasspaper on its own or just wrapped around a block. With all three nose panels in place, the remaining skinning could be added without warping as the curvature is less. When completed, a few touches with the sanding block removed blobs of glue or steps at the joints. The next stage was to cover the nose with a sheet of 3/16 in. thick plastic foam as used for upholstery which is very light weighing only the equivalent of an extra 1/64 in. of balsa. It was all part of the process of achieving a good smooth profile shape for a low weight. The foam (applied back to 17% of the chord on the top surface, 12% on the underside) was retained by dabs of glue every few inches.

The third specimen used the same nose construction, but was of the entire chord and included the proper spar. Ribs aft of the main spar were spaced at 9 in. intervals,

Continued on page 161

Basic propulsion unit is via bicycle chain drive from pedal unit to layshaft at top of pylon. Note the fuselage structure and the broad chord of the propeller.

John O'Donnell's

FREE-FLIGHT COMMENT

Man with an armful of 'chukkies' is Ewan Jones – the deserving winner at the annual Wigan Chuck Glider Contest after a long, foggy drive over the Pennines from Sunderland. A left-handed thrower, he used a rather unusual model which featured a wing mounted on a low pylon rather than the more common pod-and-boom style.

TRADITIONALLY the winter months are the time for indoor pursuits – like building new models or renovating old ones. In practice, however, the past couple of months have been quite busy on the flying field, and there are a number of meetings to be reported.

Unique in this day and age is the N.W. Area's *Rootes Trophy* contest – simply because it is primarily a team event, rather than an individual affair. Results are now based on a club's best scores in R/G/P and chuck glider: some years ago it was the best *two* scores, and the difference merely underlines some of the changes that have overtaken our hobby.

Held in good weather at R.A.F. Chetwynd on Guy Fawkes's day, the 1972 event was keenly contested between Falcons, Liverpool and Whitefield. They finally placed in the order just given – but the outcome could hardly have been closer with all three team totals being within a few seconds of each other. The contest was also something of a 'cliff-hanger' in that the results were in doubt right up to the final flights. In fact the interest in *the* decisive flight – John Carters' third glider flight that just max'd to give Falcons overall victory – made the inevitable (individual) flyoffs rather an anti-climax.

There was a three-way rubber flyoff, topped by Derl Morley with five and a quarter minutes – thirty seconds ahead of John Carter and Mike Duce. Power had only two to flyoff with Russell Peers' *'Woodpecker'* gliding well off an indifferent climb to edge out Mike Duce's ½A model. Alan Wood was third with one sub-max flight despite much field-trimming (and advice). I did the only trebles in glider, although there was apparently plenty of lift. John Carter was second, whilst Mike Reeves just squeezed ahead of Dave Barnes to place third. Dave had his revenge in chuck glider when *he* pushed Mike down to second place. Third was a tie between Dave Yates and Ian Allen. The Junior award for the best aggregate over all events was taken by Keith Lord thanks to flying three events to Dave Barnes' two.

* * *

The St. Albans club were certainly fortunate in their choice of 26th November for their **Winter Rally** at Bassingbourn old airfield. The day started with but a gentle breeze, and even this died away as the contest progressed. The lack of drift can be judged by my leaving unused the bicycle that I take for retrieving!

There was plenty of lift most of the day, but one patch in mid-afternoon was almost unbelievable. After maxing, it was possible to relaunch back into the thermal, not just once but twice at least! It was hardly surprising that contest scores were high, and that the three open events all had reasonably large flyoffs.

Taking the events in the order flown-off, open rubber was certainly the most critical as regards the moment of launch. The two highest scores came from the first pair to launch. Both were flying models with comparatively little rubber that presumably were quick to wind. Mike Gaze won by a clear two minutes, getting 8:15 from the 'simple design' illustrated last month. It was absolutely brand-new and unflown prior to the contest date. Following but a single test flight, it was then used in the competition. Smaller than the current fashion it had only a 225 sq. in. wing but 720 turns on a 14 strand, 32 in. long motor gave a 70 second run on a 22 in. x 25 in. helical pitch prop. Dave Greaves' second place model used Wakefield components on an 'Open' fuselage with a limited amount of rubber so as to keep the overall weight down to a respectable figure. Third was John Carter with his very large model. Visibility for once was not a factor as it glided dead straight back 'upwind' almost to the timekeeper! Of the rest who flew off, only Pete Putnam went badly away. He had the motor peg come adrift in flight allowing the rubber to slip forward. Inquiries revealed that he *does* use an elastic band to restrain the peg and could only conclude that the band had parted!

The open power flyoff saw Dave Pymm manage a very impressive climb with his G15 open model – only to D/T immediately the engine cut, thanks to omitting the D/T fuse and its attendant band. First place went to Phil Ireland with the same F.A.I. model that topped the Trials. Need I say Rossi, Seelig, sheeted surfaces etc. etc.? Dave Miller was second with his favourite OS 15 *'Climax'* combination, managing a very respectable 5¼ minutes. Russell Peers was third with an OS40 version of his *'Woodpecker'*, his larger K & B model had its timer seize 'solid' just prior to the flyoff – attributed to the vibration associated with large engines.

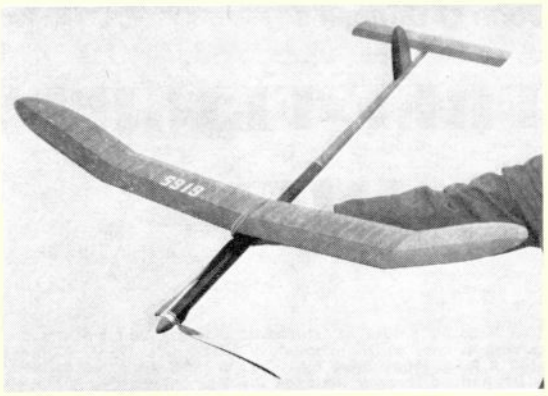
It was nearly dark by the time Glider was decided – and John Mabey's score of 3:12 with a conventional A/2 was remarkable. Second place went to John Boon with the right model for the condition, a very light 1½ size *'Caprice'*. Pete Williams secured third with a continental style, high aspect ratio design.

The two 'minor' (or small sized) events were decided without flyoffs. Both events were flown as a 5 x 2 basis. A/1 glider had quite good and close scores with all three of those 'in the money' clearing nine minutes. Colin Morris proved the winner with a newish model to Bob Bailey's design. Second and third were Phil Ireland and M. Wood – both doing more maxs than the winner!

I won Coupe d'Hiver, obtaining five maxs from my old *'Hatband'* by dint of flying tactically. In fact this was a fine example of 'overkill' as Malcolm Lambert was second with only 7½ minutes total, while his clubmate, Dave Digby, was a further two minutes behind. What I should have done was to leave 'Coupe' to fly glider in mid-afternoon! Notable, was the presence of a Dutch visitor, J. D. Van Rij, who started off quite well in Cd'H – only to inadvertently cremate his model through putting it down with the D/T fuse still alight. Apparently they don't use snuffer tubes in the Netherlands. . . .

* * *

In comparison with the idyllic conditions just described, the **Falcons Gala** held on 3rd December 1972 at R.A.F. Chetwynd felt rather windy. In fact 'breezy' would be a fair description. Neither the drift, nor a couple of odd showers were bad enough to trouble the 'regulars' and all events were quite keenly contested.



Ron Pollard's Wakefield had a most successful season last year, although was unlucky at the Team Trials, when, after leading for 13 rounds, slipped to fourth place by a matter of 18 seconds. Winning the Ted Muxlow Trophy with 20:18 helped compensate! It features an anodised aluminium fuselage plus V.I.T. and auto rudder.

Following local preferences, the scheduled events comprised open rubber, glider and power, plus chuck glider. Perhaps it is opportune to mention that there are noticeable regional variations of interest in the different categories. Despite the vocal propaganda of its enthusiasts, F.A.I. is not universally favoured!

Open is very much a 'flyoff' contest, and this meeting was no exception – even though the numbers involved were small. The four-way rubber flyoff saw Mike Duce prove victorious, closely followed by John Bailey, Dave Morley, and John Carter. The winning model featured a single-blade feathering prop, whilst the runner-up exhibited much Wiseman influence. For some reason, John Carter flew off with an 'ordinary' – size model. In power Pete Harris had a far better climb than Russell Peers – but neither the glide nor the weak lift necessary to win. Dave Pymm filled third position, some twenty seconds short of a treble.

From the way glider scores progressed early in the day there had seemed little likelihood of a flyoff for this event being required. However, John Bailey decided on a late entry and managed a very quick treble in the last three-quarters of an hour before the contest closed. This equalled my score made in even less time much earlier in the day (but in my case I flew two models, one after the other). In the flyoff John launched first but found only mediocre air to record a little under two minutes. This left me able to run-down my timer before towing, and a touch of lift gave me a three minute flyoff – plus the troublesome task of extracting the A/2 from a downwind tree. The bow and arrow method of firing a line over the appropriate branch, and then shaking vigorously eventually proved successful! Third place in glider went to Dave Hambley with 8½ minutes aggregate flying what can nowadays be called a low aspect ratio glider.

The chuck glider event proved rather disappointing in that it only attracted a round half-dozen entrants. Winning score of 6:35 from Barry Kershaw was good, however – and well in front of the next best, Ewan Jones of Sunderland.

From the names mentioned it will be apparent that this meeting attracted some long-distance entrants whilst there were others not featured in the top placings. Such representation goes quite a way towards making the organisers' efforts seem worthwhile. Prizes were usual in being various size tankards – all engraved in advance and hence effectively 'guaranteed' as awards regardless of support. In practice attendance, plus re-entry, was sufficient to give no financial worries.

* * *

Indoor flyers in this country have acquired something of a 'Cardington complex' in that other sites are so obviously restricted that serious competitions are hardly considered. Consequently it is a refreshing surprise to be able to report both a revival of interest *and* a low-ceiling contest in the N. W. Area.

The **Liverpool** club is the focal point of this activity, and staged an indoor flying session in the Southport Y.M.C.A. Sports Hall on 10th October 1972. Although limited both in height and floor area, there was an encouraging number of models to be seen. With several members completely new to this branch of aeromodelling, the Liverpool club deliberately 'soft-pedalled' the contest side of the meeting in the hopes of persuading people to first attend, and then fly. In this, they seemed successful enough for there to be continued flying activity, *and* some difficulty in splitting flying time between the rubber models and the chuck gliders.

Flying was enthusiastic rather than remarkable, and this is reflected in the times recorded in the two competitive events – Easy B and chuck glider. Not surprisingly the host club provided the bulk of the tissue entry – and all the best scores. Contest winner proved to be Dave Barnes with a two flight total of 8:39 including the day's best single flight of 4:44. This might sound low (and indeed it is), but the hall is small and it is Dave's first indoor model! Runner-up was Phil Owen, just ahead of Joe Barnes, both with approximately seven minute totals. Derl Morley had a potent-looking model but had hung-up troubles on many flights.

Chuck glider saw an assortment of approaches – some too large and heavy for the hall – and little that could be called refined. Results were based on a 'best 2 from 10' basis with flights timed to 1/10 second in anticipation of close results, probably a very wise precaution! Winner was Brian Picken with a straightforward model that he started building at 11 o'clock on the contest morning! Mike Duce and Barry Kershaw filled the next positions.

Liverpool seemed very pleased with the response to this gathering, and are only hoping that rising standards will not discourage participation in the future. Certainly more meetings are envisaged!

* * *

Chuck glider interest has been high in the N.W. for some too large and heavy for the hall – and little that could holding a Winter Chuck glider contest just prior to Christmas. The latest such event would seem to indicate that the inevitable progress made by some enthusiasts has discouraged the 'opposition' enough for entries to drop.

Held at the usual site of Beacon Park, Upholland, Near Wigan, on 17th December 1972, the contest was cold and windy. Eighteen entries were much less than 12 months before when it was really rough – so something obviously has changed. The expert's consistency is surely a factor.

The score to beat was established very quickly when the Contest Director David Yates made his own flight right at the start of the flying. Although intending that this would give the least interference with his administrational duties it actually proved to be the correct approach. His first five flights were his best and gave a 4:20 total. This looked like being enough to win but finally Ewan Jones overtook it by a few seconds. Ewan managed two flights over a minute, compared with one by Dave, and again his first launches were his best. It certainly made his special trip from Sunderland in foggy road conditions seem justified.

The winning model was a little unusual in having a lot of dihedral, and a low pylon type wing mount rather than the usual pod and boom style. The 18 in. span wing has the fashionable curved swept back L.E., whilst the fuselage is based on a g/f rod. In fact the model flown comprised a new wing on an old fuselage and tailplane.

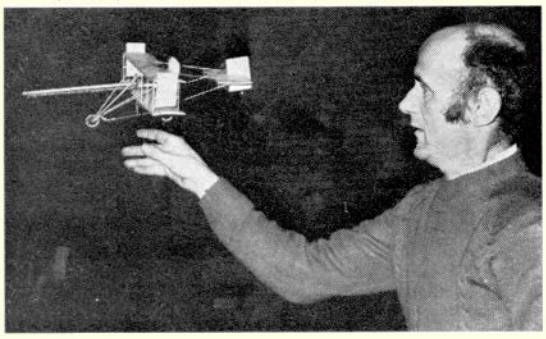
Dave Yates' model was a newish duplication of the design once drawn up in *'The Message'*, and has an 18 in. x 3½ in. wing. For once Barry Kershaw could not manage to clear a minute and had to be satisfied with third place. Dave Barnes must have set some sort of record by placing *fourth* (and top junior) for the *fourth* consecutive year.

'One event contests' like this always make me wonder whether the current tendency to cram more and more events onto single day contests is really the way to encourage entries. I reckon it is much more likely to spread out the same number of competitors over more classes!

* * *

There were two competitions held over the Festive Season. The first was arranged by Dave Tipper and held at Chobham Common on Boxing Day. From the little I've heard it would

Ken Brown launches his Curtis Wright pusher at the Liverpool Indoor meet. Despite the motor stick extended forward (scale?), the model proved to be underpowered.



Just part of the crowd at the highly successful Liverpool meeting – the group being lined up for the benefit of a local newspaper photographer. All good P.R.O. stuff which is never wasted.

appear that only glider was a viable contest despite quite flyable weather. Only two entries were received for power and none at all for Coupe d'Hiver. Presumably even the keenest of aeromodellers are affected by Christmas!

The **London Area Winter Rally** held at Bassingbourn on New Year's Eve made a much more encouraging story. There was a reasonable turnout with widespread representation despite the threat of foggy driving conditions. Once again a meeting at Bassingbourn was favoured by relatively calm conditions, and people were speculating as to whether it was merely coincidence. On the other hand it was bitterly cold, and the long grass downwind of the cars remained covered in frost for much of the day!

Thermal activity was patchy and weak – hardly a surprise in the conditions. In consequence most events were decided without flyoffs. Open glider scores were probably a fair indication of the weather. Pete Stewart was the eventual winner with 8:15 aggregate. Second was John Cooper who waited well downwind to fly tactically, and who totalled just five seconds more than the third man Dave Greaves. As far as I know no-one recorded two maxs, although Mike Woodhouse nearly did it on his first two flights only to fall down on his final effort despite a very protracted up-wind tow.

A/1 Glider was easier thanks to the two minute max, and top scores were quite respectable. Phil Ireland won with around 9½ minutes, closely followed by R. Seal and Gordon Hannah. The other 'smaller' classes were badly supported in comparison – ½A power being taken by K. Faux (now of St. Albans) with 7:23. Pete Harris was runner-up with but a single 2½ minute flight. I thought Coupe d'Hiver was going to be even worse as I was the only entrant until less than an hour before the contest close. Then John Cooper and Dave Tipper decided to make me earn my award. Making all my flights was rather a rush – but it was managed by dint of using the *Hatband* for the last flight, straight after the fourth with the 'delayed – the prop-release' model. My total of only 8:41 shows that I was going for *score* rather than maxs and underwinding to prevent wasting time breaking motors. This technique worked out well as I had a comfortable minute lead over Cooper who was fortunate to have a clubmate retrieving for him whilst he prepared (a motor) for the following flight. Chuck glider was convincingly won by Ewan Jones despite a very late arrival at the 'drome through car troubles. Steve Marriott was the runner-up.

Flyoffs were needed for both open rubber and power. Russell Peers had qualified for both, but was still retrieving his power model when the rubber flyoff was due to start. With time and daylight rather limited the organisers decided to run to schedule. John Boon assembled Russell's rubber model, and as its owner was seen approaching, commenced to wind it up! This was apparently permitted by the officials. Russell finally arrived, finished the windup, and launched – only to find that John had picked out an inferior motor for him! Whilst this was not an S.M.A.E. contest it was still run to 'ordinary' rules – which hardly allow the pantomime just described.

Open rubber winner proved to be Bob Wells who got a remarkable 4:11 from his rather faded model in what was definitely poor visibility. Norman Elliott made a rare appearance to place second with 3¾ minutes. Ron Green made third just ahead of three other fliers – all within a few seconds of one another. Disaster caught Derl Morley when his fully wound motor (and rod) detached itself from his winder just *after* withdrawing the winding tube!

Norman Duncan launches his 'Easy B' entry at the Southport Y.M.C.A. Sports Hall before a critical audience. This must be the only indoor class model for which it is possible to buy a commercial kit – albeit from specialist sources.

Dave Barnes winds Derl Morley's 'Easy B' model, which was later plagued with hang-up troubles, while Dave himself went on to win the event and score the best flight of the day with 4:44.

The power fly-off saw both participants off-trim on climb. climb. Russell's *Woodpecker* went a little tight and flat, whilst Paul Bond's F.A.I. model was too straight and consequent had a very poor transition. Glide performance was decisive, and Russell won by half a minute. No-one else neared a treble, and third place went to P. Kimber with just under 7¾ minutes.

As the last competition of 1972, this meeting was a much better affair than would have been the case if it had been held only a few days later – when insurance problems would have curtailed the entry and worried the officials.

RESULTS

ROOTES TROPHY – Chetwynd, 5th November, 1972
Team (Total of Club's best in R/G/P/CG): 1. Falcons 30:12; 2. Liverpool 30:04; 3. Whitefield 30:03. **Open Rubber** (8 entries): 1. D. Morley (Liverpool) M+5:17; 2. J. Carter (Falcons) M+4:49; 3. M. Duce (Liverpool) M+4:40. **Open Glider** (15 entries): 1. J. O'Donnell (Whitefield) 9:00; 2. J. Carter (Falcons) 8:37; 3. M. Reeves (Whitefield) 8:03. **Chuck Glider** (7 entries): 1. D. Barnes (Liverpool) 4:02; 2. M. Reeves (Whitefield) 3:59; 3. D. Yates (Wigan) and I. Allen (Falcons) 3:35. **Open Power** (5 entries): 1. R. Peers (Falcons) M+3:06; 2. M. Duce (Liverpool) M+2:28; 3. A. Wood (Whitefield) 8:08.

ST. ALBANS GALA – Bassingbourne, 26th November, 1972
Open Rubber (8 in fly-off): 1. M. Gaze (C/M) M+8:15; 2. D. Greaves (Birmingham) M+6:14; 3. J. Carter (Falcons) M+6:05. **Open Glider** (6 in fly-off): 1. J. Mabey (Croydon) M+3:12; 2. J. Boon (Falcons) M+2:53; 3. P. Williams (Richmond) M+2:40. **Open Power** (6 in fly-off): 1. P. Ireland (Southampton) M+5:37; 2. D. Miller (Southampton) M+5:29; 3. R. Peers (Falcons) M+4:48. **A/1 Glider** (5 flights): 1. C. Morris (St. Albans) 9:29; 2. P. Ireland (Southampton) 9:23; 3. M. Wood (Southampton) 9:07. **Coupe d'Hiver** (5 flights): 1. J. O'Donnell (Whitefield) 10:00; 2. M. Lambert (North Surrey) 7:36; 3. D. Digby (North Surrey) 5:31.

FALCONS GALA – Chetwynd, 3rd December, 1972
Open Rubber (8 entries): 1. M. Duce (Liverpool) M+5:32; 2. D. Morley (Liverpool) M+5:01; 3. J. Bailey (Bristol & West) M+4:45; 4. J. Carter (Falcons) M+4:14. **Open Glider** (38 entries): 1. J. O'Donnell (Whitefield) M+3:01; 2. J. Bailey (Bristol & West) M+1:54; 3. D. Hambley (York) 8:30; 4. K. Brown (Liverpool) 8:11. **Open Power** (13 entries): 1. R. Peers (Falcons) M+5:20; 2. P. Harris (Evesham) M+3:37; 3. D. Pymm (Walsall) 8:44. **Chuck Glider** (6 entries): 1. B. Kershaw (Wigan) 6:35; 2. B. Jones (Sunderland) 5:12.

LIVERPOOL INDOOR MEETING – U.M.C.A. Southport, 10th December, 1972. Easy B (7 entries) 1. D. Barnes (Liverpool) 8:39; 2. P. Owen (Liverpool) 7:07; 3. J. Barnes (Liverpool) 6:59; **Chuck Glider (9 entries)** 1. B. Picken (West Lancs) 40.1; 2. M. Duce (Liverpool) 38.2; 3. B. Kershaw (Wigan) 36.6.

WIGAN CHUCK GLIDER CONTEST – Upholland, 17th December, 1972. (18 entries) 1. E. B. Jones (Sunderland) 4:27; 2. D. Yates (Wigan) 4:20; 3. B. Kershaw (Wigan) 3:55; 4. **Best Jnr.** D. Barnes (Liverpool) 3:29.

LONDON AREA F/F GALA – Bassingbourn, 31st December, 1972
Open Rubber 1. R. Wells (Anglia) M+4:11; 2. N. Elliott (Croydon) +3:42; 3. R. Green (St. Albans) +3:37; **Open Glider** 1. P. Stewart (Crookham) 8:15; 2. J. Cooper (C/M) 8:00; 3. D. Greaves (Birmingham) 7:55; **Open Power** 1. R. Peers (Falcons) M+3:10; 2. P. Bond (Anglia) +2:40; 3. P. Kimber (Standstead) 7:42; **Coupe d Hiver** (5 x 2) 1. J. O'Donnell (Whitefield) 8:41; 2. J. Cooper (C/M) 7:32; 3. D. Tipper (St. Albans); **A/1 Glider** (5 x 2) 1. P. Ireland (Southampton) 9:27; 2. R. Seal (East Grinstead) 9:17; 3. G. Hannah (St. Albans) 9:10; **½A Power** 1. K. Faux (St. Albans) 7:23; 2. P. Harris (Evesham) 2:34; **Chuck Glider** 1. E. B Jones (Sunderland) 3:59; 2. S. Marriott (C/M) 3:21.

CONTEST CALENDAR

March 25th	**S.M.A.E. R/C AEROBATICS**. Bruntingthorpe, Leics.
March 25th	**S.M.A.E. INDOOR SCALE**. Brize Norton, Oxon (soft shoes).
March 25th	**S.M.A.E. CENTRALISED C/L MEET**. Stunt, Class B, Combat, Speed. N. Luffenham, Rutland.
March 25th	**S.M.A.E. 1st AREA CENTRALISED MEET**. F.A.I. Glider, Open Power, Open Rubber. Area venues.
April 1st	**WESTERN AREA F.A.I. GALA**. F/F: F.A.I. R/G/P, C/L: T/R, Combat. (64 entries max.) R/C: Class II Scale (20 entries max.). Fees: All classes (except RC): 40p pre-entry, 60p on day. R/C 60p pre-entry only. First 20 accepted. Prizes: Min. of £5, £3, £2. All comp, report to guard room with S.M.A.E. card. First rounds being 10 a.m. Pre-entries to R. Horwood, 145 Downend Road, Horfield, Bristol BS7 9PY – enclose S.A.E. for confirmation and heat times where appropriate. Venue: R.N.A.Y. Wroughton, near Swindon, Wilts.
April 8th	**WHITEFIELD 'KNOCK OUT' GALA**. Open R/G/P plus Chuck glider at R.A.F. Chetwynd, Newport, Shropshire.
April 8th	**S.M.A.E. F.A.I. T/R TRIALS**, Cancelled.
April 8th	**ELLIOT M.E.C. ONE HOUR ENDURO**. For C/L Goodyears, A-rat, F.A.I. T/R (20 compulsory stops). Venue: Elliot Bros., Airport Works, Rochester, Kent.
April 15th	**S.M.A.E. F.A.I. PYLON RACE**. North Luffenham, Rutland.
April 22-23rd	**S.M.A.E. TWO-DAY F.A.I. MEET**. F.A.I. Rubber, Glider, Power at Strubby, Lincs.
April 22nd	**ELLIOT SPEED MEET**. Classes 2-5 Open, F.A.I. 29, 40 & 60. Venue: Elliot Bros., Airport Works, Rochester, Kent.
April 29th	**S.M.A.E. R/C AEROBATICS**. Little Rissington, Glos.
May 6th	**BUCKANEERS C/L STUNT FLY-IN**. Finmere Airfield, nr. Tingewick, Bucks. Entry on day. Details J. Mannall, 3 Totnes Close, Bedford.
May 6th	**S.M.A.E. 2nd AREA CENTRALISED**. F.A.I. Power, Open Rubber – Area Venues.
May 13th	**EASTBOURNE M.F.C. SOARING RALLY**. Multi only. Venue: Long Man or Butts Lane (Butts Lane used if any EAST in the wind).
May 26-27th	**BRITISH NATIONALS**. R/C, C/L, F/F at R.A.F. Lindholme, Yorks. Thermal Soaring possibly at nearby venue.
June 3rd	**S.M.A.E. F.A.I. PYLON RACE**. N. Luffenham, Rutland.
June 3rd	**K.A.R.C.S. ANNUAL OPEN R/C SCALE DAY**. Fly for fun and simple contest. Venue: Perton Airfield (4 miles W of Wolverhampton, off A.41).
June 10th	**S.M.A.E. 3rd AREA CENTRALISED MEET**. F.A.I. Rubber, Open Power, Open Glider. Area venues.
June 10th	**ELLIOT C/L GALA**. Stunt, Goodyear and Combat at Elliot Bros., Airport Works, Rochester, Kent.
June 17th	**AEROMODELLER SCALE RALLY**. Old Warden, Biggleswade, Beds.
June 24th	**S.M.A.E. R/C AEROBATICS**. Topcliffe, Yorks.
June 24th	**FINCHLEY & DISTRICT M.A.C. C/L GALA**. Stunt & Combat at Glebelands, Summers Lane, Finchley, N.12. Pre-entry 25p to J. F. Goodwin, 77 Gallents Farm Road, East Barnet, Herts. Field entry 30p.
July 1st	**COLCHESTER M.A.C.'s 25th YEAR ANNIVERSARY GALA**. F.A.I. Thermal Soaring, R/C Class II Scale, F/F Scramble C/L Scale, C/L Combat. Venue: The Middle Wick, Mersea Road, Colchester, Essex. Details & pre-entry (essential 30p) to D. Sargeant, 17 Old Heath Road, Colchester, Essex.
July 8th	**S.M.A.E. R/C CLASS II SCALE**. Sywell, Leics.
July 8th	**S.M.A.E. F.A.I. PYLON RACE**. N. Luffenham, Rutland.
July 8th	**S.M.A.E. 4th AREA CENTRALISED MEET**. Team Glider, F.A.I. Power, C.d'H. Area Venues.
July 15th	**S.M.A.E. F.A.I. THERMAL SOARING**. Venue to be announced.
July 15th	**S.M.A.E. CENTRALISED C/L MEET**. F.A.I. T/R, ½A T/R, Goodyear, Speed. N. Luffenham, Rutland.
July 22nd	**ELLIOT 'CHAMPAGNE GALLOP' FOR CLASS B T/R**. Note – diesel fuels not permitted. Venue: Elliot Bros., Airport Works, Rochester, Kent.
July 29th	**S.M.A.E. R/C AEROBATICS**. Cottesmore, Rutland.
August 5th	**S.M.A.E. F.A.I. PYLON RACE**. N. Luffenham, Rutland.
August 5th	**S.M.A.E. F/F.** Reserve date.
August 12th	**S.M.A.E. SCALE MEET**. R/C Class II, F/F, C/L, at Little Rissington, Glos.
August 19th	**S.M.A.E. R/C AEROBATICS**. Bruntingthorpe, Leics.
Sept. 2nd	**S.M.A.E. THERMAL SOARING**. Venue to be announced.
Sept. 7-9th	**INTERNATIONAL F/F**. Sponsored by F/F News, Strubby.
Sept. 16th	**S.M.A.E. 5th AREA CENTRALISED MEET**. Team Power, F.A.I. Rubber, A/1 Glider, Area venues.
Sept. 29-30th	**S.M.A.E. SCALE MEET**. R/C, F/F, C/L.
Sept. 29th	**NORTHERN GALA** at Rufforth, Yorks.
Sept. 30th	**S.M.A.E. F.A.I. PYLON RACE** at North Luffenham, Rutland.
October 7th	**S.M.A.E. R/C AEROBATICS**. Middle Wallop, Hants.
October 7th	**S.M.A.E. 6th AREA CENTRALISED**. Team Rubber, F.A.I. Glider, ¼A Power. Area venues.
October 14th	**S.M.A.E. SCALE TEAM TRIALS**. Venue to be announced.
October 14th	**S.M.A.E. F.A.I. PYLON RACE**. N. Luffenham, Rutland.
Oct. 20-21st	**S.M.A.E. TWO-DAY F.A.I. MEET**. F.A.I. Rubber, Glider, Power at RA.F. Strubby, Lincs.
October 28th	**SOUTHERN GALA**. Venue to be announced.
November 4th	**S.M.A.E. INDOOR SCALE**. Brize Norton, Oxon.

ROLAND D II

AIRCRAFT
DESCRIBED No. 220

a lesser known German fighter of the First World War described and drawn by Ian Stair

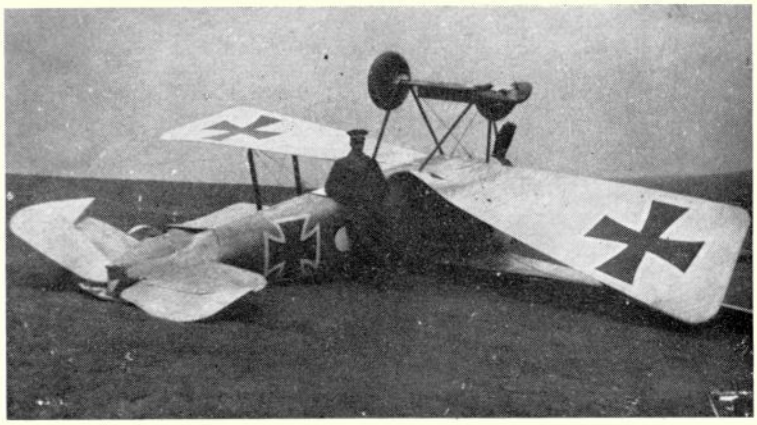
IN MARCH 1917 a new two seater from Luftfahrzeug Gesellschaft m.b.H., the Roland C.II, entered into service with the German Army Air Service, and proved to be a great advance over contemporary two seaters both in appearance and performance. It featured a carefully-streamlined fuselage of plywood skinned semi-monocoque construction which was deep enough to fill the gap between the wings. Thus the top plane could be attached directly to the fuselage in the shoulder position, avoiding the need for centre section struts and the attendant bracing. The wings had only a single bay and were connected by a wide 'I' strut, plus the usual wire bracing.

As the C.II proved so successful, it was inevitable that the design team at L.F.G., led by Dipl. Ing. Tantzen, should turn their attention to a single-seater fighter based on the same basic formula. This was the Roland D.I which made its maiden flight in July 1916. It closely followed the C.II in both configuration and construction but the wings were rigged without stagger and the 'I' strut was replaced by the more usual parallel struts with wire cross bracing.

Visibility, a weak point on the two seater, proved even worse on this single seater – the side window on the prototype presumably did not help as it was omitted on production aircraft. The problem was fundamental to the design of the deep, wide fuselage and this was the primary reason for the early introduction of the next fighter type.

This was designated the Roland D.II which first flew in October, just three months after the D.I – an interesting example of the short gestation period required for a 1914–18 aeroplane! The basic shape of the new fuselage was more conventional but in order to avoid the introduction of centre section struts, the top deck forward of the cockpit was swept up as a thin pylon to support the upper wing – a method which not only simplified the rigging, but was thought to create less drag. To further improve the forward view the side radiators were abandoned in favour of a wing radiator, which was mounted in a central position across the pylon and extended into both wing roots where it was neatly covered by louvered panels on both top and bottom surfaces.

Despite the reduction in fuselage cross section, it was still deeper than most fighters and this enabled the 160 h.p. Mercedes engine to be covered over for the greater part of its length, only the first two cylinders being exposed. This cowling was most carefully tailored to fit around the exhaust and water pipes and was cut away to clear the line of fire from the twin Spandau guns which were enclosed within the fuselage. Cooling air for the engine compartment was introduced through large louvres in the circular cowling panels immediately behind the spinner and let out by way of louvres in the various hinged access panels. These twin-louvred panels were a distinctive feature of all the earlier Roland designs.



Heading picture shows a standard production LFG Roland D-II, note the 'shadow shaded' effect where the different columns meet. Heavy washout on the lower wingtips is a common feature of German warplanes of the period. Right, Vfw Raetsh crash-landed this D-II after being involved in aerial combat with two Nieuports on 18th March, 1917. Note unit insignia of black outlined white circle on the sides of the fuselage.

The position of the guns must have made the servicing of these items difficult and the clearance of stoppages by the pilot appear to have been almost impossible. The manufacturers provided a small windscreen on each side of the pylon but these seem to have been removed from most aircraft in service as they seldom appear in photographs. No doubt the pylon gave some protection and the screens tended to obstruct the forward view.

Construction was similar to the C.II and D.I – the fuselage was built up on plywood formers with eight light stringers, the skin consisting of two layers of plywood strips laid diagonally and at right angles to each other, the total thickness, including an outer covering of fabric, being under 2 mm. The pylon, lower wing fairings and fin were built as part of the main structure. An unusual feature was the 'U' section transverse timber beam into which was fixed the leading edge of the tailplane.

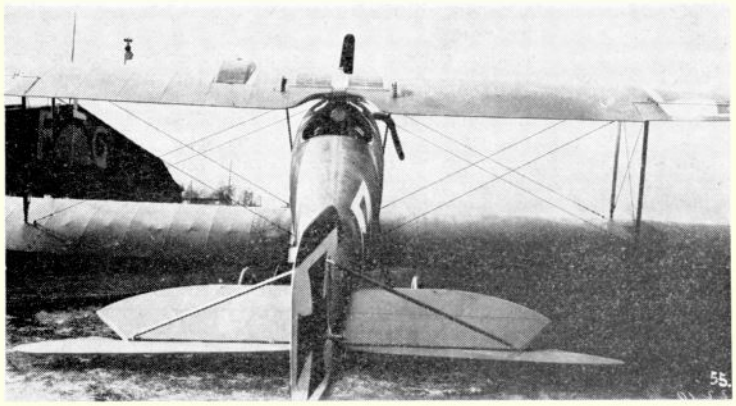
The wings were quite conventional, featuring two box spars and ribs of plywood with ash capping strips. A false rib formed by a lath 10 mm wide was fitted between each main rib on the top surface only, extending back to the rear spar. All control surfaces were welded up from steel tube and apart from the elevators were on the small side, which may have accounted for the poor manoeuvrability. Ailerons were actuated by push rods running up to a crank on the end of the aileron torque rod in the same manner as the Nieuport 17. Rudder and elevators were connected to the control column by cables. Interplane struts were made from 25 mm dia. steel tube faired out to a 84 mm x 32 mm streamline section with timber, while steel tube of 50 mm x 30 mm streamline section was used for the undercarriage chassis.

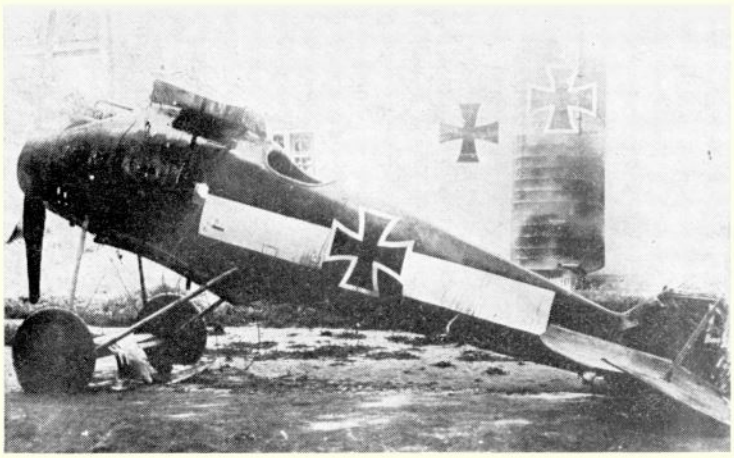
The D.II was not a popular aeroplane with pilots as it was heavy on the controls and not agile in combat when compared with contemporary Albatros fighters. For this reason its use in service was confined to the quieter sections of the Western Front, the Russian Front and Macedonia. However, in no theatre of war did the Roland D.II distinguish itself and it was soon relegated to the training schools.

A number of Roland D.Is and D.IIs were built by the Pfalz Flugzeug-Werke G.m.b.H and they had considerable influence on that company's first fighter of original design, the D.III. The structure was similar and the guns and fuel tank were housed in the same manner.

The D.II was followed by the D.IIa which had an Argus As.III engine in place of the Mercedes and being almost indistinguishable from the D.II. The louvered access panels were re-located to suit the servicing points on the Argus. From detail drawings of the undercarriage it is evident that the front legs of the D.IIa were near vertical and the axle further forward but this is not obvious from photographs.

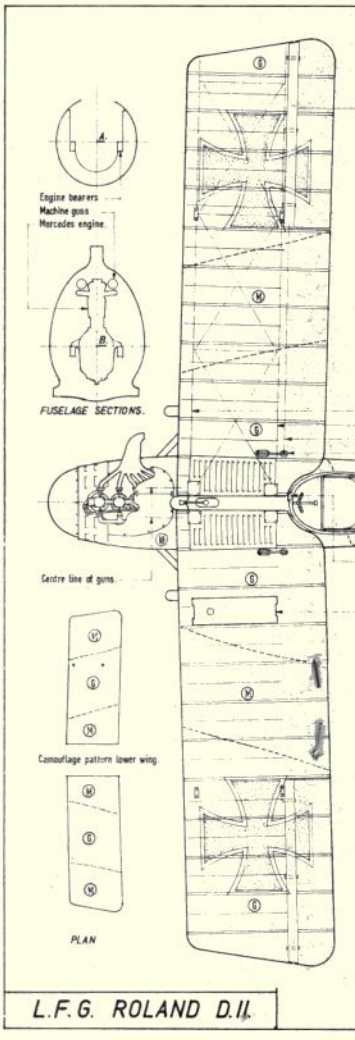
The colours are noted on the accompanying drawings





Upper, this superb period shot shows fine detail for the scale modeller. Standing outside one of the LFG factory buildings, this D-II shows off its clean lines to advantage; lower, a slightly less pristine example is a machine captured by Russian Forces at Kremeues and is seen here at the 11th Russian Army GHQ.

DYE LINE PRINTS OF THE 1/24th SCALE ORIGINAL TOGETHER WITH A REPRINT OF THIS FEATURE, ARE AVAILABLE AS PLAN PACK No. 2952, PRICE 25p PLUS 5p POSTAGE, FROM AERO MODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.



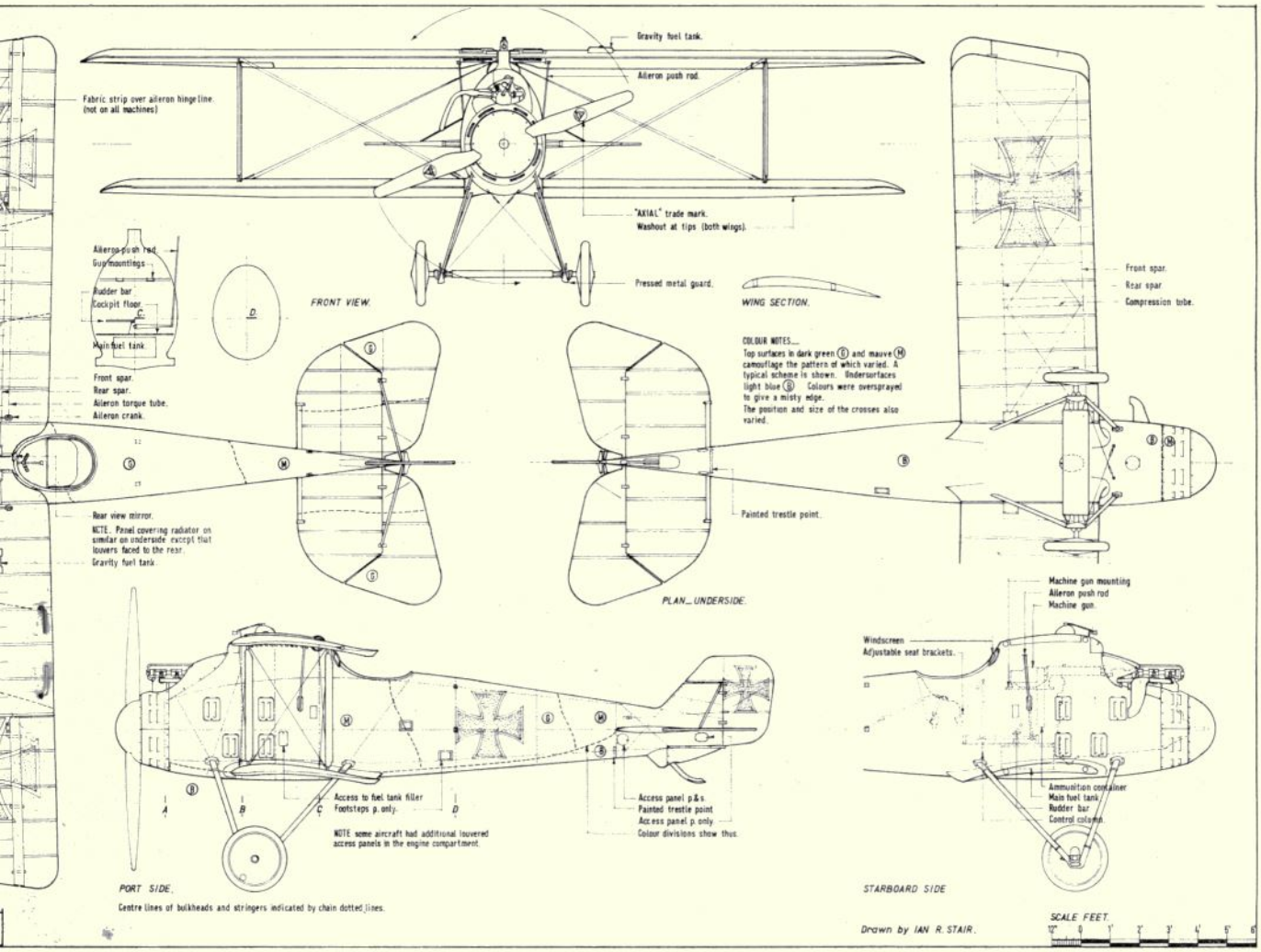
and although the pattern and position of the national insignia varied slightly there seem to have been few Rolands with individual markings. The aircraft of Jasta 25, in the Balkans, each carried a large identification letter on the side of the fuselage just aft of the cockpit. One D.II, captured by the Russians, had a white or very light-coloured horizontal band along the fuselage. The most notable personal marking to be seen on a D.II was a fine shield with a moon and star motive, unfortunately the colours are not known.

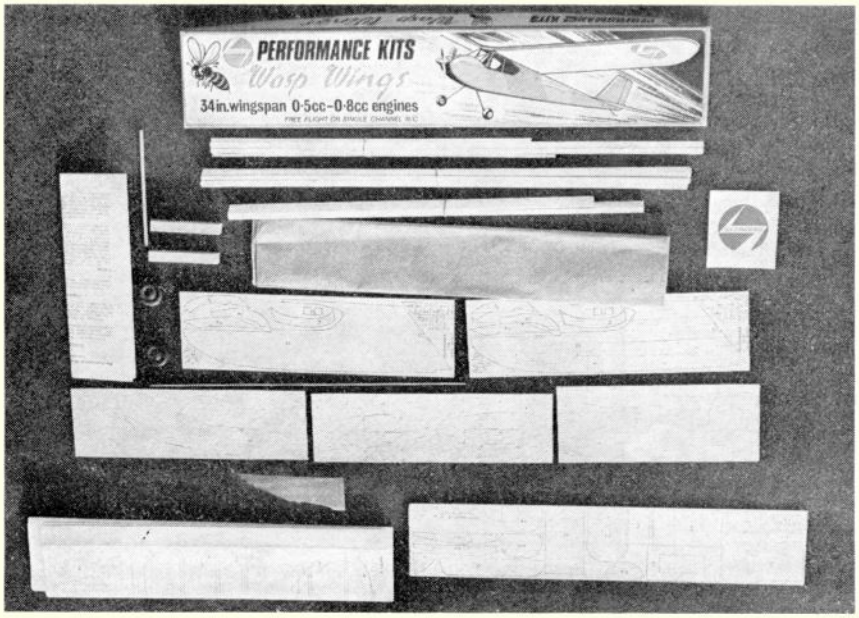
SPECIFICATION (L.F.G. Roland D.I to D.IIa)
Manufacturer: Luftfahrzeug Gesellschaft m.b.H., Berlin.
Sub-contractor: Pfalz Flugzeug-Werke G.m.b.H., Speyer am Rhein.

	D.I	D.II	D.IIa
Engine:	Mercedes D.III	Mercedes D.III	Argus As.III
h.p.:	160	160	180
Span:	8.90 m.	8.94 m.	8.90 m.
Length:		6.93 m.	6.95 m.
Height:		3.11 m.	2.95 m.
Wing area:	23.0 sq.m.	22.8 sq.m.	22.0 sq.m.
Weight empty:	699 kg.	715 kg.	635 kg.
Weight loaded:	932 kg.	954 kg.	795 kg.
Max. speed:		170 km.hr.	180 km.hr.
Climb to 5,000 m.		23 min.	20 min.

NOTE: As with most 1914/18 types the performance figures are conflicting and open to doubt.

Seated in this D-II's cockpit is Vfw R. Scholz, a useful picture containing many interesting details. The instruments mounted on the upper wing pylon are worthy of note.
PHOTOGRAPH FROM A. IMRIE, H. NOWARRA VIA HARRY WOODMAN COLLECTION.





WASP WINGS

a new model from PERFORMANCE KITS

reviewed by Steve Blake

Spread of components reveals die cut wing ribs, although fuselage parts are die printed onto the good quality balsa. Any 0.5 to 0.8 c.c. engine would be eminently suitable for power.

WHEN REVIEWING any new kit, it is only fair to relate any comments to the claims which are made for it. The new *Wasp Wings* from **Performance Kits** comes neatly packaged in a glossy finished box, on which the only claims made are that the 34 in. span model is suitable for free-flight or radio control, with engines of .5 c.c. to .8 c.c.

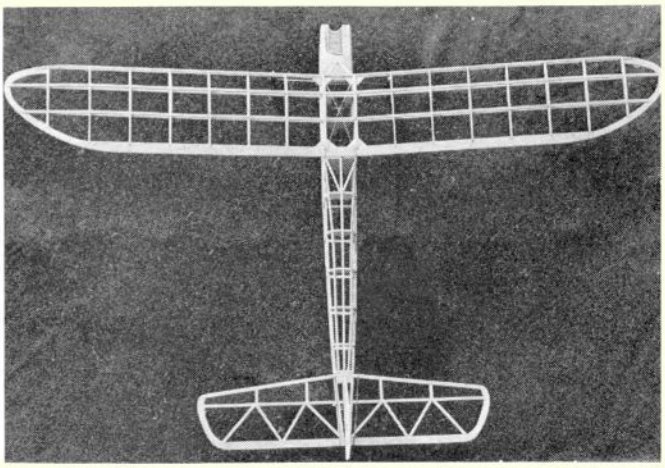
On opening the box the contents are seen to be laid out conventionally, and are completely devoid of any gimmicks or innovations. Six pieces of sheet balsa are provided, two die-cut for wing ribs, three printed (being mainly fuselage components), and one plain for fuselage sheeting. Ready-stripped balsa is provided instead of the grooved sheet material previously favoured by this manufacturer, a change welcomed by the reviewer. The engine bearers in the review kit were of spruce material rather than the normal beech, and cabin glazing is supplied as uncut acetate sheet.

The plan is clearly drawn on two sheets of stout paper, while the instructions come in a separate four-page leaflet. Landing gear components are unformed 14 s.w.g. wire, with 1 in. diameter solid black plastic wheels. The covering material supplied is lightweight Modelspan, in two colours which vary from kit to kit. Also supplied in the kit is a length of dowelling, and a *Performance Kits* transfer. Wood quality and grading throughout was excellent. Incidentally, the quality of the review kit was checked against one in stock at a model shop, and no differences were found in quality, indeed I am not sure to this day which kit I used!

Design of the *Wasp Wings* is orthodox throughout. The wing area is around 140 square inches, and the tail area about 45 square inches, giving a generous margin for stability. Wing dihedral is a little over 15 degrees total. The tailplane is mounted at 0 degrees to the thrustline, with the wing set at slight positive incidence to both. Wing construction is of the multi-spar type, which gives a strong yet warp-free structure, while the tail plane and fin are built from cut sheet parts and strip. The resulting structures are entirely adequate for their tasks. Fuselage construction is a composite of sheet box at front and open frame at rear – a sensible choice if only from the point of view of weight distribution.

Construction of the model proved to be quite straightforward throughout, though a few difficult points were noted. Accuracy of the components was in general excellent, the only exceptions were former F6 which was approximately $\frac{1}{16}$ in. too narrow, and it was found necessary to open out the spar slots in the wing ribs. The instruction sheet is written in such a way that it pre-supposes the builder has previous experience of building a similar model; not always a safe assumption! The plan could be improved if a few sketches were included to clarify difficult points such as the undercarriage mounting, and the short diagonal longerons just aft of the wing. Although a wire tailskid is drawn on the plan no material for it was supplied in the kit.

The adhesive used throughout was *Glue-All* P.V.A. which is a firm favourite of mine since it combines all the normal advantages of P.V.A., with a fast setting time, and dries hard enough to sand easily.



Uncovered structure reveals simple construction techniques employed. Model in this form weighed a mere 3 ounces, which together with the fairly large wing area accounts for its exceptionally good flying performance.

The model was covered in Solarfilm for several reasons; firstly I have always been intrigued to see if it was practical on a small model, and secondly I believe that it is more durable than lightweight tissue. In the event it proved to be a complete success, causing no C. of G. problems at all, and the overall weight of the model increased by only 1 oz. from a bare structure weight of 3 oz.

Since the *Wasp Wings* has the appearance of a vintage light aircraft, it was decided to decorate it in the fashion of pre-war light aircraft which were almost invariable silver doped overall with red trim, and huge wing registrations. Also added to the model were control surface outlines and a door – all trim was cut or stripped from Solarfilm and ironed on. The engine bay was fuel proofed with two-pack polyurethane clear varnish, which was also used over all Solarfilm joints to prevent the ingress of fuel.

All that remained was the fitting of the Davies Charlton Wasp engine, and wheels, these incidently required drilling out to fit the axles. Cabin glazing was added using epoxy adhesive, but it was noted that the plan did not show any cutting patterns for the acetate sheet, and I fell that this is a serious ommission, particularly for the inexperienced.

The completed model tipped the scales at just 6 oz,. which gives a very light wing loading. The C. of G. proved to be exactly as stated on the plan without need to add any ballast.

Fortunately the first Sunday after completing the model provided clear skies and a wind speed of less than 5 m.p.h., ideal for the first flights, except for the ice underfoot! Test glides proved satisfactory, and the Wasp engine was quickly fired up. The first flight was at half power and turned right, the model tightened its turn, lost height and hit the ground with the engine running, but no damage was sustained.

On the second flight the rudder was altered to give a left turn, which produced exactly the same result only in a different direction! At this point it was decided that the model was under-elevated, and $\frac{3}{16}$ in. packing was placed under the trailing edge of the tailplane. The engine was started again and the model launched on half power with a full tank. It climbed steadily away in a gentle left turn until after approximately 30 seconds the engine leaned out. The model responded by tightening its turn, and lifting its nose and headed for the wide blue yonder. At the end of the tank the model was just a dot in the sky, the glide looked good, being very flat with a meandering left turn. Anyhow, much chasing later, the model was recovered from the local cricket pitch, where it had apparently made a perfect three-pointer! Thus perfect trim was achieved in just three flights, and the *Wasp Wings* should now be ready to provide many hours of pleasant flying.

Motto: if you wish to fly free-flight models without a de-thermaliser, then a large open space and an attractive female retriever are practically essentially! C'mon, Steve, we know the lady's name is Rosemarie but what's her phone number?

With regard to its suitability for radio control, I am a little cautious. Firstly, I believe such a light model should only be fitted with the lightest types of equipment. Secondly, the instructions given in the kit for R/C installation seem to require an 'elastic' C. of G., and I would therefore advise the builder to devise his own installation, with all the equipment located beneath the wing.

Summarising, the *Wasp Wing* provides the F/F sports enthusiast with a docile flying model of pleasing lines and being well kitted with quality materials, carrying a price tag of just £2. it can also be recommended as good value. Remember not to fill the tank full, and make sure that name and address label is securely fixed – you could need it with this one!

Finished in silver Solarfilm, with appropriate trim, the Wasp Wings looks most attractive. The general appearance is perhaps rather of the vintage era – accentuated by the long fuselage and rounded tips to the wings – which should prove most popular with sports flyers who tend to favour this style. Pleasant model, made even more so by the extremely reasonable price of £2.

The Sqezy, Sunlight Lemon Liquid, Domestos 'FLYING MACHINE' COMPETITION

AN ADVERTISEMENT in our October '72 issue announced a competition organised by **Lever Brothers Ltd.**, for 'flying machines' based upon certain containers of that company's products. The prizes offered were generous, and not surprisingly, the contest produced a good entry – while many of the competitor's names were well known in the free-flight world!

However, expertise at free-flight was not a prime requisite – the rules demanded a machine built around an empty *Squezy*, *Sunlight Lemon* or *Domestos* bottle, and which was simple, easy to make, original in design, yet fun to fly. The only other restriction was that the only power permitted (if any) was rubber.

The resulting models showed a wide variety of approaches, although it was soon evident that some people had read the rules rather more closely than others – it was not the best performer that was going to win, but the one which incorporated most of the desired features.

Ted Smales' winning design was a classic case – his flying 'plate' employed simple all-sheet structure, given a reflex section by the way in which it slotted through the *Sunlight* bottle, while the fin was cunningly disguised as a stream of 'bubbles'. A 'knife and fork' of chrome paper stuck on the upper surface completed the fun aspect too. Martin Dilly's approach was a large-span Jedelsky wing-type rubber model, based around a *Squezy* bottle but our own John O'Donnell's machine proved even simpler, and he was alone in joining two bottles together in order to get a longer length of rubber.

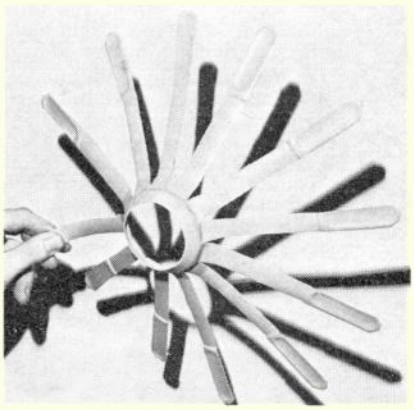
For ingenuity in disguising the basis for the model, the prize would have gone to P. W. Lee's semi-scale version of a *Stearman Northrop Alpha* – very clever, but unfortunately rather outside the 'simple to build' category with its built-up wing and rear fuselage construction. Another to lose out on the complexity factor was Terry Manley, who submitted the model which was unquestionably the most attractive, and doubtless the best performer with its long length of rubber (carried by neatly fairing the rear-end of the *Squezy* bottle into a tapered, circular fuselage made from stringers) while the power was handled by a hand-carved balsa prop with a free-wheel device hidden within a spinner. This combined with a light wing loading and clean appearance, made it the best *model*, but regrettably the rules were not designed to accommodate such an ingenious machine!

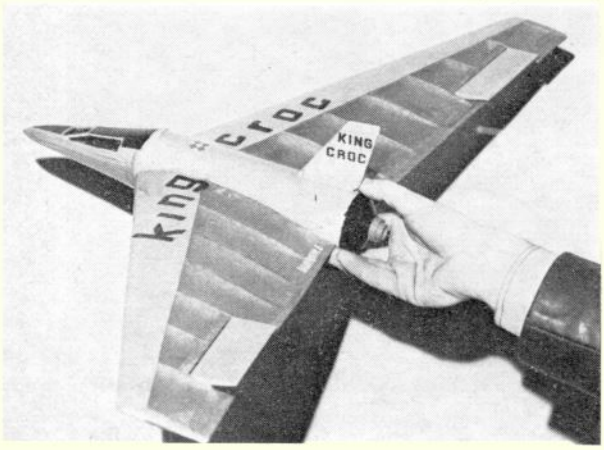
All in all, an interesting contest with an entry which provided variety – and a glimpse of the ingenuity of the aeromodeller. Now, before you throw away your next container – take a closer look at its potential. . . .!

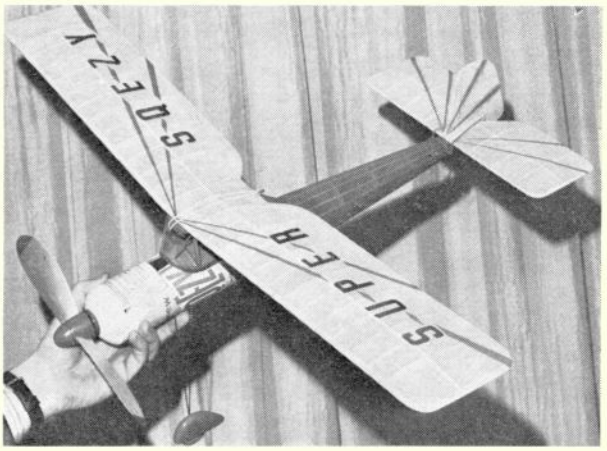
Results:

1st Prize (£50): E. M. Smales.
2nd Prize (£10): J. O'Donnell.
3rd Prizes (£5 each): M. Dilly, I. Ward, P. W. Lee, M. Sullivan, J. Sullivan, C. Leathers, T. Manley, R. Draper, F. G. Boreham, G. A. Benton.

Above left is Ted Smales' highly original winner – note the 'bubbles' forming the fin. Next to this is John O'Donnell's ultra simple model, though based on conventional lines. Below – certainly the simplest design was provided by M. Sullivan, consisting of a 'Domestos' bottle stripped down as shown, and designed to be hurled like a flying saucer! Below left is C. A. Benton's flying wing glider, which used elevons for stability – nice flat glide, too. Below right was Terry Manley's most elegant machine – by far the most attractive.

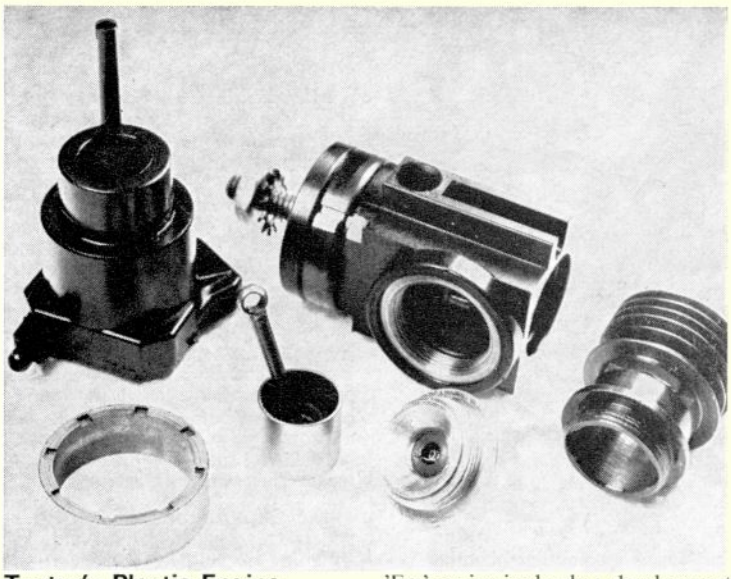






Peter Chinn's

latest engine news



Partially dismantled Testor 'Fly 'Em' motor, showing all-plastic backplate/tank unit and plastic crankcase. Cylinder/piston assembly and crankshaft are all-metal, however!

Testor's Plastic Engine

The use of non-metallic materials in model engine construction (apart, that is, from the more obvious applications such as fuel tanks and electrically-insulated parts) has been with us now for more than twenty years. As long ago as 1949, for example, the Dooling Brothers began using moulded valve rotors of thermo-setting plastic for their .29 racing engine and the majority of rear disc-valve engines since then have used valves that have been either moulded in materials such as nylon or glass fibre-reinforced nylon, or machined from, for example, Tufnol. Carburettor bodies and even complete backplate assemblies have also successfully used plastics in place of the more familiar metal alloys.

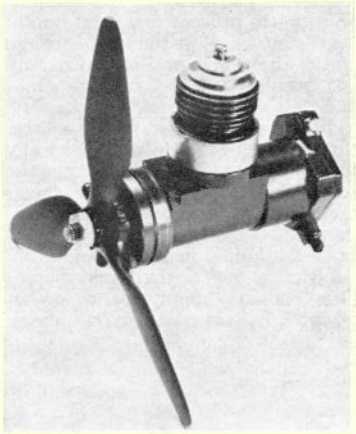
Until now, however, no manufacturer has gone so far towards a completely 'non-metallic' engine as the American Testor Corporation, with the special power unit produced for their 'Fly 'Em' ready-made plastic 'toy' control liners.

The engine illustrated is of an early type that was produced in limited numbers a couple of years ago. It has now been redesigned to incorporate a more orthodox induction system but is, we feel, well worth inspection in its original form as an example of how close one manufacturer has come to producing the 'expendable' model engine. Built to merely slot into the 'Fly 'Em' models and with no mounting lugs (it would, therefore, be difficult to fit into any conventional model) the only spare parts offered are glowhead, muffler and fuel control stem. A damaged shaft or a worn piston and cylinder assembly would, presumably, call for replacement of the complete unit.

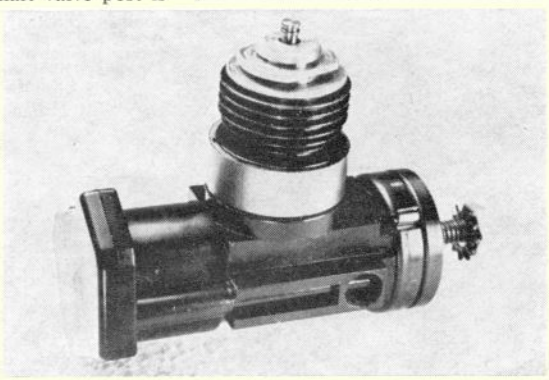
The basic design of the 'Fly 'Em' engine is clearly a development of the current Testor McCoy 049 shaft-valve motor which, itself, was originally a Wen-Mac product; the Testor Corporation having purchased the Wen-Mac plant from the American Machine and Foundry Company in 1968. It has a one-piece screw-in cylinder with twin diametrically-opposed exhaust ports and internal flute-type transfer ports, a ball-joint small-end, hardened steel connecting-rod, shaft rotary-valve induction and a self-engaging integral spring starter assembly. The hardened non-counterbalanced crankshaft has a 7/32-in. dia. journal, 1/8-in. i.d. gas passage and 0.190-in. dia. crankpin and the same type of screw-in cylinder head with truncated cone-shaped combustion chamber and integral glow filament is used.

Here, however, the similarity ends. The engine crankcase, instead of being pressure diecast in aluminium alloy, is moulded in what appears to be a reinforced nylon-type material. It has a moulded-in aluminium main bearing bush and a steel thread insert for the screw-in cylinder. The air intake to the crankshaft valve port is repositioned to the side of the engine and has no needle-valve assembly.

No screws or screw threads are used to attach the one-piece plastic backplate/tank assembly: it merely plugs into the crankcase and the two *snap* together! Forming an integral part of the tank is a long, forward-facing fuel feed tube on the right-hand side. This passes through a channel



Above, the original Testor 'plastic' engine with the 4-inch diameter 3-blade prop supplied for use with the Testor 'Fly 'Em' toy control liner.



Right, Testor 'Fly 'Em' .049 engine has self-engaging starter and a silencer – but no mounting lugs.

Parts of the G.15-F1 Goodyear motor. Slight porting changes and a modified head are main differences between this and previous model.

in the side of the crankcase and projects into the air intake to serve as a fuel jet. The amount of fuel metered to this tube is regulated by a white, nylon stem or peg which plugs into a housing at the rear of the tank.

This peg can be rotated between four basic positions: (i) fuel shut-off position (to prevent fuel from flooding the intake when the tank is being filled), (ii) prime position, (iii) rich idle position and (iv) running position. All very basic and, to simplify handling still further, there is the familiar Wen-Mac clutch-type spring starter mounted on the crankcase nose: one simply rotates the prop. backwards $1\frac{1}{2}$ turns and releases it to start the engine.

An additional item, not found on the McCoy 049, is the silencer unit. This consists simply of a collar (apparently a sintered iron moulding) that forms an annular chamber between the bottom cooling fin and the cylinder base flange. Exhaust gases are allowed to escape via eight small slots spaced equidistantly around the top of the collar.

The engine has the same bore and stroke as the McCoy 049: 0.420 in. by 0.360 in., giving a swept volume of .0499 cu.in. or 0.817 c.c. It weighs 55 grammes (1.94 oz.) including silencer and, of course, fuel tank.

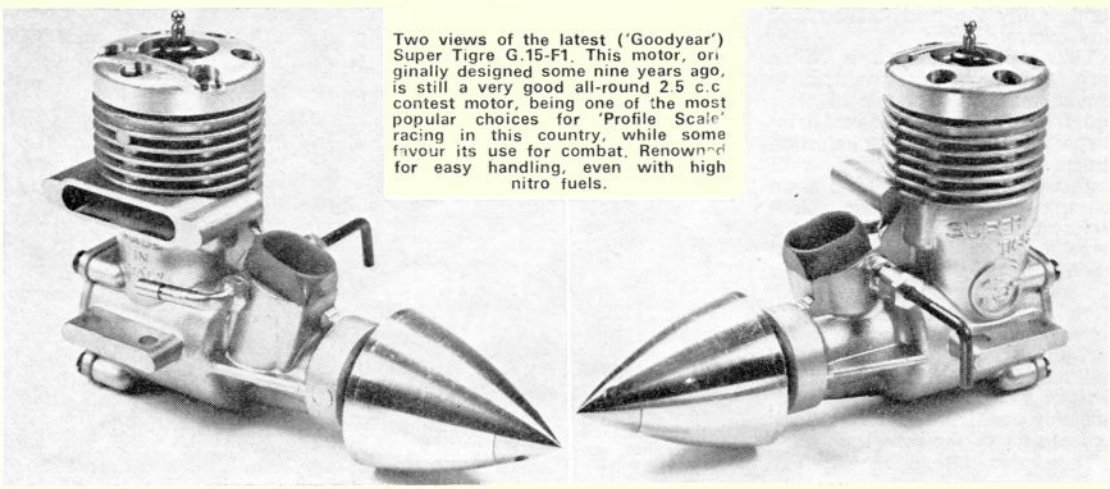
The main reason why the original 'Fly 'Em' design had to be withdrawn was difficulty in producing the mixture control stem to the required tolerance. As a consequence, production engines varied widely in their ability to start and run consistently. This method of metering the fuel was, therefore, abandoned and the engine has been redesigned to use a normal needle-valve, plus reed-valve induction in place of the shaft intake.

We hope to deal with this revised 'plastic' McCoy in due course.

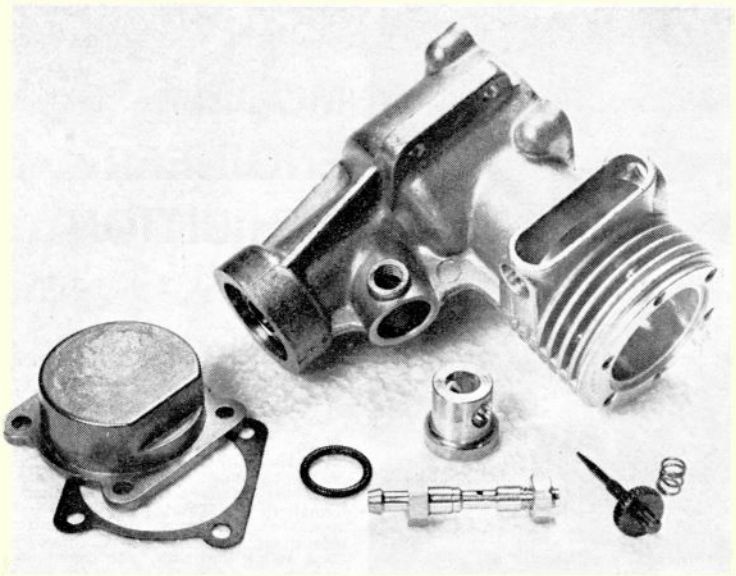
Super-Tigre G.15-F1

Mick Wilshere (of World Engines, the U.K. Super-Tigre distributors) recently sent along, for a looksee, one of the new 'Goodyear' C/L versions of the S.T. G.15. The front induction G.15, incidentally, will shortly enter its tenth year of production (it was introduced in the spring of 1964) and has undergone many internal modifications over the years, but the 'Goodyear' motor is essentially the same as the G.15-F1 dealt with in the 'Engine Test' series in June 1971. External identifying points are the red, plastic venturi insert, the rounded sides to the intake boss (to enable a throttle-type carburettor to be used on R/C versions) and the addition of lugs to the ends of the exhaust duct.

The piston has been slightly modified: it no longer has the annular stiffening rib below the gudgeon-pin bosses and is 0.4 gramme lighter. The cylinder liner is a trifle shorter below the ports and the ports themselves are a little different. The exhaust port width has been increased but the transfer port area is slightly reduced. Port timing is not significantly different. Measurement of the engine submitted for examination indicated a 136-degree exhaust period and a 134-degree transfer period The piston skirt, cut away front and rear, cleared the bottom edge of the exhaust port for 64 degrees of crank angle at the top of the stroke. The measured rotary-valve timing was 39 deg. ABDC to 59 deg. ATDC. The crankshaft, with its 10 mm. o.d. main journal, 5 mm. front journal, 5 mm. crankpin and 7.5 mm. i.d. gas passage is unchanged. The cylinder-head is slightly deeper, has a narrower squish-band and a wider, shallower combustion chamber. The boss in the backplate is no longer drilled and tapped for a pressure fitting: a nipple



Two views of the latest ('Goodyear') Super Tigre G.15-F1. This motor, originally designed some nine years ago, is still a very good all-round 2.5 c.c contest motor, being one of the most popular choices for 'Profile Scale' racing in this country, while some favour its use for combat. Renowned for easy handling, even with high nitro fuels.



Standard 'Europe Series' Veco 19 uses R/C type crankcase casting, with brass venturi insert, brass spraybar and Perry needle.

threaded to fit in place of the upper left-hand backplate screw is supplied instead.

The G.15 Goodyear motor comes complete with the excellent G.15 machined spinner assembly. Weight of the engine submitted was 168.5 grammes (5.94 oz.).

G.15s have varied quite a bit in performance over the years but the better ones are still pretty good by any standard. Outputs on test have ranged from 0.41 to 0.47 on straight FAI fuel, up to over 0.60 bhp on 50 per cent nitro fuel.

Veco 19 Europe Series

Following the introduction, in 1971, of the 'Europe Series' Veco 61 R/C, the manufacturer, Helmut Bernhardt, last year, began production of a German version of the Veco 19 engine. All Veco 19s now imported by Irvine Engines for sale in the U.K. come from the Bernhardt factories, rather than the K&B plant in California where, of course, the original version is made.

Unlike the Europe Series 61, which is not a Veco design at all, the 19 closely follows the American prototype and, in fact, uses castings supplied by the U.S. factory. However, although certain parts are interchangeable, the German engine does have a number of internal differences. For example, the piston does not have a reduced skirt o.d. below the gudgeon-pin and is not internally milled, while a solid, dome-ended gudgeon-pin (still fully floating) is used instead of a hollow pin with PTFE pads. As a result, the piston and pin at 9.6 grammes, are 1.7 grammes heavier than the K&B-built components. The connecting-rod, however, forged instead of machined and with plain eyes at both ends instead of a bronze-bushed big-end, is 0.7 grammes lighter.

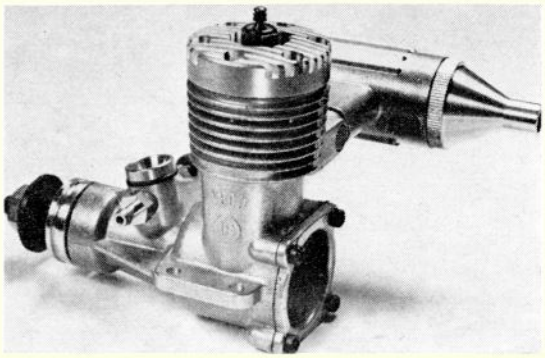
The crankshaft, heavily counterbalanced via cutaway web flanks and a crescent counterweight, is basically unchanged and continues to run in a 12 x 24 mm. rear ball-bearing and a $\frac{1}{4}$ x $\frac{5}{8}$ in. front bearing but, in place of a pressure-cast prop. driver keyed to the shaft with a square sunk key, the Europe Series uses a machined driver on a steel split taper collet.

One major difference between the American and German models of the Veco 19 is that the latter employs the R/C-type main casting for the standard non-throttle version of the engine as well as for the R/C unit. In other words, it has a shortened intake boss and has the exhaust duct bored longitudinally as for a coupled exhaust restrictor. Actually, none of the H.B. Veco 19s (there are four models in all, including a car version and a water-cooled marine model) has a coupled exhaust restrictor. Instead, the exhaust duct holes serve to accommodate a steel bar by which the H.B. silencer is secured to the engine. The venturi insert and needle-valve assembly are also different. In place of the original Veco aluminium insert, the Bernhardt engine uses a shorter brass insert and the brass spraybar is threaded for a Perry valve needle and coil spring instead of the original Veco thimble and leaf spring ratchet device. The H.B. assembly has a 5.3 mm. i.d. choke and a 3 mm. o.d. spraybar, giving a quite small effective choke area of only 7 sq.mm. This is about one-third smaller than the original Veco standard assembly and may reduce top end power a bit but should mean plenty of fuel suction for control-line stunt work.

The last standard Veco 19 to be tested in the *Aeromodeller* 'Engine Test' series was the 'Series 200' model from which the current K&B 'Series 71' and 'Europe Series' were developed. This put out 0.38 bhp at 15,500 rpm on the standard 10.5 sq.mm. venturi and 5 per cent nitro fuel, but without silencer. The same engine was also checked with its racing venturi (21 sq.mm. effective choke area) and 50 per cent nitro racing fuel and this added up to 1,000 rpm on various props. Just over a year ago, the 'Series 71' R/C version was featured in the 'Engine Test' series and achieved just short of 0.35 bhp at 15,000 rpm on 5 per cent nitro and with an Irvine silencer.

The Veco 19, even the original plain bearing 'Series 100' model, manufactured back in the mid-'Fifties, has always been one of the best engines in the .20 cu.in. class and one can see no reason why the new German-built version should not carry on this tradition.

Checked weight of the example submitted for examination was 180 grammes (6.35 oz.) less silencer but with K&B glowplug (not supplied), or 212 grammes (7.48 oz.) including silencer.



'Europe Series' Veco 19 with German-made expansion chamber-type silencer. This silencer is also adaptable to U.S.-built Veco 19s. Modifications include revised piston, forged connecting-rod, solid gudgeon-pin and machined prop.

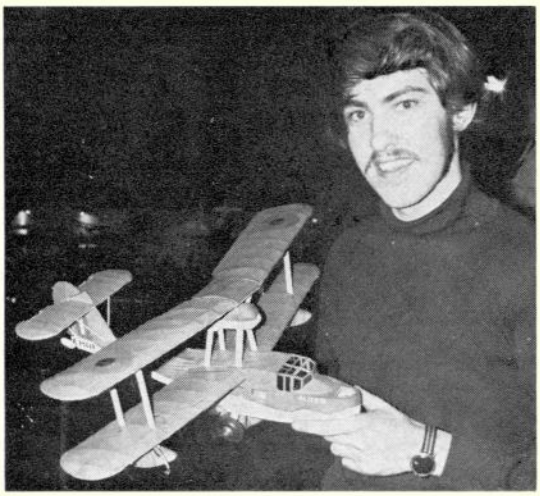
MODEL ENGINEER EXHIBITION 1973

Members of the Grantham club sitting on the balcony flying a pair of electric powered 'Pasadena Special' biplanes in formation. The elevated hardboard track stretched right across the hall to provide a flight circle of 50 ft. diameter. Once more the r.t.p. equipment was kindly loaned by the Grantham lads.

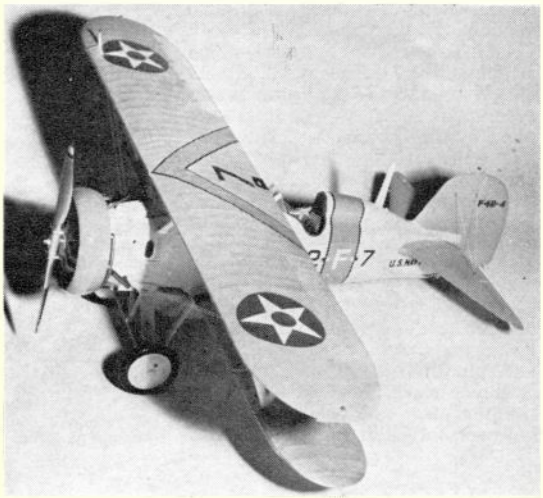
WITH MORE than 50,000 visitors during its eleven-day opening period, this year's exhibition could hardly be described as anything other than an outstanding success. The Militaria side has never been so well supported, nor has there ever been so much enthusiasm shown in the model boating world – either in the beautiful scale ships or the rapid 'flatties' scorching along in the swimming pool adjacent to the main hall. Not surprisingly at an exhibition entitled 'Model Engineer', the engineering exhibits were as numerous as ever, the locomotives and traction engines vying with one another to provide the most impressive, if not spectacular, miniature reproductions. All in all most gladdening to the heart of any modeller – any that is *except* for the aeromodeller. Only six model aircraft were entered in the flying model section (and that includes a 'Pterodactyl' and a hot-air balloon) and of these six, not all were truly exhibition – class models. In all, this year's entry was even more dismal than the last – at least it can hardly get any lower now. With so many visitors to an exhibition of this nature it seems that we are forgetting what a great deal of publicity can be gained by showing our labours to the public. Twice the exhibition was featured on television, how much more likely that aeromodelling would have been included in the screenings if there had been a whole host of top quality models. Must we always lose out? Judging by the numbers of exhibits, the General Public must have been left with the opinion the aeromodelling has a tiny, minority following – way behind the boat modellers. Fortunately, due to the generosity of Roy Scott, Roy Pitts, Max Coote and Mick Charles a few display models were provided which helped, to some degree, to hide the otherwise barren stage display.

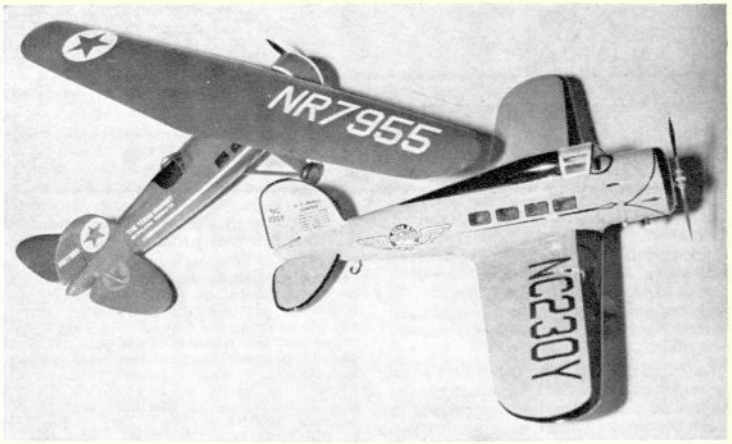
Plastic and 'solid' aircraft enthusiasts are fortunately less shy, and in consequence this side of the hobby showed a great deal of interest and ingenuity, many entries being 'scratchbuilt' out of plastic card. Standards in these entries was commendably high and biplanes proliferated. The increasing numbers of modellers who are dis-

Dick Whybray, a biology student who helped with the r.t.p. displays throughout the exhibition, with his attractive 'Walrus'. He also flew a 'Flying Flea' which was spectacular for its slow flight and noisy (geared) motor!



The 1/7nd scale Boeing F4B-4 by T. Bourke of Cricklewood was made from a Hasegawa kit but had much added detail and was superbly finished. An extremely colourful subject.



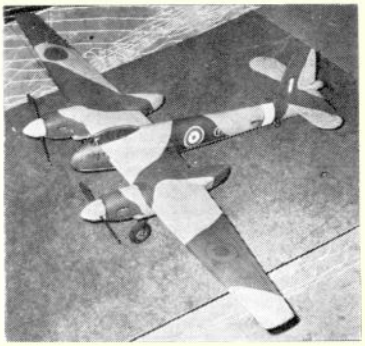


content with standard kits and insist on doing their 'own thing' are to be welcomed.

Tony Woollett entered several large biplanes of the 1930s – his Vickers Vulcan taking a Silver medal. The Championship cup went to K. Wagner of Camberley, Surrey, with a superb model of a VC10 undergoing maintenance in a hangar complex. The model is to 1/72 scale! Clive Hall took a Bronze medal with his two 'solid' Lockheed Orions, while Bill Hearne received the same for a superb scratchbuilt Nieuport 17. Scale Models staffman Ray Rimell's scratchbuilt LVG was another entrant to receive this hard-earned prize.

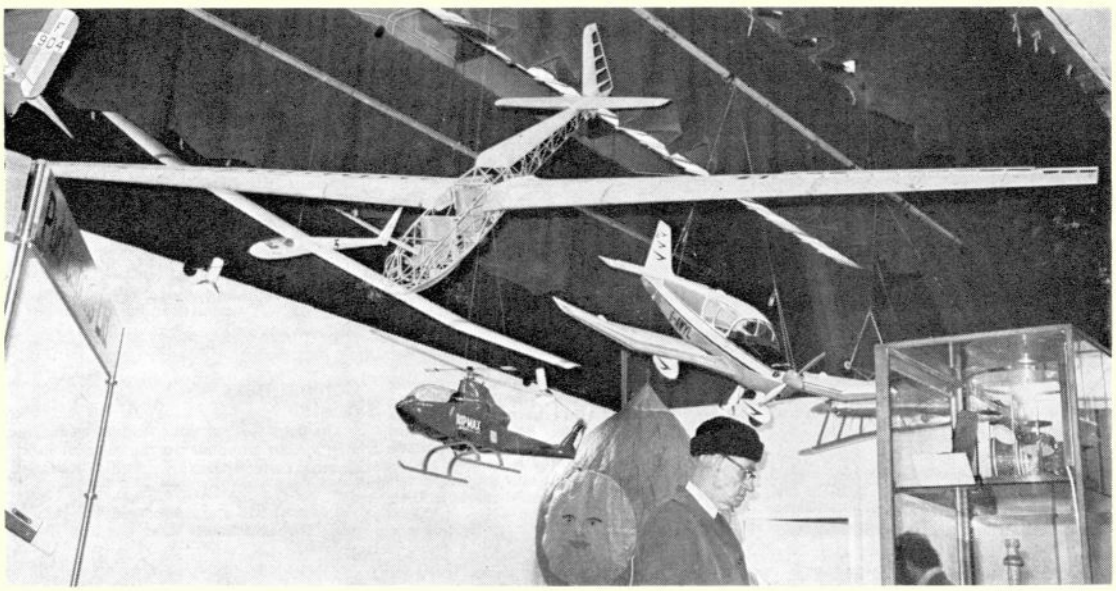
Once more our electric powered r.t.p. models were flown continuously on an elevated circuit stretching between the balconies either side of the main hall – permitting models to be flown on 25 foot long lines. Unfortunately lack of spare motors prevented us from flying three-at-a-time too often, but at least we made one discovery – loops are definitely possible! In fact our major problem was how to resume level flight with a model after performing continuous loops – a little nifty manipulation of the control box is necessary! 'Secret' to this success was merely to rather over-elevate the model, then to suddenly apply full power – and over she goes! On the first day and on each of the Saturdays the Grantham club arrived 'in force' and performed throughout the day with models ranging from Autogyros to a variety of scale multi-engined jobs. All in all, interest in electric flight is alive and well!

Above left are Clive Hall's beautifully made Lockheeds – an 'Orion' and an 'Air Express', both carefully converted from Lindberg plastic kits. Above a fine flying Spitfire by Tom Walker converted to r.t.p. from the Sterling kit and fitted with working navigation lights.



Twin-engined r.t.p. Westland Welkin by Dave Wyatt of the Grantham club proved a good stable flyer – and an unusual choice of subject.

The huge ¼ scale AS K-13 by Roy Pitts impressed all – the fuselage consisting of silver soldered tube construction. The second glider seen is his 'Windflecker' which he is now selling in A.R.T.F. form. Behind is Roy Scott's beautifully finished Jodel Regent, available in kit form from Practical Scale. Max Coote lent his immaculate Schuco-Hegi helicopter, while just visible is Mick Charles' Stampe SV4.



READERS' LETTERS . . .

Too expert orientated?

Dear Sir,

Your 'Comment' column in the November *Aeromodeller* will, I hope, promote thought and possible comment from other modellers. May I, as a person who has been modelling for some 33 years, be permitted to submit my ideas to why there is such a dearth of juniors to the hobby.

In my opinion, based on my own experience, I think that the problem is caused by the following reasons.

Firstly, I have noticed a marked drop in interest in recent years by youngsters in aeromodelling. They may be interested to see models fly when operated by someone else, but they have no wish to partake themselves. It is largely an admitted lack of patience on their part, lack of confidence, – but not apparently a lack of cash!

Secondly, of those who do make flying models, very few are interested in entering contests. Some might say that there should be a strong competetive element as there are considerable numbers of juniors who affiliate to the S.M.A.E. each year. They may affiliate, but this is only for insurance reasons, not for any interest in competitive flying. True there was a surge of enthusiasm at the 1971 Nationals when the *Junior Kit Contest* was started, but after this one year the interest has noticeably waned. There were 150 enquiries concerning the 1971 contest, and 50 actual entries, so one may well wonder what happened to the other 100 prospective entrants. I think this is due to the non-competitive attitude of, *'what's the good of me entering, I'll never win'*, which seems very prevalent these days, coupled with the feeling of being 'squeezed out' by the predominant senior contingent. The sight of scores of grown men with models built, finished and fitted to the nth degree of perfection does, in my experience, have a demoralising effect on youngsters with their own humble offerings. Even though they are not going to compete in the same event(s) as the seniors, the overpowering effect of the superiority of the older modellers is there. The prizes may well be good, but prizes are no incentive when the prospective competitor is disconsolate.

You say that we adults are overlooking some vital points, but what is it? I think that this vital point is that aeromodelling has now become a highly scientific hobby dominated by the serious-minded senior who has little or no time for the junior modeller, forgetting that he was once this age himself.

One only has to look at the contents of *Aeromodeller* to see which way this pattern has drifted. Young modellers are not interested in the monthly free-flight dirge by John O'Donnell or the long-winded reports on World Championships in the C/L and R/C field. They want something they can understand. The excellent *Golden Wings* page showed the type of problems that youngsters face, but even this article seems to have evaporated into thin air over the last month or so, possibly pushed out by the intrusion of some highly technical topic.

In short, when aeromodelling was a happy-go-lucky hobby, it suited all generations. As the upper end has now been pushed to fanatical levels of perfection, so the lower end has diminished, discouraged by modelling which juniors feel is beyond their ability.

I admit that in this letter, I have only given my reasons as to what I think has caused the lack of enthusiasm. I do not pretend to know the answer apart from saying that encouragement is the crucial issue. How to get this encrougement under way, assuming that the seed of interest has been sown is the problem. Possibly a 'Junior Nationals' where **all** events are for those under the age of 18 may promote enthusiasm. I would be most interested. as no doubt would be many others, to see what the Juniors themselves consider is needed.

But will many juniors write to give their views? If I am any judge very few of them read the *Aeromodeller* now compared to previous years, as the contents are of no interest to them.

Ashtead, Surrey. S. V. Tucker.

A junior replies

Dear Sir,

Having read the letters in January *Aeromodeller*, I felt I must jump to someone's defence. Most juniors who wrote seemed to want competitions for their engine in their own back garden, without opposition. I fly control-line, and regularly cycle, with a 30 in. span stunter, five miles to a flying site. I have also cycled 30 miles to and 30 miles back from the Southern Area Champs.

Clubs cannot be expected to move to the junior modeller, especially as he may give up when he's 16 for more homely interests. There are three clubs within 20 miles of my house, and I am prepared to cycle to whichever club suits my interests at that time, CL, R/C or F/F.

A number of people suggested up to three different Stunt Classes. Already turn-outs at events are doleful, which would be even worse, as the competitions would have to be nearer, and even further from people's back gardens.

I'm 14 and it amazes me how anyone can find the articles in *Aeromodeller* above them. People ought to be glad there is a reliable magazine which doesn't deal with just R/C, and is not 80 per cent advertisements, à la U.S.A.!

All the points mentioned in 'name and address supplied's' letter (sorry) could be answered by reading three issues of *Aeromodeller*.

Plans are not supposed to be copied out of magazines – A.P.S. supply the best plans available. Another point with competitions is that they need administrating which is hard enough with the present situation. Reception at the local control-line club proved a dead loss, 'no junior members unless sponsored' proves prohibition. Official comment is that the Council disapproves of junior members. Officials!

Wallington, Surrey. *P. D. Hykin*

Where are the juniors?

Dear Sir,

I would like to make some comments on this so-called junior problem. In reference to P. J. Marshall's letter about having to travel two to three miles to his nearest club, surely this should present no problem to a young lad. When I was a junior, I used to cycle four miles to my club's flying site in all kinds of weather, with three models tied to my back, as did a lot of the juniors in that club; we did this because we were keen.

My next comment is about the 'blood boiling' Keven Wise; I feel that his comments should be directed at his club. As it is up to the club to foster interests of junior members. We of the Morley & District M.A.C. recently moved into some new premises, and affiliated to the local body for further education. We had posters printed aimed at recruiting young blood into the club. On the first official meeting all our members turned up with models, result four juniors, two of which have never turned up since. To try and help our juniors, we have building and covering demonstrations, film shows, all of them have the telephone numbers of the members with transport if they want a lift to the flying sites or competitions. But they never ring, so 'where is all the enthusiasm now?'; not in this area. According to the letters there are thousands of juniors wan'ing to join a club such as ours whose members will take an interest in them. I think that there seems to be more apathy than enthusiasm. In our experience, no matter how much help is given to juniors, you're lucky if one in ten sticks with the club.

Batley, Yorks. *R. Ashby*

More junior contests

Dear Sir,

I was interested to read your comment in the January, 1973, issue of *Aero Modeller*, and especially the piece about contests for juniors.

As I am a control-line flyer, I would, naturally, like to see a wider range of junior contests covering this side of our hobby. There is already a junior stunt competition, and there have also been some 'Goodyear' compe'itions for the novice at some meeting. Yet, as far as I know, there are no combat competitions for juniors or novices. This, to me, is rather surprising, especially as combat nearly always has the highest entry at any control-line contest. If it is so popular, why is it just about the only C/L class that has no special contest for juniors. I, for one, would very much welcome an event of this sort – it would not be before time.

Malvern, Worcs. *Ian Nichols*

Combat rules

Dear Sir,

On page 460 of your August issue you mention an 'anomaly' in the rules of F.A.I. Combat, which disallows string cuts and 'taking the knot'.

I submit that the rules as laid down are perfectly satisfactory and if the above

conditions are not adhered to in the British Nats. then all the results over the past few years are null and void. We have been using these rules across Australia equally as long as yourselves and the string-cut has never been allowed to my knowledge.

You say, 'Obviously this rule must be reviewed'. I say your officials must be reviewed for knowledge of the rules or otherwise.

This rule must be retained to avoid the carnage which occurs in open combat.

West Leederville, W.A. 6007 *P. Somers*

Try C/L Stunt!

Dear Sirs,

During the last summer I have noticed that there has been a slight general rise in the number of entries to C/L Aerobatics Competitions over previous years.

However, I think this rise can only be accredited to one specific area of the country: that is the South Midland and London areas. Obviously, there are great incentives to encourage the competition minded stunt flier from these areas to 'have a go' in a competition. These, I think, arise from the numerous well organised C/L clubs around London, and the large number of good model shops.

Now, since there has been evidence of a rise in the number of competition minded stunt fliers from the London area, it follows that there are a number of potential competitors from the N. Midlands who, because of relative isolation from the stunt scene, have not been given the urge to enter a competition.

Another factor discouraging potential stunt fliers is the attitude of 'Well, I shall only come last anyway', or 'they are much too good for me', etc. This is a negative attitude to take and one which is often quite wrong. No one expects a new stunt flier to excel in his (or her!) first competition. So may I say to anyone considering stunt competitions next season, do so, because you will certainly not regret it. I am sure you will find everyone eager to help you along and give advice. Indeed, the amount one can pick up about stunt flying at a comp is quite staggering. Regular stunt fliers are always eager to discuss such things as the positioning of manoeuvres, side areas, flap to elevator ratios, tail movements, etc., all of which are important individual items.

The stunt scene in this country is very tightly knit and there seems to be a nucleus of stunt fliers who attend each comp as it comes along, an individual missing perhaps only two or three comps in a season. Because of this, most comps are held in a very relaxed, friendly atmosphere which is to be thoroughly recommended to any would-be competition stunt flier.

Littleover, Derby *J. A. Heanen*

Modelling down-under

Dear Sir,

I am one of those uncivilised, backward aeromodellers from down under. I was thinking last night how totally different out two set-ups are. If you know at all what the ordinary fun flying set-up for an Australian modeller is, it involves a public oval, a few keen blokes and some engines and planes. No hitches at all. Yes, you may well laugh at our primitive set-up but you have forgotten some important things. We fly for fun, there are no hitches, no compulsory club fees, insurances or land rentage or hot-headed competitive clashes. Maybe we suffer from overpriced quality goods which are unfortunately necessary to buy from overseas, but we save on the fact that there are no other hitches involved.

So my distinguished aeromodelling friends from up above, gain one point for our type of association. A bunch of loosely-associated friends, flying for their own satisfaction.

Tell me, does this type of situation exist in the U.K. or does civilisation clamp down everywhere on your hobby, or does your brilliant magazine cater only for clubs?

N.S.W., Australia. *T. Hunter*

Anti noise

Dear Sir,

I feel I must forward a few comments on my pet hate, 'noise'. I shudder to think about how many good flying sites have been lost through this one factor, and I feel sure that if manufacturers claimed that 'their' engines were quieter, sales would go up considerably. I quite realise that to produce an efficient silencer of reasonable proportions is no easy task, but surely we can have a few more engines with a rear facing exhaust port, at least then the model aeroplane builder can have a go at putting our larger but more efficient silencers in the fuselage.

Imagine that beautifully-built scale Spitfire not being ruined by a W.W.2 torpedo hanging out of the side! Or what appears to be the trend now, an object that looks like a small dustbin.

Compton, Staffs. *D. V. Bute*

Help please!

Dear Sir,

I am gathering material for a history of *Royal Air Force Station Wyton*, in Huntingdonshire, from 1915 to the present day. If any of your readers feel that they might be able to help, I should be most grateful to hear from them.

I am interested in obtaining personal accounts of life at Wyton in the various sections and squadrons; in anecdotes – humorous or otherwise; in newspaper cuttings, old station magazines and photographs. Photographs sent to me are taken great care of – copies are made by the station photo section and originals are returned to their owners as soon as possible. By way of thanks, I make a special effort to put correspondents in touch with one another, if I believe them to have been acquainted during their service days

Wyton, Huntingdon. *Ian Fisher*

JUPITER

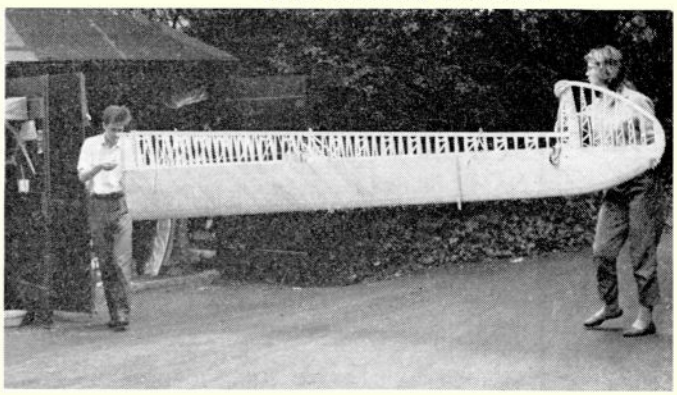
Continued from page 143

and strips of foam rubber, as used for draught excluders, were glued along their edges, again to prevent a smooth surface for the covering. The specimen was then covered with Melinex, using contact adhesive applied to the framework – one helper held the covering clear of the framework while another person smoothed it steadily down.

With this task completed, a stress check was necessary. To do this I made two dummy wing panels, each approximately 15 feet long from ordinary 4 x 2 in. sawn softwood, joining these each side of the specimen using an $\frac{1}{8}$ in. dural brackets bolted to the spar - in fact the same method of wing joining which I envisaged using on the full size. The tips of this structure were then supported while I walked down the length of the span to check the strength. It took my weight - and a lot more too in order to obtain the equivalent of a $2\frac{1}{2}$G loading.

So it was strong enough, smooth enough, and an estimate of the weight for the entire wing showed it to be light enough; but most important of all, it was capable of being made, using not much more than a lino knife and a sanding block. Henry Kremer here I come!

To be continued next month



Big, isn't it? – and that's only one of four wing sections! Chris Roper and his wife find that the bulk of Jupiter's wing is the problem – not its weight. Storage wasn't so easy either! Wing panels were made to bolt together to ease this and transportation problems.

GOLDEN WINGS AEROMODELLER MODEL CLUB

Are you between 10 and 16 years of age? Then don't delay, join today

JUNIOR KIT RESULTS

YOU MAY RECALL that the S.M.A.E. offered a special prize in 1972 (the 50th Anniversary Year of S.M.A.E.) for the best performance in one of the several free-flight *Junior Kit Contests* held in the past season, and the winner proved to be 13-year-old Nicholas Watson from Market Harborough flying a **KeilKraft** *Caprice*. In three flights at the South Midland Gala, Nicholas achieved a total of 289 seconds. Yes – almost five minutes. (In fact, he achieved more than five minutes because one flight was over three minutes but only counted for three minutes under the 'maximum' rule.) Each of his other two flights was over 50 seconds also.

In addition to the prize collected on the day, Nicholas receives an engraved cup to keep; well done, Nicholas.

Nicholas was by no means an easy winner – next on the list came H. Godden at the *Northern Gala;* his three-flight total was 270 seconds and in some ways you may think that he was very unlucky not to win – because each of his flights was around 1½ minutes. In fact, of five flights he made that day, the *worst* was 60 seconds and the best was 103 seconds. This is remarkable consistency, helped, no doubt, by the very good flying weather at the Northern Gala. He was flying a **KeilKraft** *Gypsy*, so both rubber and glider can, and do, give good results!

Other worthy performances were:

A. Cameron *(Senator)*	218 secs.*
G. Moore *(Mentor)*	202 secs.
P. Dilks *(Caprice)*	195 secs.
M. Moore *(Grebe)*	178 secs.

(*A. Cameron also got 137 seconds with a 'Swan' *at the same meeting!* He must be fit.)

Well, despite the relatively poor number of entries in 1972, those who did enter found it enjoyable and many had never entered any contest beforehand. So in 1973, why don't *you* enter and join the fun. Keep looking in *Golden Wing Column*.

Right, Maurice Moor with his Mercury Grebe which he flew in the 'Junior Kit' event at the South Midland Area Rally, held at Cranfield. Below right is brother Graham with a Mercury Swan glider, seen at the same meeting – although Graham actually won the rubber event. Obviously a couple of keen enthusiasts!

Dear John,

I have recently constructed a low-wing F/F model, powered by a McCoy .049 engine. It was based on a design in a book. However, all is not well. I have, in my enthusiasm, left out an important factor which was the dihedral on the wing. I have made the sheeted wing horizontal; could you please tell me (a) if this will affect the flight; (b) if so, how can I remedy the defect?
Bower Ashton, Bristol. *A. Parfitt*

Oh, dear! You have made a mistake, haven't you. (Don't worry, my personal favourite is when I build two left-hand wing panels instead of one right-hand and one left-hand!)

I'm afraid that there is nothing for it but to break the wing and introduce dihedral. However, there is more than one way of doing it and it shouldn't be too much trouble. If the model wing is detachable from the fuselage, then I would carefully cut the wing in half at the centre. A stiff-backed razor saw sometimes helps here – but if you are using a normal balsa knife or razor blade, then use a ruler as a guide as much as you can. This done, push one wing half to the end of your work bench so that the cut end is flush with the edge. Next, pack up the wing tip to the required dihedral and with a sanding block held vertically, carefully chamfer the cut end until it too is vertical (with the wing tip still packed up!). Don't do this on your Mum's best table! Repeat the process with the other wing half. Cut two extra wing ribs and cement one to each prepared end, leaning at the correct chamfered angle. Then cement the two wings together with both tips packed up at the correct angle. You will need at least one plywood dihedral brace and its position will depend on your wing spars; try to cement it in place before removing the blocks from under the wing tips. Sometimes this is not possible if you already have top sheeting in place, in which case the brace must be inserted from the underside after the initial cementing of the two wing halves has set properly – but be careful until the brace is in position and set.

If the wing is fixed to the fuselage, then make a dihedral break on each wing more or less as above, as close to the fuselage as possible.

You must have dihedral on a low-wing F/F model – and plenty of it. Without it, your model will be unstable in the rolling plane and quite simply will not fly without it.

Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 25p to cover cost of the enamel club badge, two coloured transfers and membership card.

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topical twists

by 'Pylonius'

illustrated by 'Sherry'

'He's lucky – he's unlicenced, uninsured and he didn't get one of these.'

Watch This Space

Some hint of what model flying may well be like in the not too distant future was given in a recent report on a space age model meeting. From this the change from airfield to space flying looks like being one of altitude rather than attitude, as it appears likely that all the old contest forms will survive but at a greater operational height.

So far, only two traditional events have been given the space treatment: power duration and chuck gliding. The first is a logical progression. The nearest thing we have to rocketless rocket flight is the model plane going up vertical under the pull of an engine about ten times more powerful than is required for civilised flight; so powerful, in fact, that it can outfly the average airfield on a four-second engine run, or 3.5, 4.2, 4.4, according to the reflex condition of the timekeeper. How much more rational, then, to use an actual rocket for the upward journey and a parachute for the long glide down? Given a specific amount of standard fuel and a parachute area formula, you would hardly need a timekeeper – just a bloke who could count ten backwards.

The other contest model to be given the space age treatment is the very down to earth chuck glider. The space age application is, in this case, a very simple one: you use a booster rocket instead of your primitive right arm to project the model spacewards. If nothing else, this makes for a more democratic approach, for although we know from the telly adverts what our right arms are for, some right arms are more equal than others. You're not likely to emulate the feats of a Tony Slater if you're the sort of six stone weakling who gets sand kicked in his face.

Of course, it will not be long before Radio catches up with the space age, when aerobatic rockets should be a sight worth seeing and spot landing something to watch with binoculars from a concrete bunker.

One good thing, though, tactical flying will be out. The count down is hardly likely to be suspended whilst the tactician waits for an advantageous clearance in the cloud cover.

Now, Children . . .

As model planes develop in range and performance there is an equal development in the environment in which they operate. At one time your model, like the poetic arrow, was shot into the air to go, you cared not where, but now there are all manner of obstacles to be avoided, like pylons, motorways – and worst of all, airfields.

In the United States, from where we get advance notice of the ghastly things in store for us, like hypermarkets and eight-lane motorways, a safety standard pamphlet has been issued as a guidance to the model flyer. This warns, in effect, that the only safe thing to do with a model plane is to keep it in the boot of the car. The model plane, like the citizen who flies it, has no rights where modern 'progress' is concerned. If they build an airport near your flying field, or run a power cable over it, it is the model which has to move out of the way. It is not likely that the aircraft captain will ask his passengers to wait until the model flyer gives him clearance. By the same token, if your backyard comes in line with a motorway route it is your back yard that has to go, cry 'Magna Carta' as much as you like.

It is a wry comment on our times that the very 'progress' that has given us the wonder of the engine-powered, remote control model plane, seems to ensure that we cannot fly it – or any model come to that.

The Young in Art

Young, would-be model flyers are asking if there is another less painful way of earning one's flying wings than by the crude bash-and-crash initiation system.

The answer, as far as I'm concerned, is a definite no. There is that happy band of modellers, of which I have not the good luck to belong, who are born with 'green' fingers. Right from the word 'go' their models just fly and fly. They never, for some reason known only to the gremlins, get the mid-air collywobbles, with which I am chronically afflicted and they never suffer the humiliation of walking back with a bundle of pieces.

Thus, when spreading your fledgling wings, you feel that you are going to be one of the ugly ducklings of the model movement rather than an O'Donnell-type swan; never fly, or attempt to fly, anything that is capable of drilling a hole in the ground and an even bigger one in your pocket, but go instead for the light, bounceable stuff – chuck gliders and things.

Unless, as I say, you have 'green' model fingers, you shouldn't touch Radio with a fifty-foot aerial. You should also remember that it can be pretty expensive finding out if you have the gift. There are people who bring out an impeccably-built first Radio model, with all systems in perfect order, and more or less do the book on the first outing, whilst others get a staggering, uncertain climb, the inevitable sticking control and the ultimate crunch. The cure, alas, is not to be found in repeating the dose; you just have to give up before it becomes a bad habit – like bashing your head against a wall.

For initiation purposes, it would be a good idea if someone were to produce a sort of simulator. This would determine on a drain hole/violets basis whether model planes were going to fly for the youthful aspirant or not. Thus, for the cost of a few pence he could know whether he should build a multi-radio, a chuck glider, or just carry on at the disco.

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Flying Scale Column

by ERIC COATES

being mainly concerned with 'twins'

THIS MONTH, I am going to discuss what I consider to be just about the most difficult of all types in scale modelling: the powered free-flight twin.

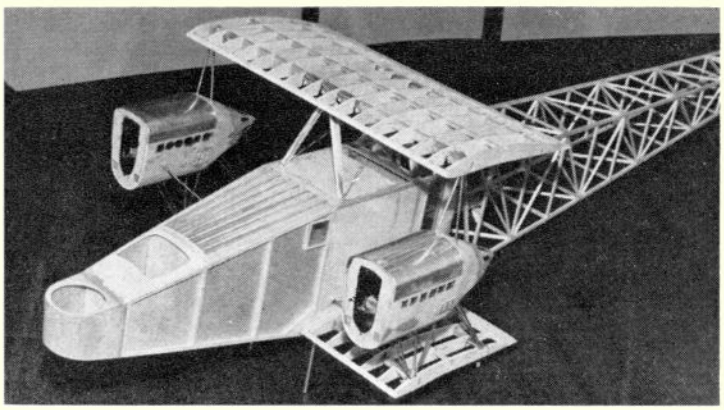
Twin-engined aircraft are relatively easy to fly by control lines; the only tricky bit being if the inboard engine cuts out first, and the model tries to turn-in on the lines. Suitable offset on rudders and ailerons, plus wing tip weight, fuel tank sizes etc. can, however, minimise this problem to almost negligible proportions, while stability problems never enter into the control liner's world. The sight of a large model usually flying at three times scale speed in unbanked turns on too-short lines (to look realistic I think 300 ft. lines would be about right) holds no thrill for me, while even worse, is the pilot's eye view of the continuously rotating side elevation. However, every man to his own tastes and far be it for me to decry the avid bunch of enthusiasts for this class of modelling. A scale model is a scale model, no matter by which means it remains airborne.

Without doubt, the most realistic way to fly multi-engined models is by means of radio control. One can then observe the aeroplane in a realistic flight and simultaneously enjoy the pleasure of 'driving' it. Surprisingly, this class of model was more popular seven or eight years ago when reed equipment was still pre-eminent and proportional control was only just gaining a foothold. In more recent years the radio twin has become relatively rare – possibly due to the problems of building down to the F.A. maximum of 11 lb. and with the 10 cc. maximum engine displacement. This argument only really applies to the 'hot' models, such as *Mosquito* etc. Perhaps the risk of engine failure, during landing or take-off, which usually ends in disaster puts people off – the resultant 'pile' can be very expensive in both terms of cash and time spent repairing.

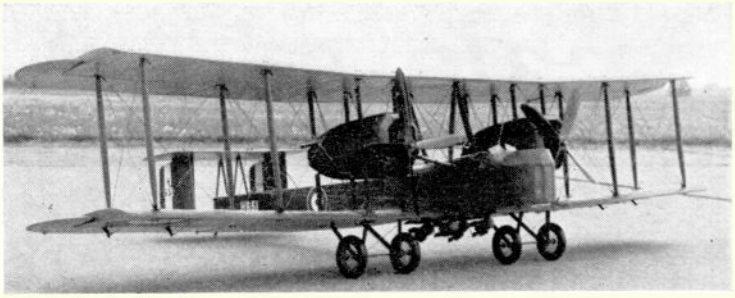
Twenty years ago, before R/C became sophisticated, the only way to a satisfactory solution was to fly them free-flight. Rubber powered twins had been flown successfully before the war, by such pioneers as Harold Towner and Rupert Moore, but they were relatively light, all tissue covered machines with limited motor runs. The small diesel engine solved the problem of unlimited motor run, but brought along another in its wake: that of balancing the power output of the two engines.

The first man I knew to solve this problem and produce a satisfactory flyer that could compete on equal terms with single engined-scale models, was Jim Bridgewood of Doncaster who, in 1952, installed a simple pendulum throttle system in his *Bristol Bombay*. I followed suit and produced a similarly controlled J4F-1 *Gosling* in 1954.

Heading picture is a flashback to 1954, when a youthful-looking E.A.C. took second place in the Eddie Riding Memorial Trophy with this 54 in.-span version of the Grumman J4F-1 Gosling. Power was supplied by a pair of E.D. Bees, controlled by pendulum throttles as described in the next.



Right, Terry Manley's twin-engined project is a 72 in.-span Handley-Page 0/400, to be fitted with a brace of Mills 75s. These motors Terry finds so reliable that he does not consider the use of pendulum throttles worthwhile. Quite an impressive beast – and just look at that fuselage bracing.



Probably the best way to model twins today, and certainly the safest, is with modern proportional radio control. This Vickers Vimy bomber by Peter Neate flies most realistically with 'full house' R/C.

Both these machines competed in the *Eddie Riding* event at Woodford in their respective years . . . and crashed! Jim built a *Mosquito* round about the same time as my *Gosling* but this was written off during trimming. I will give further details of these pioneer machines later.

Our early efforts at twins must have put the rest of competitive scale modellers off the subject, including ourselves, for I never saw another successful twin fly free-flight in a competition until Terry Manley's magnificent effort with his *Vickers Vimy* at the Little Rissington all Scale Meeting in 1971. Unfortunately, although flying well the machine damaged itself on landing during the competition, and Terry did not think it worth repairing. However, I was inspired to write this brief history on the subject when I saw his half constructed *Handley Page* 0/400 during the Christmas holiday. He threatens to assail the 1973 contests with this machine; bomb dropping and all!

Terry' approach to free-flight twins is vastly different to that of Jim's and my own of all those years ago. With his love of W.W.1. subjects he produces very lightly loaded machines, equally low powered. The 0/400 will have a span of 70 in. and a target weight of only 40 oz. and be powered by a pair of Mills 0.75 cc. engines – a 'paper bag' if ever there was one! His *Vimy*, although with not so large a span, was of greater chord and, therefore, of similar area using the same power units. Terry spurns all mechanical aids for equalising the power output of his engines; relying on the wonderfully consistent performance of the Mills engines and a single timer to cut both engines simultaneously. Of course if one engine cuts prematurely then disaster is unavoidable, but providing a rigorous check-out is made before each flight then the system is 99% foolproof. You just have to hope that the odd 1% does not occur too soon! On models of this type two separate tanks, each mounted as close as possible to each engine, are used. These should be of the cube type with the mean fuel level at carburettor height. The shortest possible fuel tube should be used, and here rear induction motors, such as the Mills, are so much more suitable. Tall tanks which give greatly varying heads of fuel as the level decreases must be avoided. The tanks should have sufficient capacity for about a four minute run. This will allow for two minutes airborne running, one minute ground running and one minute safety margin. I need not repeat what disaster will happen if one engine runs out of fuel before the timer operates the cut out.

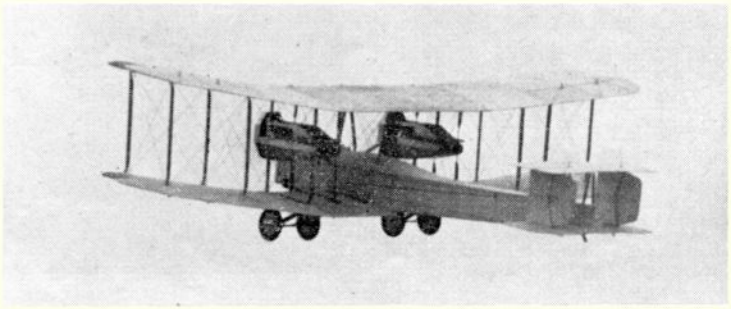
Starting procedure should be along the following lines:

1. Start No. 1 engine and let it warm up, slightly under compressed.
2. Start No. 2 engine and let it warm up likewise.
3. When they are warm, adjust the compression screws of both engines so that misfiring just ceases. (Nitrated diesel fuel is a must for twin engine operation.)
4. Tune both engines to the same r.p.m. by 'beating'. (When two engines are somewhere near the same speed you will detect a rise and fall in the sound of the combined noise. The faster this beat, the greater the difference in engine speed.) It should be possible to tune Mills engines to beat regularly to as low a frequency as ½ second, when the engines will be running in synchronism.
5. Top up both tanks.
6. Re-check the 'beating' and if O.K. start the cut-out timer.
7. Release model and pray.

The thing to avoid doing at all costs is overcompressing the engines, and if they are not allowed to warm up thoroughly before setting, then this is a distinct possibility. An overcompressed engine will overheat, lose power and may even stop.

I can only recommend this uncontrolled – engine type of flying for low-powered lightly-loaded machines such as the *Vimy* and 0/400. There are numerous machines, stretching up to the *Heyford* era of the mid-thirties, all eminently suitable though: such as the *D.H.* 10, *B.P. Overstrand, Vickers Virginia, H.P.W.* 8 etc. The only stability problems these machines may suffer from is lack of tail area, although a little enlarging of these surfaces on a complicated model such as a twin is well 'within the book' and most judges, I am sure, would look favourably on such a model.

The twins Jim and I made all those years ago were a very different kettle of fish. They were slightly smaller (my *J4F* spanned 54 in.) and were a lot more heavily loaded. Both the Bombay and the J4F were powered by ED Bee Mk. 1's of 1 cc. capacity – rather nice scale motors in their day, being compact, more powerful than the Mills 75, but unfortunately nothing like as durable. The bore wear was fairly rapid and slop soon took place in the drive to the rear induction disc from the crank pin. Their great attraction to us though was the relatively simple manner in which they could be adapted to pendulum control.



Another Vickers Vimy, this time. Terry Manley's free-flight version of the 'Transatlantic' which he flew at the All Scale Meeting in 1971. It spans 56 in., and is powered by a pair of Mills 75s (naturally!) and uses no pendulums of any sort.

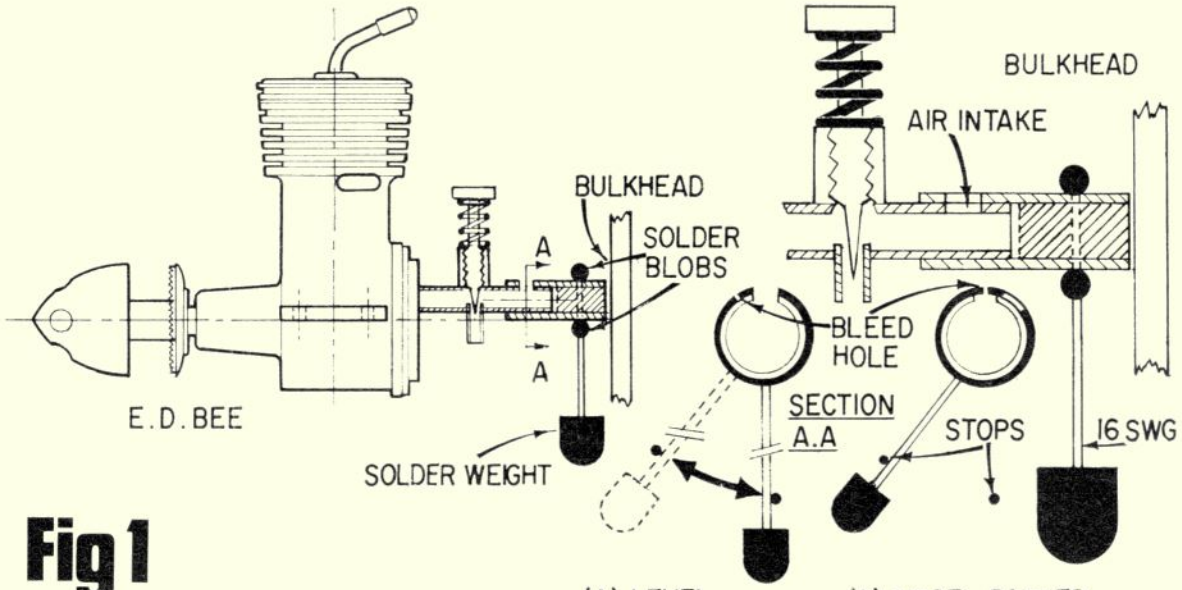
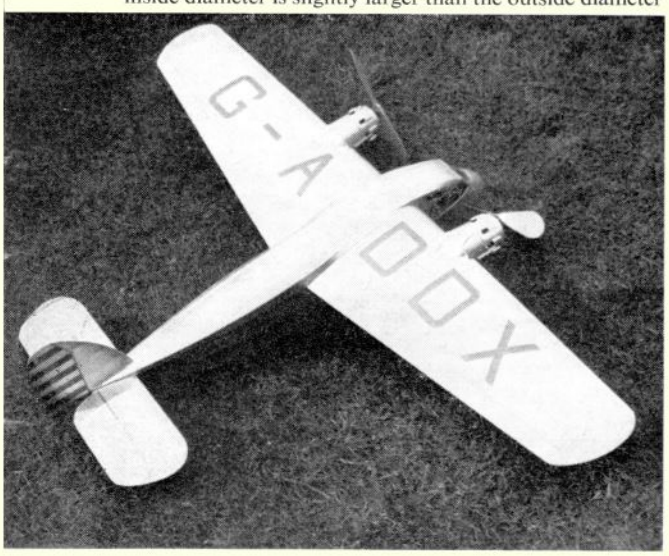


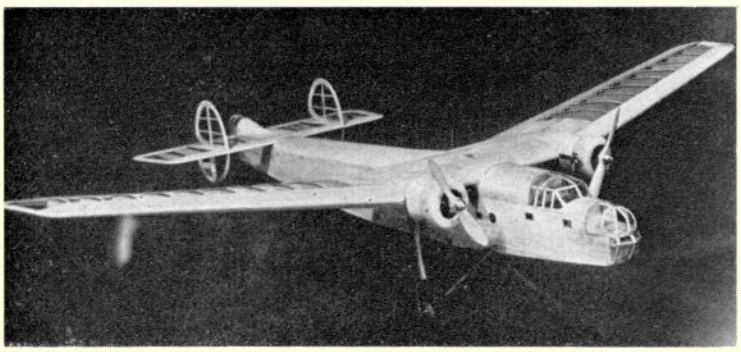
Fig 1

Now many people who know my views on pendulum controls for scale models may be surprised at my advocating their use here. My main objection to pendulums is that the weight cannot differentiate between vertical gravity and inertia forces created, within the aeroplane, due to acceleration. Now most of these forces occur in the fore and aft plane making pendulums rather unsuitable, in my opinion, for the simplest and most popular of control functions – the elevator. I think a better case can be made for lateral control when hooked up to the ailerons, but not to the rudder. Unfortunately aileron linkage, particularly on a biplane, is very difficult to combine with knock off or flexible wing fittings, hence its comparative rarity. Lateral pendulum control, when fitted to the engines of a twin is very simple indeed. The system used by Jim and myself on the Bees was shown in *Figure* 1. The Bee readily adapted to the modification by just drilling a 3/32 in. dia. hole in the parallel choke tube. Other rear induction motors can be similarly adapted but very often trumpet mouthed choke tubes, such as the Mk. 11 Mills 1.3 cc. will need to be replaced with parallel jobs, but I have never detected much difference in performance, on this class of motor, whatever its shape. The pendulum throttle itself can be made from any tube whose inside diameter is slightly larger than the outside diameter of the choke tube. An air intake hole, 3/32 in. dia., is drilled also in this tube to register with the hole in the choke tube. For larger engines suitably larger holes are used, roughly corresponding with the bore of the parallel choke. When in line these two holes form the modified air intake – the original air intake is blocked off by filling the outer tube end with hardwood epoxied in place. The pendulum is 15 swg. wire, passing through the tube and the wood core, held in place by blobs of solder on the wire. The lower end is bent over and a solder weight cast on. The size of the weight depends upon the engine and how freely the throttle operates, but for a Bee, a suitable mould can be made by drilling a hardwood block about $\frac{1}{4}$ in. deep with a $\frac{1}{4}$ in. dia. drill. Molten solder should be poured into the mould and the fluxed pendulum wire plunged into the solder. The mould will char a bit but it will cast one weight. Drill another mould for the other throttle.

When the model is laterally on an even keel, both pendulums will hang vertically and the holes in the choke tube and throttle will be in alignment. Both engines will, therefore, run almost flat out, but set to run in synchronism as previously described. Stops are arranged to allow the pendulums to swing inboard only. It can, therefore, be seen that when the port wing drops the starboard engine is progressively throttled back; the port engine of course continues to run flat out. In theory then, the port wing is pulled up, as the model turns to starboard, due to the asymmetrical power and as the port wing comes back up, then the starboard engine opens up again to maintain straight flight. The system of course works in the opposite sense if the starboard wing drops. Shallow flat turns can be accomplished as on a single engined model using rudder trim. E. D. Bees, due to their timing system, will only run in an anti-clockwise direction therefore all turns were made, under power, to the left – against the gyrocouple. Although I have no experience of it, if Mills engines were used, they could run in opposite directions completely cancelling out all torque and gyrocouple forces. Turns could then be safely made in either direction.



Twins are not a modern phenomena, indeed last year Brian Buckley built this rubber-powered version of the Short Scion from Rupert Moore's pre-war plans!



Bristol Bombay, built by J. Bridgewood of Doncaster M.A.C. in 1952, and which competed in the 'Eddie Riding' of that year. Two E.D. Bees were fitted, which were controlled by pendulum throttles. Imposing subject.

Both engines are stopped simultaneously by a timer pulling both pendulums inboard, so that the air intakes are completely shut off. Needless to say all the previously described drill on tank location, engine warming and tuning applies equally to pendulum throttled engines as to the 'hope and pray' variety.

Jim had a further sophistication on his machines: a climb throttle. This was fitted to the air intake of the port engine only. If the model climbed too steeply then the port engine was throttled back and the starboard engine then pulled the machine round into a safe left hand turn – in theory. As this latter device worked in the dangerous fore and aft plane, I did not fit one; anyway my J4F didn't really need one, as its rate of climb was in the order of about 3 feet per furlong! Looking back now, this was far too complex an aeroplane for a first-choice twin scale model – but such is the ambition of youth! Whereas Jim's *Bombay* was designed as a flyer rather than an exact scale replica (tissue covered wings and exaggerate dihedral etc.) my purism led to the production of what was, for me, my best looking scale model up to that date. All the metal areas of the original were sheet balsa covered; which meant that all the fuselage and over 50% of the wings and tail surfaces were thus covered. A considerable amount of planking was utilised on the nacelles and top decking of the fuselage while added to this a complicated Grumman-type retracted undercarriage including tailwheel, was fitted. This was rubber powered, to retract only, signalled from a timer. The gear did not come down again for landing as it was considered that it was better to let the model slide on its planing bottom, but all this sophistication led to a model which was just too heavy for twin Bee power. I was pushed for time too and the flight tests were made only a few days before the '54 *Eddie Riding*. From a hand launch the model flew well, but as previously mentioned, the rate of climb was almost non-existent. I entended to fit E.D. Hornets (virtually Bees bored out to 1.5 cc.) but time did not permit before the competition.

I elected to hand launch at the competition as the take off performance was unproven and with the power available I doubted whether it would anyway. Unfortunately it slipped in my hand when launched (as you can imagine it was an awkward brute to hold) and was launched upwards at about 30°. Of course the thing stalled and was severely damaged with the resultant clout on the runway.

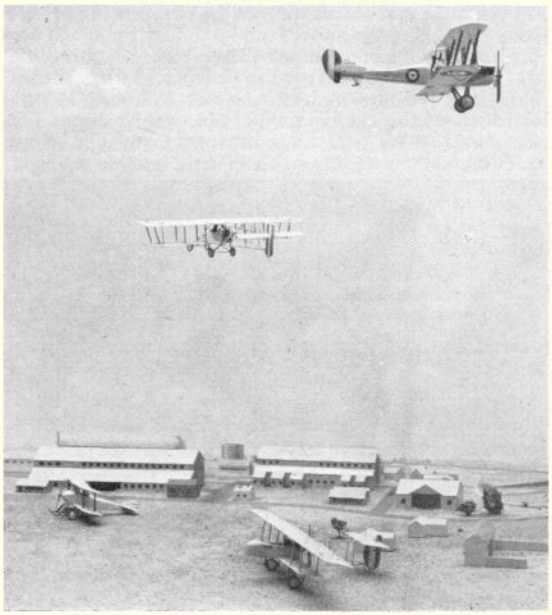
It was a bad year for smashes in 1954 and surprisingly I gained 2nd place – the judge (Bob Gosling) must have taken pity on me! The model could have been repaired but college studies at the time precluded immediate attention and as is so often the case, when time was available the mind had passed to other projects.

Jim's *Bombay* met an even more spectacular end in the 1952 contest. The machine was flying beautifully when one engine cut, it then cartwheeled and plunged vertically downwards 100 ft., requiring the services of a vacuum cleaner to pick up the pieces.

Speaking to Jim recently we both agreed that the twins taught us a lot about scale flying and building, apart from the art of twin trimming, but we are unlikely to repeat the exercise. If I built a twin again it would be a full house radio job while Jim considered that if he did one, he would trim it out by radio first then fly it free-flight, but to me this seems to be a hazardous operation. When it comes to the 'crunch' I can't see anyone removing radio from a perfect flying machine to subject it to the hazards of free-flight!

One can discuss this subject but, I hope it may inspire some of our younger scale flyers, with more time to spare, to have a dabble at this fascinating challenge. I would be interested in hearing from people with proven ideas, many people have wonderful theoretical notions as how to automatically control motors and stability but so few people carry them out. Perhaps, in a few months time, I can report a few more practical twin-engined successes in the column.

Another of the 1/48th scale dioramas seen at the R.A.F. Museum which our author discussed last month. Incidentally, his none too enthusiastic report aroused adverse comments – but more of that next month!



club news

What's so remarkable about this photograph of part of the S.M.A.E.'s display unit, seen at so many public shows during the past year? Well, look at the 'picture' seen in the centre, between the photographs of the R/C model and team-race action shot. Notice the shadow? That's no photograph, it's one of Mike Fantham's tiny indoor models flying within the S.M.A.E.'s stand at the Model Engineer Exhibition! Not surprisingly it amused, and amazed, the public on each and every flight.

A THING that often disconcerts the newcomer to the art of model flying is the very fine limits to which a model plane must be aligned and trimmed. A model plane is all or nothing when it comes to flying; either it flies correctly or it crashes. Often, though, the difference between a satisfactory flight and a disastrous one is a very small degree of adjustment, which the expert flyer could readily apply, but which the novice has yet to learn about. This suggests that the beginner is well advised to have someone of experience on hand when trying out his first model. Not always easy to find anyone, but it is often better to wait than to fly blind, as it were. Apart from joining a club, which is the best line of approach, you can always get advice from other people you see on the flying field – you will be surprised how helpful other modellers can be.

Big winter event for the **South Bristol M.A.C.,** was the 25th Anniversary Dinner, according to a report from P.R.O., Richard Evans. Guest of honour was *Aeromodeller's* Managing Editor, Ron Moulton, who replied to the S.M.A.E. toast with an amusing talk, and acting on behalf of the S.M.A.E., was pleased to receive a cheque for £70 which, it was hoped, would go some way towards enriching the Society's depleted funds. The handsome sum was raised through a special club raffle – a very successful one. A cabaret entertainment was provided (nothing so aerodynamic as a drag artist) and the evening ended with a presentation of club prizes.

Most of the news we aeromodellers get is of gloom and doom: fewer flying fields and more restrictions, so we find an item in the same club's newsletter, the *South Bristol News,* about the effects of the introduction of V.A.T., cheering rather than otherwise. Seems that the present 25% tax we now pay on our bits and pieces could well be reduced to a less onerous 10%, although we will have to wait and see if any benefit is actually passed on to the aeromodeller. At best it may mean that prices may not increase quite as much as they otherwise would. After all, look what they said about North Sea Gas!

The club's Free-Flight Champion for 1972 was G. Pink, with B. Silcocks as runner up. Control Line Champion was R. Evans, with I. Perkins heading both the Junior and Novice sections.

The new year has brought some good flying field tidings to the members of the **South Essex M.A.S.** The local council has firmly established the right of the club to use its present site well into the future. Much of the praise for the consideration shown to the model flyers of the community (150 out of 120,000) should go to the Chief Parks Officer, Mr. L. Page. One day, it is hoped, Southend will have its own model airport, complete with runways and shelter from the stormy seaside blasts. Comment in the newsletter, *Marsh Gas,* on the termination of the S.M.A.E. insurance cover is far from pessimistic. Members are assured that alternative arrangements have been made, from which no increase in club fees is to result. There might even be a slight reduction.

The Winter Building Contest is well under way, or should be, in the **Sittingbourne & D.M.A.C.** Their newsletter mentions a few jobs that have been successfully prised off the building boards. Notable for an industrious consumption of balsa is Keith Luckhurst's 64 in. *Spitfire,* which features a retracting undercart. Suggested it may well cause a national balsa shortage. Another model – alas no more – in the news is John Ripley's *Black Knit.* Not named thus because it came a purler. It would have got the full accolade but Mr. Ripley ran out of letters. It was black to the end, though, as was its owner, up to his knees in the black ooze of the dyke.

An interesting oddfish which gets a mention in the **Three Kings'** *Court Circular* is a combat model that could well keep the opposition guessing: a Canard wing. Produced by 'Doug the Devastator' or 'Balloon Basher Blake', as he is variously known, the flying order is elevator first with engine pushing up behind. Capable of diabolical manoeuvres. But models are not the only things up a-loft in the Three Kings. The Secretary, it is reported, has been hard at work converting his loft into a workroom. Well, it's one way of creating a bit more space in the suburban box, safe from wifely harassment and I've thought about doing the same for years, but come the winter – and the thought of that icy loft. . . . Bill Miles, however, opted for the other end of the house for his sanctuary. He has dug out a den under the floor rafters and hopes to get a model or two built before the house collapses. The lads are not only active on the flying field, they take protection of their rights seriously too. Now, whether you think model flying to be a sport or a hobby you cannot dismiss the advantages of belonging to a body such as the Regional Sports Councils. When it comes to tenancy of flying fields, the model flying priority comes somewhere below horse grazing. But it is here that the Regional Sports Council can bring their weighty influence to bear, as they appear to be doing in the South East.

Sad to note that the December issue of the **Belfast**

M.F.C's lively *Nitro* might well be the last one. Its function, albeit in a broader sense, is likely to be taken over by an M.A.C.I. newsheet. It will be a pity to lose the parochial colour of the Belfast newsheet, quite apart from its good national coverage.

Just a couple of items culled from the **Telford M.A.C.** newsletter. The club is to financially support, to a £10 limit, the building of a number of C/L planes in the clubroom during the winter. The club uses R.A.F. Chetwynd for R/C purposes (*lucky lads*) and since it is the S.M.A.E. who arranged their permission to fly on a Ministry field, a decision will have to be made on the issue of continued membership of the Society, for which an Extraordinary General Meeting has been called. Continued membership would mean doubling up the club subscription to £5 annually – hardly expensive with such facilities available.

Whilst we Northern Hemisphere types more or less hibernate in the winter, the lads 'down under' are in full contest spate. Ron Magill's *News of the North* gives an account of the New Zealand Taupo Meet last November. Weather was just fantastical. Masses of maxs were scored in the A/2 event, 63 out of 111 flights! Wakefield, less spectacular, with no one getting a full five-flight house; Paul Lagan falling just 14 seconds short on his last flight. The page of photos in the mag. comes by kind permission of our own John O'Donnell, or at least half of them did. A nice shot here of Miss Aeromodelling – when next your wife says 'Why don't you give aeromodelling a miss. . . . '

Down under the aeromodellers are really down under. Published in the N.Z.M.A.A's *New Zealand Newsletter* are the 'big stick' regulations for the operation of model aircraft. In substance it means, keep your model low and away from airfields. There is, however, a safe operation clause which demands that you fly safe at all times. One thing I noted, though, that the directive was applied to members of the N.Z.M.A.A., whereas the 'rogue' flying that goes on, anywhere over the globe, is mainly the preoccupation of the unlicenced, uninsured, unattached flyer. More and more, the attached radio flyer is operating in safe, club-controlled areas, and these safe flying directives never get to the notice of the people who create the danger. Only the other day I saw some uninsured radio flyers doing a lot of dangerous things on a common, where power flying is specifically forbidden. Another thing that is of universal concern to model flyers is the weather and this can be just as naughty in N.Z. as in G.B. For instance, the North Island Trials got treated to bags of wind and rain following a disarming spell of super weather. Fortunately, things simmered down a bit on the Sunday and a successful Trials got under way.

For people who like to tinker with engines but stay well on the right side of the noise barrier, they might take up with the latest U.S. craze: .020 cu.in. miniature old timers. According to the **San Valeer's** *Satellite,* the kit manufacturers have now 'picked up the ball' and some nice dinky, low pollution kits are on the market. Models are not too teeny; the *Brooklyn Dodger,* a sleek cabin model, a bit like a *Slicker Mite,* has all of 32½ in. of wing span. You can see I try to keep abreast of the old tyme scene but *Old Time Wakefield,* an event put on by the **Thermal Thumbers,** is way ahead of me (or way back).

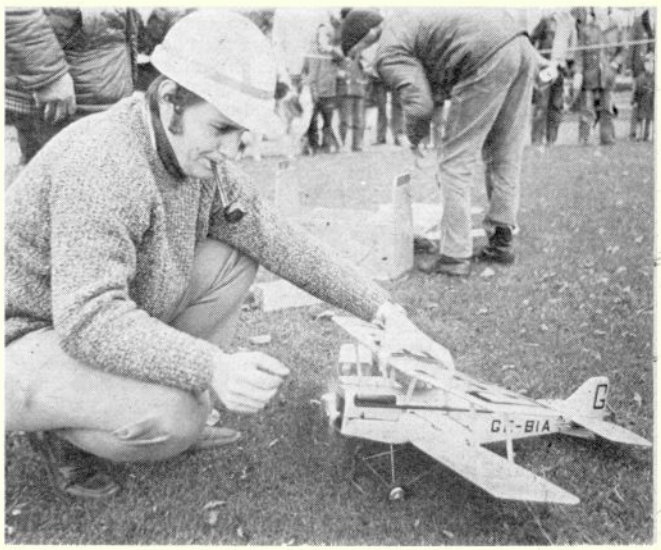
Judging by the enthusiasm sparking from the pages of *Hot Leads,* the newsletter of the **Southern California Antique Model Plane Society,** old tyme flying must be vieing with Radio for popularity. And just to give some idea of the following it has, there was a contest held for 36 in. version of *Miss America.* (Presumably, an oldie gas model rather than a midget beauty queen.)

Radio Control news in *Propshaft,* the newsletter of the **Salisbury** (Rhodesia) **M.A.C.,** is of a club prize offered for take off, six loops and land in the fastest time. Oddly enough there were no takers. C/L news is talk of lighter team racers. The Russians appear to be producing them at around 16 ounces, so Alan van Breda is looking to glass fibre as a possibility as a reducing medium. Lighter weight means quicker acceleration at take off and quicker come downs on landing.

Would like to hear from more model clubs. Come on you P.R.Os.

Clubman

John Braisby of the Leicester Model Aero Club starts his scale SE5a control-line model just prior to flying in a display put on by his club at a 'Sports For All' event organised by the Leicester City Parks Committee. Some 30 models, both R/C and C/L were flown, despite blustery, wet conditions.



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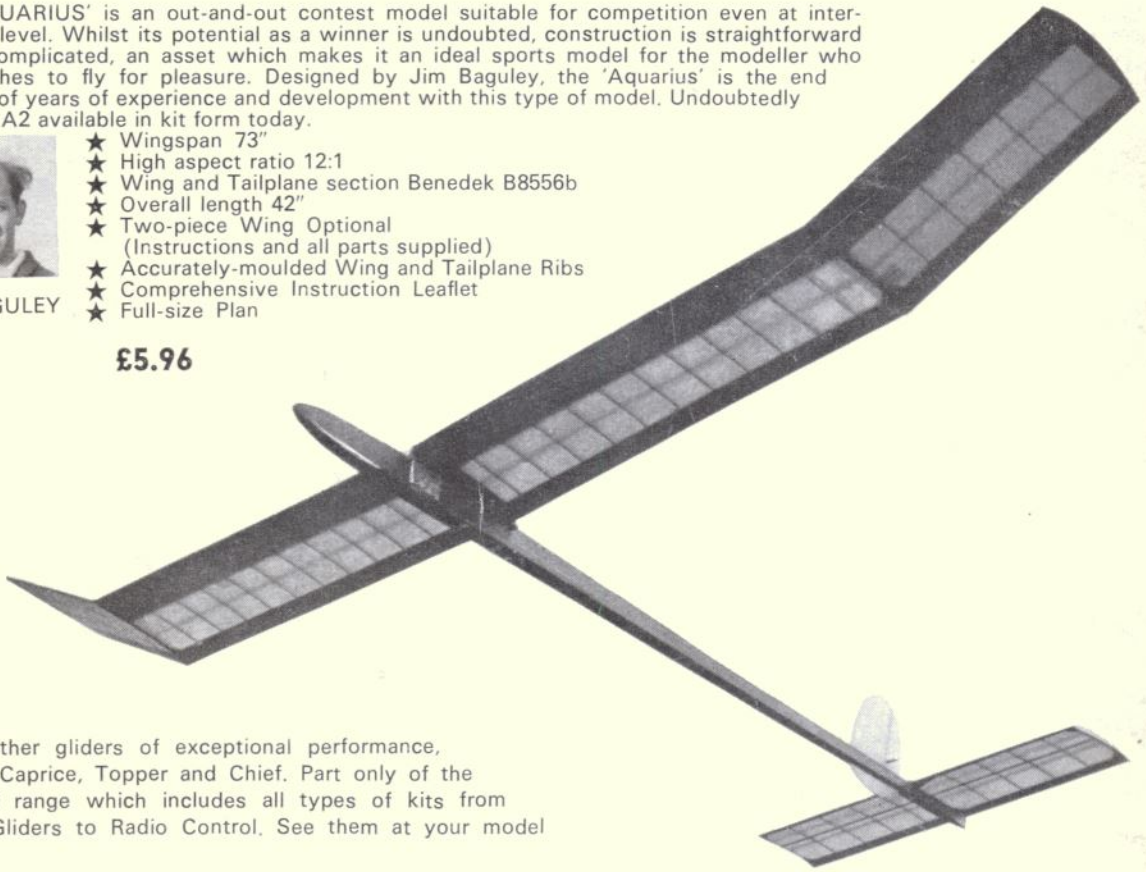

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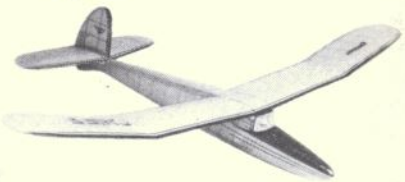

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The position of the guns must have made the servicing of these items difficult and the clearance of stoppages by the pilot appear to have been almost impossible. The manufacturers provided a small windscreen on each side of the pylon but these seem to have been removed from most aircraft in service as they seldom appear in photographs. No doubt the pylon gave some protection and the screens tended to obstruct the forward view.

Construction was similar to the C.II and D.I – the fuselage was built up on plywood formers with eight light stringers, the skin consisting of two layers of plywood strips laid diagonally and at right angles to each other, the total thickness, including an outer covering of fabric, being under 2 mm. The pylon, lower wing fairings and fin were built as part of the main structure. An unusual feature was the 'U' section transverse timber beam into which was fixed the leading edge of the tailplane.

The wings were quite conventional, featuring two box spars and ribs of plywood with ash capping strips. A false rib formed by a lath 10 mm wide was fitted between each main rib on the top surface only, extending back to the rear spar. All control surfaces were welded up from steel tube and apart from the elevators were on the small side, which may have accounted for the poor manoeuvrability. Ailerons were actuated by push rods running up to a crank on the end of the aileron torque rod in the same manner as the Nieuport 17. Rudder and elevators were connected to the control column by cables. Interplane struts were made from 25 mm dia. steel tube faired out to a 84 mm x 32 mm streamline section with timber, while steel tube of 50 mm x 30 mm streamline section was used for the undercarriage chassis.

The D.II was not a popular aeroplane with pilots as it was heavy on the controls and not agile in combat when compared with contemporary Albatros fighters. For this reason its use in service was confined to the quieter sections of the Western Front, the Russian Front and Macedonia. However, in no theatre of war did the Roland D.II distinguish itself and it was soon relegated to the training schools.

A number of Roland D.Is and D.IIs were built by the Pfalz Flugzeug-Werke G.m.b.H and they had considerable influence on that company's first fighter of original design, the D.III. The structure was similar and the guns and fuel tank were housed in the same manner.

The D.II was followed by the D.IIa which had an Argus As.III engine in place of the Mercedes and being almost indistinguishable from the D.II. The louvered access panels were re-located to suit the servicing points on the Argus. From detail drawings of the undercarriage it is evident that the front legs of the D.IIa were near vertical and the axle further forward but this is not obvious from photographs.

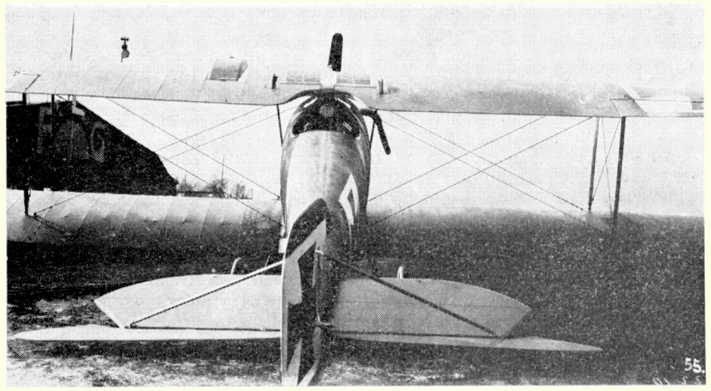
The colours are noted on the accompanying drawings and although the pattern and position of the national insignia varied slightly there seem to have been few Rolands with individual markings. The aircraft of Jasta 25, in the Balkans, each carried a large identification letter on the side of the fuselage just aft of the cockpit. One D.II, captured by the Russians, had a white or very light-coloured horizontal band along the fuselage. The most notable personal marking to be seen on a D.II was a fine shield with a moon and star motive, unfortunately the colours are not known.

SPECIFICATION (L.F.G. Roland D.I to D.IIa)
Manufacturer: Luftfahrzeug Gesellschaft m.b.H., Berlin.
Sub-contractor: Pfalz Flugzeug-Werke G.m.b.H., Speyer am Rhein.

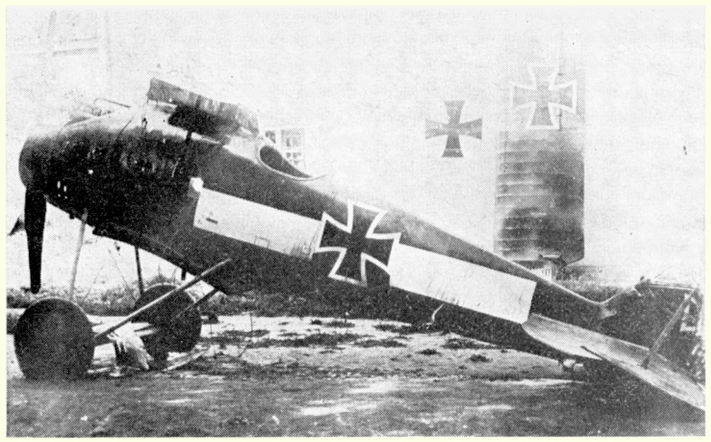
	D.I	**D.II**	**D.IIa**
Engine:	Mercedes D.III	Mercedes D.III	Argus As.III
h.p.:	160	160	180
Span:	8.90 m.	8.94 m.	8.90 m.
Length:		6.93 m.	6.95 m.
Height:		3.11 m.	2.95 m.
Wing area:	23.0 sq.m.	22.8 sq.m.	22.0 sq.m.
Weight empty:	699 kg.	715 kg.	635 kg.
Weight loaded:	932 kg.	954 kg.	795 kg.
Max. speed:		170 km.hr.	180 km.hr.
Climb to 5,000 m.		23 min.	20 min.

NOTE: As with most 1914/18 types the performance figures are conflicting and open to doubt.

Seated in this D-II's cockpit is Vfw R. Scholz, a useful picture containing many interesting details. The instruments mounted on the upper wing pylon are worthy of note.
PHOTOGRAPH FROM A. IMRIE, H. NOWARRA VIA HARRY WOODMAN COLLECTION.



Upper, this superb period shot shows fine detail for the scale modeller. Standing outside one of the LFG factory buildings, this D-II shows off its clean lines to advantage; lower, a slightly less pristine example is a machine captured by Russian Forces at Kremeues and is seen here at the 11th Russian Army GHQ.



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