

Aero Modeller

February 1973

INCORPORATING
MODEL AIRCRAFT

15p USA & Canada 75c.



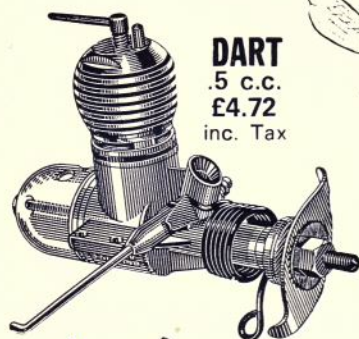
HOBBY MAGAZINE

Free Plans inside WESTLAND LYSANDER

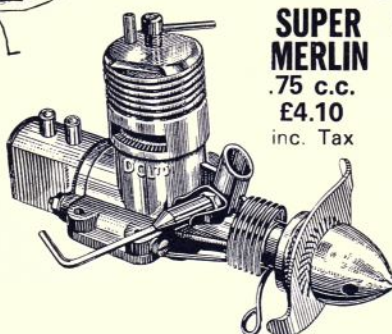
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Royal Air Force Museum feature



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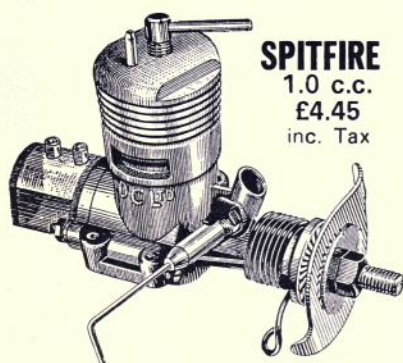


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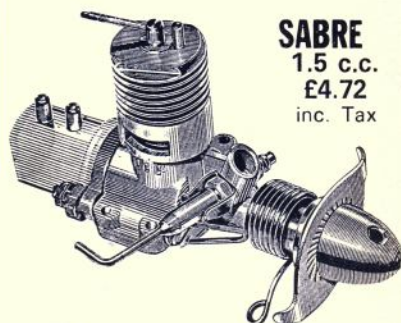
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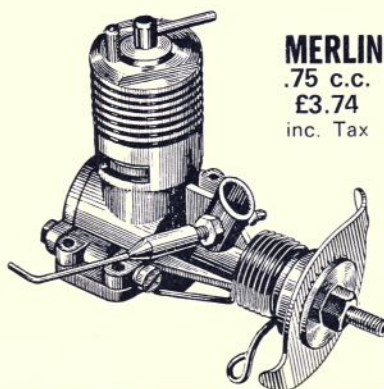
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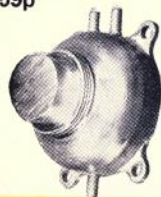
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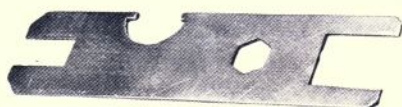
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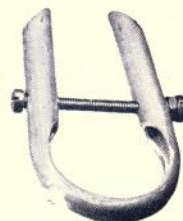
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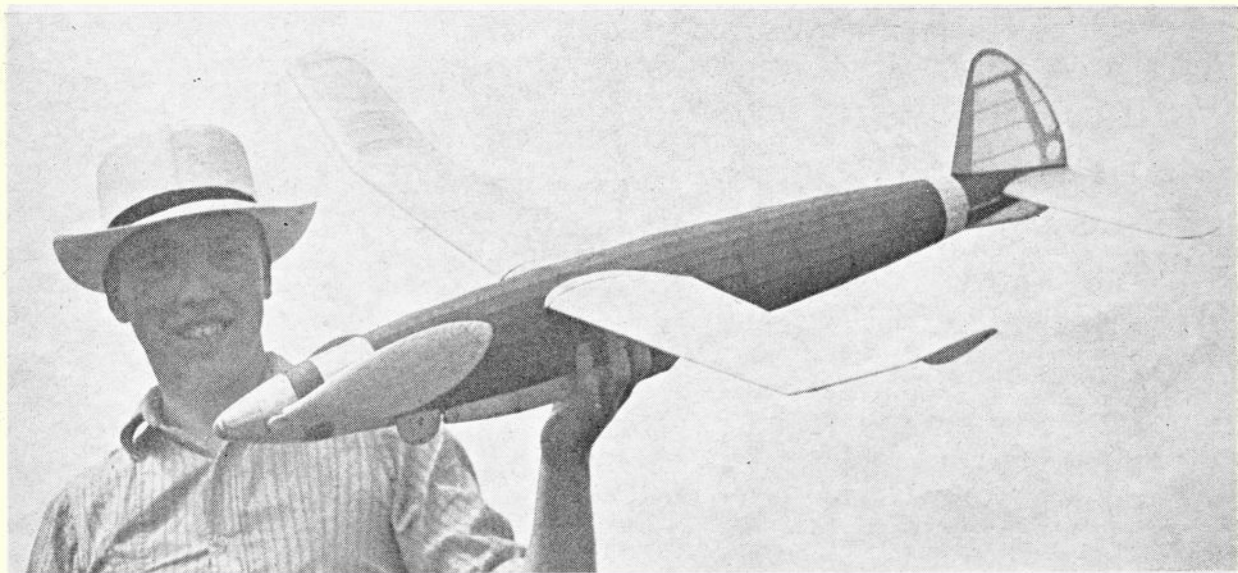
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Spanner 26p
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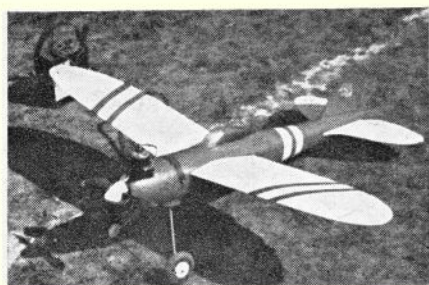
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SOLARBO



When the rubber-powered model was top of the pops for contests, the big argument was 'streamliners *versus* slab-siders'. The streamliner builders really had to know their balsa to keep the airframe weight down. Eventually it worked out that it was rubber weight/airframe weight ratio which really counted – and performances got so good that rubber weight had to be restricted. Progress in reverse, really – but necessary. Though it did kill rubber models as a top contest interest.



The smaller pic. (below left) shows an even more significant model. Jim Walker's 'Fireball' which really started control line (they called it U-control then). The fuselage was literally hacked out of a solid block of balsa in two halves – even in kit form. And the rest was all-balsa (apart from the spark-ignition engine and wire undercart!).

In fact, the whole development of aeromodelling has depended on balsa since about 1930. And top performance has depended on using the right quality balsa for the job ever since. That's the easy part. Always ask for Solarbo – the name for true *aeromodelling quality* balsa since the days of the old-fashioned Wakefields!

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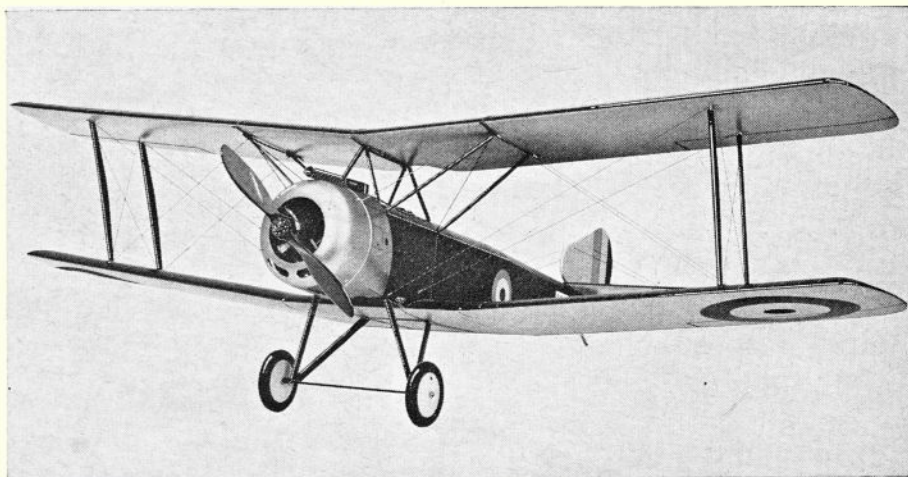
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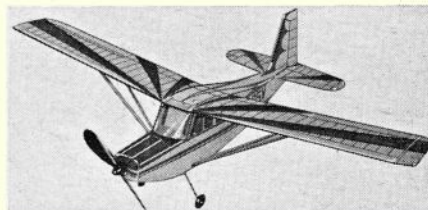
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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

February 1973

Volume XXXVIII No. 445

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COMMENT

1973 heralds some interesting changes in British modelling. The Nats will inevitably move from the delightful west country venue of many recent years to a northern location, currently being negotiated by the S.M.A.E., and it is more than likely that it will resume the 'all-together' character instead of continuing last year's experiment of free flight separation. Rotary wing - mostly helicopter, but also many autogyro enthusiasts will have their special Rally at our 1973 R/C Expo, Sywell next Easter to show how rapidly this exciting branch of modelling has advanced. Electric powered free flight seems at last to be on the fringe of becoming a practical possibility, leading to a new class of power-assisted glider for park flying. Powered ornithopters are still very much the enigma, but the generous prizes offered in the January issue will have inspired experiment and we are sure that the first successful demonstration will create a flock of flappers, perhaps in '73? Those who scoff at such a suggestion might well be reminded of the scepticism that once surrounded model helicopter experiments - or even ridiculed the possibility of two-man powered flight. The first officially recorded flight by the Herts P.A. 'Toucan' at Radlett on December 23rd may only have been 68 yards; but it opens up new vistas for the massive 123 ft. balsa, metal and plastic structure which to all aeromodellers will represent the largest model aircraft in the world. Here's to a bright new season, enriched in experiments and refreshed with new outlook!

on the cover

The Royal Air Force Museum Westland Lysander, restored in authentic colours as exhibited at the Jubilee display, Abingdon. Currently on show at the R.A.F. Museum, Hendon, this example is one of three in the country, the other two being under overhaul preparatory for flight under private ownership.

next month

Plans that scale enthusiasts have long been awaiting - Eric Coates well-known B.E.2b. Full story behind Jupiter - the most successful of the man-powered aircraft. Continuation of our Beginners Series details the building of a set of wings in words and pictures. Flying report on the KeilKraft Aquarius. All this plus much, much more in the March issue of Aero Modeller, on sale February 16th.

AIRFIX NEWCOMERS

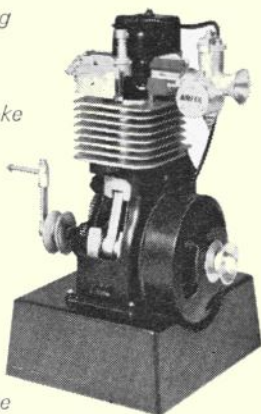


New! Big 24th scale P-51D Mustang. Series 14

During the Second World War a British-based Mustang was the first single-engined combat plane to reach Berlin. This aeroplane, with its detailed Rolls-Royce Merlin engine, bombs, rockets, drop tanks and retractable undercarriage, makes up a trio of superb Superkit aircraft.

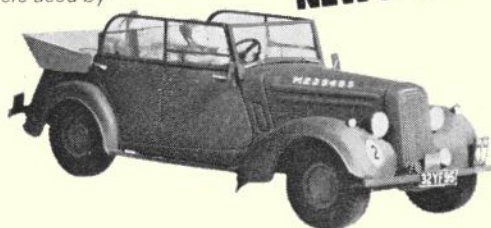
Four Stroke Cycle Engine. Series 7

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.



32nd Scale Monty's Humber Series 5

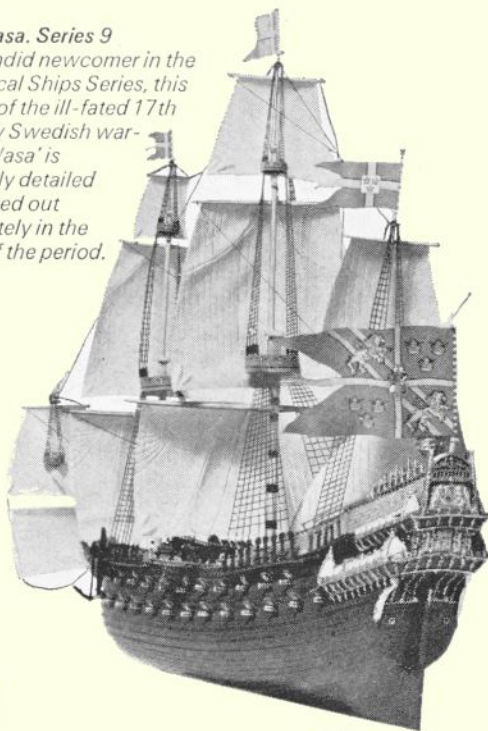
This unique, personality car of World War II introduces a completely new Airfix V.I.P. series. The 133-part kit, complete with appropriate decals, builds the vehicle used by Field Marshal Montgomery in the later stages of the Second World War.



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



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MAP

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173 AEROMODELLER ANNUAL 1972-73

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128 pages, size 8½ x 5½ in. Coloured dust jacket, bound hard boards with full-colour cover illustration.

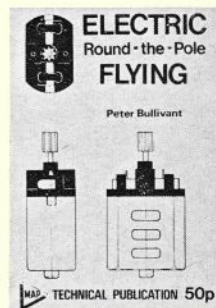
£1

126 ELECTRIC ROUND-THE-POLE FLYING

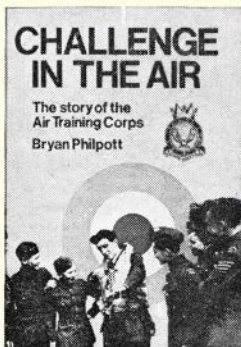
A compact and full appraisal of all aspects of electric-powered round-the-pole flight from which the experimenter can produce all the needs for operation either at home or the clubroom. Liberally illustrated, and written from long experience by Peter Bullivant, the text includes data on choosing the motor, fitting propellers, gearing and direct drive, scale and novelty model subjects and rules for club contests. Highly recommended to all who seek a novel and rewarding indoor model flying activity.

56 pages, size 8½ x 5½ in., stiff cardboard covers. 49 photographs, 19 diagrams, 56 pages, 4 model plans. List of suitable designs. Actual-size drawings of four suitable electric motors. Diagrams cover various pylon heads and controllers.

50p



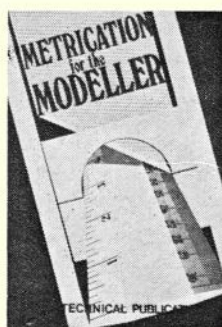
156 CHALLENGE IN THE AIR



The story of the Air Training Corps from its tenuous beginnings after the 1914-18 war, when the idea of a youth organisation with an aeronautical flavour formed in the minds of two young ex-service-men - to its present position as the main source of recruits for the Royal Air Force. The story unfolds via the formation of the Air League's Air Defence Cadet Corps, through the difficult days of World War II - during which the Air Training Corps was formed - to the present day.

164 pages on antique wove paper and white glossy plates, size 6 x 8½ in., being 128 pages of text, and 35 pages of illustrations. Bound in Linson, with gold foil blocked title on spine and colour dust cover.

£1.75



170 METRICATION FOR THE MODELLER

The main object of this book is to provide the modeller with figures and information for making conversions from English units to metric units and vice versa, when necessary to match the availability of materials, etc.

At the same time it aims to go a little further and explain the relationship between the various alternative units which crop up in both systems, with the particular objects of making sense of conversions. All that is needed is to look up the appropriate section - Linear Measure, Areas and Square Measure or whatever you are involved with and find all the information you need in condensed form.

8½ x 5½ in. (A5 size), 40 pages, numerous tables and charts, two-colour drawn on cover.

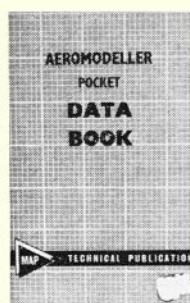
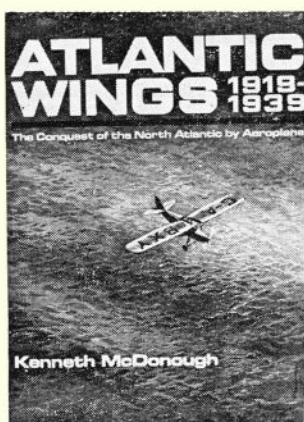
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6 ATLANTIC WINGS

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3 AEROMODELLER POCKET DATA BOOK

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7½ x 4½ in. 64 pages. With 61 pages of detailed explanatory sketches and text, based on Flying Models Reference Hand-book.

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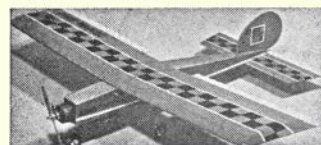
TAXI ... £12.80

Kit includes die-cut balsa-ply and ply parts, preshaped engine mount, bulkheads and fairings, milled stripwood, shaped wire parts, scale-type wheels, cement, covering material, decals, etc. 'Quick-build' plan and separate R/C INSTALLATION PLAN. Wingspan 59". Engines .15 to .35. Ideal for 2- to 8-channel R/C.



TOPSY 32" span £3.45

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This kit makes an authentic duplicate of Phil Kraft's WORLD CHAMPIONSHIP winner. Kit includes glued and curved fuselage sides, shaped wood parts, diecut balsa and ply sheets, formed undercarriage wheels, canopy, hardware, etc. 59½" wingspan. Wing area 657 sq. in. Engines up to .61. Acclaimed as the Finest Kit yet for R/C 'multi' or proportional.



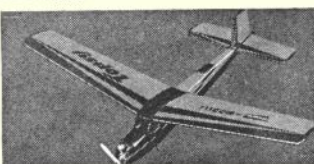
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43½" span. Kit includes full-length diecut balsa fuselage sides, diecut sheet and ply, shaped wire parts, wheels, hardware, etc. Takes engines up to 1.5 c.c. for free-flight or radio control. One of the best sports-type power models available today, with semi-scale appearance and a proven flying performance. Ideal as an R/C trainer.



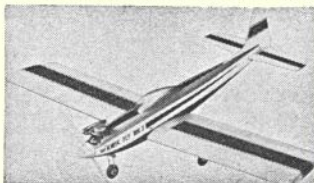
CESSNA 177 CARDINAL £29.40

A truly SUPERB prefabricated kit with injection moulded plastic fuselage, foam wings and tail. Span 61" for 5-6 c.c. motors. This kit is an outstanding example of modern design and use of mixed materials - plastic, foam-plastic and wood - with all parts fully shaped. The most advanced production of its type!



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Wing span 55". Length 38¾" overall. Wing area 611 sq. in. Tail area 124 sq. in. Weight approx. 3¾ lb. (up to 5 lb. with radio). Suitable for 40 engines. Assembly time is reduced to a minimum with plenty of precut parts, including precurved, preglued fuselage sides.

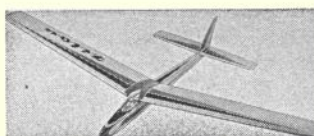


KADETT ... £5.40

High wing F/F sports model, in the traditional style. Kit is complete down to hardware, wheels, adhesives, decals, etc. A popular favourite for 'Sunday flying'.

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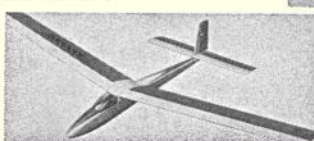


FILOU SAILPLANE £4.85

50" span sports-type sailplane which converts to auxiliary power (pylon mount 92p extra). Kit contains quickbuild plan, printed and die-cut sheets of balsa and ply, canopy, wire parts, tissue covering, decals and miscellaneous items. Model also recommended for R/C flying.

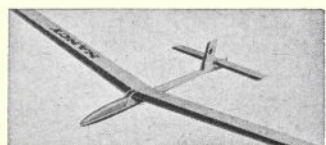
AMIGO 2 £8.30

Here is a real contest-type sailplane, 78¾" span and total area 694 sq. in. Extensively prefabricated, the kit includes die-cut and printed balsa and ply parts, milled and slotted stripwood, ready-formed tow hook, canopy, tissue covering, decals, etc., etc. The Amigo 2 also adapts readily to pylon power and is ideal for R/C (R/C installation plan included).



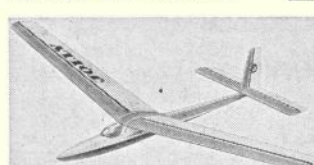
DANDY £6.90

A kit designed for rapid assembly with die-cut sheet, preshaped fuselage parts, milled and slotted stripwood, canopy, cement, tissue covering, decals, etc. Span 63". Total area 540 sq. in. Can be converted into a powered glider with pylon mount (92p) and 049 engine.



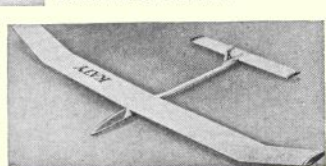
NANCY £4.15

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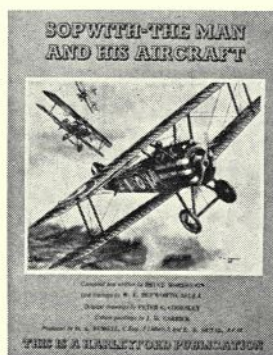
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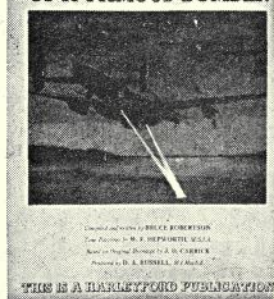
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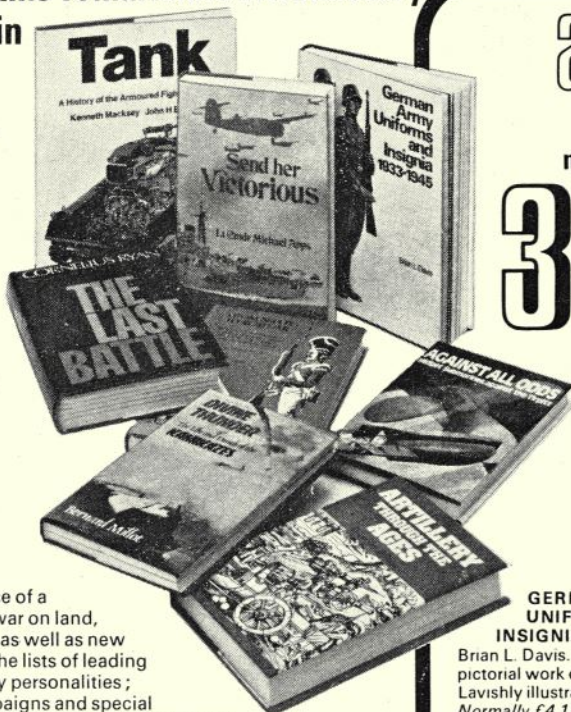
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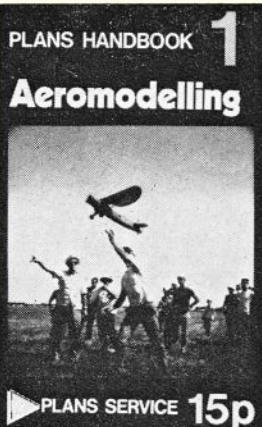
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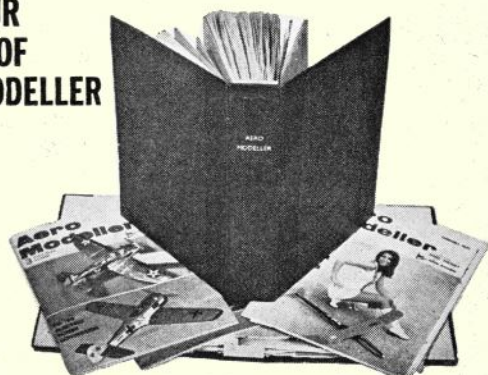
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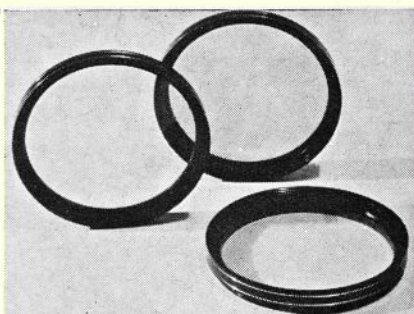
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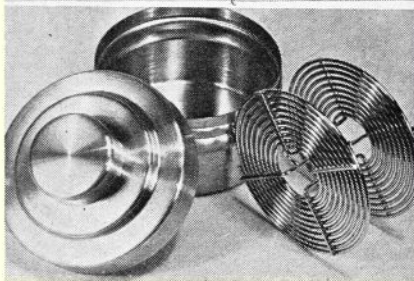
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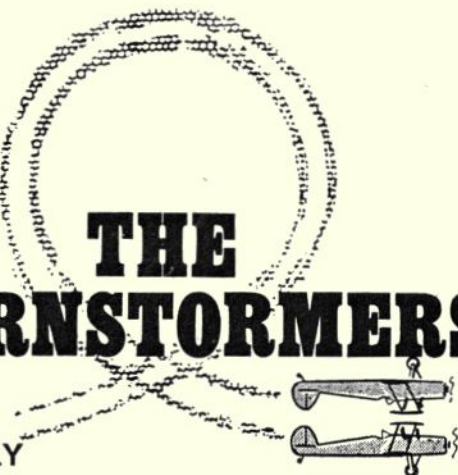
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Heard at the HANGAR DOORS

Left, Mrs. Firth presents the 'Heather Trophy' to Keith Lord of Syke M.A.C., Junior F/F Champ., at the S.M.A.E. prizegiving. Below left: Ian Peacock (S.M.A.E. P.R.O.) and Max Coote award the Schuco Helicopter kit won by Valkyries club members in the Esher R/C Sympo Raffle. Below, right, the superb trophy created by Laurie Barr for the Fred Boxall memorial fund. A scale model of Fred's Wakefield in metal is encased in a cube of clear plastic.

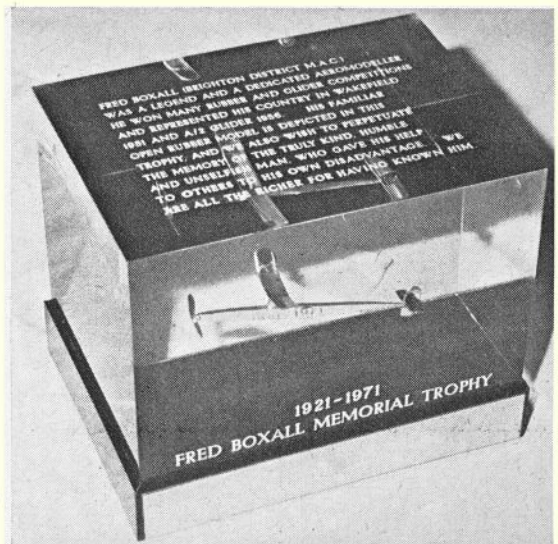
terminated and will continue throughout 1973 and beyond. Speculation amongst model clubs appears to have generated the impression that our Modellers' Accident Protection Scheme was not going to be re-negotiated for 1973 – **NOTHING COULD BE FURTHER FROM THE TRUTH!** We have, in fact, negotiated for an even more protective policy on renewal of the premium. This is not to say that the renewal rate will remain static for the whole of 1973. Readers may have our assurance that Model and Allied Publications has negotiated for the best possible terms and will continue to provide an Insurance scheme for Third Party Liability at the most economic membership fee possible.

AT THE A.G.M. of the Society of Model Aeronautical Engineers, held on December 2nd, 1972, the members agreed on a new membership structure, and to discontinue the Society's Third Party Liability insurance scheme as from 31st December, 1972. From 1st January, 1973 there will be only one class of membership, and the fee will be £2.50. All members will receive a copy of the Society's newsletter *Model Flying*, which will be issued on pre-published dates. Members will still need to be insured before joining the S.M.A.E. This new fee was calculated on a budget

which as far as possible excluded any elements of competition expenditure – the extensive contest programme costs about £2,500 per annum, and this will be raised by the contest fees, the latter being adjusted to more accurately reflect the differing organising costs of the various types of contests. The Meeting decided that the Society could no longer afford to heavily subsidise the Junior fees as had been the case (there are over 700 Junior members), thus there is no reduction for Junior membership.

THE M.A.P. INSURANCE SCHEME is certainly not being

WITH DEEP REGRET, we have to announce the death, following a brief illness, of Philip Martin McAlroy who in the early 1950s was a leading member of the first Sunderland and Jarrow clubs, his A/2 design *Marsden Rattler* being well remembered by his Northern friends. His work took him via the Harrogate club (where his recently published *Barracuda* design originated) down to Sheffield. He became the P.R.O. of the Sheffield Soaring Club, and was well known for his *Waco Hadrian*. He leaves a wife and two sons to whom we offer our condolences.



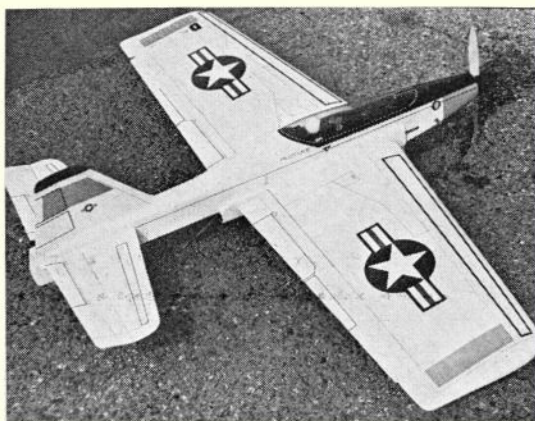


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STUNT FLYING is a specialised, almost art of form model flying, and in common with ice skating or dancing, it is not the pure performance that counts, the whole presentation ought to have a touch of 'beauty'. Not that there is any good reason for this but the judges are only human – you know what I mean! Not so long ago, a top US stunt pilot preferred to appear all in white: shirt, trousers, shoes, model – just to give an appearance of cleanliness!

Although strongly against the awarding of appearance points as used in the States, I'm convinced that a 'clean' model is not only a source of great satisfaction to the builder, but also forms good publicity for our sport. When watching the stunt circle until it's your turn to fly, you realise that most stunt flyers agree with this opinion. How often do people ask you 'is that plastic or metal'? What is missing is just the *originality* of design. Most models still look like the *Nobler*, and the colour schemes vary even less. With such an abundance of 'full size' aircraft to choose from, I have far more ideas for stunt designs than I can ever build – take, for example, just the 'jet fighter' section.

This type of model has always impressed me most, I think, the sleek and elegant, yet straight and clean lines are most suitable for the task of today. *Commodore* is now my fourth model in this style, the forerunner was originally inspired by the sleek lines of Milan Drazek's *Orion* team racer some 8 years ago. It was an elegant model, but I found the shape somewhat too 'round', and since the 60 in. wingspan proved too much for my Volkswagen, it gave way to the *Commodore*.



Since the fuselage has little effect on the flight characteristics, it was chosen to be the most distinctive part of the design. The only criterion was to place most of the side area aft of the centre of gravity. I prefer to use a large fin with a considerable amount of right rudder, instead of much engine offset, to maintain line tension, because this is still effective during the occasional engine 'burps' and when the engine stops. Side area in front of the CG is kept to the minimum, so the engine is not fully cowed, and this eliminates cooling problems. With an otherwise immaculate model, the protruding cylinder head of a *clean* engine does not detract from the overall appearance.

The most important part of any design is the wing, and there are a lot of planforms and airfoils to choose from! In general, the planform is fairly similar in all stunt designs, but small modifications to sweep back, tips and flap shape give a different look without affecting the flight characteristics. The airfoil is a different matter altogether, although it is impossible to state which is best – it mainly depends on what kind of aircraft you like, what flying style you prefer, and how fast your reflexes are. I will not delve too much into the aerodynamics, but in short the possibilities of design are: thickness, point of maximum thickness, nose radius, and curvature of the airfoil fore and aft of the point of maximum thickness. As for thickness it should be pointed out that the *Nobler* wing – which is nominally 17 per cent – is actually just 13 per cent with the flaps included, and I see no reason why the flaps should not be taken into account. Since we have to fly in different weather conditions, you either have to build two different airplanes or one with average flying speed and manoeuvrability.

In my own case, I find that my reflexes are not the fastest, and I like the big, open, smooth and slow pattern which means that I must have a lightly loaded airplane at medium speeds on long lines with 'grooving' flight characteristics, especially during corners. To achieve this I rely on a section with medium thickness, a large nose radius, steep camber to the point of maximum thickness (at 30 per cent of the chord) and little curvature behind that. Such an airfoil provides a separation of airflow at a high angle of attack, thus making for tight corners without 'wobbling' on the exit. Thickness increases from 13 per cent at the root – for reasonable speed – to

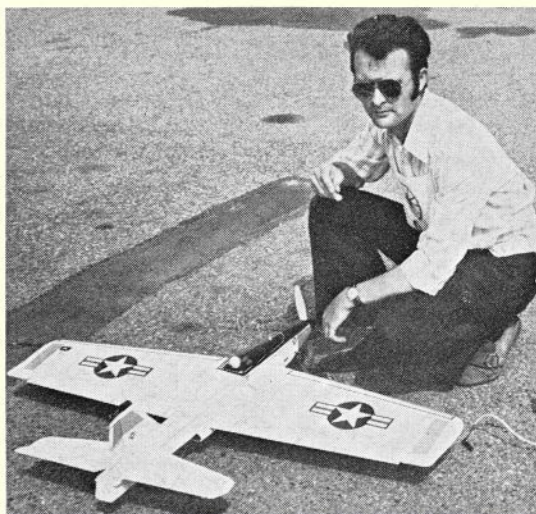
The modern, jet-like appearance of 'Commodore' is greatly aided by the immaculate white finish, together with carefully applied indian ink 'panel lines'. Certainly a distinctive model – and a breakaway from the usual 'stereotyped' stunt designs.

16 per cent at the tip, for stability around the yaw axis. Increased leading edge sweepback adds to this effect. To turn tightly in the square corners, I use large control surface movements (elevator over 90°, flaps over 30° total movement). The CG is located at about 28 per cent of the root chord.

Before designing an airplane, you have to decide which engine you will be using. As my 35 size models have always been powered by Mr. Fox's excellent products, the moment arms have remained basically the same. Since *Commodore* came out a lot too heavy and with a rearward CG, I had to look for a more powerful engine. My choice was the O.S. Max H40S which from Mr. Chinn's engine test seems quite a capable stunt engine. Unfortunately it was not readily available at that time, but I acquired a secondhand O.S. H40P, which when fitted with extra cylinder head gaskets and after trying various venturi inserts, made a quite satisfying stunt engine.

I do not recommend this pylon racing motor as an outstanding stunt engine, but over the years some manufacturers have attained a similar level of performance to Duke Fox and this motor is no longer the only choice. Take a look at the weight figures, this eliminates most of the otherwise powerful engines, but a motor that is most suitable is one whose crankcase has been designed to take different capacities, for example the Super Tigre G21/46 (.40, .35 cu. ins.), the Veco 45, (the 50 is even lighter). Also the O.S. Max 35S should be a good buy – it is sold with a suitable light muffler, too.

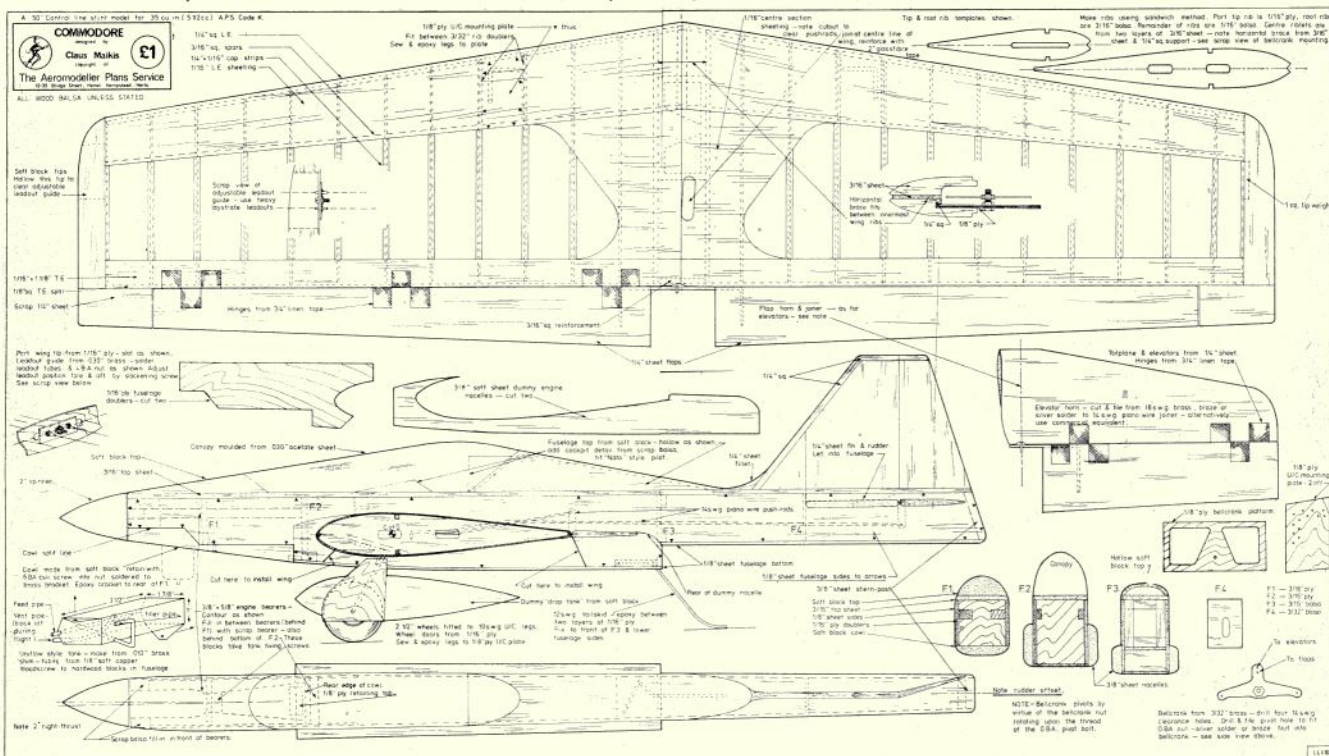
This brings us to the fuel tank. Since all my models feature a tank compartment for a removable tank, one can try different types and shapes in several airplanes. I have had the best results with the uniflow type. My opinion is that the shape and dimensions of a tank are not so critical, the most important



The designer with his model at the Helsinki World Championships, where he was a member of the German team. Rather too generous an application of paint caused it to be overweight, which handicapped his flying. Be warned! factors are the position of the vents: where the tubes begin and where they end.

What also do we need? R/C elevator horns are easily available but – at least on my large stunters – I prefer to make my own from 14 s.w.g. steel wire and 18 s.w.g. brass sheet. All holes are bushed with small brass eyelets. I mount the bellcrank by soldering a OBA brass nut into the bellcrank. A suitable screw is bolted to the platform, and the bellcrank then rotates on the screw. A brass nut and steel screw fit

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rather tight yet free, have little drag, and last forever.

I don't like those springy undercarriages! If you often fly over a grass surface the legs will bend sooner or later. I use 10 s.w.g. steel wire for the legs, with big semi-pneumatic wheels, this type of wheel has the advantage of spring and damping effect, whereas weak legs and sponge wheels only spring. With this undercarriage you can put the aircraft on the ground hard and fast – it just remains there, bumpy landings are a thing of the past.

I won't say much about the finish: everybody has his own – but since I'm not willing to rub down all those millions of brush lines, and on the other hand do not own a high pressure spraying unit, I use spray cans. Do not spray at cold temperatures, as I did and found that I had to put on twice as much dope to get the stuff flowing! This resulted in a model weighing over 50 ounces. With the *Dupli Color* spray as base colour and a resin-type clear finish, it should be possible to build this airplane to a weight of no more than 45 ounces. Alas, this method is not cheap.

You will have noticed that this is not a construction article as normal! Those who need building instructions will not usually try his hand on a model like this, and this airplane is not a beginners project, anyway. However, just a few hints.

The ribs are cut from quarter grain wood between two templates in the traditional 'sandwich' method. The inner tip rib is made of $\frac{1}{8}$ in. ply to take the adjustable lead out system. Lead out wires are heavy weight laystrate. Discard the two root chord ribs made in the sandwich method, and replace with a pair cut from $\frac{1}{8}$ in. balsa. Very light wood is used for all planking.

Be sure to glue the landing gear mounts very securely, I do this with false ribs above and below the plywood plate, these points will have to take high stresses. A layer of glass fibre cloth should be applied at the centre section to reinforce this point.

I build my wings on four supports (2 at the tips, 2 at the root ribs) which are contoured to suit the corresponding ribs. Measure from all centre lines (leading edge, trailing edge, flaps, tip blocks) to the building board. If all dimensions are the same, your wing is straight! Cloth hinges are used for ease of installation. The tailplane is built from quarter grain stock, the fuselage sides, too. Don't forget the spruce blocks between the bearers and behind the rear former for the tank installation. Engine retaining nuts are soldered onto small brass sheet which is bent

around the engine bearers before adding the top sheet and block.

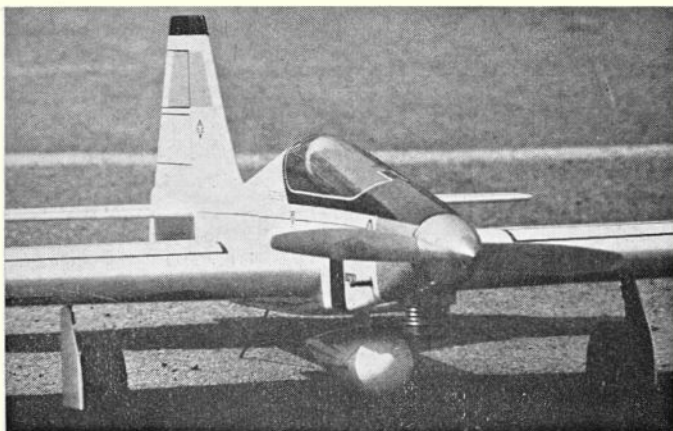
To achieve this unique fuselage shape, it was necessary to mould my own canopy. After several destroyed sheets of celluloid, I found the following procedure best: make a balsa pattern with hardwood grip. Clamp the model in a vice. Take a large sheet of celluloid, well oversize for the job and fix two hardwood spars to the long sides. Drill a hole in each end of one spar and bend a holding frame of 18 swg. steel wire to fit into the two holes in the spar which acts as a handle, allowing the sheet to hang freely. You must be able to remove the sheet quickly from the frame. Put this unit in the oven and heat. During the heating process, frequently watch the celluloid – when it begins to smell and smoke, hurry! Remove from the oven, holding the sheet at the spars, and remove from the wire frame, then pull over the model on left and right hand sides. Ideally, have a helper to pull down the front and back ends. Use gloves!

Glue small pieces of glass cloth, to prevent stress cracks, inside the engine compartment and between the wing leading edge and fuselage, using epoxy resin. Apply a thin coat of epoxy over the whole of the engine and tank compartment. Sand the whole model smooth, and apply two coats of sanding sealer overall, then cover the open areas of the wing with heavy weight tissue. Cover the rest of the model with light weight tissue.

Apply dope until the pores in the tissue are filled, then apply the base colour. The model is now ready for trimming. Lots of transfers are available for this, while lines may be applied by a valve-type ruling pen filled with Indian ink. You have to roughen the surface a little, and do not touch the lines – they smear! Narrow, coloured lines, can easily be made by cutting small strips from a solid colour transfer sheet; these are also fine for imitation of the undercarriage recess, or other areas where masking is awkward. When spraying, don't forget to cover screw holes, lead outs, wheel axles, flap horns and elevator horn exit. When brushing, have patience. . . .

I didn't intend to persuade you to build this airplane – although it's an eyecatcher there are numerous ways of building an attractive stunt model. I just wanted to give some inspiration, a reason or excuse for building an aircraft like this!

And, remember, take a picture before that first flight!



... with an otherwise immaculate model, the protruding cylinder head of a clean engine does not detract from the overall appearance. Note the word 'clean' – none of your castor-oil baked, brown effigies please, but gleaming metal! Exposed engine certainly solved the overheating problems which Claus first encountered when silencers for stunt models became mandatory. Take care in building this model – poor workmanship cannot be hidden by layers of paint!



Back to SQUARE ONE!

In which we take the beginner through the various stages of building the fuselage of the MERCURY SWAN glider

RIGHT, CLEAR a space on the kitchen table, and let's begin! Tape the plan to your building board (we used a flat piece of $\frac{1}{4}$ in. plywood, size 3 ft. x 1 ft.), and study it carefully in conjunction with the instruction sheet. You will see that the fuselage is composed almost entirely of $\frac{1}{8}$ in. square balsa strips and that this is built up by making two basic sides, which are then joined together by horizontal spacers, forming a square 'box'. The first task is to make those basic sides, so cover the fuselage drawings with polythene sheet, which will prevent the glue from sticking to the plan.

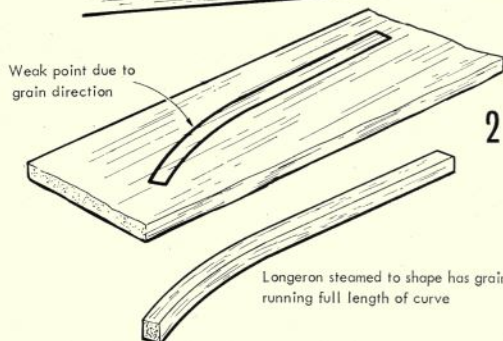
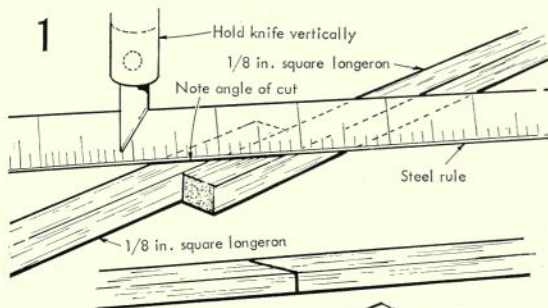
The kit includes a bundle of $\frac{1}{8}$ in. square balsa, and from this, select five pieces of equal hardness and flexibility for the longerons – those members which run for the full length of the fuselage. The hardness may be determined by both the weight and its resistance to being crushed – try squeezing it with your fingernails, and you will soon detect the differences.

The flexibility is best judged by holding two strips at one end between thumb and fore-finger. When

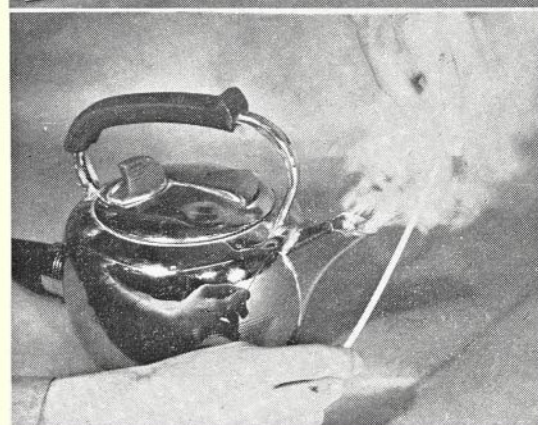
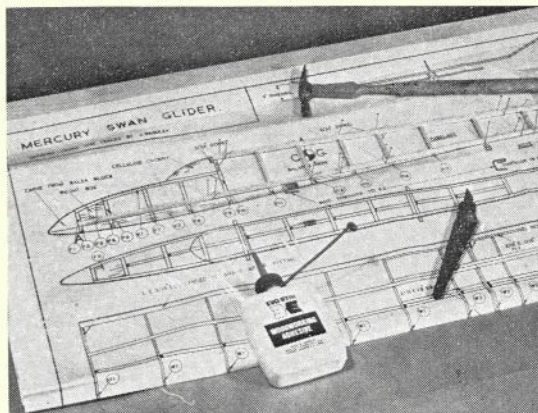
waved gently up and down they should deflect by approximately the same degree. By now you will have realised that balsa wood is a very variable material and is available in many grades of hardness and weight – or to be more correct densities – and you will find in due course that selection of the right grade of wood for the job in hand is an integral part of aeromodelling.

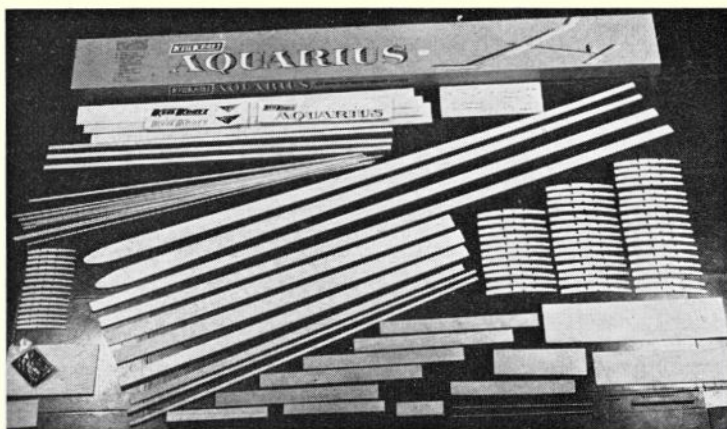
Using some of the softer $\frac{1}{8}$ in. square strip material, cut all the upright spacers to exact length – two sets will be required. Set on one side in size order. Make sure that the ends are cut truly square – if the knife is not held vertically the ends will be slanted and produce weak joints.

One tip here. When cutting these spacers to length, do not do so directly over the plan – you will quickly cut it to pieces, and score the building board. Instead, lay the strip over the plan and just make shallow impressions on the wood with the blade in the appropriate position, then slice through the wood on a separate cutting surface – such as a piece of softwood or even thick cardboard. This separate



Above right shows the plan covered with polythene sheet and the basic fuselage components pinned in position on the building board. Note how the pins are placed either side of the narrow strip wood – not through it, as this would cause splitting. The tack hammer is a useful accessory! At right, bending the longeron to shape in the steam of a kettle – wait until the wood is well saturated before attempting the curve. Soft balsa will bend far more readily than hard.





Peter Freebrey reviews the latest kit aimed at the free-flight market – an A/2 class glider of 72 in. wingspan, designed by the well known enthusiast, Jim Baguley, the

KEILKRAFT **AQUARIUS**

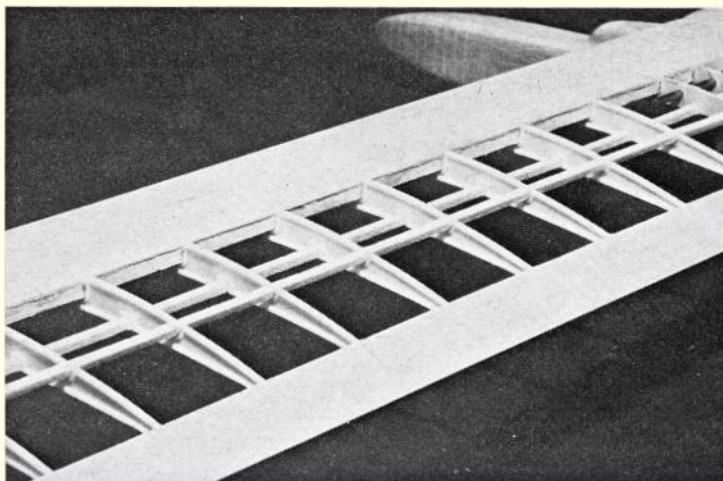
THIS NEW KIT from KeilKraft is the first free-flight 'contest' kit that has been produced for many years and was designed by Jim Baguley, a modeller who has been at the top of the contest league for this class of model for longer than most of us can remember. The kit has one innovation that is, perhaps, a pointer to the future, in that it employs the use of plastic ribs. These are utilised for both wing and tailplane, and on opening the box, give the hardened balsawood modeller quite a shock! In practice these were found to help maintain the required wing section splendidly; being themselves difficult to sandpaper away, one can gaily sand all round them without worrying about rib damage! There is, unfortunately one drawback to this material (nothing is perfect!) and that is its weight; the weight of all ribs; wing and tailplane, comes to over 3 oz., which is rather on the heavy side. More of this later.

The general quality of the kit is quite high, the wood supplied is not perfect for the purist, but within the limitations of mass production, is fully acceptable. Our fuselage sides were rather hard, whereas the top

and bottom sheeting was soft, which goes to show that we did not have a specially selected kit! The grading of the wood for the wing (spars, leading edge, trailing edge and sheeting) was incredibly good, there being no perceptible difference in weight between the two finished wing halves, certainly not like some kits we could mention!

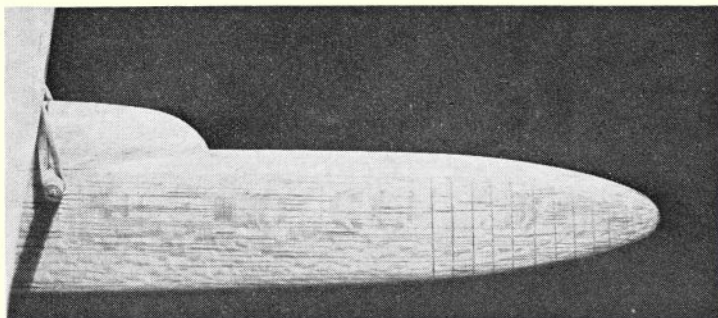
The die-cutting of both balsa and ply parts was clean but all parts needed some assistance from the modelling knife to free them from the surrounding material. The kit contains all that is necessary to make either a one-piece wing or a two-piece wing joined by two 10 s.w.g. wire dowels. Although the instructions recommend a one-piece wing, unless you live next door to your flying site or own a large car, you will find a two-piece wing much easier to handle than 6 ft. of tissue-covered structure! The instructions are quite clear and the building order suggested is logical and easy to follow.

It was thought that tissue covering of the undercambered plastic ribs might prove difficult, but tackled slowly and carefully, this proved not too trying on



Spread of components revealed in the heading picture show that there is plenty of 'meat' in this model. The plywood dihedral braces and the fuselage formers are all die-cut, but have yet to be extracted from their respective sheets in this photograph – hence the 'anonymous' rectangles seen in the foreground! The wing and tail ribs being all plastic, saves even this minor chore – and no risk of damage during construction either. Ample tissue for covering is provided – as is an 'if lost' address label, a wise precaution for a high performance design.

The plastic wing ribs – unique for this type of model, and indeed most unusual anyway – guarantee a true section, and the moulded-in flange provides maximum glueing area for joints to the spars, leading edge, etc. As the plastic is considerably harder than the other balsa components, the wing may be easily sanded down with no risk of spoiling the section, or of breaking the ribs themselves. Should prevent the newcomer from making many of the common errors.



Close-up of the nose shows the saw cuts which our reviewer found necessary to make in the rather too-hard fuselage sides. These cuts (which do not penetrate right through the wood) enabled the sides to adopt the correct degree of curvature without splitting. Balsa wood being such a variable commodity may make such a 'mod' unnecessary in other kits.

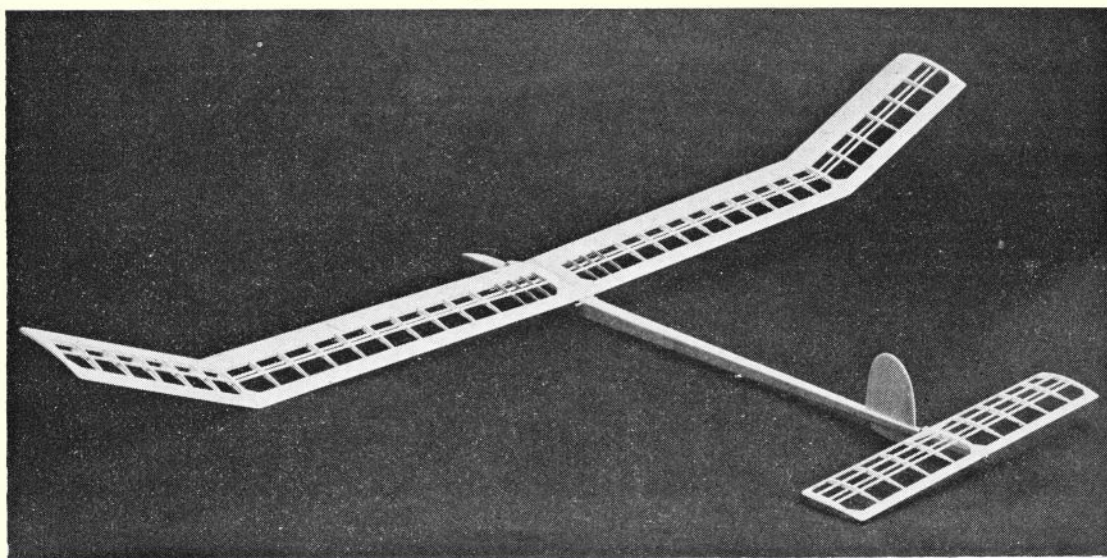
one's patience. First, give the balsa parts of the wing and tailplane a coat of sanding sealer, let this dry and lightly rub down with very fine sandpaper. This serves two purposes: (i) it gives a better finish, and, more important, (ii) it provides a surface to which 'doped on' tissue paper will adhere more readily. Using lightweight tissue, the tailplane is very easy to cover but to get good adhesion when using the heavy-weight tissue on the wings, it was found that the best system was to use thick (undiluted) clear dope and coat the undercambered surfaces (each rib and the lower spar) immediately prior to placing the tissue on the wing. Then lightly rub the tissue down with a finger on to the spar and each rib. The leading and trailing edges can be stuck down by doping through the tissue.

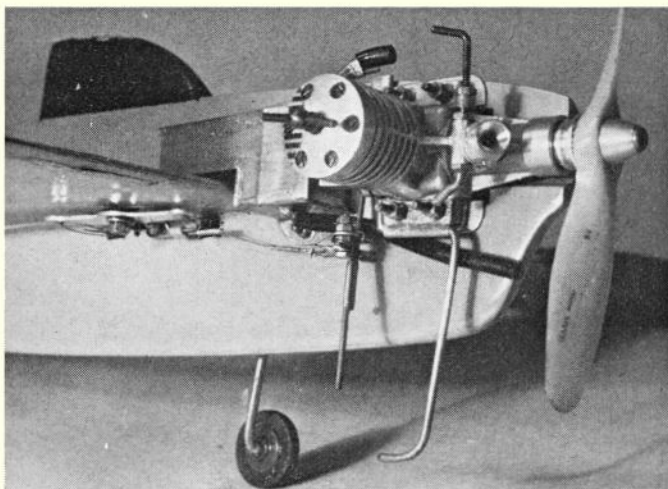
The final weight of the wings (including 1 oz. for the wire joiners) was $8\frac{1}{2}$ oz., which is a little on the heavy side – a penalty one pays for using plastic ribs although it must be mentioned that many people produce wings of more than 7 oz. wings, even when using balsa ribs! A possible disadvantage in the weight of the plastic tailplane ribs was that they scale $\frac{3}{4}$ oz., giving a finished weight for the tailplane of just over $\frac{3}{4}$ oz. It is very strong and not very likely to warp, though this weight meant that in our particular case, $6\frac{1}{2}$ oz. of lead had to be put in the fuselage nose to get the correct balance. Anticipating that this might be the case, our test model fuselage was covered in lightweight tissue, not heavyweight as

recommended in the instructions – and the model still came out at $19\frac{1}{2}$ oz. Instructions are a little optimistic here, informing the builder that he must ballast the model up to 14.46 oz. for A/2 competitions.

The total weight ($19\frac{1}{2}$ oz.) increases the flying speed slightly without affecting performance. If the trimming procedure is followed as in the instructions, good competition performance is within the grasp of those people who like to build from a kit. The structure builds true and no warp problems became evident in the test model. The kit *could* easily be uprated by tapering the thickness of the fuselage sheeting if it were found to be a very heavy grade of hard wood, and also by substituting light quarter-grain balsa ribs (with perhaps a closer rib spacing) in the tailplane. The *Aquarius* is altogether a pleasant model to build and fly, and with a retail price of £5.96. It is certainly the best value modern model available in kit form with which the less experienced modeller could confidently enter a contest.

Due to inclement(!) weather in recent weeks, Peter was unable to fully assess the flying potential of the Aquarius, but this will shortly be rectified and in the next issue we will give details of average 'still air' times obtainable and comments on the glider's general performance. In the meantime, however, Peter reports that all looks well, and at least it tows up nicely! Let's just hope the weather men look more favourably on our flying tests.





SHOW A LEG —BUT WHERE?

Dave Clarkson discusses
the optimum position of
the undercarriage leg on
a control line racer

THIS ARTICLE is essentially concerned with rearward mounted mono wheel undercarriages, although in discussing rearward wheels it is worthwhile stating why this potentially troublesome layout is preferred by many to the more conventional, forward raked undercarriages.

The purpose of a rearward wheel U/C is to allow high speed, bounce-free landings which can then be followed by ground braking on the run-in to the pitman. If you want to stay with the 'old style' of braking the model in the air (with large elevator movements) and landing the model just before the pitman at low speed, hoping that the pitman can deal with the bounce, then you do not need a rearward wheel. Many people have realised that this new approach is superior (and certainly more spectacular) in that it allows a reduced time loss in the landing-catching manoeuvre — watch Harknett/Smith or Heaton/Ross at any team event if you don't believe this. The sparks speak for themselves!

Wheel location

The general rule is $\frac{1}{4}$ in. — $\frac{1}{2}$ in. in front of the model's centre of gravity. At $\frac{1}{4}$ in., incipient bouncing may be found, and the model may not brake on the ground, while at $\frac{1}{2}$ in., ground braking will be easy but take-offs will be troublesome. The optimum position varies from model to model, and also to meet individual judgment on the ease of landing/difficulty of take-off balance; however, I have found $\frac{3}{8}$ in. in front of the G.G. to give good results on most models.

Simple fore-and-aft location is not all there is to learn about rearward wheel U/Cs. As described above, there is a balance to be made between take-off and landing performance; the table below sets out the various factors to be borne in mind.

	More rearward	More forward
Takeoffs	More difficult because of greater tendency to:	Less difficult because of reduced effects.
	a) Nose-tip due to engine thrust.	
	b) Nose-tip due to down-wind launch.	
	c) Come-in due to precession as tail comes up.	

Landings Less difficult because of increased effects.

More difficult because of reduced tendency to:

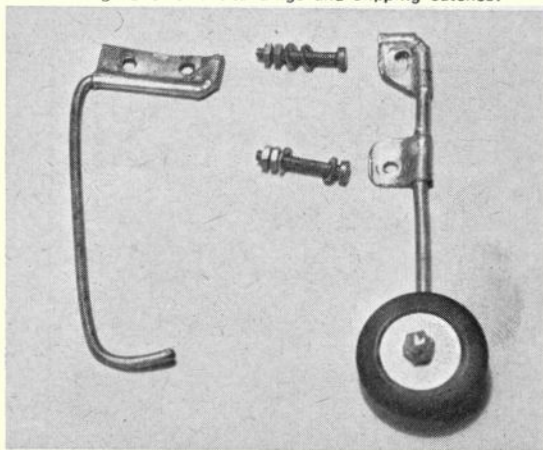
- a) Nose-tip on application of down elevator, and therefore reduced braking.
- b) Avoid bouncing.

It will be seen from this table that the optimum position is the most rearward that is satisfactory, i.e. provides no-bounce landings, ability to ground-brake and yet is reliable and safe on take-offs.

Refinements which enable the optimum location to go rearward or to improve take-off performance are discussed below.

Lateral location

This is the location of the wheel with respect to the fore-and-aft centre-line through the CG of the model. Experience has shown that the more inboard the wheel is, the less are precession effects on take-off. A good rule of thumb for team racers is to install the landing 'hardware' as fitted to the 'Deer Fly' Goodyear racer, seen in the heading picture. Mounting of the equipment is self-evident, and has proved most robust, the model itself having 'worn out' three tailplanes plus sundry other damage due to fast landings and slipping catches!



the wheel in-line with the inboard edge of the fuselage (i.e. 1 in. inboard of the CG). Mounting the wheel further inboard brings structural problems.

Subsidiary benefits of inboard wheels are:

- Easier mounting of detachable undercarriage legs.
- Contribution of force required to pull model upright on take-off increases line tension at this critical moment.
- Increased tendency to put outboard tip down on landing as pilot moves towards edge of the piloting circle. This gives greater ground braking effect and also helps to stabilise the model during the run-in to the pitman.

Nose skids

Nose skids are a somewhat controversial topic. On the plus side is the fact that a really stout nose skid can prevent prop damage from nose-tipping on take-off; by stout I mean 10 or 12 swg piano wire, but definitely not 14 swg or lighter. Similarly, when nose tipping is deliberately initiated on landing, a nose skid can again protect the prop, and also provide further braking.

On the negative side, there is the fact that a nose skid scraping along the ground may damage another competitor's lines (some would say *will* damage the lines). A secondary point for FAI team racers is that the mounting of a nose skid is difficult in a well-designed model since there is little wood in the nose. For these reasons many people, particularly in the FAI class, prefer to do without such fittings.

Elevators

It is a strange fact that many people still install symmetrically disposed elevators on racing models. Not only is this needlessly intricate, but none of the benefits of the outboard-only elevator are found. I must assume that many people prefer their models to actually look like full-size ones! In racing, prettiness comes last, although some may argue with that statement!

Not only is it easier to install outboard-only elevators, but there is also the distinct advantage that when using full-up elevator on take-off the drag produced works against precession and gives greater line tension.

To exploit to the full the advantage of asymmetric drag, I prefer to use fairly small elevators (say 5-6

sq. in.) and allow big movements at least of $\pm 45^\circ$. This is a more drag-producing set up than the more commonly employed big elevator with little movement.

Mounting details

a) Nose Skids

If used properly for braking after landing, nose skids are subjected to very high stresses. I have fatigued-off 14 s.w.g. skids and abraded away 16 s.w.g. skids in a very short space of time! Therefore nose skids should be stout and also detachable and herein lies the problem. I know of only three totally satisfactory methods of mounting viz.

- Bolting to engine cylinder as per Bugl (although if I had a Bugl, I am not sure that I would treat it in this way!)
- Bolting to the motor mount. This is most applicable to Goodyear racers.
- Bind and solder to U/C leg.

The last method is most suitable for FAI team-racers, however, the forward pointing ski is a little too perfect for scooping up lines, therefore reservations must be expressed about this method.

If anyone knows of other methods which will survive my piloting and yet confer no significant weight or aerodynamic penalty on the model, then I would certainly like to know about them!

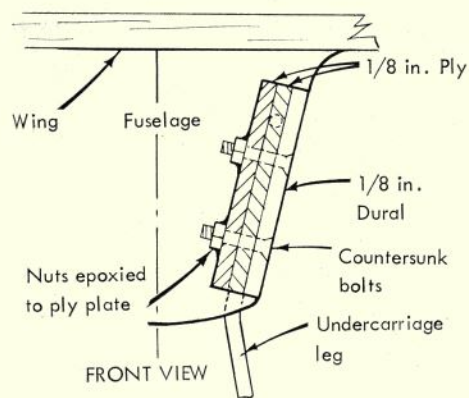
b) Undercarriage legs

To gain the maximum benefit from rearward wheel U/Cs, the position must be 'tuned' as described and also must be capable of being restored to this optimum after a very heavy landing. This to me indicates that U/C legs must be detachable and also should be a single wire leg.

Because rearward wheels allow very fast landings, operators must also expect the occasional very heavy landings, thus the mounting must be strong enough to withstand such impact. I am surprised at those acknowledged experts of FAI team race in this country who manage to completely remove the U/C on landing (I have seen this happen to Harknett/Smith, Place/Howarth and Heaton/Ross this year). Therefore, considerable attention should be paid at the design stage to structurally integrating the mounting with the model - more attention I feel than most of us think.

My favourite method is that I first saw on Bader/

Figure 1 - BADER/KAUL METHOD



Dave's adaption of the Bader/Kaul leg mounting arrangement is shown at right, on his crashed F.A.I. racer. Note that despite the fact that the 'pod' was nearly detached by the force of the prang, the landing gear mount is undamaged. The leg fits in a slot caused by fretting out the centre (ply) lamination, and is secured in place by the dural cover plate. When soldering on the 'skid' use a big hot iron and appropriate flux. Multi-core solder is not strong enough.

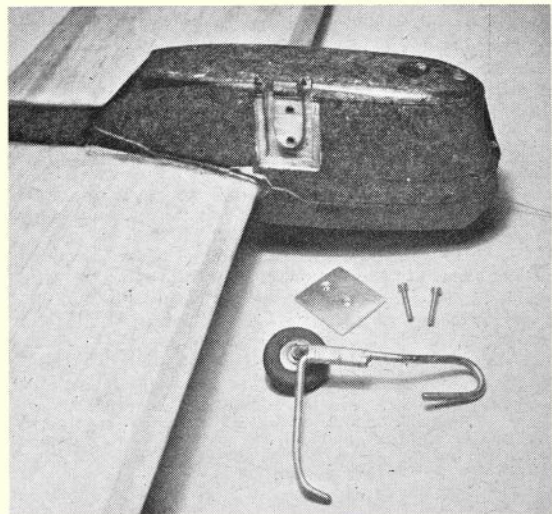
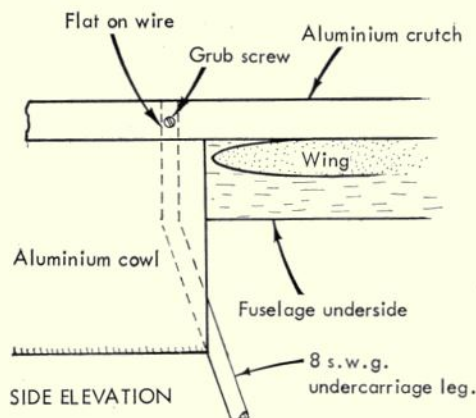


Figure 2 - BUGL METHOD



Kaul's winning model at the 1972 Nationals. This used a grooved ply plate to accept the leg, with a dural cover plate attached with bolts. The ply plate is most securely glued into the fuselage inboard side. Most of the forces of landing in this design are transmitted vertically to the model crutch.

A very simple method is employed by Bugl on his (in)famous model. The 8 s.w.g. leg is threaded up through the model to the motor mounting crutch and secured to this item with a grub screw. This method is widely used on R/C model nose legs and is therefore of proven strength.

To illustrate the complexity justifiable in U/C mounts, the Krasnorutsky method is sketched below. Of course, the finding of suitable billets of Titanium for such a job is beyond the ability of most of us, but the system works well.

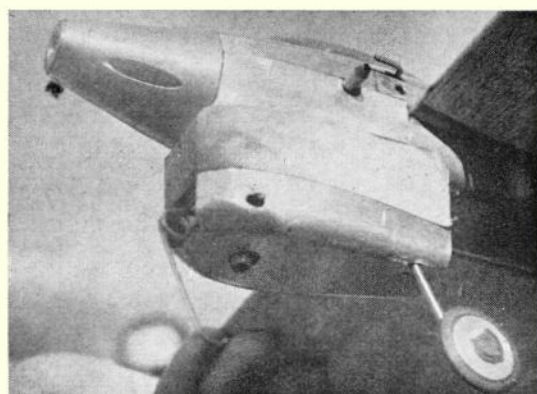
For Goodyear models, I have just used two methods and both have proved to be satisfactory. The first and simpler method, is as described in the *Booray/Lil 'Gem'* plan and, if the tin plate clips are well soldered to the U/C leg, a very strong mount results.

The second method is a Bader/Kaul type composite plate installed in the fuselage as described for FAI models.

Model features

In addition to the nose skid and U/C leg mounting details, and the outboard only elevator, two further features should be noted.

a) Since the model does not bounce, few stresses



Paul Bugl locks his undercarriage leg into the motor crutch with a single grub screw, while the prop skid is similarly clamped to the top of his motor. Simple, and certainly lightweight. Another rear-wheel enthusiast!

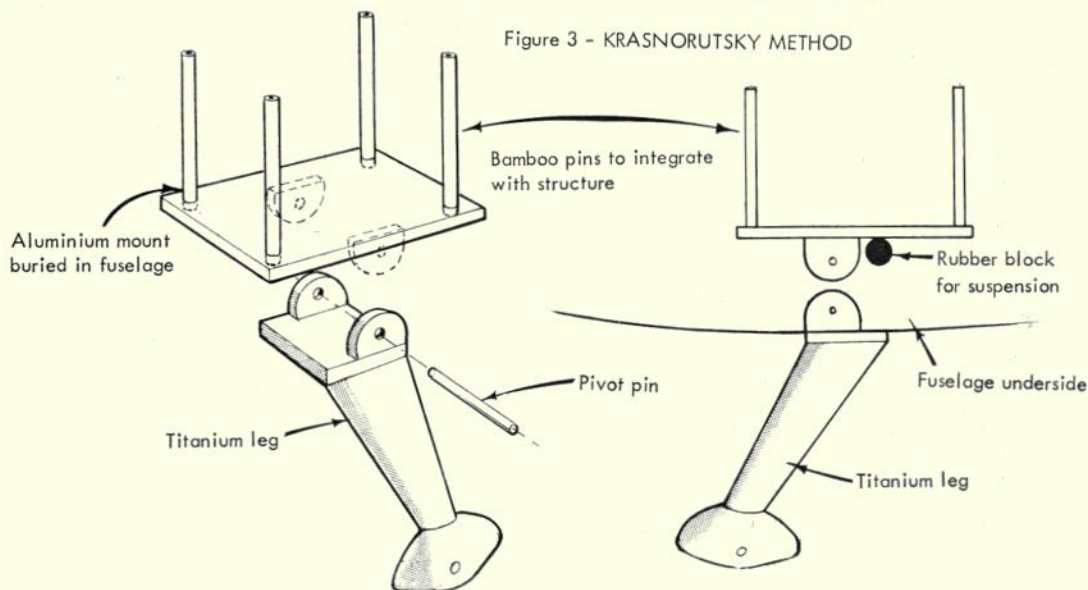
are imposed on the tail and therefore this may be built light. A feature which is a great help in the construction of the presently fashionable very light team-racers, and also of the C.G. problem-prone Goodyear designs.

b) The model's outboard tip, particularly at the front of the tip, has to withstand a great deal of wear from scraping along tarmac, so some form of good protection is indicated here. I recommend a piece of 14g or 16g wire epoxied over and under the tip in one piece, preferably covering the full tip chord top and bottom to ensure that surface irregularities in the tarmac do not rip the tip skid.

Conclusion

Much has been said here of the difficulties involved in the use of rearward wheel U/Cs. Whilst these difficulties should not be made light of, I hope that this article gives practical and simple methods of overcoming such difficulties. After all, the same sort of considerations should be applied to the mounting of any U/C in any control-line model (i.e. performance and durability). My own feeling is that for Goodyear and FAI T/R models, nothing in this world would persuade me to go back to forward wheel U/Cs; the advantages described on landing are so useful when properly exploited.

Figure 3 - KRASNORUTSKY METHOD

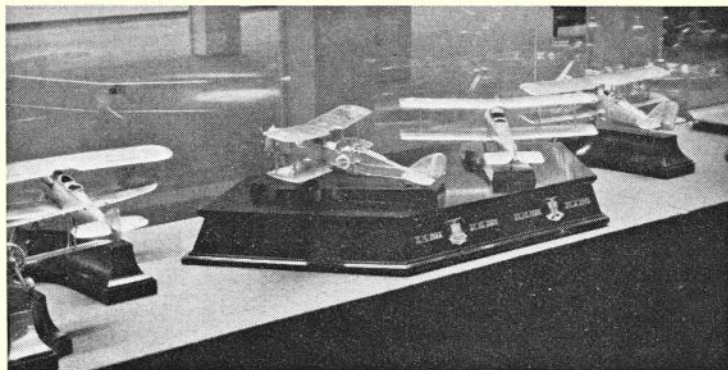


Eric Coates'

FLYING SCALE COLUMN

takes a controversial
view of the R.A.F. Museum

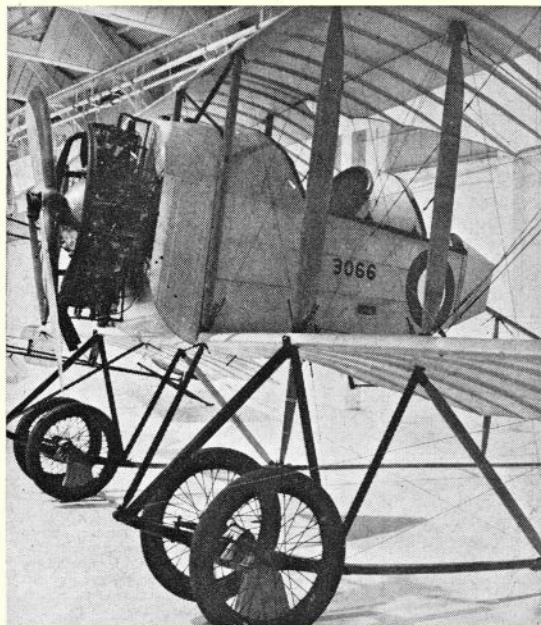
Priceless scale models, fashioned in silver and representing classic biplanes of the thirties form part of the Royal Air Force Squadron Trophy display at the Museum.



ON NOVEMBER 15th, 1972, Her Majesty the Queen opened the R.A.F. Museum at Hendon, an event which many aircraft enthusiasts have looked forward to for many years. I visited the museum a few days after the opening ceremony, and by way of a change this month I will give my impression of the collection, looked at from a scale modeller's viewpoint.

The museum is readily accessible by car, being just to the West of the M1 and East of the A5, about eight miles North of Hyde Park Corner. A large car park is provided, and admittance to both car park and museum is free. The actual exhibition hall is, in fact, two of the old hangars joined together and surrounded by an impressive multi-arched structure. Externally one gets the impression of an Eastern palace – there is no aura of anything aeronautical at all, but internally the old latticed wooden girders convey a definite 1914-18 atmosphere.

Now to the exhibits. Most important, of course, are the aircraft themselves. Until comparatively recently the R.A.F. has had an ineffective preservation policy, and the aircraft which are exhibited are consequently those which fortuitously escaped the scrap heap, or were preserved by some other organisation,

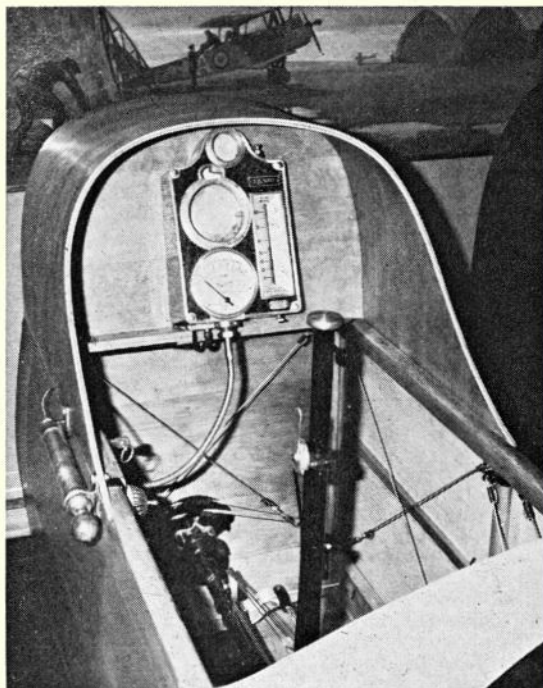
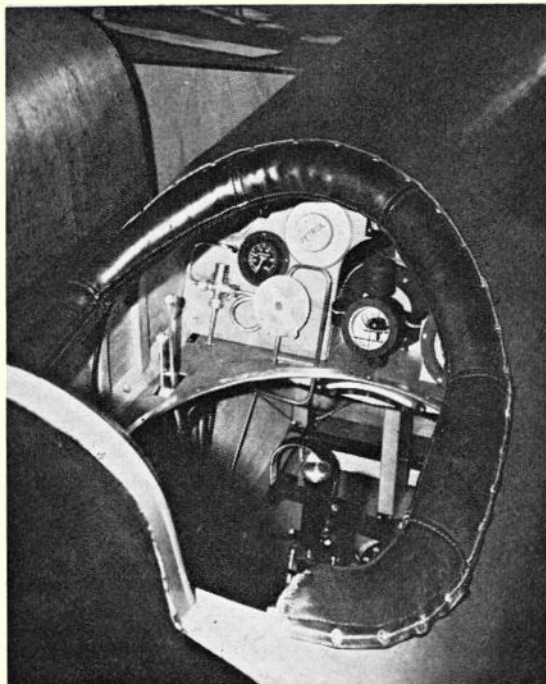


or person, blessed with a better sense of history. Considering, therefore, how the collection became scraped together, it is remarkably complete. Unfortunately, there are one or two tragic omissions; a *Halifax* possibly being the greatest gap, followed closely by the *Whitley* and the *Hampden* among W.W.II types. I believe a *Blenheim* is to be put on display sometime; it is at present being 'converted' from a *Bolingbroke* traded from the Canadians for a surplus *Beaufighter*.

Although not represented here, examples of those stalwart twin trainers, the *Oxford* and *Anson*, reside in the Skyframe Museum at Gloucester. The World War I era is well represented from a *Scout* point of view, but there are no bombers, unless you count the *Vimy* replica – a type which never saw wartime service. The War Museum is better off in this department possessing an *R.E.8* and a *B.E.2c*. I am afraid, however, none of the D.H. bombers, which were the backbone of the R.A.F.'s offensive armoury in 1918, survive – the 'tween war years are the worst represented of the lot. Apart from the restored *Gladiator*, in 87 Squadron livery, no other example of that beautiful line of silver biplane fighters, stretching from 1920 to 1938, exists, indeed it is incredible that not a single example of a *Grebe*, *Gamecock*, *Siskin*, *Bulldog*, *Gauntlet* or *Fury* survive today. Apart from the *Fury*, Britain's foremost fighter designer, Sir Sidney Camm, is well represented in this museum; no less than 10 of his machines being present.

Having seen, this summer, the colossal task the Shuttleworth Trust have set themselves in restoring an ex Afghan *Hind* into flying condition, I don't really see the justice in the perfectly servicable ex Hawker Siddeley *Hart* being exhibited alongside the almost identical Afghan *Hind* and a *Hart Trainer*! At the other end of the scale, less historic types, which have escaped the axe, are presented even though they are of little historical significance. How can a *Belvedere* helicopter, for instance, be justifiably nuzzled up to the nose of R5868, the most famous *Lancaster* of all, veteran of 137 raids?

The full list of aircraft, at present on show, in approximate date order, are: Bleriot XI, Avro 504K, Vickers Gun Bus*, Caudron G.III*, Sopwith Triplane*, Sopwith F.1 Camel, S.E.5a, Vickers Vimy, Hawker Cygnet*, Hawker Hart*, Hawker Hart Trainer*, Hawker Hind, D.H. 82a, Tiger Moth, Gloster Gladiator, Miles Magister, Westland Lysander, Hawker Hurricane I, Supermarine Spitfires. To the Museum staff, and to most air historians, the Caudron G-III represents the finest restoration in the entire Museum. Each detail of the Caudron has been rebuilt precisely as originally made, including the unique method of wing covering.



1 & 24, B.P. Defiant*, Supermarine Stranraer*, Vickers Wellington*, Bristol Beaufighter X*, D.H. Mosquito III, Avro Lancaster 1, Hawker Typhoon 1B*, Hawker Tempest V*, Hawker Sea Fury, Sikorsky Hoverfly, Gloster Meteor, English Electric Canberra, Bristol Belvedere, English Electric P.I.B. (Lightning). The starred items are, I believe, unique in Great Britain.

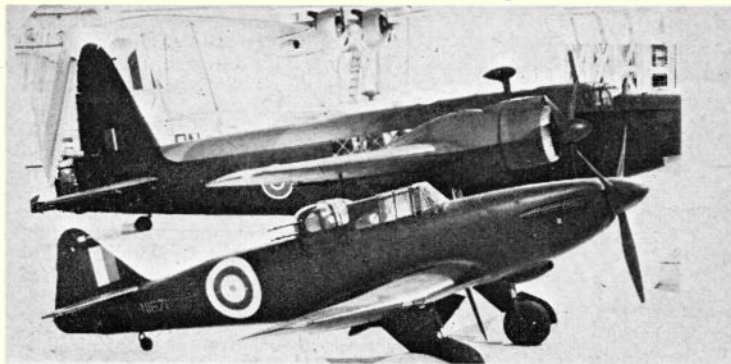
Generally, all the aircraft have been restored to a high 'bull' standard, and I am sure that if R.F.C. pilots of 1917 had been presented with such gleaming mounts as the *Camel* and *S.E.5a* exhibited here, they would have expected a royal review the next day! The camouflage khaki-green used for the 1914-18 types looks about right to my eyes (at least it is about the same shade I paint my models), but it will no doubt upset the 'they were all chocolate-brown brigade'! I would, however, quibble at the rather vivid hue of blue used for the roundels on machines of this vintage, as although this did vary considerably if one studies photographs of the period, generally I thought it should have been somewhat lighter. The camouflage colours of the aircraft used in the latter part of W.W.II looks 'bang on' to me; especially the shades of the roundels. I am not sure about the camouflage green of some of the machines repre-

senting the early part of that war. . . . These are all minor points, not put forward in any nitpicking manner as I realise the enormity of the task of restoring these machines, and also bearing in mind that they were not all done under the direct auspices of the expert museum authorities who have gone to great lengths to ensure authenticity.

I thought the placards describing the aeroplanes rather poor. Very seldom do they give the Mark number, or the Squadron, of the exhibit. Cutaway drawings are displayed alongside, some of them a long way behind the standard published in *Flight* and *Aeroplane* over the years.

The aeroplanes are spaciouly set out so that you can get a good look at them from a variety of angles, and particularly from above, as there are observation balconies on the upper floor. The exhibition hall is well lit and shadow areas minimised by the white floor, which is just as well from a photographic point of view as, for some inexplicable reason, flash is not allowed. On a bright day, however, using fast (400 ASA) film, good black and white results should be obtainable with an average exposure of over 10 seconds.

Adjoining the main exhibition hall (hangars) are two galleries, the contents of which in part should



Two dummy W.W.I cockpits are exhibited in the Gallery and provide modellers with excellent references for the SE5A (at left) and BE 2 (at right) with its universal Elliot instrument panel.

Boulton Paul Defiant and Vickers Wellington. Two sole survivors which will give modellers adequate opportunity for direct study of two famous aircraft which are generally neglected as scale subjects.

prove of great interest to modellers. These galleries contain numerous reconstructions of workshops, dioramas, vehicles, etc., depicting life in the R.A.F. from the turn of the century to the present day. Generally, I would say all these were well done, with the exception of the aircraft models, which are not a patch on the models in the I.W.M. In fact, if they were flying models presented for judging their scores would be in the 2 and 3 category! Most are 1/48 scale, which in itself is hardly suitable for a museum with so many full-sized 'blanks'. They were professionally built to a budget, but I am sure that if an approach had been made to one of the non-flying scale model associations, a more realistic collection of models could have been (or still can be) accumulated at very little cost. Some noteworthy 'solid' scale modellers are already known to be contributing.

The material in the galleries runs chronologically, starting with balloons before the First War. Of great interest to modellers of W.W.I types are the reconstructions of workshops of the period, and while it is hardly likely that so much varied activity would have taken place in so little space, one can see how propellers were laid up, wing ribs constructed in jigs and various metal parts built and repaired. There are many interesting 'props' in the workshops, such as an F.2b fin, Vickers and Lewis guns, wicker seats, etc. There are numerous other R.F.C. exhibits not directly pertaining to aircraft, but interesting all the same: a Crossley Tender and Triumph motorcycle, for instance. There are also several reconstructions of typical barrack blocks of the period, while the far end of the upper gallery is devoted to Personalalia, medals, etc.

The greater part of the lower gallery is devoted to the Second World War but, prior to this, there is an interesting section on the 1919-39 period. The most valued exhibits here are original wing panels of a D.H.10 and a Siskin, which are displayed in glass cases to keep damaging fingers at bay. They are still covered in faded fabric showing just how difficult it is to determine the true original colour. Sufficient fabric is cut away to display the structure underneath - wood in the case of the D.H.10, and metal, of course, for the Siskin III. It is interesting to note just how small a diameter tubing was used for wing tips - a point which is so often overlooked by modellers. The point which struck me most forcibly was the crude manner in which wing tapes had been applied, as I have always tried to make a neat job of these on my models, going to great pains to produce constant thickness tapes and dope them on perfectly parallel to each other! On both the D.H.10 and Siskin wings the tapes were of varying thickness, frayed edged and anything but parallel. I checked back on some of the fabric-covered restored machines in the exhibition hall and was pleased to see that they also had been re-taped in identical manner. That's one job I shall be able to do quicker on my next model!

The Second World War gallery will no doubt produce the greatest nostalgia, not only for the thousands who served in the R.A.F. during those momentous years, but to the thousands of schoolkids who, like myself, built 'solids' by the barrow load and spent all our days 'plane watching. Living in Yorkshire then, I was in the heart of No. 4 Group of Bomber Command, and the sight of the huge Headquarters board, displayed in the Main Hall, on which the names of those familiar 4 Group stations appeared (Brighton, Holme-on-Spalding-Moore, Pocklington-Melbourne-Driffield, etc.) brought back memories of many a tiring bike ride to see the *Halifaxes*

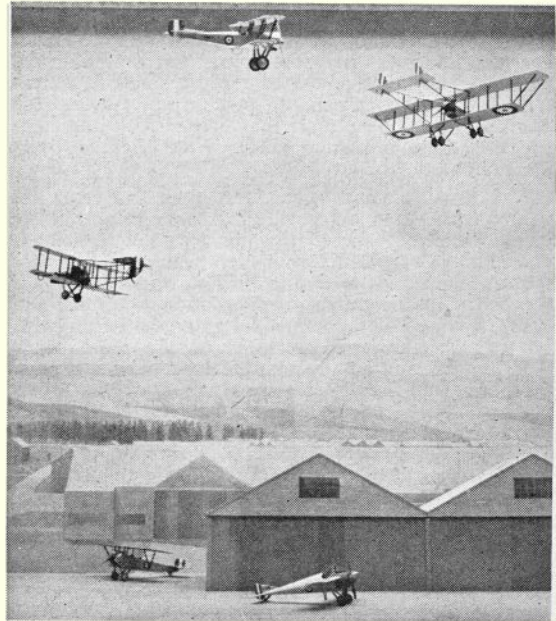
on the ground and the occasional test flight. Memories also of the sky full of 4 Group aircraft congregating over my home town of Goole on those summer evenings in 1943 and 44. It seems hard to realise that was nearly 30 years ago. Perhaps that is also the reason why I think the lack of a *Halifax* beside the *Lanc* is such a shame! All the ground trappings of the war are displayed in this gallery, right down to Aircraftman 'Plonk's' regulation bike.

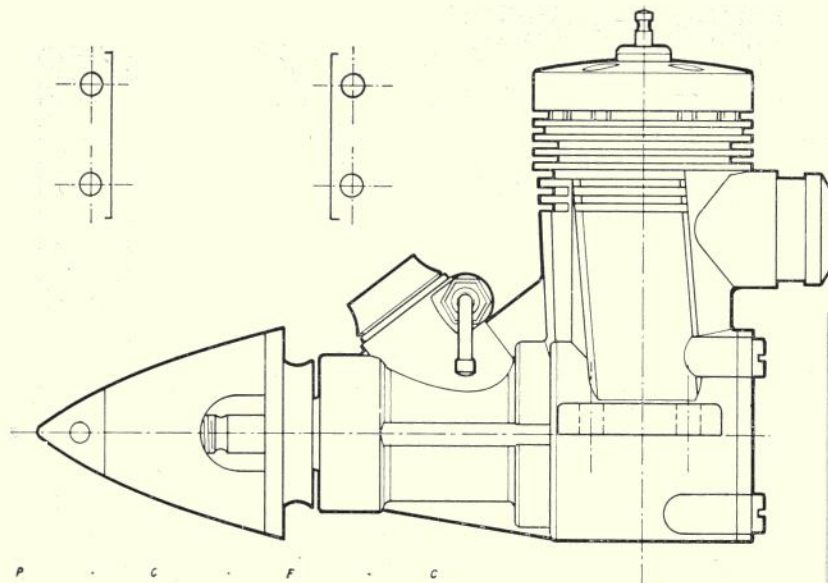
The final part of the ground floor gallery is given over to the post-war and the present-day R.A.F. - the jet era - not really the flying scale man's domain.

A part of the museum not to miss is the art gallery. Here aeroplanes of all eras are depicted on canvas, but the standards are variable. There are some canvases I wouldn't put on my lloo wall! Aircraft are difficult to paint, and even if the proportions are only slightly wrong the whole painting is ruined for anyone who has only a slight knowledge of the type. To me, two artists stand out above all among those represented: Ken McDonough, who is well-known for his excellent flying scale models (he can capture the atmosphere of an aircraft in flight, for me, in a manner no other artist is able), while the other is Terence Cuneo, who I had not associated with aircraft work before. Like myself, many readers will have admired his wonderful pictures of steam locomotives, and it appears during the war years he made several oil paintings of aircraft in production. His study of a Beaufighter production line is most realistic.

Well, that's about all there is space for. I hope I have put my impressions honestly to paper - it is well worth a visit, but frankly I was a little disappointed. However, it is a fine building and the site has plenty of room for expansion, a lot of venerable aircraft have found a last resting place worthy of them: where they can be revered by generations to come.

One of the many model groups, this one representing the early war period with French and British types in R.F.C. colours. All models are to 1/48th scale.





ENGINE TEST

by Peter Chinn

ROSSI R-15 'NORMALE'

'... one of the all-time greats'

FOLLOWING ITS considerable success in recent international and World Championship events, the Rossi R-15, both in its standard free-flight form and in its piped C/L speed version, is greatly sought after at the present time. 'Sought after', we should add, are definitely the operative words, since the supply of these engines from the small Rossi Brothers factory in Northern Italy is well below the current demand for them. The situation, in fact, is not unlike that existing in the late nineteen-fifties with the Oliver Tiger, when this famous British diesel was very much the 'in' motor among free-flight power people the world over, but for which there was invariably a long waiting list.

Our test report deals with the *R-15 Normale* which is the version made in the largest numbers. Timed for non-pipe use, this is the model that is eligible for the FAI free-flight power category where one is restricted to an open-exhaust power unit. It was, of course, one of these units that helped Rolf Hagel to become the present World Free-Flight Power Champion.

The Rossi brothers spent more than five years developing the R-15 before the first production models were released. Prior to this, they had accumulated considerable experience with high-performance model motors, dating back to the 'fifties, when they were successful participants in international control-line speed flying. Their commercial interests began with offering special tuned versions of the Super-Tigre G.20 engine and in the manufacture of the Vulcan pulse-jet, followed by the production of the Rossi 60, the C/L racing unit that finally ended some 15 years' domination of the 10 c.c. speed class by the McCoy Series 20.

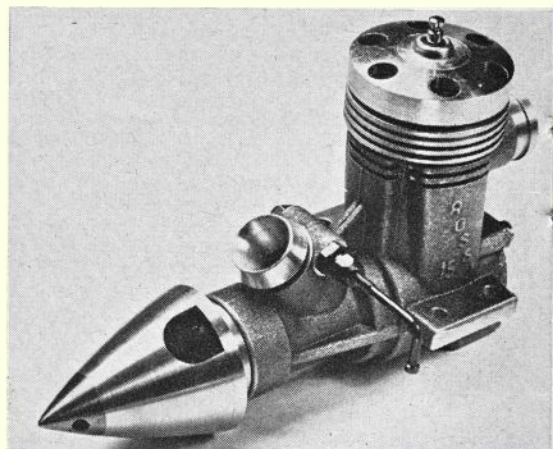
There is no doubt that the standard Rossi R-15 has a very definite edge in performance over all other stock commercial 2.5 c.c. motors. There are one or two new rivals in the offing which could conceivably present a challenge but, at the moment, the R-15 remains the No. 1 choice. Nor has the R-15 necessarily reached the limit of development. Quite apart

from a new rear-induction version promised for 1973, experiments with the existing front intake model have, we understand, yielded further gains and may well lead to modifications being incorporated in the production model in due course.

Basically, there is nothing original about the design of the R-15. It is a twin ball-bearing shaft-valve racing type motor having the now familiar features of Schneuerle loop scavenging and rear exhaust. Where it scores is in its excellent mechanical design, first-rate construction and highly developed porting. Induction is through a well-shaped multi peripheral jet carburettor venturi having a generous (28.3 sq. mm.) choke area which blends very smoothly into the intake port slightly offset in the direction of shaft rotation. The induction timing is conservative by racing engine standards, the rotary-valve closing at barely 48 deg. ATDC after a 190 degree induction period, but maximum use is made of this by employing a long (12.7 mm.) rectangular shaft port and a parallel sided bearing aperture for rapid opening and closing.

Transfer is firstly through two forward sloping channels in the main casting which are shaped to line up with intake ports each side of the exhaust port. They are angled to direct fresh gas towards the front of the cylinder across the piston crown as they open (10 degrees after the exhaust opens) at 65 deg. BBDC. A couple of degrees later, a large rectangular third port, diametrically opposite the exhaust port and steeply inclined upwards, releases a scavenging gas flow towards the combustion chamber. Incidentally, the exhaust period, it will be observed from these timings, is unusually long for a non-pipe engine, at some 150 degrees of crank angle.

The cylinder head design is closely modelled on the Cox glowhead conversion so successfully adopted by tuning specialists for modified Super-Tigre G.15s. A trumpet-shaped combustion-chamber insert with integral glow filament is used and this, plus the cylinder-liner, are secured by a machined ring forming the outer part of the head fixed to the main casting with six screws.



Performance

In accordance with the current FAI regulations for the 2.5 c.c. World Championship class, our tests on the R-15 were carried out on straight methanol/castor-oil fuel. The engine is, in fact, set up for operation on such fuel, and if the owner wishes to use a hot nitro blend instead, a reduction in compression ratio is recommended. The test motor came direct from the Rossi brothers and had been partially run-in but was a completely stock unit.

The makers' recommended running-in procedure with the R-15 calls for 20 minutes running on 70/30 methanol/castor-oil and a $7\frac{1}{2} \times 3$ prop, followed by one hour on 80/20 and a 7×3 The average example of the latter size prop will allow the engine to unload to around its peak output when the R-15 is leaned out to its optimum needle setting and, on the completion of the running-in period, our test engine, running less spinner shell, showed a reading of 25,400 rpm on a Top-Flite wooden prop of this size.

Obviously such a prop will take the engine beyond its peak as it accelerates under actual flight conditions and a slightly larger size is therefore indicated. The Bartels epoxy-glassfibre $7 \times 3\frac{1}{2}$ is one such prop and has, in fact, been successfully used in contests. Changing to this produced a static rpm reading of 23,600 which would suggest that full peak performance should be available in the air. Other static prop speeds recorded on test included 21,400 on a $7\frac{1}{2} \times 3\frac{1}{2}$ Bartels and 20,900 on the fastest of two 7×4 wood Top-Flites. Needless to say, decent wood or resin fibreglass props (not nylon) are to be preferred if the risk of blade shedding is to be avoided.

The manufacturer's claimed power output for the R-15 Normale is 0.70 bhp at 25,000 rpm on FAI fuel. This is so far above the highest levels previously recorded for 2.5 c.c. free-flight motors that, prior to actually handling the R-15, we were a trifle sceptical. In fact, our torque and rpm figures recorded on test, when plotted, indicated the peak output as occurring at between 25,000 and 26,000 rpm. The actual bhp determined was 0.65 bhp which, while not quite so high as the manufacturer's rating (the difference, of course, could be largely accounted for by differences in climatic conditions) is nevertheless high enough to make the R-15 the most powerful engine, on a specific output basis (over 260 bhp/litre that we have tested to date).

From 20,000 rpm upwards and especially at its peak speed, the Rossi ran with impressive smoothness and steadiness. The faster it ran, the happier it sounded. Below the speed at which maximum torque

SPECIFICATION

Type: Single-cylinder, air-cooled glowplug ignition, Schnuerle loop-scavenged two-stroke with crankshaft rotary-valve and dual ball-bearings.

Bore: 15 mm. (0.5905 in.)

Stroke: 14 mm. (0.5512 in.)

Swept Volume: 2.474 c.c. (0.1510 cu. in.)

Stroke/Bore Ratio: 0.933:1.

Checked Weight: 162 grammes (5.7 oz.) including 8.5 grammes for spinner shell and nose cone.

GENERAL STRUCTURAL DATA

Sandcast aluminium alloy crankcase/cylinder casing/front housing unit. Detachable rear crankcase cover secured with four screws. Hardened steel crankshaft with full disc internally counterbalanced crankweb, 10 mm o.d. main journal, 7.5 mm i.d. gas passage and 4.5 mm o.d. crankpin. Shaft supported in one 10 x 19 mm. 10-ball steel-caged ball journal bearing at rear and one 6 x 16 mm. 6-ball brass-caged shielded ball journal bearing at front. Flat crown deflector-less lapped cast-iron piston running in hardened steel cylinder liner. 4 mm. o.d. hollow gudgeon-pin located by circlips in piston. Machined aluminium alloy connecting-rod, unbushed but with oil holes at both ends. Two-piece machined cylinder-head assembly consisting of trumpet-shaped combustion chamber insert having integral glow filament and a separate outer ring securing complete assembly to main casting with six screws. Single 0.2 mm. aluminium gasket between head insert and ground cylinder flange. Machined aluminium alloy prop driver combined with spinner backplate, mounted on shaft via aluminium split taper collet. Machined aluminium alloy spinner shell. Steel spinner nose-cone securing spinner assembly to shaft. Machined aluminium alloy venturi insert with 6 mm. i.d. choke retained by tangent mounted needle-valve assembly feeding fuel to six peripheral jets in venturi.

TEST CONDITIONS

Running time prior to test: $1\frac{1}{2}$ hours approx.

Fuel used: (i) 70 per cent methanol, 30 per cent Duckhams racing castor-oil (running-in); (ii) 80 per cent methanol, 20 per cent Duckhams racing castor-oil (tests).

Glowplugs used: Rossi No. 2 glowheads as supplied.

Air Temperature: 16 deg. C (60 deg. F.)

Barometric Pressure: 29.7 in. Hg.

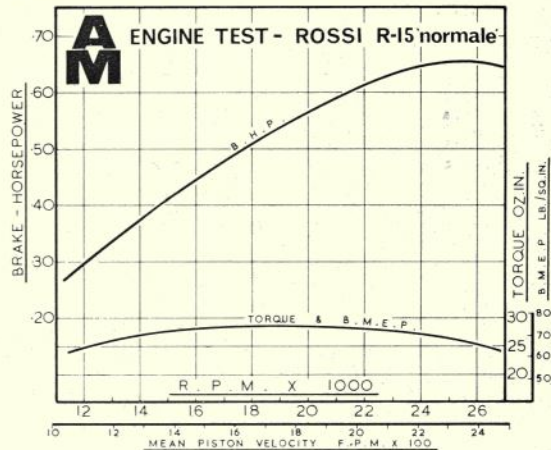
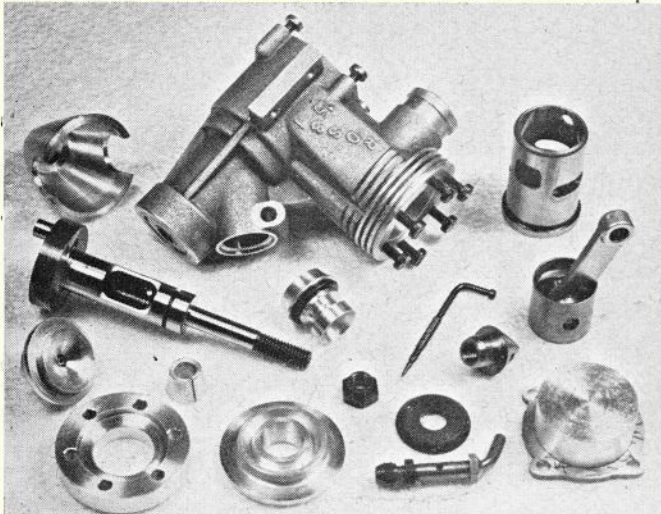
was indicated (18-20,000) it was much less happy, culminating in an obtrusive vibration period at around 15,000 rpm. However, this is of no practical importance since there would be little point in buying a Rossi 15 if one were intending to prop it for speeds much below its peak.

Starting qualities (hand or electric) were good. For a cold start, we found it best to prime via the exhaust, but warm restarts were generally instantaneous following a single choked flick of the prop.

In all, a most impressive engine which, contest capabilities apart, one must unhesitatingly place on one's list of 'all-time greats'.

Power/Weight Ratio (as tested): 1.83 bhp/lb.

Specific Output (as tested): 262 bhp/litre.





SOCIETY OF MODEL AERONAUTICS



Above: retiring in 1972 after long and diligent service are Competitions Secretary George Lynn and Records Officer Stan Wade. Right: Bob Gosling receives his Certificate from H.R.H. with congratulations for a lifetime of aeromodelling.

Above left, H.R.H. The Duke of Edinburgh, Patron of the S.M.A.E. signs the visitors' register; Henry Nicholls at right. In the background, Bob Copland, Edgar Clark and Norman Couling. Top right: Lt. Cdr. Alwyn Greenhalgh shows H.R.H. some of his collection of historic models and engines, behind are A.V.M. Sir Bernard Chacksfield, and G/Captain Eric Baddeley, President of R.A.F.M.A.A.

Left: A. E. Jones, doyen of the Fellows at 89, and founder-secretary of the Society meets Ron Firth, Chairman 1972, with Norman Butcher and Alwyn Greenhalgh behind.

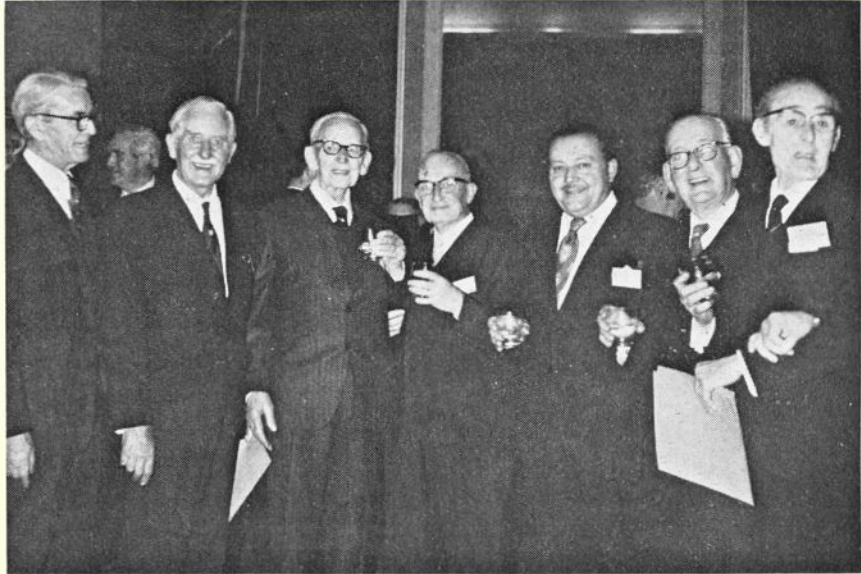
CAL ENGINEERS FELLOWS RECEPTION



A RECEPTION at the United Service and Royal Aero Club celebrated the 50th Anniversary of the S.M.A.E. in Regal style. His Royal Highness the Duke of Edinburgh presented certificates to the 21 Fellows present and met members of the Society Council as well as their guests from the Aviation Council, the Royal Air Force, Cranfield and the Aircraft Industry. The spirit of aeromodelling was never more flourishing as the pioneers met the present generation of administrators. Covering five decades of model flying activity, prominent names were drawn together, some for the first time in over 30 years. Conversation rich in reminiscence ranged from 'Aerial Golf' with A-frame pushers to the marvels of present-day radio control – no wonder that another 'Old Boys' reunion has been earnestly requested!

Below, 'They've seen it all' – pioneers of British aeromodelling. Doug Gordon, Bob Gosling, A. E. Jones, M. R. Knight, Eddie Cosh, Arthur Rippon and Alex Bell.

Top left: Sir Bernard Chacksfield; D. A. Russell, who established 'Aeromodeller' and many other modelling publications, as well as the famous Eaton Bray sportsdrome, with H.R.H. Centre. Ken Brookes, the P.R.O. of the Fifties, gets his certificate; and right: Norman Couling, Chairman 1971, shows the Duke the new F. Boxall Trophy with the maker, Laurie Barr (Chairman 1970) at right. Immediately above, Jack Hartley (Chairman 1973), Geoff Dallimer (back to camera), H.R.H., Sir Bernard, Peter Freebrey and Dennis Thumpston.





YOUR TWO

Jack Arnould's

BOEING B-47

a 19 in. span, profile
scale, catapult launched
glider, with ultra simple
construction

AFTER FLYING your umpteen channel, high powered, flying bank roll through some hairy manoeuvres, COOL IT, relax and have some low pressure fun! Build this no channel, low cost, high start glider – just think, no engine noise, no radio problems, just plain old fun – but don't let your kids see it or you may never get your hands on it again! I know this to be true as I have four girls and this is the first of my many models that they have taken any great interest in. Now they are actually disappointed if we don't go out and fly it.

The plane is a 1/72nd profile scale model of the Boeing B-47, the world's first all-jet high speed bomber and the mainstay of SAC for many years, until replaced by the B-52.

Construction is quite simple and straightforward, and uses medium hard balsa throughout. First cut the fuselage from $\frac{1}{4}$ in. sheet, taking great care with the slots for the wing and tailplane. Keep the knife blade vertical and cut from both sides to avoid the slots sloping from one side to the other of the fuselage. Cut the hole for the ballast and then cement the $\frac{3}{32}$ in. ply nose doublers in place. Next cut the wings and tail surfaces from $\frac{1}{8}$ in. sheet and sand to section – also cutting the engines from the same sheet. Leave these parts with a square section except for the inner engine supports, which should be streamlined. The $\frac{1}{16}$ in. square strips inset into the leading edges of the engine supports are to stop the engines shearing off in a moderately hard landing; in a really heavy landing they will let go and save the wings from damage.

When all the individual parts are ready, mark out the control surfaces, cockpit cover, windows, and other lines shown on the plan with a felt tipped pen. Join the wing halves, not forgetting to put in the anhedral. When the joint is dry, re-enforce it with a $\frac{1}{2}$ inch wide strip of silk cemented to both sides. Next cement the wings to the fuselage, followed by the tailplane. Assemble the inner engines and cement them and the outer engines in place. Once dry, give the whole plane two coats of sanding sealer, sanding lightly between coats. This will waterproof the pen lines before putting on the transfers and will also help prevent warps in case you fly over wet grass. Apply the transfers and the model is finished! Didn't take long did it?

Now for the flying. Install the tow hook and balance the model to get a flat glide. The glide must be dead straight – this is very important to get a good high start launch. If the glide is not straight the model may swerve sharply while on the line and

even crash before releasing from the line. Believe me when the model is still on the line she is really travelling and a crash at that speed will probably result in a complete wipe out. For a launching line I use 24 feet of rope wound elastic cord, the kind you buy at a sewing notions counter. This is much more durable than regular rubber strip, will not get cut by the grass, and is protected from sunlight by its covering. However, if you cannot obtain this, then use $\frac{1}{8}$ in. flat rubber strip. Attached to this is 30 feet of 6 lb. breaking strain nylon fishing line; a spark plug washer makes a good tow ring. With this set-up I can launch my model 75 to 100 feet in still air. I have made no attempt to determine the optimum rubber and line length, so be my guest!

Tow hook position is quite critical; make adjustments of about $\frac{1}{4}$ inch at a time. Note the kink in the tow hook, this enables you to vary the tow hook position easily and is self locking in the fuselage. Use care in inserting it in the fuselage so that it does not stick through the side and you should have no problem with it. If the climb is too steep then move the hook forward, if not steep enough, move back.

One word of caution: Never let anyone stand in front of you when launching the model, even the tow ring itself with no model attached could do serious injury if accidentally released when the line is stretched. Safety first. Never let anyone be between you and the anchor point when the line is under tension. For a line anchor, a stout metal tent peg can be used – the right angled section type which should be hammered securely into the ground.

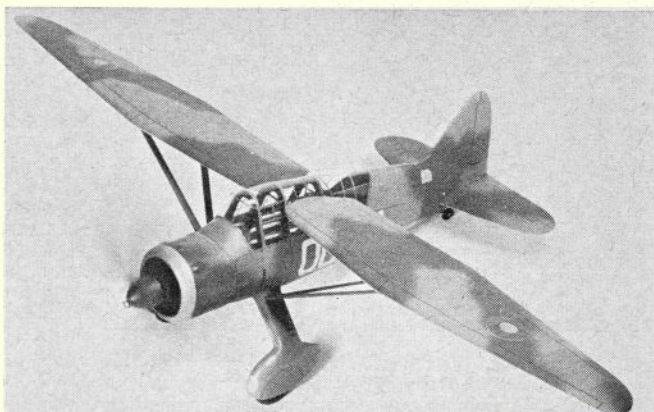


FREE PLANS!

KEELBILD

WESTLAND LYSANDER

a 19 in. span, free-flight
rubber-powered scale model



NOSTALGIA RUNS high amongst aeromodellers – particularly the scale fraternity. Make a reference to the 'old days', at any club meeting and we can guarantee that several of the more senior modellers will immediately begin to reminisce about the late '30s-early '40s, when there was a wider variety of delightful rubber-powered (many of them scale) designs available in both plans and kit form.

While, of course, some of these recalled days are seen through coloured, if not positively rose-tinted optimistic, spectacles – to a large degree these people are absolutely right! There were some superb little flyers, accurate in every detail in those days when petrol-powered models were for most people a mere pipe dream. Admittedly, only the skilful few could extract full performance, but at least they were fun – which surely is the most important aspect of all.

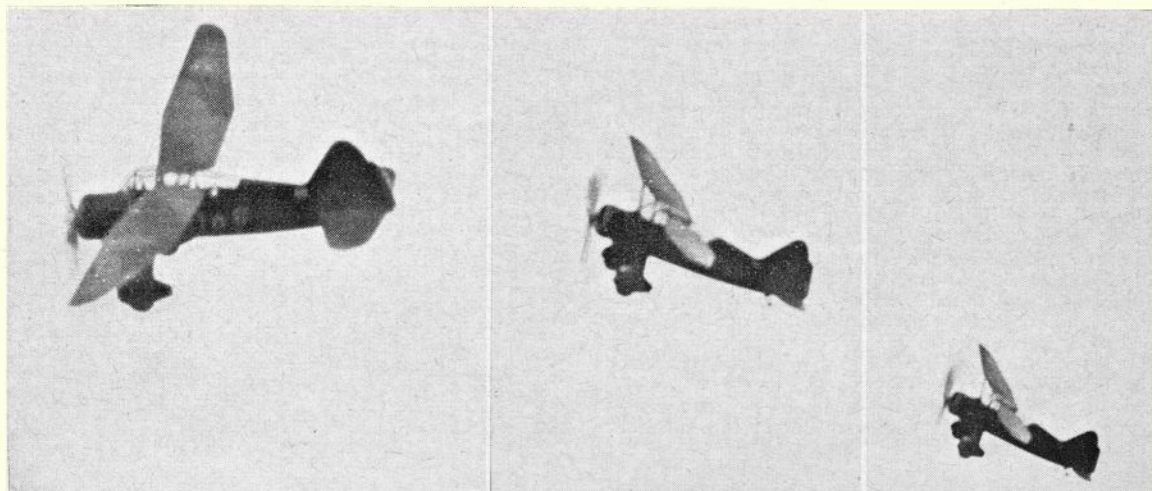
Thus it is for those who hanker after the days of more than 30 years ago, plus the growing band of 'Peanut Scale' enthusiasts and the large numbers of people too young to remember these classics, that we publish the plans of this Westland Lysander. Originally sold in kit form ('kit includes finished wheels, prop, cement, tissue, printed formers, wing, tail and fin ribs, wire, glue, elastic, block balsa, prop shaft and full-size drawings – price 4/-' read the 1940 advertisements) the Lysander was designed by the Model Shop (Newcastle) in their 'Keelbild' series. We are

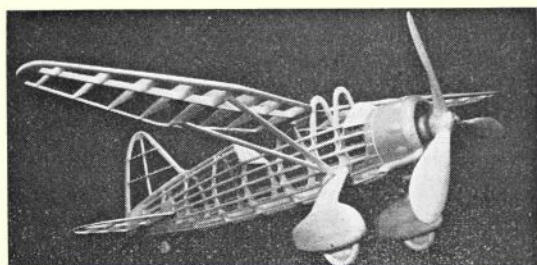
indebted to this company, and to J.N.T. Models of Easingwold, Yorkshire (who have purchased the copyright and manufacturing rights of the M.S. Keelbild products) for permission to reproduce this plan. The design is exactly as published in the original kits, except that it has been retraced to suit our paper sizes, and has been modified to include full-size drawings of the parts which were originally printed on to the balsa sheets.

It is not a model for the absolute novice as a considerable degree of delicacy and careful building is necessary to achieve a lightweight, accurate replica, but it certainly makes up into an attractive little machine in more experienced hands as Doug McHard's prototype reveals.

Start construction with the fuselage, by cutting out all the parts belonging to fuselage. Crack former F5 where shown and cement up again with the top half at the angle shown on drawing. Slot all the formers excepting F9 – it being best to slot this one for each stringer as it is required when building up the fuselage. Cement half formers 1 to 9 on to the keel in their respective positions marked seeing that they are upright and square. Repeat for the opposite side. When set, begin putting in the stringers – starting with the centre ones first and working in pairs, i.e. one on either side of fuselage to prevent warping. When you have the two centre stringers in place you can cement

Yes folks, of course it flies! Arch mini-scale enthusiast Doug McHard just could not resist building this 1/32nd scale 'Lizzie', and after initial trimming problems, discovered a beautiful little flyer. He found it necessary to add an extra $\frac{1}{4}$ in. to the rudder chord (just visible in these pictures), as well as a trim tab on the starboard wing bent up to keep the outside wing down, as the model turns left under power.





Uncovered structure reveals the basic, almost traditional way of building these little scale jobs – and also shows why the original kits were known as 'Keelbirds'! Weight is critical for these models – keep it to the absolute minimum.

in former F2A, then proceed to fit the rest of the stringers. When set, shape the tail block and cement into place. Cement in the pieces of 1/16 in. sheet to take the rear motor peg which is a piece of 1/8 in. dowel slightly tapered. Cover the fuselage with as many pieces of Jap tissue as can be conveniently applied without wrinkling, i.e. two side panels, two bottom ones and two top ones. Run banana oil all round panel to be covered and apply tissue with grain running lengthwise, stretching it tightly and smoothing out any wrinkles. When you have the whole fuselage covered, spray lightly with water and put aside to dry. Cut out the cowl pieces. The rear part is formed by cementing the pieces C2 into slots in formers C1. Cover with 1/32 in. sheet balsa, and cement the front cowl (already correct to shape) in place forming the crankcase into a nose button as described on drawing. Fit pieces 3/16 in. x 1/16 in. into slots on formers F3 and F4 on to which the wings are mounted. Cement the cockpit's celluloid enclosure into place and cement thin strips of paper to it to represent the cabin framing. Fit the fuselage with all other details as described elsewhere on drawing.

Now for the wings. Cut out the ribs and spar as shown. The two halves of the wing will have to be made in two operations as noted on drawing. Using the drawing as a jig, pin down the inner half of each spar and build up the inner part of wing complete with leading and trailing edges. When set, lift from drawing and pin down the outer part of spar and complete the wing by fitting the leading, trailing edges and tip pieces. Sand leading and trailing edges to shape and set aside for covering.

Now cut out ribs and spars for the tail and rudder, and again using drawing as a jig, build up these items leaving the ribs rectangular. Cement in the 1/16 in. sheet outline. When set, lift from drawing and stand to streamline shape as shown by dotted lines.

When covering wings, tail and rudder, start with the bottom first. Cut a piece of Jap tissue 1/8 in. larger all round, with grain of tissue running lengthwise. Apply banana oil round the frame but not on the ribs, stick down one end, then stretching tightly, stick down the other end. Smooth down the sides, avoiding all wrinkles. Trim off surplus tissue with a razor blade. Proceed similarly with the upper surfaces, then spray lightly with water and allow to dry. Thin down the remainder of banana oil and use as a dope, giving the whole model one coat.

Next, cut out the spar halves and cement together, then sand to shape. Cut out undercarriage legs, and cut to shape shown in front view on drawing. Slot the top of spats, and cement in the undercarriage legs making sure they are at the correct angle. When set, carve the legs to shape. Slit the tissue where the undercarriage leg enters fuselage; obtain this position

from the drawing of the front view. Slot the top of the legs and cement in place on former F2, setting both legs to the correct track. Make two sets of wing struts. Cement the two wing halves in place, holding them with pin stuck into the spar and also into sides of cabin, packing up the tips to the required dihedral, then leave to set. When set, fit in the wing struts, scraping away the tissue where they meet the wings. Cement the fin in position upright and square and fair off the joint with tissue. Slot the tail block and cement in the tailplane, making sure that it is horizontal. Make up the stub wings and cement into position. If model is for flying, make up the flying prop and fit with a shaft, and if only for exhibition, make up three-bladed scale prop and spinner. Fit the model with all other details described on drawing. An exhibition model should be painted in regulation R.A.F. camouflage scheme – the whole fuselage and fin and the upper surfaces of wing and tail; also the stub wings and spars should be painted in large irregular patches of brown and green. The under surfaces of wing and tail should be silver, with black lettering. The cockades on upper surfaces of wing and fuselage are surrounded by a ring of yellow, while the front part of cowl and exhaust are copper colour. Prop, wheels, tyres and other details are black. All paint used should be of the matt variety.

Hints and Tips Department . . .

Doug McHard, who made the model illustrated on these pages, makes the following comments:

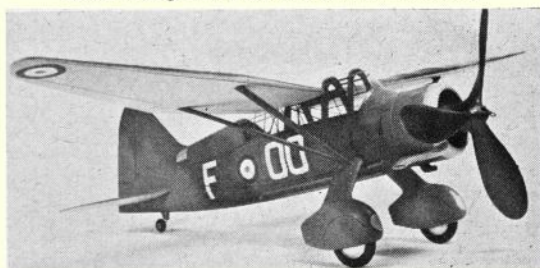
'It is most important to keep the weight of this model to a minimum. The bulky fuselage and relatively small wing area make a demanding combination.

'Use light balsa for the undercarriage and if attached rigidly to the fuselage (as drawn), use copious supplies of cement at joints. A longer-lasting landing gear will result from making a 20 s.w.g. wire 'yoke' right down each leg and across the fuselage separating the leg at the top below the wing strut attachment joint to allow it to spring outwards on landing.

'Bamboo stub spars to join the wing halves through the cabin add considerably to the airframe strength and all strut ends should be reinforced with slivers of bamboo through the joints and epoxied.

'I found it necessary to increase the rudder area by adding an extra 1/4 in. to the chord in order to produce consistent performance. A trim tab on the starboard wing (turned up) keeps the outside wing down as the model turns to the left under power. One loop (two strands) of 1/4 in. rubber powered my Lizzie satisfactorily and its all-up weight came out at 22.5 grams including a little weight in the nose. Who's for a CO₂-powered version!'

Use of an air-brush enabled Doug to achieve an incredible degree of realism at minimum weight. But for the flying prop, it could easily be mistaken as a 'plastic' job! Care taken with glazed areas will be well rewarded.



topical twists

by 'Pylonius'

illustrated by 'Sherry'



Getting the Bird

Had poor old Icarus a tube of five-minute epoxy he might have changed the whole course of aviation progress. Surely he was a bit over-optimistic in expecting the wax adhesive on his wings to last more than a few frantic flaps, but what else could he have used? Back in those primitive times you didn't even have balsa cement to fall back upon; it was either wax or concentrated cow dung.

These thoughts occurred to me on seeing the blurb for the simulated bird flight contest. It's an odd thing when you come to think of it that, although man had a working model flying machine, i.e. the bird, to copy, all his attempts at flap flight never got off the ground, though he came down to it in no uncertain manner, from bridges, buildings and other elevated launching points. If any of the hopefuls did realise his wing flapping ambitions it must have been on a ethereal cloud, but here, proof for record purposes, would be sadly lacking.

What the would-be flappists failed to realise is that theoretically the bird is a non-starter. According to all the best equations, flight with all that hefty wing loading, just isn't possible. This is why the pioneers had to learn the hard way that the only thing that could fly like a bird was a bird.

But why all the flap about flapping wings? After all, no one is thinking of propelling a boat by means of a large wagging fish tail, or copying the duck by sloshing through the water with two huge webbed paddles. It's quite bad enough getting normal wings to stay rigid, but to try to use them as huge air paddles, with all the complicated gadgetry involved, is like walking with crutches when you don't need them.

Stop Me and Fly One

A while back I was wondering what was happening to that old purist dictum, the builder of the model rule, in this age of progressive processing. Up to now that last citadel of old-style modelling, free-flight, has been fairly free of reddi-made adulteration, apart from the odd glass-fibre boom of the A/2 glider, but now the processed bits and pieces are making a concerted attack. Only the other week I saw a batch of glass-fibre Wakefield fuzzes being hawked around the contest areas, and no one is blinking an eye at the purchase of a reddi-made prop assembly or a dishy engine pan, but I was gladdened to learn that polystyrene wings are not all they are cracked up to be – crack-up being the operative term.

Model flying, like so many things these days, seems to hinge so much on the depth of your pocket, so that unless you can afford all the latest 'in' gear you are right out of things. Even in the rarified world of indoor flying you need sets of fine balances,

'They start off on radio and work up to free-flight.'

mechanical rubber strippers and hair-fine torque meters. Without such gear you are just another 'also ran'.

Little wonder, then, that the newcomer to the hobby doesn't immediately apply to his local model club; he first takes advice from his bank manager and accountant.

Flight Links

When next you switch on your transmitter you could be confronted by an irate golfer claiming that the interference from your toy plane transmitter had lost him a very expensive golf ball. You may be taken aback by such an accusation but at least it would explain why your model went into a sudden nosedive.

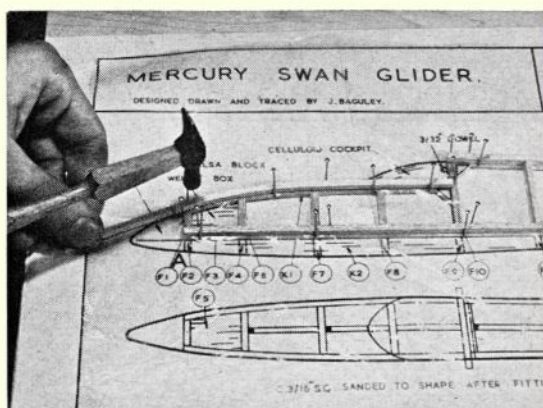
But the transmitting golf ball may not be your only worry. Thief-proof gadgets on cars and motor-bikes can also come in the form of tiny, yet powerful, transmitters; so, again, when your model does some unlooked for and disastrous manoeuvre you can draw comfort from the thought that it is doing so in the cause of public security.

Hobby Son Choice

Looking back through some old model mags., that seemed to breathe the very spacious air of those far off, unpressurised days when the only radio about was the mahogany one on the family sideboard, it occurred to me that, in one sense, the modeller of yesteryear was luckier than his modern counterpart in that he did not have such a bewildering choice of building options in front of him – not to mention the expensive, non-building ones. Unless he was wealthy enough to get gassed up with a Brown Junior petrol engine, it was a rubber-powered model – like it or lump it.

Problem here, though, was to find a suitable model to build. In spite of the fact that the Americans had for many years been model building the easy way with a new wonder substance called balsa, the conservative Englishman was still grappling manfully with spruce and oiled silk. Model development centred mainly on an increasing number of frontal gears, and between lengthy articles on skeinmanship, the short story and the club news (almost every street had its model club) there was only enough room in the model mags for a plan of an improved wire frame tailplane.

Plenty of variety there may be today, but even so the affluent teenager usually opts for multi-radio, which has come to be regarded as a symbol of masculinity. Only after he has gone through this severe initiation can he turn to a free-flight or control line model without losing face.

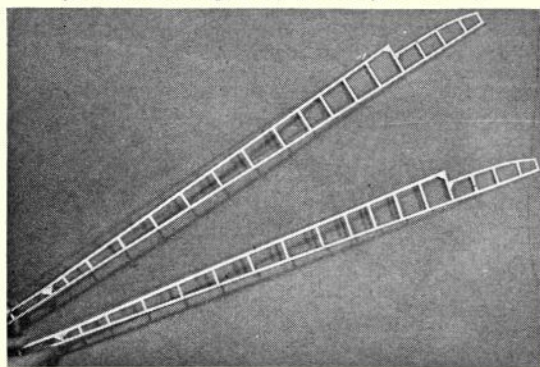


Pinning the steam-curved longeron in place. Note how this second fuselage side is being constructed on top of the first - with a layer of polythene sheeting being inserted between to prevent them from sticking together.

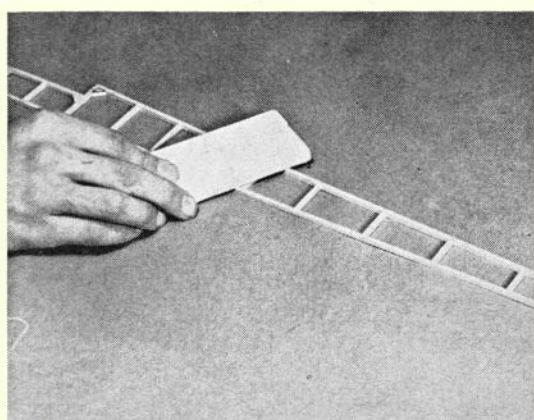
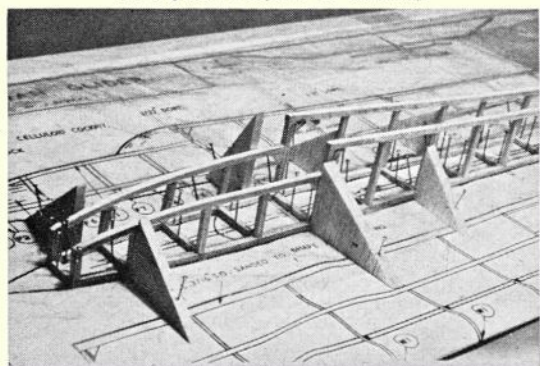
cutting surface should be used for all cuts, but do not use a hard surface such as hardboard as this will rapidly blunt your knife.

A note about glues. If you used balsa cement, apply a thin smear to each end of every one of the uprights. This is known as 'pre-cementing', and is necessary whenever gluing end grain stock because balsa cement does not penetrate the wood fibre very well, but by applying this thin coat to seal the wood fibre before making an actual joint this problem is overcome and the finished joint is strong. However, with PVA glues this is not necessary - its emulsion properties of being slow drying and thin enough to penetrate well eliminates this task. Personally, we

The two basic fuselage sides prior to joining. Note how the small triangular gussets are already in position. Check each joint after sanding, and if necessary, re-cement.



The same gussets are used when adding the second fuselage side - these really do assure accuracy. Alternatively, blocks of wood may be used, if available. Check also with an engineer's square for accuracy.

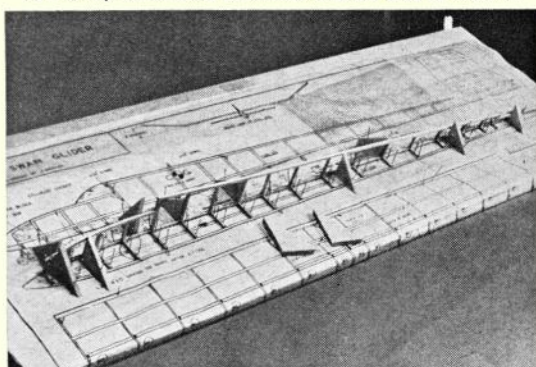


Sanding the fuselage sides flat with the aid of a sanding block. Take care here to avoid 'catching' the spacers with the edge of the block, and sand slowly to avoid straining the structure.

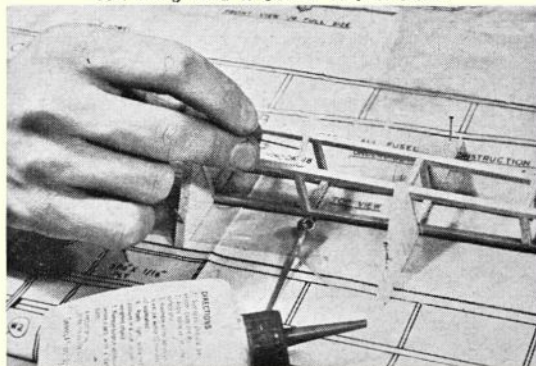
prefer to use such a glue, and used Evo Stick Resin W throughout. This is available in handy 'squeeze' packs with a long thin spout which aids application greatly. Another advantage is that this type of glue is also available in large 'economy' packs which reduces its cost considerably.

Now, from the five pre-selected strips, take two to form the lower longerons, which necessitates a spliced joint. This is best done by placing the strips side by side so that the ends overlap by approximately one inch. Taking your steel rule, slice through the strips together at the diagonal angle shown in order to present a large glueing area for a strong joint. See diagram 1. The purpose of cutting through

With the horizontal spacers pinned to the plan, add one of the fuselage sides. Note the use of right-angled gussets from scrap balsa used to ensure that the side is vertical.



Adding the top horizontal spacers - use a pin to place them in position for convenience. Note how the gusset-jigs are still being used to ensure vertical sides.



both strips together is that even if the knife cut was not vertical the two surfaces will mate exactly – essential for a strong joint.

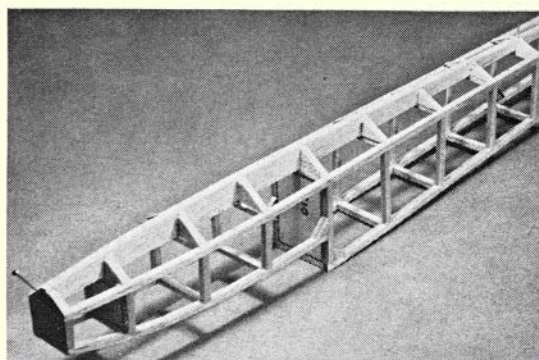
Pin one of these spliced strips over the plan to suit the lower longeron – with the splice in the position shown. When pinning this size of strip wood to the building board, do *not* pin through the wood – as this would cause it to split, but place pins either side. Use as many pins as necessary to prevent the strip from moving out of position and use a tack hammer to tap them in securely. Apply glue to the other face of the spliced joint and mate with its partner – pinning this front part of the longeron carefully in position, particularly around the spliced area in order to make a smooth, strong joint. Trim this piece of wood to length and set the excess on one side for joining to the other longeron when this is built.

The top longerons may now be pinned in position in a similar fashion tapering the one around the tail area as shown. At this stage we then made one minor deviation from the plan – this concerned part K1 – the curved nose longerons. This should be cut from the printed sheet – but this we disregarded. Why? Cut it out and see for yourself – it is very weak and easily broken due to its curved nature which means that the balsa grain does not follow its length. See diagram 2. A better solution we found was to use more $\frac{1}{8}$ in. square stock. So it won't bend to that shape without splitting? It will – after it has had the benefit of the steam treatment. Simply bring a kettle to the boil and hold the balsa in the steam from the spout until it is well and truly 'soggy' – it will then bend quite easily. Place pins around the inside line of the K1 outline on the drawing, then add this strip – leave overlength temporarily at the nose in order to make it easier to handle. Apply more pins on the outer surface until it is once more held in the correct position. A much stronger solution.

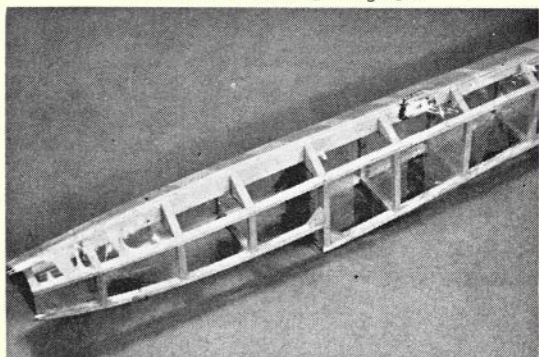
Now insert one set of all the pre-cut vertical spacers – applying just sufficient glue for the job – followed by the gussets where shown. Leave to set – allow at least half an hour for balsa cement, while if using PVC glue, wait until the glue has turned from white to clear.

When dry, remove all the pins, lift the fuselage side from the board, and remove the polythene sheeting. Lay this polythene sheet on top of the newly constructed framework, then pin it down in position over the plan again. The other fuselage side is then built directly over the first in exactly the same way, thus ensuring that they are absolutely identical. When dry, remove both assemblies from the plan, and lightly sand smooth. To do this the sanding blocks described last month should be used, or alternatively fine glass paper wrapped around a block of wood can be utilised, but do *not* merely rub down with glass paper folded over and held with the fingers. This would produce unevenness, and probably dislodge half of the newly installed spacers! In any case, 'make haste slowly', taking care not to stress the framework unduly. This done, cut out two sets of horizontal spacers (as shown on the plan view of the fuselage) and once more pre-cement the ends if required.

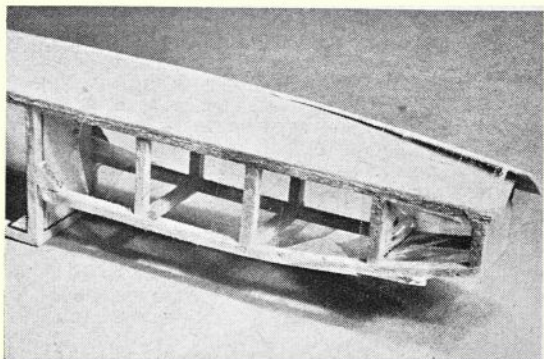
Take one set of these spacers and pin over the plan in the appropriate positions – again using pins either side of the wood. Take some scrap balsa, of either $\frac{3}{8}$ in. or $\frac{1}{2}$ in. thickness, and cut out several right angled triangular gussets, at least $1\frac{1}{2}$ in. deep – these will be used as 'jigs' in the next stage, which consists of adding one of the fuselage sides. Apply dabs of glue (PVA is preferred here due to its slower



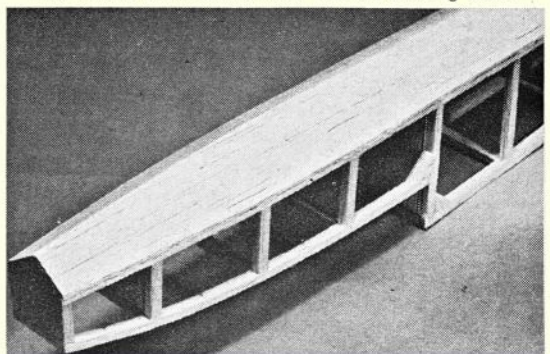
With the basic fuselage completed, add the keel and its supporting formers. Chamfer keel and longerons as described, and illustrated in figure 3.

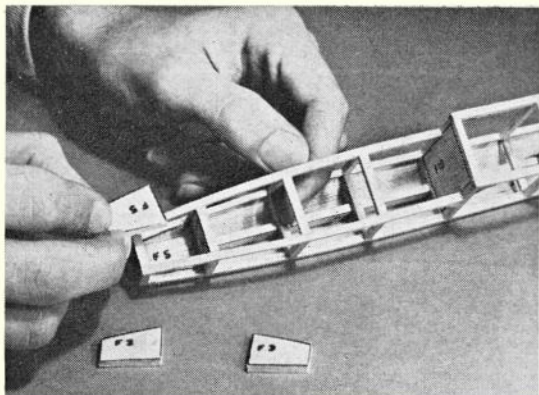


One half of the nose sheeting being glued in position – held in place temporarily with Sellotape. Leave oversize. Do not forget the towhook!



With the first piece of sheeting trimmed to size, add the remaining portion – again using Sellotape. PVA adhesive is strongly recommended for this procedure. Below is seen the final results when sanded flush with the sanding block.



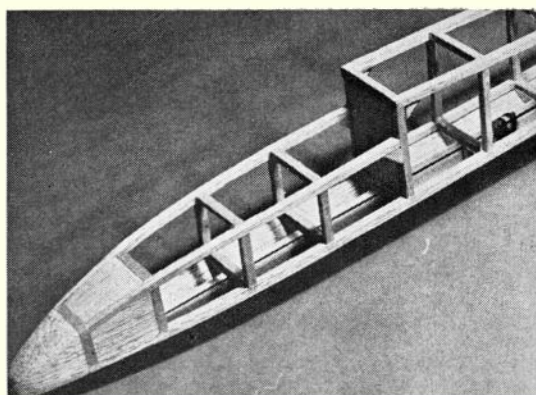


Adding the sheeted portions to the weight box. Cut the balsa to the outside dimension of the printed outline, check for fit, then sand as necessary. Allow the sheeting to protrude very slightly from the longerons.

setting time) to the lower longeron at the corresponding places and offer this framework up to spacers, pinning it in position starting at the tail end and working forwards as this is where the greatest curvature occurs. To ensure that the frame is at right-angles to the building board, pin the triangular jig pieces either side (see photo). This will ensure that we are building a truly 'square' assembly. When the glue has set, remove the jiggling pieces on the inside of the fuselage only, then add the opposite side. Again using the jigs add formers F1, F6 and F10 followed by the top horizontal braces – leave the jigs in position during this process. You should now have a truly square, accurate basic fuselage structure.

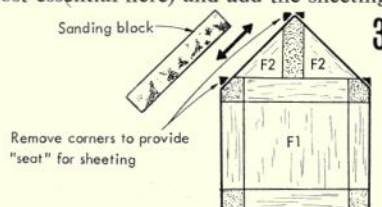
Remove from the board, and sand the top and bottom surfaces smooth in the same manner as before. The keel (part K2) must now be cut out and glued in position, followed by formers F2, F4, F7, F8, F9 and F11-15. These are all cut from the die-printed sheet supplied. Unfortunately, the printing is rather poor, with very thick lines being shown – but cut to the inside edge of these lines and you will be O.K. This keel portion is to be sheeted in, but the instructions are perhaps not too clear as to how this is best done. Our solution was as follows.

Using the sanding block once more, sand the lower longerons and keel to a chamfer, as shown in diagram 3. The degree of chamfer varies from F1 to F11 due to the compound curve – but the purpose is just to form a slight 'flat' to act as a gluing surface. This done, bind the towhook to shape and bind to the keel with thread in the position shown. Note that it is fixed to the *right-hand* side of the keel. Now take the $\frac{3}{32}$ in. sheet supplied and hold in position over



The nose section completed shows the nose block carved and sanded to shape, and the weight box sheeting sanded flush with the longerons. Finish off the fuselage by adding the tail-retaining dowel.

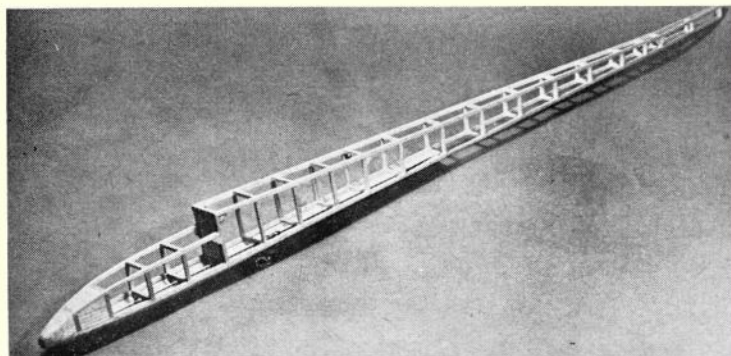
one side of the keel, noting how it may be bent to the correct curvature quite easily, and mark the lower edge of the longeron roughly in pencil. Trim off to this line, allowing a slight excess. Now apply glue to the longeron, the keel and the formers (PVA is almost essential here) and add the sheeting, holding



in place with Sellotape, and a few pins. When dry, roughly trim off level with the lower longeron, using a knife, then sand it flush. With a steel rule, trim off the remaining excess sheet by lightly cutting through it along the centre line of the keel. Using the sanding block once more on the open side, chamfer the sheet to conform to the chamfer on the keel. Add the remaining sheeting, again using Sellotape to hold it in position. Finally trim off with the knife and glass paper and a neat job will result. Sounds more difficult than it is too!

All that remains to complete the fuselage now is to add the nose sheeting (K4&5), the noseblock – which should be carved and sanded to shape after gluing in position, and to add the rear tail-retaining dowel. Contrary to the instructions, do not add the wing retaining dowels yet!

Next month: Wing Construction.



The finished product! With all the fuselage construction now completed, rub down lightly with very fine glass paper, then set aside while the flying surfaces are built – details next month!



John O'Donnell's **FREE- FLIGHT COMMENT**

Winner of the rubber event at St. Albans Gala at Bassingbourn was country member Mike Gage, with a refreshingly simple design!

SUCCESS IN CONTESTS is very largely a matter of individual ability, enthusiasm and effort. In contrast, the success of a contest is usually due to the combined labours of several people – plus a number of extraneous factors such as the venue and weather conditions. As anyone with experience in this field soon realises, there is no sure-fire method of 'pleasing all the people all the time'. Tastes change with time, so merely presenting 'the mixture as before' is no guarantee of continued popularity.

It might well be thought that I am only interested in the contestants' viewpoint. To dispel this notion I would mention that I have had many years 'behind the scenes' as both an Area and club official – so I know both sides of the picture. Whilst a dissertation on contest organisation is out of place, a few basic principles should be obvious enough. Modellers have to be attracted to the meeting and then satisfied with what they find in the way of facilities and arrangements while prizes should be in keeping with the status of the event. In short, it should be clear that the whole venture matters to the organisers as well as to the participants.

With these underlying requirements in mind, the situation existing on 15th October was bound to produce disappointments. There were no less than four free-flight meetings announced for this date! As a sizeable percentage of the expected entry at any major meeting comes from those enthusiasts willing and able to travel up and down the country, the multiple date clash inevitably 'split' the entry and cut attendances all round.

The South Bristol M.A.C.'s Silver Jubilee Gala, featured in a photo report last month, was, in fact, moved back a week from the originally scheduled date of 8th October. The change solved the host club's airfield problem – but caused conflict with the already publicised Southampton Gala at Beaulieu. From the report sent to me by Phil Ireland, the Southampton club were not only disappointed with the poor attendance at their rally – but also more than a little annoyed as to its cause. Those who did arrive found that the events carried quite substantial guaranteed prizes. Some £15 had been donated by club members, whilst an assortment of modelling goods had been given by R. G. Lewis (Southampton) Ltd.

The weather at Beaulieu was sunny all day – but was windy enough to cause some glider towing problems – and even wing breakages. Thermals were strong, and several models spun out of the lift. Unusual was the combining of open rubber and power into a single event. This was won by Alan Jack with the only treble of the day – although at the price of losing one rubber model when it failed to descend on D/T. His presence at this and other Southern meetings is one of the 'perks' of having commenced a post-graduate course at Southampton University. Runner-up (and soundly beating her husband in the process) was Kath Allen – also flying rubber. In contrast, third place went to one of Fred Chilton's power models.

Open Glider surprisingly had less entrants than the combined event just described. Pete Stewart took first with only 6:42 whilst Clifford James and Dave Glue were not very far behind. Results might have been rather different if Dave had not lost his model on its second max. In comparison the A/1 event had a remarkably high winning score of 9:36 out of a possible 10 minutes – achieved by Dave

Alan Jack is another believer in the 'D.P.R.' (delayed-prop release) Wakefield – seen here launching at the Bassingbourn meet. Lots of 'heave' necessary to gain advantage from this system – note how prop is still well furled back. Hope he set the D/T fuse!

Hewitt of Portsmouth. Heartbreaking was the complete lack of any entries whatsoever for the scheduled ½A power and Coupe d'Hiver events.

Meanwhile many people had arrived at R.A.F. Weathersfield for the '3rd Round of the London Area Gala' – only to find that the permission to use the 'drome had been withdrawn at very short notice. In fact, the meeting had never been planned at all – it was an unfortunate printing error in the Contest Calendar, combining details of a previously cancelled meeting with a control-line event – and people turned up to fly in consequence. (On realising the error, some 80 clubs were circulated with the correct information. – Ed.)

The local Stansted club were amongst the first to discover the situation at Weathersfield – and decided to offer the use of their farmland flying ground at nearby Henham and to run an impromptu contest. A moderate breeze necessitated the use of a two-minute max, and a five-flight all-in event was run. Conditions improved in the afternoon and three competitors max'd out. In the fly-off, Laurie Burrows managed a fraction under four minutes with his F.A.I. Power Model, despite a decidedly off-tune Rossi. Close behind was Trevor Grey with his consistent O.S. 19 Open model – whilst third place went to Stansted member Neil Cox with a quite respectable A/2 score. I have Julian Hopper to thank for





Far left, John Carter's monstrous 500 sq. in. wing area rubber model had a most successful debut last year, despite its late appearance. Here he is seen launching to win the fly-off at the Northern Gala. The timekeepers friend! Left, Trevor Grey who has been performing well recently with his O.S. 19 powered model based on the Dixie-lander. Placed well at Woodford, Lindholme and Cranfield.

this report of the 'comp that never was'.

Apart from illustrating 'the power of the press' this affair would seem to show that all concerned should check their publicity material. Information presented is sometimes different to that intended! There is a case for running what is printed rather than what was planned – especially as regards detail. As a very recent example, I would recall the fuss at Cranfield when the prospective Coupe d'Hiver fliers found the advertised event was not being held!

On the crowded weekend under discussion, I went to the fourth (and nearest) contest – the perennial **Northern Area F.A.I. Meeting**. Held at Topcliffe, this meeting was fortunate in having kinder weather than the more southerly events, and although it was generally overcast and initially murky, the wind remained light all day in Yorkshire. It did change direction to an extent that necessitated the re-siting of the contest control.

There was plenty of lift, although it was usually very weak and frequently difficult to detect. Out of the two 'thermal' events, no one managed a perfect seven-max score. Nearest was Brian Baines who totalled 20:47 to win A/2 – mainly through very patient tactical flying. In comparison, runner-up Jack Kay flew early and quickly to clear 20 minutes. Third was Dave Barnes with a new model featuring very long tapered wing tip panels and a Russian-style towhook system to permit a circling tow, and catapult release. This is the first English version seen of what was the only real advance in glider at the last World Championships.

Wakefield soon became a flight between Ron Pollard and myself. Ron flew very well indeed with the same model that just missed putting him in the Wakefield Team. It fits the modern formula of tubular fuselage, Schwartzbach prop, timer-operated V.I.T. and A/R – but has fully elliptical wing tips instead of the more fashionable squared-off alternatives. Winning total was 20:18 with three flights just a little under three minutes.

My model flew better than I did – as two flights were in very poor air. Even so, it totalled just under 19 minutes for an easy second place. I flew the delayed-prop-release model that caused so much comment when it first appeared at the Trials – and which embarrassed me with the wing failure shown in last month's heading photograph (despite the caption saying it was the C.d'H!). The extensive repairs worked out well as the model needed very little in the way of re-trimming. Third place was announced as Dev Morley – but some post-contest arithmetic revealed that it should have been Joe Barnes. Both had scores of just over 18 minutes. Joe was flying a box-fuselage design, not the compressed paper motor tube version with which he won at Cranfield.

F.A.I. Power had but seven entries – and a very high standard as might be expected in the conditions. Birmingham members Ray Monks and Roger Baggott both recorded a steady string of maxes and qualified to fly-off against each other. Meanwhile, Brian Martin suffered a premature D 1 to drop a minute and miss both the fly-off and third place. Alan Cooper filled the third spot with 20:34 total. The Power fly-off was run to the reducing motor run scheme. The first fly-off using eight seconds gave neither flier any trouble – but the subsequent one off six seconds proved quite decisive. Roger's model is several seasons old and is G15

John Sayer of Darlington was unlucky at the York meeting. Needing a flight of just 40 seconds to take first place, he repaired most of the severely damaged tip on his 'Graduate', but several pieces were still missing, as evident in this picture. He ran out of time in his bid to record an 'official' fifth flight.

powered, and although it glides well, the climb is inferior to more modern designs with thin flat-bottomed airfoils. Ray's model follows such trends and looked very much higher on the decisive ninth flight. Altitude difference was reflected in scores of 3:00 and 2:06 – it looks pretty certain that a high rate of climb is going to be a prerequisite for success under short fly-off (or contest) motor runs.

There was another very unofficial fly-off. Ron Pollard and I, having argued Schwartzbach versus helical (or even washed-in) propeller designs for years, decided to try out our beliefs. We wound together, and arranged to launch simultaneously and close together. The comparative climbs were watched with considerable interest. One such test is hardly conclusive – but Ron said he 'wasn't going to play that game again!' Certainly, my new and radical model is very competitive with its helical flat-bottomed prop. Perhaps the secret of Schwartzbach's prop lies elsewhere than in the pitch distribution! Other evidence that pitch variations away from helical are unlikely to give sensational performance changes can be found in the latest (1972) N.F.F.S. Symposium report!

With good weather and scores, plenty of flying (only one entrant in A/2 failed to complete his full complement of flying), and trade support for prizes the F.A.I. meeting could justifiably be claimed as successful in all but one respect. It no longer attracts long-distance participation from the 'Sunny South'.

Right from the beginning the York M.A.S. made it clear that they intended their annual rally to become and remain a major contest. They do not participate, so administrators and timekeepers are available – the latter feature is all but unheard of elsewhere! Events have been chosen on the basis of popularity – and keen competition encouraged by guaranteed prizes, including a very substantial £10 for the A/2 event.

Despite all these excellent ideas, this year's event was not well supported. The 'reasons why' must be of concern to the host club – but the weather was very windy and thus must be contributory. Perhaps there has simply been too much else happening this autumn – and people have 'had enough'.

Even the 'big money' event failed to produce any outstanding performances. Admittedly, conditions were difficult and off-putting. When the contest opened, it was not particularly windy, but it was overcast and lifeless with a threat of rain – then the wind dropped a little and everyone





waited for the improvement to continue. However, the wind suddenly freshened, and the rest of the day was 'draughty' enough to trouble many models on tow. I had a busy day flying two events – both to five flights. Fortunately, three flights in Coupe d'Hiver proved sufficient to beat George Jennings – this was as well since my model had D/T'd on to a hangar and blown off into the trees alongside. Damage was repairable, but not on that day!

My efforts also paid off in A/2 to the tune of first place with a very modest total of just under 10 minutes for five flights. I used but one model throughout – the same old 1964 glider that must be familiar to any regular contestant. John Sayer of Darlington was unfortunate to severely damage one wing tip of his *Graduate* on landing at the end of his fourth flight. It was very near the end of the contest and only the urgings of clubmate John Turner made him attempt a repair. The tip panel 'pinned' back satisfactorily, but various bits on the actual tip and associated trailing edge were missing. With no time to 'bridge the gaps' and only needing 40 seconds to beat me, an official flight was attempted. The model veered off on tow and was released low down for a short but stable glide. It was under the 20-second 'non-scoring attempt' but there was no time left to repeat it! Third place went to Dave Barnes with his silk-surfaced *Accipiter*.

Open power saw another brave try with a hastily repaired model but with rather more success. In fact it put Keith Harrison into first place, comfortably in front of Russell Peers who had pattern problems with one of his ETA 29 *Woodpeckers* and finished with a O.S. 40 version. Brian Picken started well but spoilt his third flight to finish a minute behind Russell.

Even open rubber failed to produce a perfect score, although John Turner only missed out through disappearing OOS at two minutes on one flight. This dropped him to third place behind winner Ron Pollard and runner-up Lou Roberts. The latter had his troubles in the form of a loose motor peg that let the rubber slide forward to give a very short flight.

Chuck Glider was very closely fought between a handful of specialists. When all was totalled up, Barry Kershaw was the winner with a scant single-second lead over Ewan Jones. Incidentally, the runner-up is left-handed and is the first such person I can remember with a really good throw! Mike McAskie was third with one of his radical designs as mentioned last month.

One week later there was another clash of dates – but this time intentionally. The Northern Area ran a couple of 'local' contests on 29th October to cater for those unable or unwilling to travel to Odiham for the Southern Gala. I went to Topcliffe for a variety of reasons (including that of being unable to raise a co-driver). In the absence of any official results or a first-hand report, I am unable to comment fittingly on the S.M.A.E. contests at Odiham.

The Northern Area ran a repeat of its 'experimental' events as already tried out last year. For rubber, three flights are required in very short rounds (15 minutes), spaced well apart to allow for retrieving. The max employed is decided just before the round on the basis of wind strength, visibility, etc. Conditions were distinctly unpleasant, being very similar to the York rally, i.e. windy and overcast, but with marginal visibility as well.

Rubber maxes were set at 3, 3 and 2½ minutes and only Ron Pollard achieved a perfect score – and that at the ex-

John O'Donnell's delayed prop-release *Wake*, which he flew at the Northern Area F.A.I. meeting. In fact this was the model illustrated last month when it was wrongly captioned as a Coupe d'Hiver. Hmmm . . . thought he was stretching the motor size rule a little there!

Dave Digby won the open glider event at Cranfield with his straightforward looking design – could almost be said to be unconventional in that it does not employ a glass-fibre rod fuselage.

pense of losing his windy weather 'bitsa' on the final flight when search was curtailed by failing light. Ken Proctor and I were second and third with very similar score sheets – two flights of 2:20-odd surrounding a max! Unlucky were John Turner, who spiralled in with a displaced tail unit (after a double max), and John Godden who lost his model on its initial flight.

Glider was run to the Abbott/Whitehead 'non-tactical' rules. In essence, these involve flying from a line, having only seven minutes to launch (i.e. wait and/or tow) and an enforced wait between one glider being released and the next being allowed to start. The last mentioned feature is specifically intended to prevent 'piggybacking' – as our American friends call it!

In the prevailing conditions the weather made 'tactics' impossible in any case. Few entrants waited anything like the allotted seven minutes – maybe it was too cold! There proved to be a surprising amount of lift present and the 2½-minute max used was just about right. As an aside, both the max and the number of flights were determined after contestants' views had been obtained.

Some very consistent flying saw Brian Picken emerge as the winner with just a few seconds short of four maxes. This model was the distinctively-shaped design shown in the 'Woodford' feature a few issues ago. Runner-up was John Turner with a wooden-fuselaged A/1 managing three maxes after a poor first flight. I made one bad mistake to do under a minute – but 3 maxes pulled me up into third position. Apart from John Sayer, fourth on only three flights, no one else appeared to have mastered the conditions, and remaining scores were very low.

What was remarkable was that this admittedly minor event attracted more entries and more fliers than the (A/2) event the week before at Elvington. I've no explanation for this phenomenon, especially as the weather was very similar at both meetings – as I said in my introduction, there is no formula for success.

RESULTS

SOUTHAMPTON GALA – Beaulieu, 15th October, 1972

Open Rubber/Power (9 entries): 1. A. Jack (Tynemouth) 9:00; 2. Mrs. K. Allen (Brighton) 7:48; 3. F. Chilton (Crookham) 7:32. **Open Glider** (8 entries): 1. P. Stewart (Crookham) 6:42; 2. C. James (Hayes) 6:04; 3. D. Glue (Brighton) 6:00. **A/1 Glider** (2 entries): 1. D. Hewitt (Portsmouth) 9:36. **½A Power**: No entries.

Coupe d'Hiver: No entries.

3rd Round LONDON AREA GALA – Henham, 15th October, 1972

All-in R/G/P: 1. L. Burrows (Blackheath) M+3:59; 2. T. Grey (C/M) M+3:35; 3. N. Cox (Stanstead) M+2:16.

NORTHERN AREA F.A.I. MEETING – Topcliffe, 15th October, 1972

F.A.I. Glider (26 scores): 1. B. Baines (R.A.F.M.A.A.) 20:47; 2. J. Kay (Leeds) 20:08; 3. D. Barnes (Liverpool) 19:22. **F.A.I. Rubber** (14 scores): 1. R. Pollard (Tynemouth) 20:18; 2. J. O'Donnell (Whitefield) 18:53; 3. J. Barnes (Liverpool) 18:13. **F.A.I. Power** (7 scores): 1. R. Monks (Birmingham) M+3:00+3:00; 2. R. Baggott (Birmingham) M+3:00+2:06; 3. A. Cooper (Leeds) 20:34.

YORK RALLY – Elvington, 22nd October, 1972

A/2 Glider (5 flights): 1. J. O'Donnell (Whitefield) 9:57; 2. J. Sayer (Darlington) 9:20; 3. D. Barnes (Liverpool) 9:08. **Open Rubber**:

1. R. Pollard (Tynemouth) 8:53; 2. L. Roberts (C/M) 8:29; 3. J. Turner (Darlington) 8:04. **Open Power**: 1. K. Harrison (Darlington) 8:29; 2. R. Peers (Falcons) 8:11; 3. B. Picken (West Lancs.) 7:19.

Coupe d'Hiver (5 flights): 1. J. O'Donnell (Whitefield) 5:03; 2. G. Jennings (Leeds) 3:38. **Chuck Glider** (5 from 9): 1. B. Kershaw (Wigan) 4:37; 2. E. B. Jones (Sunderland) 4:36; 3. M. McAskie (C/M) 4:23.

NORTHERN AREA EXPERIMENTAL CONTESTS – Topcliffe, 29th October, 1972

Open Rubber (9 entries): 1. R. Pollard (Tynemouth) 8:30; 2. K. Proctor (York) 7:55; 3. J. O'Donnell (Whitefield) 7:48. **Open Glider** – Non-Tactical (23 entries): 1. B. Picken (West Lancs.) 9:51; 2. J. Turner (Darlington) 8:55; 3. J. O'Donnell (Whitefield) 8:29. **Best Junior**: N. W. Duncan (West Lancs.) 1:50.

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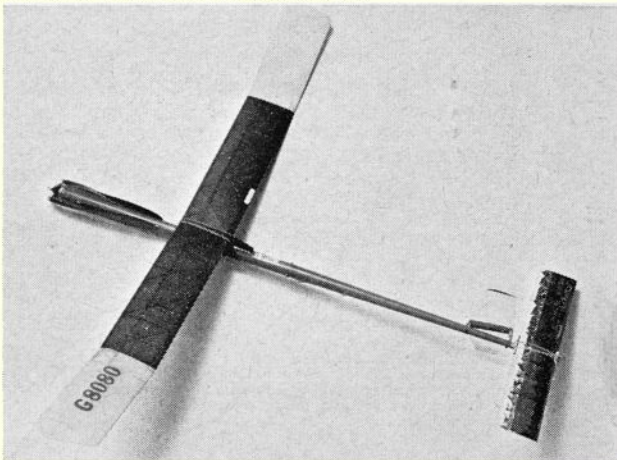
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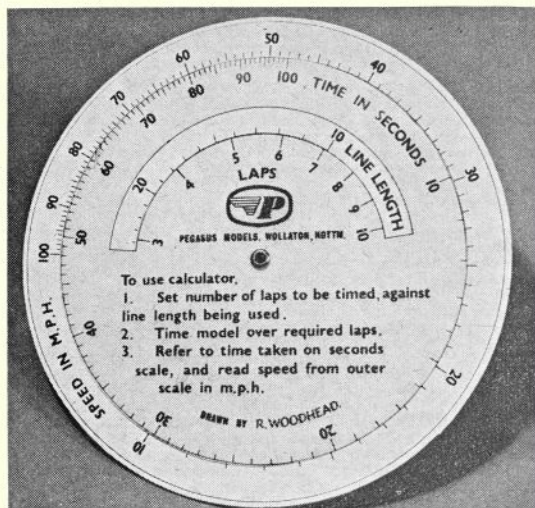
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PEGASUS MODELS (of 171 Bramcote Lane, Wollaton, Nottingham NG8 2Q5) are perhaps best known for their very successful *Warlord* control line combat model kit, and this go-ahead concern has now introduced a second model to supplement this design. Known as the *Minilord* it is, not surprisingly, a scaled-down version of the *Warlord*, being intended for 1.5 c.c. engines, thus making it ideally suited for $\frac{1}{4}$ A combat as well as sport flying. It is strong, highly manoeuvrable and seems well able to withstand a tremendous amount of punishment when covered in nylon. The kit is complete, even down to the thread necessary to stitch the elevators, and includes a set of fuel tank parts. Retailing at £1.75 it must be considered extremely good value, and will be the subject of a Kit Review in the near future.

Incidentally, the *Warlord* kit has been somewhat improved in that the ribs are now die-cut (by Solarbo), blind nuts are supplied for mounting the engine, instructions are supplied in three languages (English, German and French) and transfers are also included – price remains at £2.80. Even better value now!

Apart from their kitting interests, Pegasus Models have also produced some useful accessories. In particular we liked their handy 'Speed Calculator' for control-line enthusiasts. This comprises of two plastic discs which enable the speed of the model to be instantly read from the clearly-marked graduations after the 'line length' and 'number of laps' scales have been set. Time the model and there's the answer! Saves considerable pencil work on the back of envelopes – and being made of plastic the device is impervious to the inevitable oily fingers gained at the flying circle. Slips into the back pocket easily without damage too. The scale is commendably large – even from 90-100 m.p.h. the one-mile-per-hour graduations are nearly $\frac{1}{16}$ in. apart. Price of this gadget is just 48p – worth it to stop some of those exaggerated performance claims heard at the flying site!

Decorative trim tapes are also available from this company – in a wide variety of forms and colours. These are all printed on self-adhesive vinyl – thus unlike transfers, one simply presses them in position,

Just some of the range of self-adhesive backed vinyl tapes which Pegasus Models produce – certainly a quick and easy way of decorating your latest machine, or even for giving a face-lift to a model now past its prime.

The speed calculator from Pegasus Models measures some four inches in diameter, and it is thus particularly easy to read the results from the large scales provided.

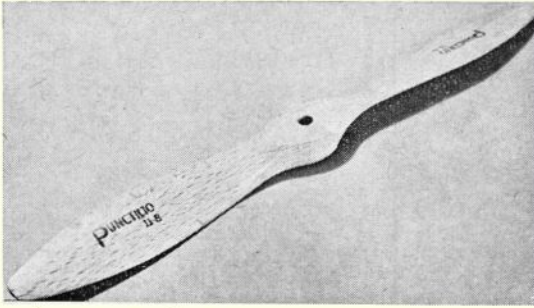
TRADE NOTES

and if necessary, fuel proofs the edges. Strips of 'flashes' are available in six colours (green, orange, blue, pink, white and red) at 9p each, while sheets of stars and stripes come in the same colours at 16p each. One-inch wide chequered tape in rolls 18 in. long of the same basic colours (with white) cost 9p each. Rolls of 'solid' colour, sized 2 in. x 1 metre cost 18p, being available in black, red, green and yellow (18p), and are useful for cutting out your designs or letters – while for the same price you can have 26 in. x 2 in. strips of white or chrome. Free-flight enthusiasts will be glad to see (literally!) the 'Dayglow' strips (2 in. x 30 in. for 21p) which comes in red, orange and yellow – ideal for catching the attention of the time-keepers as well as aiding recovery. The 'chrome' sheet, sized 4 in. x 14 in. would provide the same service at a cost of 24p.

Scale fans are not forgotten either – the sheet of self-adhesive-backed aluminium foil retailing at 45p for a piece sized 7 in. x 20 in. is ideal for reproducing those awkward panel and cowlings pieces – much more realistic than silver paint – and just the job for a basis when an 'engine turned' cowl is needed. This is not vinyl, but actual aluminium, albeit rather thin. We found that when placed on the wing of a plastic scale model and 'boned' down it reproduced the rivet lines quite well – but don't expect it to negotiate compound curves.

Good news for free-flighters now! Tatone timers have been virtually unobtainable for some time, but **Henry J. Nicholls and Son** (308 Holloway Road, London, N.W.7 and 8 Southgate Road, Potters Bar, Herts.) sent us the sample photographed and inform us that they are now available once more, in slightly revised, updated form. Two versions are available, the Dethermaliser variety plus the Tick-off engine stoppers. Both priced at £2.65, they provide good insurance in helping prevent loss of that model – even more important with the price of modern high





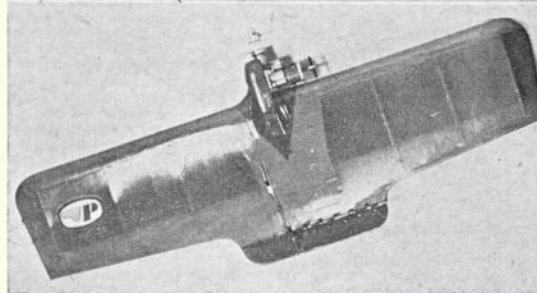
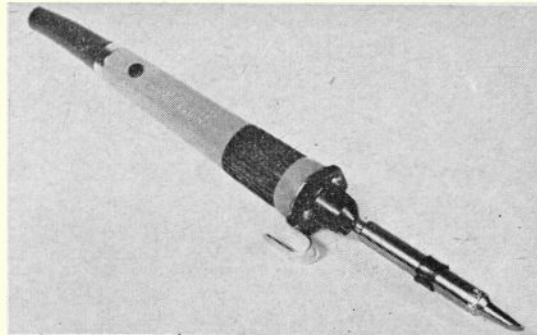
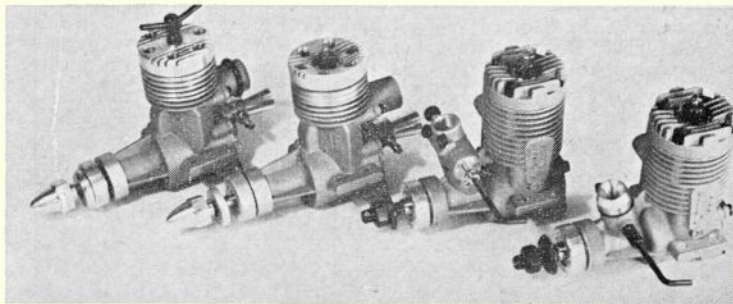
performance engines.

One piece of equipment which nearly every modeler needs during the course of constructing his latest 'defier of gravity' is a soldering iron, and the latest such item from the **Antex Company** is a good choice for medium duty work. This is the Antex X 25 - which incorporates the virtues of a specially constructed element totally enclosed in ceramic and with a stainless steel shaft, which rapidly produces the correct working temperature. The bit is 'long life iron-coated' and may be readily changed - a $\frac{1}{4}$ in. diameter tip is supplied as standard, but $\frac{3}{32}$ in. and $\frac{3}{16}$ in. tips are also available. A nice, lightweight job, ideal for electrical or general purpose soldering duties, though being rated at 25 watts is not big enough for tank construction, etc., when a 65-watt iron at least is required. Priced at £1.75 it represents excellent value for money - and should spare parts be required, these are readily available from stock. See your local hardware store, or obtain direct from **Antex Ltd.**, of Mayflower House, Plymouth, Devon.

There has been a dearth of the once-popular 'unconventional' models recently. Why? Perhaps the answer lies partly with the availability of suitable props, as many of these designs used pusher-engine layouts, and with the current absence of such propellers, this has made life decidedly awkward for the experimenter. However, **Punctilio Props** to the rescue! Their 11 in. x 8 in. pusher prop is already established, and is now joined by a 7 in. x 4 in. partner - just the job for these .8-1 c.c. engines. Distributed by Keil Kraft Ltd., they should be in the model shops now - so there is no excuse left not to start building!

Ron Irvine (of **Irvine Engines**, 31 The Fairway, New Barnet, Herts) has added yet another string to his bow with the adoption of the Kosmic agency. In future he will be the sole British importer of these finely-made Italian products which comprise of the rear exhaust K-15 diesel and glow engines plus both the standard throttle-equipped versions of the K-23 glow motor. Kosmic will shortly be producing their own silencers, but until they do so, Irvine Engines will supply their own units to suit.

The current range of air-cooled Kosmic engines imported from Italy by Irvine Engines - water-cooled version plus a special geared mount for marine are also available. Neat diecastings and high quality seem trademarks of this range of motors.



Above left. Noticed the difference? Yes, it's not quite normal - in fact, it's a pusher prop from Punctilio. At present, just two sizes are available, but the range will probably be extended shortly. Above right, the Antex X25 soldering iron - a nicely designed, lightweight unit. Below, this is the 'Minilord' - a scaled-down version of the 'Warlord', from the Pegasus stable, and designed for 1.5 c.c. engines. Good flyer, and strong, too.

Below, the Tatone 'Tick Off' engine stopper, now available once more from H. J. Nicholls and Son, together with its Dethermaliser twin.





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

THE LETTERS printed in January's *Aeromodeller* concerning the 'Junior' problem were most interesting, and I would like to take this opportunity to comment on the letters and to make some proposals based upon them.

Although numerous points were raised, the main themes in the letters were:

- What is the least expensive way to start aeromodelling?
- The shortcomings of clubs.
- Finding out basic information about aeromodelling.
- What type of contests are required?
- What should be done to attract Juniors?

Let's take these one by one:

a) *What is the least expensive way to start aeromodelling?* Before answering this it is necessary to agree what the question means. It is assumed that the real question should be: 'How can a junior make a first model with reasonable assurance that it will fly satisfactorily?' If the first attempt is successful, the junior has confidence to continue and adopt aeromodelling as a hobby - if it isn't, then he is almost sure to give up without trying further.

Well, there is no doubt that there is only one branch of the hobby which an absolute beginner can attempt, with help only from books, and to have a pretty good chance of ending up with a model that he can fly. That branch is rubber-driven free-flight from a kit - closely followed by free-flight glider from a kit. (Glider requires towing to launch, and this requires a helper and a bit of a knack).

From the letters, it is appreciated that many people wish to start with control-line models - and many are successful. But, control-line means buying and operating an engine as well as a model - two new obstacles for the beginner on his first step, and the chances of success are certainly less than with rubber and glider. In addition, the first few control-line flights, whatever your age, are not easy; rather like riding a bike - once you have done it successfully you wonder what the difficulty was and you never forget how to do it again. But that first successful flight can be very elusive if you haven't got a friend who can show you how, and prove to you that the model will fly before you have a go. Getting your

dad to help will be worse than useless, unless he has flown control-line before! The natural instinct of all beginners at all ages is to haul back on the handle with an inevitable climb, slack lines, dive and crash. Look at young J. A. Woodcock's letter for proof of this.

Learning how to start an engine is also something which is a lot easier if you have a friend who has started one before. Books help a great deal, but they cannot teach you the 'feel' of an engine just nicely ready for starting. All modern engines will start within one minute in the hands of someone who has had an engine before - so there's no reason why a beginner can't start it just as easily - with a little bit of help.

The object of all this is not to put you off engines or control-line - far from it. The idea is simply to get you into whatever branch of the hobby you want, in the cheapest way and with the greatest chance of success. If you are a 'loner', don't expect instant success with engines and control-line - if you have a friend who does know a little about them, then great - go to it. Finding people who know naturally leads to clubs.

b) *The shortcomings of Clubs*

There is no doubt that the criticisms made of clubs in the letters are generally justified - but it is worthwhile juniors examining why this is so. Clubs do not just happen, they need to be organised, which requires at least one person willing to give up a great deal of his personal liberty for service to others. Even among aeromodellers it is doubtful whether one person in 20 is able or prepared to do this. Clubs tend to get started by mutual agreement of a group of people who find that they continually meet each other at the same flying field. The club grows to include nearly all those who use that field and then stops. Very few clubs actively seek members - why? Simply because it takes even more writing and time to do so, on top of running the club. If someone comes to the club, then they welcome him with open arms, usually, and he gets all the help and advice he can use - but the club won't come to you. Another question asked was why aren't there more clubs? The answer is that there are too few people willing to run them, and also

that club membership implies giving from its members as well as taking. Lone wolves tend to stay away. If you want more clubs, why not start one yourself among your friends or at school. John Bridge is here to help with advice if you want it.

The letters also raised the matter of information about clubs and one of the things worth trying is to get clubs to advertise locally - this matter will be raised in the right places.

Finally, one aspect of some clubs is disappointing and is without doubt harmful to aeromodelling in the long term. This is the club which is so interested in one particular branch of the hobby that it will, in fact, turn away people requiring help in other branches. Almost as bad, is the club that is exclusively contest minded. However, these are facts of life and cannot easily be changed, and fortunately these clubs are in a very small minority, it being rare that a beginner cannot get help if he asks for it.

If you want to know your nearest club, then write to me (John Bridge) or to the Society of Model Aeronautical Engineer's (S.M.A.E.) Public Relations Officer, 41 Carrs Way, Harpole, Northants, enclosing a stamped addressed envelope for reply.

Clubs are the very backbone of aeromodelling and ensure healthy progress and development of the hobby. They often have some contest interest which helps to bring modellers together, and all this prompts a demand for the trade to fill and ensures that you can buy a kit or a bit of balsa from a model shop. Clubs do have shortcomings, as we have seen above, but they have far more advantages to us all. Every aeromodeller ought to join a club, it is one of the few easy ways to give something to the hobby instead of just taking your enjoyment from it. If even a quarter of the aeromodellers in Great Britain joined clubs, the hobby would get a fantastic spur forward and be able to gain better facilities throughout the country.

c) *Finding basic information about aeromodelling.* The comments in the letters about this matter are largely justified but once again the writers are tending to expect the information to come to them rather than to go out and seek it! Join a club, go to a contest and ask questions (not while he's towing his glider, please!) - how do you think anyone else but Jedelsky learned about Jedelsky wings! The comment about contests being difficult to find and get into is one of the few points which I found hard to believe. Spectators are never refused entry to a contest venue if they bother to go there, except in a very few cases and this is notified in advance. Finding the airfield is rarely difficult, unless you are confined to public transport.

Absolute beginners will already have seen that *Aeromodeller* is starting a new series taking the raw recruit all the way through to the flying stages for both a free-flight and a control-line model. It is hoped that this will fill a recognised gap, so make sure you get your copies!

d) *Contests for juniors.* The letters make it pretty clear that control-line contests would be worth trying, so

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.

NAME IN FULL

ADDRESS

YEAR OF BIRTH.....SCHOOL.....

NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I

BELONG (if any).....

Send to: GOLDEN WINGS CLUB, AEROMODELLER, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.

2/73 15p in the £1 Rebate
plan purchase coupon
for Golden Wing Members
G.W. No.

once again a word will be put in the right ears. The engine limit idea seems sound, as does the sliding handicap for age.

On a more general point the question of fear of entering contests was raised in one letter – this is very real and impossible to dispel completely. The evolving rules of the Free Flight Junior Kit Contest have been designed to minimise this fear and anyone who has bucked up courage to enter one will confirm that nobody laughs at you – they are all too busy hiding their own models! Perhaps the rule change which now allows any model under 50 in. span was a mistake in that it gives further area of doubt in the choice of model. Should only one or a few specific kits be nominated again? It always raises the fear of commercial bias but that would be a secondary issue if the entries showed a better response.

No one has given, or even offered, a reason why the Postal Contest attracted only four entrants – surely here was a golden opportunity to avoid travelling, avoid those mythical laughing on-lookers, etc.?

e) What should be done to attract Juniors? Mr. Malmstrom's letter provides ample scope for useful discussion and two of his suggestions in

particular look most attractive. Firstly, the link with schools. If every club could make contact with a local school, offering free advice, lectures, demonstrations, etc., on a continual basis, this would be a very great step forward. The S.M.A.E. might well be able to produce some centralised co-ordination, handouts, etc., and the cost would really be minimal (apart from people's time – once again!). Incidentally, it would also provide a much-needed decentralised task for S.M.A.E.-affiliated clubs and areas. It would involve all levels in the S.M.A.E. in some thing not aligned to contests. The S.M.A.E. is anxiously searching for such a task and this might well be it. (It sounds as if it might be of greater benefit to S.M.A.E. than to the juniors!)

Secondly, a magazine for juniors – this, quite frankly, would not be a commercial proposition in this country – but it is certainly worth considering expansion of the *Golden Wings* page to a regular Junior Section of *Aeromodeller*. Your editor will give serious thought to this.

The other two ideas suggested by Mr. Malmstrom do have practical drawbacks which make them doubtful starters at this point in time. A wider

variety of kits for the young builder requires either increased market demand or considerable speculative expansion by the trade. The former must come after the above-discussed sort of steps and the latter really would be a risk at the moment.

Television was the other idea, and of course, Mr. Malmstrom is absolutely right. Unfortunately, the first people one has to attract are the T.V. Companies, and it would need a really concerted effort or 'someone who knows someone' to get one of them to agree that, say, a short series, was worthwhile producing. It takes a great deal of time and money to produce even a 5-minute spot. This again is something which could well follow the initial ideas discussed above.

Well, the above discussions cover a pretty wide field and only time will tell what can be achieved. Rest assured that all of the matters raised will be taken up with organisers and other people in a position to get things moving. The S.M.A.E. is, of course, the governing body, delegated by the Royal Aero Club, to administer the hobby in Great Britain – so most of our whispers will go to them. In the meantime, if you want to do one thing to help yourselves and help aeromodelling – join a club.

F.A.I. INTERNATIONAL CALENDER

WORLD CHAMPIONSHIPS

August 14-19th	Wiener Neustadt, AUSTRIA	Free-Flight Championships
September 11-16th	Gorizia, ITALY	Radio Control Championships, F3A

INTERNATIONAL CONTESTS

(Provisional)

April 20-22nd	Hradec Kralove, CZECHOSLOVAKIA	Control Line F2A, F2B, F2C
May 11-13th	Slanic-Prahova, ROMANIA	Indoor, FID
May 19-20th	Roozen Daalse Heide, NETHERLANDS	Amsterdam Cup, Free-Flight, FIA, FIB, FIC
May 26-27th	Drover Heide b. Duren, GERMANY	Eifel Cup, Free-Flight, FIA, FIB, FIC
May 26-27th	Dubnica nad Vahom, CZECHOSLOVAKIA	Space models: Parachute duration, boost glider duration, scale model rockets
May 31-June 3rd	Wiener Neustadt, AUSTRIA	Free-Flight, FIA, FIB, FIC
June 2-3rd Alt. Date 27/5	Lenate Pozzolo (Milan), ITALY	Radio Control, F3B
June 9-11th	Maubeuge-La Salmagne, FRANCE	Criterium du Nord et Challenge European de Radio-Commande, Free-Flight and Radio Control, FIA, FIB, FIC, F3A
June 9-11th	St-Andre de l'Eure, FRANCE	Radio Control, F3B
June 9-11th	Koblach, AUSTRIA	Radio Control, F3A
June 16-17th	Longuyon-Villetta, FRANCE	Control-Line F2D
June 23-24th	Karlovy Vary, CZECHOSLOVAKIA	Radio Control Scale, F4C
June 30-July 1st	Munich, GERMANY	Free-Flight, FIA, FIB, FIC
February 18th	Helsinki, FINLAND	Free-Flight, FIA, FIB, FIC
July 6-8th	Pecs, HUNGARY	Mecsek Cup, Control-Line F2A, F2B, F2C
July 14-15th	Brno, CZECHOSLOVAKIA	Indoor, FID
July 18-20th	Alicante, SPAIN	Free-Flight, FIA, FIB, FIC
August 3-5th	Bratislava, CZECHOSLOVAKIA	Radio Control, F3A

August 10-12th	Kraiwiesen, AUSTRIA	Igo Etrich Cup, Radio Control, F3A
August 11-15th	Petit Ballon d'Alsace	Radio Control, F3B
August 14-19th	Wiener Neustadt, AUSTRIA	Free-Flight, FIA, FIB, FIC
August 16-20th	Debrecen, HUNGARY	Indoor, FID
August 18-19th	Spaarndam, NETHERLANDS	Control-Line F2D
August 23-26th	W. Neustadt/Herzogenburg, AUSTRIA	'Kolibri', International Cup Free-Flight, FIA, FIE
August 24-26th	Marigny-le-Grand, FRANCE	'Pierre Trebod', Free Flight, FIA, FIB, FIC
August 24-26th or 1 week after Wiener Neustadt W/CH	Sezimovo Usti, CZECHOSLOVAKIA	Free-Flight, FIA, FIB, FIC
August 16th	Dientikon, SWITZERLAND	Free-Flight, FIA, FIB, FIC
August 25-26th	Brno, CZECHOSLOVAKIA	Combat
September 1-2nd	Breitenbach, SWITZERLAND	'Jura-Cup', Control-Line F2A, F2B, F2C
September 7-9th	Mablethorpe, UNITED KINGDOM	Free-Flight, FIA, FIB, FIC
September 8-9th	Rieti, ITALY	Radio Control, F3B
September 8-9th	Bochum, GERMANY	Control-Line, F2A, F2B, F2C
September 8-9th	Rana u Loun, CZECHOSLOVAKIA	R/C Slope Soaring
September 14-16th	Bucarest, ROMANIA	Control-Line, F2A, F2B, F2C, F2D
September 20-23rd	Pecs, HUNGARY	'Mecsek Cup', Radio-Control, F3A
September 22-25th	Lienz, AUSTRIA	Radio Control, F3A
September 29-30th	Lugo di Romagna, ITALY	'Coppa d'Oro' Control-Line, F2C
September 29-30th	Per, HUNGARY	'Raba Cup', Free-Flight, FIB
October 5-7th	Nyiregyhaza, HUNGARY	'Nyirseg Cup', Control-Line, Radio Control, F2A, F2C, F3A, F3B
October 6-7th	Berndern, LIECHTENSTEIN	Radio Control, F3A



F.A.I. Rule Changes

IN EARLY DECEMBER the aeromodelling sub-section of the *Federation Aeronatique Internationale*, the C.I.A.M., met once more, and arising from those discussions are several relatively minor rule changes for the coming contest season.

Greatest affected is the speed category, where the most important rule change is the increase in line diameter from 0.3 mm. to 0.4 mm. – introduced in the interests of safety as several models have been known to leave the lines with potentially disastrous effects to officials and spectators alike. In the same vein, the pull test will now be a full 15 kilogrammes (33 lb.) in lieu of the previously permitted 20g test. A special attachment to hold the handle, allowing equal tension on the two lines, will be required, while the official is instructed to apply the test-load slowly, and to maintain the full 15 kilogramme strain for three seconds. This has been found necessary as the faster models are now exceeding a 20g load in flight.

These two requirements will obviously provide safer conditions, particularly as the increase in line diameter will once more have an appreciable effect on the top speeds obtainable. No doubt most flyers will find that they will be obliged to reduce the pitch on their propellers somewhat . . . any offers for a bundle of 6 in. x 8 in. props?

Other changes for speed enthusiasts concerns contest procedure – they will now be permitted a maximum of five minutes to make an official flight. However, as soon as an 'official' has been made (i.e. the handle has entered the pylon) the competitor must leave the circle, irrespective of how much time re-

Mick Chilton receives the magnificent Whitney Straight trophy for the Nationals combat event from Mrs. Firth at the prizegiving ceremony held after the S.M.A.E.'s Annual General Meeting at Leicester.

British speed fliers in action! Gordon Isles waits patiently with the handle while Brian Jackson adjusts the Rossi's needle, Bill Firbank, who performed starting duties, stands clear, and Gordon Farnsworth keeps an eye on the time. Scene was the 1972 Bochum International – no doubt this event will receive even better British participation in '73, due to the absence of a European Championship. Well worth a visit, and easy to reach by car or train.

CONTROL LINE NEWS

mains. The number of attempts made within this five minute period is not limited.

Aerobatic flyers are hardly troubled – the only changes are to prevent time-wasting. Now an attempt will be called if the pilot does not enter the circle within two minutes of being called, and his flights must be completed within seven minutes of giving a hand signal prior to starting his motor. In any event, this seven-minute period will be timed no later than three minutes after the competitor has entered the circle. This will overcome the existing situation whereby the competitor can waste any amount of time in 'preparations' providing he does not flick the propeller. Remember, chaps, we fly to F.A.I. rules for aerobatics this year. . . .

Team racers have no alterations to their rules, except that the C/L sub-committee has been requested to produce stricter 'semi-scale' requirements for 1975, and that the fuel tank ruling is re-phrased to specifically mention that the maximum fuel permitted *including lubricants*, shall be 7 c.c., to be contained in a single tank separate from the engine. This has been necessary as it could have been argued that oil is not a fuel, and thus the percentage of oil used should not have been taken into account during processing, or even that separate oil tanks could have been provided.

No doubt combat fliers in this country will be sad to learn that the British proposal that the 'knot cut' should score, was rejected.

The saddest aspect of all to arise from this meeting was that no nation offered to organise a limited International meeting in 1973. A most distressing situation, and one which must not be allowed to occur again. Although the C.I.A.M. meets again next April, it is most unlikely that any such offers will be forthcoming at such a late date. The 1974 World Championships are on, however, and will be hosted by Czechoslovakia.





News from the States

Ex-P.R.O. of the Feltham club (who said 'Mighty Feltham?'), Len Clarke, now resident in the somewhat warmer climate of California, sent brief details of the American speed scene. It seems that Chuck Schuette managed to lay his hands on a factory reject Super Tigre X-15, and mounted it in his typical asymmetric design (as used at the '72 World Champs). At the Los Alamitos meeting last November he turned in an official flight of 154 m.p.h. in the F.A.I. class, although in practice he had reached 163 m.p.h. Yes, he did say a factory reject motor! Apparently only 50 of these engines have so far been produced, 40 of them finding their way to the U.S.

In the 5 c.c. category, we hear that Rick Wisniewski has reached the magic 200 m.p.h. barrier, but the control unit failed and the model disintegrated on contact with the tarmac. Fate of the engine is unknown, but at that sort of speed it is unlikely to have escaped unscathed. Remember that the Americans insist on 'thick' lines for their competition too - so just imagine how much faster they are going than ourselves.

Flying Displays

Many clubs receive requests for a display of model aircraft from organisers of fetes, sports days, etc., and the responsibility of putting on a good show often falls on the shoulders of the control-line modellers due to the space restrictions prohibiting R/C. The formation of club display teams is thus a wise move and gives its members a chance to practice their 'routine' and introduce novelty events. From our own experiences, demand for displays rapidly follows any such public showing - indeed one almost suspects that organisers have 'talent-scouts' touring local fetes to find new attractions! Clubs frequently benefit from increased membership and from a swelling of funds - displays can be quite lucrative - and of course they are showing our sport/hobby to the Great Public. There are snags of course. To justify charging a fee, one must put on a good, professional

Above right, Maes, of Belgium, flew this tidily built, all white tissue/clear finished model at the '72 Bochum meeting. It looks deceptively small, yet is powered by a Super Tigre 46, and is based on an Italian kit with modified fuselage. Weighs 58 ounces. Below right is the well-known French pilot Billon, with his Olympus, which flies relatively fast for such a large model. Power is supplied by a Merco 49 (with Merco silencer) and a Super Record 11 x 6 prop. Nicely finished, complete with cockpit detail and undercarriage, it, too, tips the scales at 58 ounces.

A competitor at nearly every International control line event possible, in both team-race and aerobatic categories, Bert Metkmeyer still remains faithful to his six-year-old 'Trionic'. A Super Tigre 46 is used in this large-area model, turning a 10 x 6 three-bladed propeller - a very popular combination on the Continent. Dutch control line fliers are certainly among the most enthusiastic, and their dedication pays off with top playings in most of the events they contest.

showing - engines that are slow to start or which cut out in the air cannot be tolerated. A 'programme' of events must be worked out so that each display member knows when he is to perform - and what he has to do. Wherever possible, use the Public Address system for a running commentary given by a knowledgeable club member - someone who can 'fill-in' embarrassing lulls in activity by a little well informed chat. What 'acts' can you perform? This depends on your abilities and imagination and we would welcome the views of clubs which do provide such display work, as to what they feel the crowds best appreciate. Let's make '73 a more professional year!

Rather removed from the 'village fete' category, was the flying demo which four members of the Hot Heads Model Airplane Club put on in Busch Stadium before 48,500 American football fans as part of an 18 minute pre-game show.

The first flight was a tandem aerobatic stunt flight performed by Mike Tallman and Lou Wooland of Wichita, Kansas. Mike flew a *Fokker Eindecker E III* powered by a K & B 40 and Lou flew a *Morane Solnair Type L* powered by a Super Tigre 40. Both engines were modified for slow flight and ran smoothly at an even speed, as the planes flew manoeuvres together.

The second flight was a slow combat match between Cliff MacBridge, Jr. and Gary Frost of St. Louis. Both planes were modified, mylar covered *Flitestrears* powered by Super Tigre 35's, towing 18 ft. streamers. The crowd cheered as the streamers were cut, while both teams got a loud applause as they left the field.





CLUB NEWS

The Lee Bees Club annual dinner and prizegiving was its usual success – and here are some of the recipients of the 'hardware'. At left is N. Hudson, next Eric Coates the Chairman with E. Thomas the Treasurer. No need to identify our own Managing Ed. 'RGM' himself, who handed out the trophies, while W. Bessant is on the extreme right.

A FUNNY OLD climate we have. You go week after week in the summer waiting for a decent flying day, then comes the winter and you get a whole succession of flyable Sundays. One such the weatherman had reserved for the St. Albans Winter Gala, where winter seemed a misplaced term; from the free-fighters' point of view it was high summer, with clear skies, a breathless wind and huge funnelling thermals. I feel sure if more model flyers were to attend meetings of this sort they will see some really splendid flying and get an insight into how the experts work.

Our first report comes from the **Market Harborough M.A.C.**, sent in by their lady P.R.O., Diana M. Gibbs. She talks in terms of quite a large membership, fluctuating around the hundred mark, of which approximately two-thirds are senior and the remainder junior. A membership of this order calls for quite an administrative effort, but this seems to be taken care of in a most detailed way, judging by the magnitude of the winter programme, which has at least one event per week, starting with an open rubber driven helicopter contest in the clubroom. Another bit of fun to keep the winter gloom at bay is an R/C Team Race, with limited fuel supply and pit stops. A sort of short circuit pylon race. Coming to the question of flying fields, the club is yet another taking advantage of what our quiet rural retreats have to offer. The farmer who owns their bit of land has allowed members to roll and mow a mid-field strip for radio operation – and they have a club hut on the field. There is no doubt if you want to fly in comfort, radio in particular, you are better off on your own field than on public land. But for all that the club is far from parochial in outlook; it recently held an Inter Club Rally for F/F, C/L and R/C contests. Nothing flamboyant, just a good day's flying with modest entry fees and a friendly atmosphere. The club newsheet carries a list of club records, including Paper Glider at 5.6 secs.

According to the newsletter of the **Wolves M.A.C.**, the conditions of use for their Pendeford Airport flying site are pretty stringent. Members have to make individual application to the field's custodian on each occasion they wish to fly. Sounds tiresome, but members are asked to give it a try. Radio seems to be particularly hit by this arrangement, and outstanding R/C contests have been put in obedience. However, for some other types of flying the club seems to have the use of Sutton Park and a sports ground. Odd story: Bill Hatfield had a lost model returned to him after a period of two years. The returnee admitted to having enjoyed flying it, and

finished up by buying it from the owner. Not so odd story. Aeromodelling chatter taboo at gatherings of members and wives at local dances. All to encourage the wives to think their husbands are married to them and not to aeromodelling.

Just to show how Scale has caught on in all departments of the hobby over the past few years, the **Leicester M.A.C.** was able to stage a static/flying event for R/C, C/L and F/F scale. Overall entry was 16, quite staggering for one club, and, as was pointed out in the newsletter, would have been an accepted Nationals level a few years ago. Quite a varied and intriguing collection of craft on show, and obviously a treat for the lucky spectators. Exhibitions and displays are a speciality of the club, and a number were staged during the autumn; the scale interest being an obvious advantage here.

Model clubs are not nearly as localised as they used to be. Nowadays the catchment area for members takes in quite a chunk of geography. This is no better illustrated than in the case of the **Hull Area R/C Society**, where the club meetings are actually held in Beverley, quite some distance away. Mr. A. Oakley, the P.R.O., who has sent us this report, does not give us a membership figure, but numbers must be substantial to support the club's three flying fields, one of which is its own private patch. Seems though, that this wealth of flying area has led to a lack of cohesion among club members during the summer, but with the start of the winter season fliers are once more congregating on the same field. Obviously, in a large club, you get all shades of interests and expertise, and keeping all members banded together in a common purpose is not all that easy. This is why the club attaches so much importance to its winter programme of meetings in the convivial atmosphere of the olde worlde 'Rose and Crown' at Beverley. There are talks – of particular interest to beginners – film shows, auctions, concours, and bring-and-buy sales. At the club A.G.M., the most crucial item discussed was that of club fees. Eventually it was decided to retain these at the very reasonable level of £2 per annum, which nobody could grumble at in these inflated times. The club is always in flying session on Sunday afternoons at Beverley Westwood, where new members are always welcome. The site is on the south side of the A1079 York/Hull road, across the road from the racecourse grandstand.

Pleased to see the **Crawley & D.M.A.C.** still going strong, although we do not hear much from that corner of the world. Anyway, the club held its A.G.M., last November, where a new committee was

elected and the state of the club discussed. The club has now been in existence for 12 years, but the last few years have been, admittedly, lean ones. However, things are once more looking up and the club is gaining in strength as new members join each week. Winter flying is taken care of in the Hazelwick School Hall, where a variety of indoor models can be seen on Thursday club nights. Electric r.t.p. acts as a centrepiece of attraction, and visitors and new members are welcome. No news of general club flying, but at the South Coast Gala Alec Cameron flew his rubber-powered *Senator* and *Swan* glider to first place in both classes in the junior kit events. Good flying in bad conditions. Report from P.R.O., J. Oulds.

The **New City Model Society** makes its debut as a new Buckinghamshire club. The club is one covering all model building interests, but at least half of the members are aeromodellers. Mainly C/L, with a touch of R/C, we are told by Mr. H. A. Severne. Flying areas are a local common and a field on a farm at Hanslope, and club meetings take place fortnightly at 7.30 p.m. at Watling Way Middle School. New members should contact Mr. H. A. Severne, 4 Buckingham Street, Wolverton, Bucks.

On behalf of the **South Bristol M.A.C.**, Mr. R. E. Wade would like to thank all the people who bought and sold tickets for the Grand Autumn Draw in aid of S.M.A.E. funds. The proceeds of the draw, £98.11, was presented to Mr. R. Moulton, our Managing Editor, at the club's 25th Anniversary Dinner. We are told that the turkey was a full-scale flying model propelled by sage and onions.

Ron Hughes of the **Watford Wayfarers M.A.C.**, went on a sortie to a proposed satellite flying field near St. Albans, according to the club bulletin. The field is ideal, but an unexpected snag cropped up, or should I say an unexpected nag, for down at one end of the field was a stable of highly strung horses who did the book on the end of their tethers at the merest hum of a model engine. There is always something to say you neigh!

The flying field situation has not been too easy of late for the **East Anglian Area**, but they now seem to have R.A.F. Watton back on their list of options. It was here that the Area held its Autumn Gala. Weather was well – autumnal; overcast and a fresh breeze blowing, but not constant in direction, necessitating a bit of shifting around the compass points. Modest entries, with four clubs participating. Bright spot was the four entries in Junior Kit. Won with a *K.K. Caprice*, flown by Edward Brammley of Nor-

wich; 4.40 aggregate for three flights. Not all that far behind many of the flights in the Senior events, but at least Ray Pavely managed four maxes out of five flights to win the Combined F.A.I., with his Wakefield, and Bob Wells got a full house in the Open Rubber event. Barry Halford topped the Open Glider list, and D. Miller the Open Power. Watton is also available for the Winter Gala in January.

Whether due to the flying field situation or to an epidemic of handle waving, the **Belfast M.F.C.** boys have certainly been brushing up on their control line techniques. By constant practice they have got down their Goodyear times from a so-so 15 minutes to a highly competitive 11. Much the same picture in F.A.I. team race. In the early part of last year 5½-6 minutes was considered normal, but now the time is down to a recorded 5.05, a big improvement. By way of an inducement to do even better a scheme has been set up. Each member contributes 25p, and the target times to beat are 5:00 for F.A.I., and 5:15 for Goodyear. 100 lap heats.

Quite a pot pourri, the Contest Calendar for the **Scottish Aeromodellers Association's** 1973 season – something for everyone. But one thing everyone must have – meaning by 'everyone', the competitors – is insurance. These must be shown at all events. The newsletter gives a balanced coverage of all classes of flying, reporting on some of the outstanding events of 1972. Some advice here for Juniors. The time has come, it seems, for a Junior lib movement. Why be downtrodden and ignored by the Seniors when you can manipulate them to your own ends? By going about things in a self-assertive way you can soak up their experience and have them eating out of your hand. Just let them know you are around by keep asking questions. After all, they were juniors once themselves, but don't be tactless in reminding them how long ago it was.

It's quite an industry these days: the fossilising of history in the preserving and reproducing of relics of our immediate past. When I was at school, history was 1066 and all that, but now it is what happened 10 years ago. In the *American Aviation Historical Society's* newsletter, history has a quite new dating method, reading something like this: P-47N, C54E, F-6A, etc. The only machine given a name is a Constellation. I, too, must confess to a bit of fossilising myself. From an old 1938 model mag plan I built Bob Copland's *Parastar* – free-wheeling prop and bamboo undercart. It flew straight off the drawing board, and I was quite proud when it hooked a thermal at the St. Albans Winter Gala.

Pioneer of radio control, well known and popular visitor to the Continent and a founder club member of the Northampton club, Howard Boys receives the Plugge Trophy for that club's efforts in the free flight field during '72. Occasion was the S.M.A.E.'s annual prize giving ceremony, where the chairman's wife, Mrs. Firth charmingly performed the traditional duties of presenting the awards.



Contest Calendar

- April 1st** **WESTERN AREA F.A.I. GALA, F/F:** F.A.I. R/G/P, C/L: F.A.I. T/R, Combat (64 entries limit). R/C: Class 2 scale (20 entries limit). 40p pre-entry (60p on day), except R/C where pre-entry is essential, 60p. Prizes minimum of £5, £3 and £2 per class. Venue R.N.A.Y. Wroughton, near Swindon - report with S.M.A.E. card to guard-house. Send pre-entries to R. Horwood, 145 Downend Road, Horfield, Bristol BS7 9PY, together with s.a.e. for confirmation, etc.
- April 29th** **BLACKBURN D.M.A.C.'s WORLD WAR I RALLY.** For R/C versions of aircraft designed before 1918 only. Informal competitions with trade-supported prizes. Venue Witton Park, Blackburn, Lancs. Details and pre-entry (50p) from E. Herbert, 2 Elizabeth Drive, Helmshore, Haslingden, Lancs.

CLUB SECRETARIES:

Please forward details of your forthcoming contests or rallies as soon as possible to avoid duplication of dates and/or interests in next season's Calendar. Items for insertion in the Calendar must be received at this office by the 20th of the month, for publication in the next immediate issue. Details should be brief but explicit, and include exact location of venue.

It is always gratifying to us old stagers to see young people take up aeromodelling with the same enthusiasm that fired us many gallons of fuel ago, particularly when they have the initiative to form their own club as the lads of the **Worcester Royal Grammar School M.A.C.** have done. The club, which is under the aegis of a helpful master, has the advantage of the use of the school games field for the

predominant interest, control line, and a meeting room has been made available. Interests also extend to free-flight, with a dash of model cars and boats thrown in. Schools are ideal nurseries for bringing out the model flyers of the future, although perhaps I am being a bit too patronising because the standards reached by schoolboy flyers can be very high indeed. Good luck to the new club.

A club whose name is synonymous with control line is the **Wharfedale & District M.F.C.**, and Mr. F. Yates writes to inform us that the club continues to organise contests and give displays with the same old enthusiasm. But just to prove that the club is not blind to other branches of the hobby, Mr. Yates is himself a free-flight sport and scale man. Neither is the club blind to the fact that just as important as competing in events is the running of them - you cannot have one thing without the other. Apart from organising such things as the Northern Gala F.A.I. meeting, members are not averse to a spot of flag waving at R/C Pylon events and judging R/C Scale events, though they get no danger money for either of these hazardous undertakings. Back in October the annual Rufforth 1000 B Class Team Race was held, and it is suggested that the success of this event is leading to a revival of this class of team racing. Later on at Rufforth the club Combat event was held. Twenty models took the arena, some with a decided vintage look, but flying was fast and furious, and a good time was had by all. The club is hopeful of finding a permanent C/L site during the next two years; there's nothing like your very own pad.

More reports required, why not drop a line?

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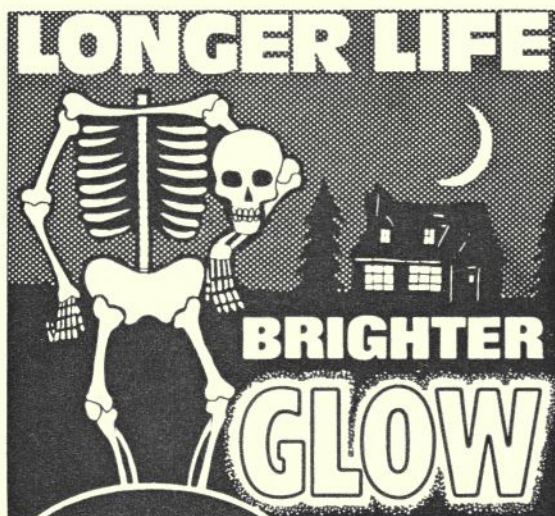
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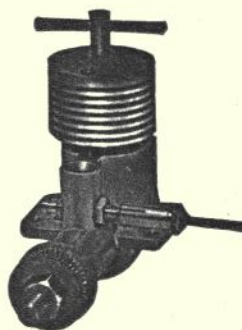
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