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MAY 1959

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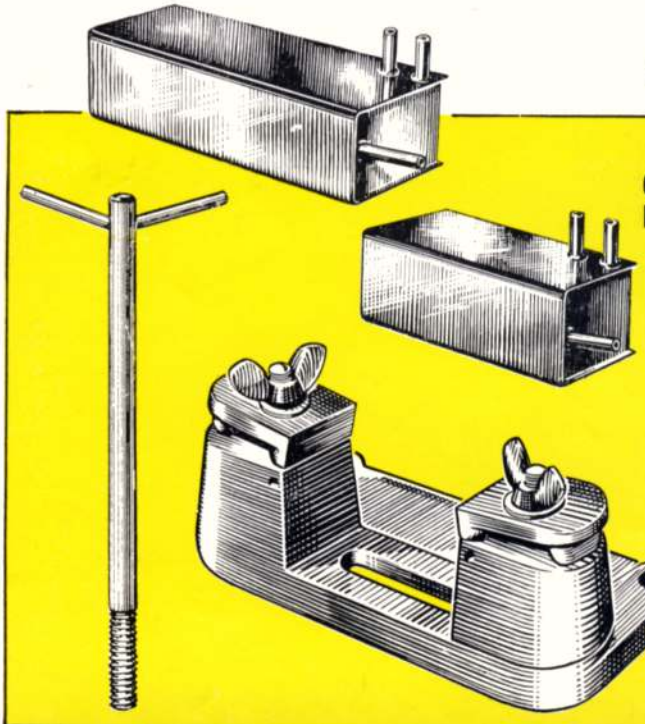

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SEE ENGINE ANALYSIS PAGE 212

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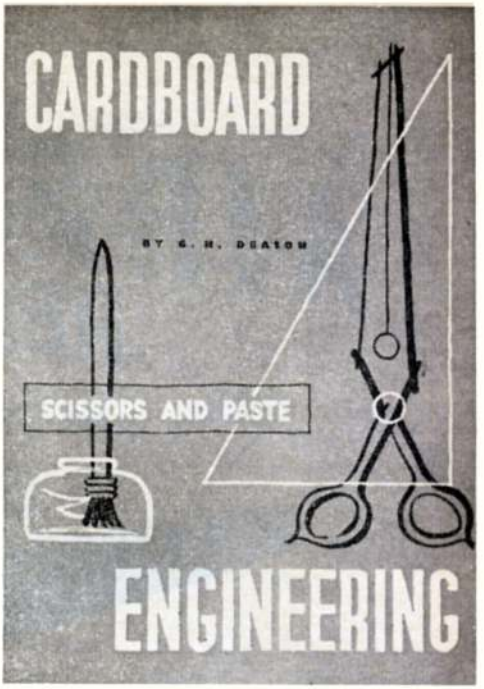

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HERTFORDSHIRE . . ENGLAND

the SOLARBO BALSA STORY continuing

This is one of a series of articles written by John Paterson, Managing Director of Solarbo Ltd., all about Balsa Wood and its many applications in aeromodelling and other industries.

Nothing succeeds like success and the SOLARBO BALSA story is a success story

BALSA FOR INSULATION . . .

NO DOUBT a lot of you will have read and seen pictures in the Press of the *Methane Pioneer*, which has recently arrived in the Thames with the first ever cargo of liquefied natural gas. This is a very important thing indeed because it establishes for the first time that these vast quantities of gas which are now being wasted can in fact be used. Indeed, the oil producing countries who are more and more pushing for bigger royalties are not going to let this portion of their natural wealth be wasted.

What the *Methane Pioneer* has established is that it is a practical proposition to ship liquefied gas at these very low temperatures and the cargo has been insulated with balsa wood.

Balsa requirements

Let me try to tell you what this may mean on the balsa wood end of it. The average thickness of the material sent out from our works is about $\frac{1}{8}$ in. The minimum thickness of balsa wood for insulation like this is 12 in. We employ 100 people in these Works cutting up balsa wood and as I have said, we are substantially the biggest users in the world. One small trial tanker, that is the *Methane Pioneer*, has used as much balsa as we use in one year. But that is not the entire problem. To get the most effective insulation with balsa wood you need the lighter weights and the lighter weight balsa wood is only about one-third of the whole, so the big problem is what to do with the other two-thirds. It is very obvious that there is only one thing you can do with it to get an overall economy if a big demand for balsa for this gas handling arises and that is to use it on the gas handling job.

This indeed seemed so obvious to us that we spent a lot of time and money looking into this problem and we have taken out a patent on a method of converting the heavier wood into an insulating material equal to the lighter wood and certainly equally strong.

Our researches

We have done a very great amount of work on this liquefied gas problem. Commencing in 1954 we spent two years working on development contracts for one of the major oil companies and we ended up by lining a tank 30 ft. long and 10 ft. diameter on the inside, with 12 in. of balsa wood.

At this stage in the thinking, both here and in America, it was thought that the answer to the problem was to pour the liquid gas straight into a tanker which had been lined with balsa wood with the liquid gas actually in contact with the balsa.

Low temperature effects

At these very low temperatures most materials alter physically a very great deal. For instance, if you take a piece of rubber and put it in liquid nitrogen, which is about the same temperature as liquid methane (minus 273 degrees F), take it out and hit it with a hammer, it will splinter like glass. Ordinary steels do not retain their strength: they become brittle too. But stainless steel does not become brittle. This is another instance of the curiously different properties that can be given to metals by the introduction of relatively small quantities of other elements. Balsa, on the other hand, retains its physical properties remarkably well at these low temperatures.

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45	½ pint	3/–	Pint	5/6

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A.M.35	"C"	Babe Bee	"G"
Merco 29	"D"	Thermal Hopper	"H"
		Pee Wee	"J"

Jun Mallard, "G"
Magna, "G"
Matador, "A", "F", "B" (R/C)
Teal, "G", "H"
Agressor, "G", "H"
Monocoupe 40, "G"
Tiger Moth "G"
Midge, "A", "H"
Wasp, "G", "H"
Marvin, "A"
New Junior Monitor, "B", "F"
Picador, "A", "F"
Toreador, "B", "C", "D"
½A Team Racer, "A"
Texan Team Racer, "B", "F"
Mac Team Racer, "B", "F"
Thunderbird T/R, "D"
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CONTENTS VOLUME XXIV
No. 280 MAY, 1959

CONTENTS

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

MODEL AERONAUTICAL PRESS LIMITED.
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"...to see ourselves as others see us"

Since our recent happy arrangement to exchange magazines with our Russian "oppo" and the discovery of a wealth of Russian-speaking talent amongst our readers we have been able to enjoy the Soviet outlook on modelling to a wider extent than ever before through the medium of "Wings of the Fatherland".

The official Soviet report on the 1958 World Championships at Cranfield for free flight and the Brussels meeting for control-line makes very interesting reading. Fair comment on the quality of Frigyes's winning power model and the general high standard of flying includes the phrase "the American team had to be content with 8th position" but offers no excuse for the non-attendance of U.S.S.R. representatives. In Wakefield, Bond Baker's single-bladed prop has obviously attracted Soviet observers as they refer to it as the most outstanding feature, and have little to say of the other competitors apart from Poland's Zurad in second place.

At the control-line meeting the Russians attended in person. They are full of praise for Dick Edmonds's team race time of ten kilometres in 4:58, especially for the high speed of both his model and his re-fuelling. Self criticism extends an admission of lack of experience in speed and stunt and the statement that "we must make our stunt models light and the engine must work on an enriched mixture. We must choke our engines so that the model will fly with a vapour trail".

Explaining their lack of success in speed, the Russian observer lays the blame on the high temperature (it was around 80 deg. F.) and states that the small percentage of oil used in Leningrad and Moscow record flights was no good for hotter climes and caused overheating.

(An interesting sideline on this temperature question arises from correspondence with K & B engine designer Johnny Brodbeck who prefers flying in colder weather and uses "winterized" fuel of 15 per cent. Castor in place of 25 per cent., 10 per cent. Nitro Propane where normally none is used, 25 per cent. Nitro Methane and balance Methanol. Torps run best at 60-70 deg. F. air temp.; with relative humidity 50-60 per cent. and at correct needle setting the head temp. should be around 360 deg. F.—ED.)

Other items selected from recent Soviet Aeronautical press features include announcement that the talented modeller, Ivannikov, is awarded the Tsiolkovsky prize. Ivannikov's prowess with Power, Wakefield and particularly jet models is well known internationally and the award is justly deserved by this likeable little fellow modeller.

What, then, do we see in translations of Russian reports? Simply this: the days of restriction of news to home produce only are gone. Soviet magazines are up-to-date, give due credit where due, and do not let their modelling deficiencies pass unnoticed. Within a few seasons we shall see how this new policy will bring the Soviet modellers to a very high international standard in all classes.

Prize for the highest

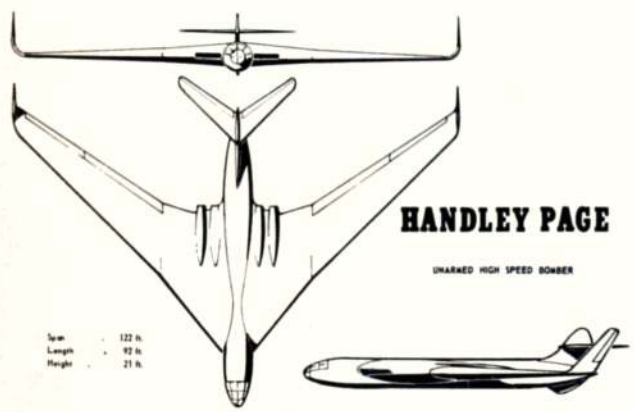
Manufacturers of the Altmaster height recording instrument for models propose to put up a cash prize of £10 plus a suitable trophy to be held for one year, to the aeromodeller who records with the use of an "Altmaster" the highest altitude obtained with a model. The class of model to be used will be "open". The height recorded must be witnessed by two responsible persons or if, for example, a Club Secretary is present his confirmation will suffice. Claims for height achievements must be forwarded to their address bearing witnessed signatures. The competition applies to the British Isles only and the trophy will be known as "The CHARON Altitude Trophy". The closing date for 1959 is first post on October 1st, 1959. All subsequent entries will be lodged for 1960.

Russ

Aeromodelling lost its most alert chronicler of the types who follow the hobby when Russell Potter passed away in his sleep on March 5th. Never strong physically, but blessed with unbounded enthusiasm for sketching the eccentricities of his fellow men, "Russ" did not recover from influenza at the early age of 32. Who can forget his wonderful "Fetchermites", those incidental details in his many "What's The Answer" cartoons, and, of course, his portrayal of Maestro McGillicuddy's activities? "Russ" had a unique style of his own, yet never had a drawing lesson in his life. His sketch pads would keep us rocked with mirth, and we count ourselves extremely lucky that he was so prompt a contributor that we shall be able to reproduce many of his unpublished works in months to come. We know that all Aeromodellers will join us in extending heartfelt sympathy to his mother and brother in their great loss.

Public Barr

Our old friend Laurie Barr suddenly loomed into Editorial T V screen the other evening in the *News Chronicle's* "Get Ahead" contest, when he was a first round winner with his scheme for commercial model aircraft building, making the utmost use of such modern production materials as fibreglass. Since Laurie was until recently Works Manager of Westway Models he was able to speak with authority on his subject and did aeromodelling a fine service in bringing it for once to a truly adult audience. Thanks Laurie, and good luck with the new venture!



The Victor that Never was

Recent development and production releases giving a background story to the evolution of the Handley-Page Victor leave us regretful that at least one of the earlier designs never came nearer to fruition than the drawing board. This 1946 project for an "unarmed high speed bomber" envisaged a true tailless aircraft of 122 ft. span with elegant upturned tip-fins and a centrally placed stabiliser, which repeated the sweepback of the mainplane. Though thirteen years have passed since its inception it still looks as functionally beautiful as ever, and we are sure readers will share with us an appreciation of its pleasing lines. We wonder how many more beauties like this are hidden away in the files of the great aircraft companies, perhaps to puzzle and intrigue future aircraft historians of a distant space age.

"For Sake of a Nail . . ."

We all know the old story "for the sake of a nail a horse went lame . . ." and the chain continues until a "battle was lost". This is very pertinent to our 1959 Nationals' venue at Scampton V-Bomber base where litter can be lethal. Can we all just for once be scrupulously careful to pick up everything we put down, with particular reference to glass bottles and discarded control line wire; or, better still, make a real point of not even putting it down in the first place. A brown paper carrier bag as part of the equipment of every team, solely to take unwanted yet potentially dangerous litter would not be too much to ask as some slight return to our generous R.A.F. hosts!

Nationals at R.A.F. Scampton

Good offices of S.M.A.E. Treasurer Harry Barker have obtained use of the immense aerodrome R.A.F. Scampton for this year's Nationals, taking place as usual over the Whitsun Holiday on Sunday, May 17th, and Monday, May 18th. Sketch shows location, about six miles north of Lincoln on A15. It is about the same distance south of R.A.F. Hemswell already quite well known as a modellers' flying field. Contests will commence on each day at 10 a.m. and finish at 6 p.m. A special camping site adjacent to the aerodrome will be available at 2s. 6d. per tent, but campers must apply for their permit on the official Entry Form, to be received at Londonderry House by first post on May 4th. Field entries to some events at double fees will be accepted, but entry for Team Race, Combat and R/C events will be restricted. Pre-entry at normal fees will be accepted also up to May 4th. Club secretaries should apply for entry forms and details to S.M.A.E. Ltd., Londonderry House, 19 Park Lane, London, W.1.

Class A Team Race at Nats will be strictly to F.A.I. specifications and distances, though not necessarily run to F.A.I. heat system. So if you have any doubts brush up on those specs., and come appropriately equipped. Briefly, specs. are: Engine 2·5 c.c. max.; projected surface area 186 sq. in. minimum; fuel 10 c.c.; fuselage at cockpit 2 in. × 4 in. min.; line length 52 ft. 3 in.; wire dia. ·010 in.

Experts' Forum No. 5

OPEN RUBBER MODELS

Hints on model operation and design, by

Eric Barnacle

1957 1st Gamage Cup
1958 2nd Surbiton Gala
2nd Model Aircraft Trophy
2nd First Wakefield Trials
5th Combined Wakefield Trials
3rd Fairey Cup (Northern Heights)
2nd Flight Cup
3rd Croydon Gala
1959 2nd Gamage Cup

RUBBER-DRIVEN MODEL aeroplanes have been flown in contests from those very early days of aeromodelling recounted in the March issue, and in spite of the great advances that have been made in the design and production of miniature engines, the rubber model still has its following of enthusiastic devotees.

As an aeromodeller, whose main interest has always been in this type of model, and who has been flying them in contests for a few years now, I hope that my views on some of the problems involved may be of interest.

Without doubt the most important part of the rubber model is its propeller, unless this is efficient, the model is useless. Whether to use a folder, free-wheeler or featherer is a matter of individual choice. In my own opinion, the double blade folder is best, it is also about the most popular type used in contests today. The choice of a block of wood from which to carve a propeller for a lightweight rubber model is important. This should be of a medium light grade of balsa, with a long straight grain. In order to keep the weight down to a minimum, the blades should be made very thin, but they must retain enough strength to withstand the load placed on them when the model is released on full turns.

The large hubs seen on many folding propellers are unnecessary and apart from looking ugly, must also absorb a lot of power. With a hinge made from dural plate it is possible to reduce the size of the hub to about a $\frac{1}{4}$ in. square. Good folding can be obtained by skewing the hingeline about ten degrees (this angle does not seem to be critical, but it must be the same when viewed from the front as it is from the side). Light rubber bands should be fitted to hold the blades in place against the sides of the fuselage. I think the best method of attaching the rubber motor to the propeller assembly is to have the end of the shaft bent into the form of an "S" hook and covered with neoprene tubing. When the motor is in place the hook should be closed by winding a small rubber band around it.

Remember to inspect the neoprene tubing each time you change a motor and renew if it shows any signs of splitting. Otherwise your motor may be cut through just as you are nearing full turns, with disastrous results to your fuselage.

The fuselage of a rubber model has two positive loads imposed upon it by the rubber motor. The first is compression, with which the longerons cope quite easily. The second is a torsional load to which the normal fuselage (with straight spacers) has very little resistance, and in fact relies mainly on the tightness of its covering to prevent it from twisting, which is not very satisfactory on a contest model which must be flown in all weathers.

For this reason I recommend the use of Warren-girder construction. It is well worth the little extra trouble in building and need not weigh more than the simpler type. As proof of its rigidity, I have seen a Warren-girder fuselage suffer a broken longeron on full turns without collapsing. Construction is simplified by making the fuselage square in cross-section and having the sides parallel for most of their length.

The square fuselage may be used as a slabsider or alternatively, may be turned on edge and used as a diamond. There is not much to choose between the two aerodynamically, but from a practical point of view, the wing mount on a slabsider can be a simpler affair, though fixing the fin securely is not so easy as on a diamond, where it can be anchored firmly to the top longeron. Instead of the usual method of building two sides on the plan, I build a top and bottom as the fuselage is symmetrical in plan view. This means that after removing from the board, one of these can be reversed so that the spacers run in opposite directions. When putting the spacers into the rear fuselage sides, the top longerons can be made to run parallel to the datum line for the last few inches in order to make a platform for the tailplane.

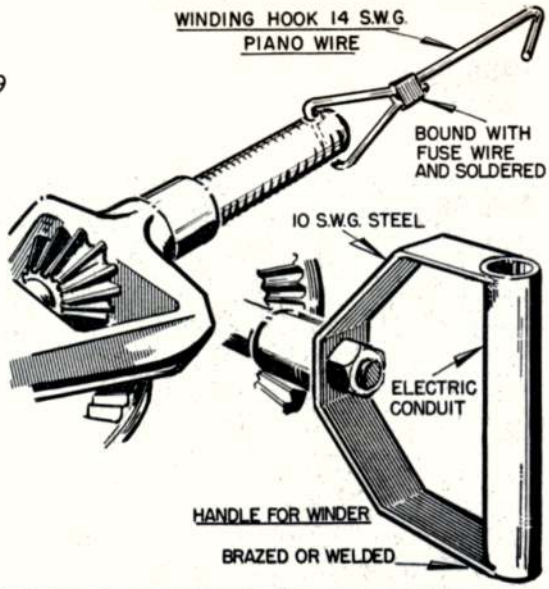
A wing of around Wakefield area should not weigh more than $\frac{3}{4}$ oz. and by careful selection of wood this figure can be reduced to 0.6 oz., but a wing of this weight becomes very difficult to handle in windy weather, especially when carrying the model back after making a flight. Quite a stiff wing can be made by using two $\frac{3}{32}$ x $\frac{3}{32}$ or $\frac{1}{8}$ x $\frac{1}{16}$ in. spars located one above the other at the maximum point of camber and webbed between each rib with light $\frac{1}{32}$ in. sheet, the grain running vertically. Until recently, I have used $\frac{1}{32}$ in. ribs on my models, but as there has always been some distortion with these, I have abandoned them in favour of ribs cut from very light $\frac{1}{16}$ in. sheet which has first been sanded lightly to remove all traces of saw-cuts. I do not believe in slotting the trailing edge to take the ribs, but prefer instead to use small gussets to strengthen these joints. Jap tissue should always be used for covering the wings, tailplane and fins, as it requires very little dope to

make it airproof. Many good lightweight wings are ruined by too much doping. In order to preserve the section, apply the tissue with grain running chordwise. As the tissue tightens mostly across the grain, there is very little sag between the ribs with this method.

Once you have found a wing section that gives a good performance, it is best to stick to it as you can then get used to the trimming technique required. The section I use is a Cheesman 25-100-10, which is a fairly thick section, which may slow the climb a little but certainly gives a very good glide. Some time ago, I tried using a flat-bottomed section with the idea of getting a faster climb. The model certainly did climb faster and higher. On checking the flight times however, I found that the duration was less than that obtained with my usual undercambered section. The dihedral form used is largely a matter of personal preference, polyhedral is fashionable, but has the disadvantage of having three joints. Vee dihedral seems to work quite well so too does tip-dihedral which has the advantage of having no joint at the centre, which of course, is where most of the load goes. I don't think the systems of fancy anti-warp structures are necessary on flying surfaces if enough care is taken in the construction and covering. I would warn here against using cement with strong shrinking action.

The Bongo design

The model I have been using during the past year is a development of an old-rule Wakefield design. I have retained the 2.8 oz. motor and with the airframe weighing about the same, the performance is around the five-minute mark. With most rubber contests being decided on a fly-off nowadays, I realised that this performance was not good enough and I have now built a "stretched out" version with a wing area of 250 sq. ins. carrying 3.5 ozs. of rubber. I managed to do this without increasing the airframe weight and there has been a considerable improvement in performance, but the model is rather weak and I don't think I'd care to fly it in a strong wind. To get the best out of any rubber model, it is necessary to wind the motor up to somewhere near maximum turns and to do this, the motor must be stretched to four or



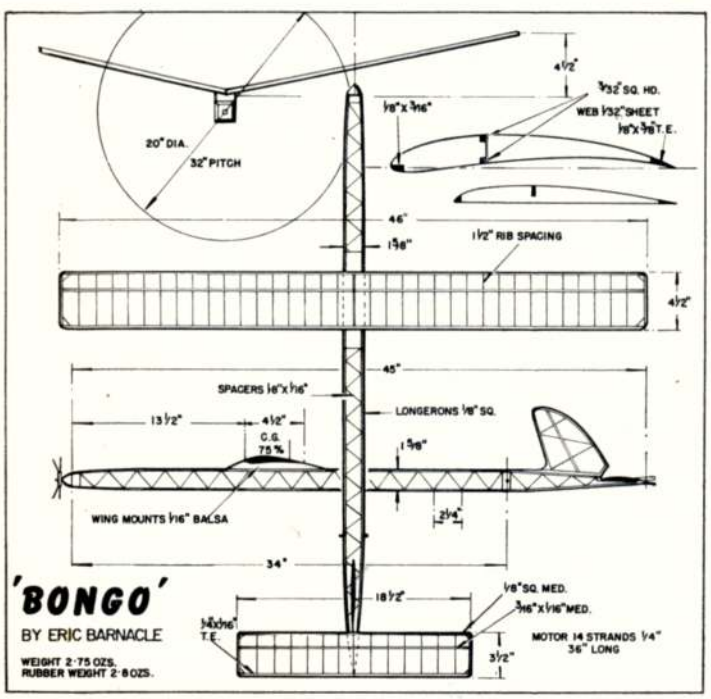
five times its normal length. The winder used to do this should have a spade type handle to allow a firm grip to be maintained while piling on the turns. A wheel brace modified in this fashion should also have the chuck removed and the shaft drilled to take a 14 s.w.g. wire winding hook. Make the hook on your prop shaft a snug fit on this and you will have no trouble with it climbing up the hook. It makes things a lot easier too if you remember to oil the winder occasionally.

At the contest try to do your winding up in a calm manner, it helps here to have a well-known to you and trusted assistant, who is not of a nervous disposition. I lubricate my motors with a mixture of soft soap and glycerine, though castor oil may be just as good. Trimming technique is, of course, something that must vary with each model. The pattern I like to achieve, is one in which the model climbs straight and almost vertically for the first burst, to a height of about fifty-feet, where the model slows down almost to the stalling-point. The right wing should then drop slightly and the model will continue its climb in a steep and wide right circle. A few degrees of tailplane tilt will help to produce this effect and is also helpful in maintaining a constant glide circle. In windy weather, it is not advisable to alter your rigging angle, but instead, a small amount of weight should be added to the nose.

The Wakefield today is a very different proposition to the open model, but it can still be a very interesting type, presenting as it does, a challenge to improve performance without either reducing airframe weight, or increasing power. It can also be fun to fly, providing no one is flying an open model in the same field.

I consider myself lucky to live in an area where there is such a strong interest in rubber and also to belong to a club whose members are keen contest fliers in this class. The friendly rivalry of club members does as much to stimulate advance in design and performance as does actual competition flying. Members of a club all using the same basic layout will each incorporate their own ideas, the ones which bring about an improvement in performance will be adopted by the others and the result is continual advance.

In winning contests, luck plays its part with thermals and downdraughts. If you keep at it you are bound to win something sooner or later. A win will spur you on to further effort and before you know where you are, you will be an expert, so my advice is "get winding".



Sailaway

by Vern Clements

For maximum fun from a minimum of outlay, the humble chuck glider is unbeatable

TRY A CHUCK-GLIDER for sheer modelling fun. Cheap to make, robust and long-lasting, they give endless hours of pleasure and are capable of high duration flights. "Sailaway" continues upwards from the launch as if it has no resistance, soars over the top without stalling and dipping, and settles into a smooth floating glide. It will ride a thermal just like a bird; but first you have to launch it fast.

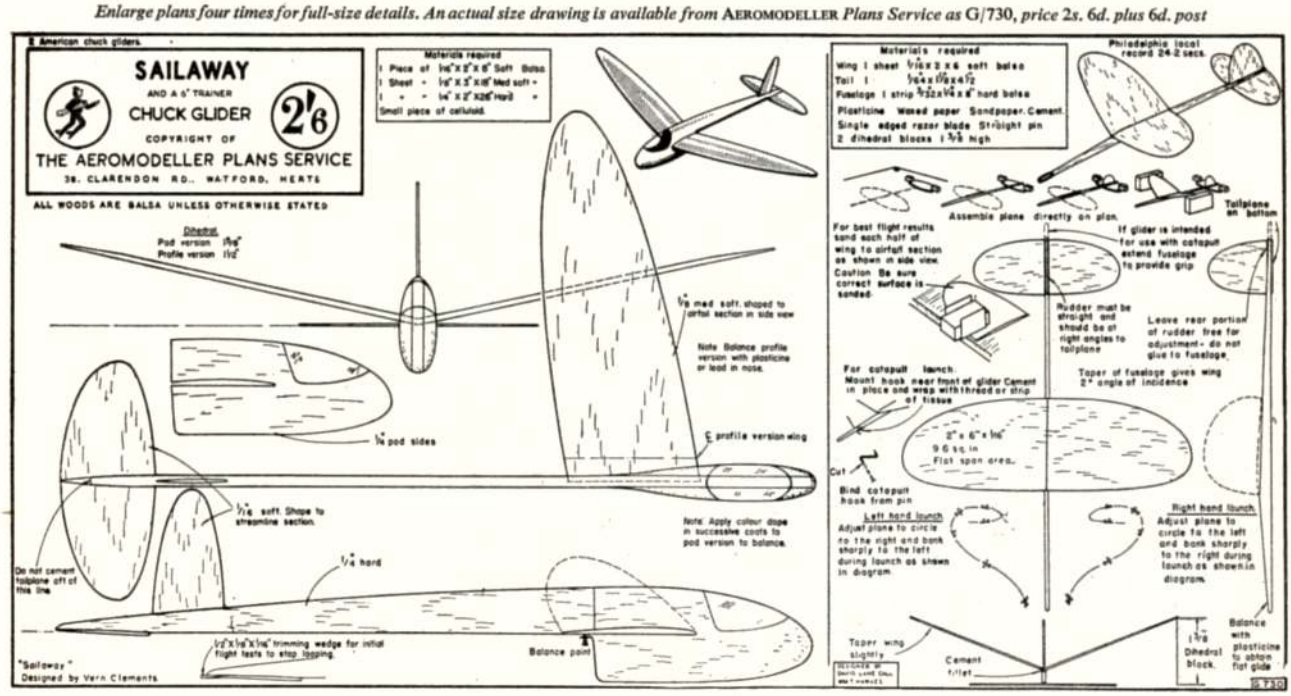
Draw it behind you at arms length, run forward three steps and throw at a 30-degree angle with all the power you can put behind it. Release the glider in a right-banking attitude; left rudder holds the nose up until the launching speed is expended. At the top of the launch your profile "Sailaway" hesitates, then skids into a very flat glide path without losing any precious altitude. It glides much slower than its heavier pod version brother (both variants are detailed on the plan).

All with so little expended, and with no mechanical worries such as engines, timers and dethermalisers. The thought of losing your gliders is no worry to you since there is little money or effort invested in them. A replacement can be made easily in an evening.

Before this type of performance can be enjoyed you must test your glider carefully, remembering that a small adjustment goes a long way. The laminated pod version will probably balance close to the point indicated on the plans, without adding ballast. The profile version will require some lead in the nose. Test glide, using a slight left warp in the upper half of the rudder for turn. If necessary, a V-shaped wedge approximately $\frac{1}{2}$ in. long by $\frac{1}{16}$ in. at the thickest point may be pushed between the trailing edge of the tailplane and the boom, taking out enough incidence to prevent looping on a hard throw. Leave just enough angular difference to pull the glider out of a dive in the event of a bad launch. This is accomplished by moving the wedge incidence-adjuster backward or forward before gluing at the proper setting. Leave a slight stall in the glide, correcting by applying wood filler and colour dope on the pod, ahead of the centre of gravity, until the stall disappears. A bright colour on the pod, such as orange, should be used for better visibility. As a final touch, the canopy may be doped silver as outlined on the plans. For added beauty and realism you may want to mould a plastic canopy for your "Sailaway".

Now that your glider is adjusted properly, turn your

Enlarge plans four times for full-size details. An actual size drawing is available from AEROMODELLER *Plans Service as* G/730, *price* 2*s.* 6*d. plus* 6*d. post*



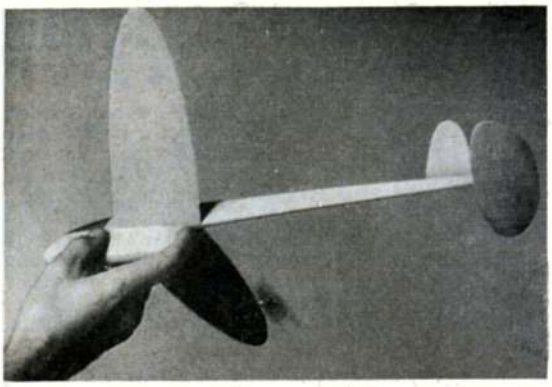
attention to the development of your launching arm. Warm up gradually at each session on the flying field. Do not over-do it the first day out. Strive to develop your launching power, *maintaining control* of your arm, and working for the smooth recovery which is a characteristic of the "Sailaway" design. If you are left-handed, the adjustment technique will be reversed, using right rudder and banking the glider left upon launching.

Select a $\frac{1}{8}$ in. sheet of light weight medium soft balsa for the wings. If one edge is harder, use it for the leading edge of the wing. Using carbon paper, trace the outlines on to the balsa and cut to shape. The profile version has shorter wing panels, as on plans. Carve to the approximate airfoil section, using a long whittlers blade. Use a sanding block (approx. $\frac{1}{2}$ in. x 3 in. x 12 in.) and sand to a smooth contour (*see* side view), finishing with a fine grade of sheet sandpaper. Bevel the wing roots and glue the wing panels together at the proper dihedral angle.

While the wing dihedral glue joint is drying, saw the fuselage profile from hard balsa and check the incidence settings carefully with the plans. If you plan to add the pod side panels, it will be easier to carve and sand them to the top view outline before gluing on to the fuselage. It is recommended that they be glued on after the wing has been glued to the main fuselage profile, carving the pod wing slots to agree with the dihedral angle. When rounding off the pod, leave the finger rest at the back $\frac{1}{4}$ in. wide for a secure finger grip.

The tail surfaces should be made of very soft $\frac{1}{16}$ in. balsa. A lighter tail means less nose ballast, resulting in a lower total weight. Glue the tail assembly to the boom, aligning carefully.

Apply several coats of glue on the wing-to-fuselage joints for added strength, and sand the entire glider thoroughly with very fine finishing sandpaper. This is very important as it will reduce the amount of filler required for a smooth finish. Our "Sailaways" were doped with one thinned coat of clear and talcum powder sanding sealer mixture, and polished again with finishing sandpaper. After balancing with colour dope on the pod as per flying instructions, our pod (with side panels) and boom version weighed 26 grammes as flown. The profile "Sailaway" tipped the scales at 18 grammes.

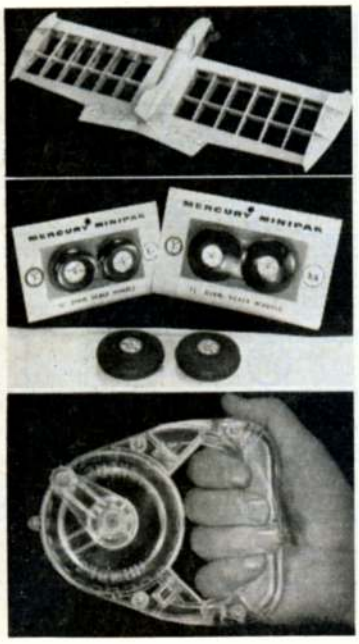


Grip for a high speed launch on the pod version of Sailaway. Attractive semi-scale lines have practical use this way

Also detailed on the plans opposite is a novel 6-in. span glider for indoor or outdoor use, and which can put up a surprisingly impressive performance. Balsa requirements are such that a whole squadron can be made up in no time at all; why not take it up as a club-room building/flying contest subject at your next meeting?

Trade Notes

New items tested for YOU



Automobile Plastics Ltd., of Barnet, announce their Autoplax glass fibre kits in five sizes, at prices ranging from 19s. 6d. to £9 10s. For the modeller, the 19s. 6d. Apcopak kit contains sufficient to meet one's needs, as can be seen in picture at right. Chopped strand mat and glass cloth to cover a wide variety of jobs, comes with measuring and mixing cup, resin and release agent, and ample instruction. A new formula **Humbrol** enamel in no less than 29 colours, including 12 matt, is now reaching the model shops in an attractive light alloy can pack as picture below right. These are seamless, printed cans containing half fluid ounce and we have no doubt that the gadgeteers will soon be finding a novel use for the lightweight cans when emptied.

Our **KeilKraft** Talon combat review model is now through flying tests. Fitted with an A.M. 25 diesel, it more than lives up to expectations, and as can be seen at top left, the structure is both simple and tough. The next picture illustrates those new **Mercury** wheels we mentioned last month. We fancy that their treaded tyres will be a standard feature of many a scale model for many moons to come. From **Bradshaws**, who have been responsible for importation of many kits and accessories from the U.S.A. in recent months, we have a sample of the Thimble-Drome Handy Reel in transparent plastic. Lines are individually reeled in by separate winding handles, then safety locked. The handle is light enough not to affect control sensitivity, and its size has been cleverly kept down by the renowned L. M. Cox Co as manufacturers, so that its bulk is not at all obvious when flying. Price in Britain is 38s. 4d. Finally, a note for all three-blade power prop fans, is that 7 x 3, 8 x 6, 8 x 8, 9 x 6 and 10 x 4 sizes are now introduced in the **Mercury Star** series in moulded nylon at 7s. 9d. with replacement blades at 1s. 9½d. These are ideal for those c/liners and give extra smooth engine running

Engine Analysis No. 59

BY R. H. WARRING

UNIQUE AS A PRODUCTION motor in this country, the Taplin twin utilises two 3·46 c.c. cylinders, with specially designed side porting and mounted in-line on a two-compartment crankcase, firing alternately. A genuine carburettor is fitted with a barrel-type throttling valve which gives quite outstanding flexibility and control. An exhaust manifold is also fitted with a single stub exhaust pipe to which can be fitted a further extension pipe, if required, ejecting all the oily waste associated with model diesel operation at one point instead of scattering it wholesale into the slipstream, as is common practice.

A number of the running and handling features are outstanding. Provided the fuel line if full to the carburettor and the compression settings are substantially correct—and new engines are supplied "ready to run"—starting is virtually instantaneous on flicking over with the throttle anywhere between ¼ and full open. The "Feel" on flicking over is odd, with two compressions appearing per revolution, but starting is so easy with established settings that it is comparable with a "full size" engine in this respect.

If the compressions are way off the required settings, then you do have something of a game of "trial and error" to get them right. It did not appear practical to work on one cylinder only (with the other compression backed right off), but to increase the compression on one until the engine fired and then work on the other until continued running was obtained. Then final adjustment could be made on both cylinders. It is easy enough with the engine running to find the optimum settings for each cylinder. Excess compression on either cylinder produced a drop in r.p.m. and a laboured note; lack of compression, misfiring. The adjustments are by no means critical. In fact, the only awkward part of the procedure is that the front cylinder is rather near the propeller for comfort and one is apt to touch the propeller disc when working on the compression screws.

With the compression settings correct, they can be left alone and the engine re-started at running settings. Using progressively smaller propeller loads, however, starting did deteriorate and with sizes corresponding to 10,000 r.p.m. load-speed and above it was not quite as easy to handle as a single-cylinder diesel. The double-compression settings must be advanced, and the mixture leaned out, for consistent optimum performance at these higher speeds.

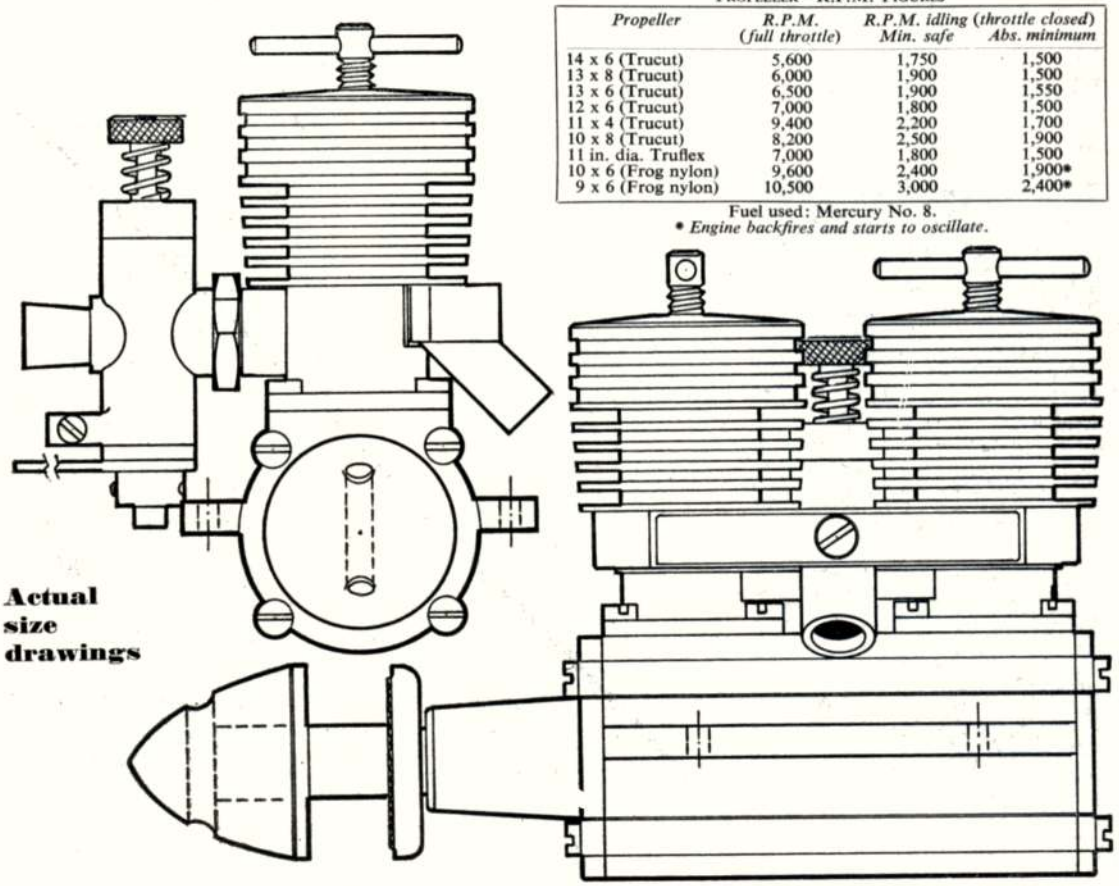
The Taplin Twin also seemed to prefer propeller loads with a good flywheel effect. Large diameter propellers suited it admirably. With the smaller diameters, it was happier on plastic propellers than the lighter wooden ones, but right down to 9 in. diameter sizes, we would not rate it a difficult engine to start, and on 12 and 13 in. diameter propellers it must rate as one of the easiest starting diesels produced.

Mixture setting is established by a conventional

PROPELLER—R.P.M. FIGURES

Propeller	*R.P.M. (full throttle)*	*R.P.M. idling (throttle closed) Min. safe*	*Abs. minimum*
14 x 6 (Trucut)	5,600	1,750	1,500
13 x 8 (Trucut)	6,000	1,900	1,500
13 x 6 (Trucut)	6,500	1,900	1,550
12 x 6 (Trucut)	7,000	1,800	1,500
11 x 4 (Trucut)	9,400	2,200	1,700
10 x 8 (Trucut)	8,200	2,500	1,900
11 in. dia. Truflex	7,000	1,800	1,500
10 x 6 (Frog nylon)	9,600	2,400	1,900*
9 x 6 (Frog nylon)	10,500	3,000	2,400*

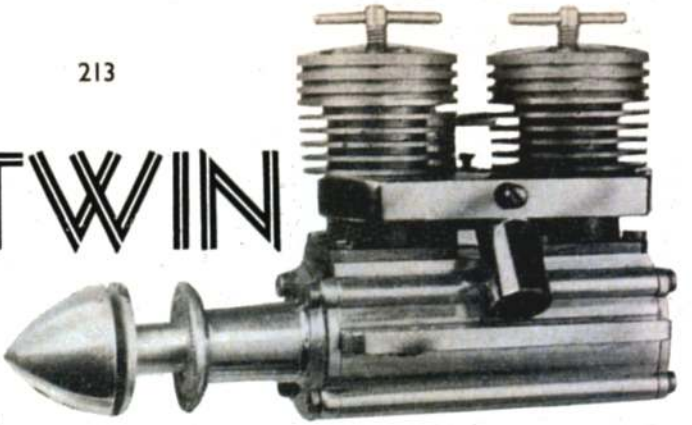
Fuel used: Mercury No. 8.
* *Engine backfires and starts to oscillate.*



Actual size drawings

TAPLIN TWIN

Seven c.c. twin provides wide range of operating speeds for 'Payload Power'



needle valve adjustment on the top of the carburettor. The barrel valve controls the air supply and when the throttle is closed, cuts off the air entirely. The actual closed position is adjustable by means of a screw stop, just like the slow running adjustment on a full size carburettor. In this "idling" position, air supply is drawn through a hole in the side of the carburettor body, again adjustable via a screw. This bleed hole is closed off when the throttle is opened past the ¼-open position.

Good throttle control

Throttle response is extremely good, the engine responding immediately up or down and two-stroking throughout down to minimum speed, with any propeller load. We found that the minimum speed which could be held safely, was just under 2,000 r.p.m. with the larger sizes of propellers and slightly more with the smaller propellers. Idling speed could be reduced to about 1,500 r.p.m., but at this stop setting the engine was on the verge of cutting. With smaller propellers the limiting low speed was when a misfire occurred, the normal running turned into oscillation. Being a sideport engine the Taplin Twin will, of course, run equally well in either direction. Again, with the smaller propellers it did sometimes misfire and start running backwards on occasions.

As one would expect from an engine of this type, the real performance comes at the lower end of the speed range. Torque is in excess of 40 inch-ounces at the lower running speed which represents real "slogging" power for driving a large diameter propeller. However, we found that the peak B.H.P. output was realised at 9,000 r.p.m. which is appreciably above the recommended operating speed—a 13 x 8 propeller is specified, corresponding to a speed of around 6,000 rp.m. To get optimum performance with the smaller propeller sizes, though, considerable fine adjustment is necessary. For example, with a 10 x 6 nylon propeller, apparent optimum running speed could be varied from just below 9,000 to 9,600 r.p.m. by persisting with adjustment. Beyond the peak the fall off is rapid. Because of the far superior handling characteristics, therefore, and the greater efficiency of larger diameter propellers, 12 and 13 in. diameter sizes are probably the best choice.

The B.H.P. curve drawn shows maximum performance as the full line curve, the dotted curve representing the fall-off without this extra attention to adjustment at the higher speeds. A static r.p.m. figure of around 7,000-7,400 r.p.m. would probably be the safest proposition for deciding the best propeller size.

Constructionally, the Taplin Twin is assembled around a stout—and heavy (3-ounce)—crankcase casting which is gravity die-cast, with two separate compartments. The centre portion is press fitted with two ⅜ in. ball-races, one either side of a bulkhead and the two-piece crankshaft assembled through these races. The method of joining the crankshafts is ingenious. One main shaft is used, incorporating one web and crankpin. The other piece consists of a web and stub shaft which fits over the end of the first shaft. This shaft end is lightly splined before hardening and grinding and forced into a narrow shoulder inside the stub shaft (web end) to produce a rigid assembly when the two are driven together.

Triple ball-bearing shaft

The drive is taken up at the front end with a conventional shaft and circular web, a hole in this web engaging the projecting end of the front crankpin. This

Lieut.-Col. H. J. Taplin with sons Michael and John bench-test and run-in every engine before despatch, including stroboscope r.p.m. check and assured one-flick start. No engine goes out without this personal final check before boxing with the detailed Taplin handling instructions which make certain that even the least skilled buyer can cope.

SPECIFICATION

Displacement: 6.920 c.c. (·420 cu. in.)
Bore: ·656 in. Stroke: ·621 in.
Bore/Stroke ratio: 1·06 Weight: 15 ounces
Max. B.H.P.: ·29 B.H.P. at 9,000 r.p.m.
Max. torque: 44 ounce-inches at 3,500 r.p.m.
Power rating: ·042 B.H.P. per c.c.
Power/Weight ratio: ·0194 B.H.P. per ounce.

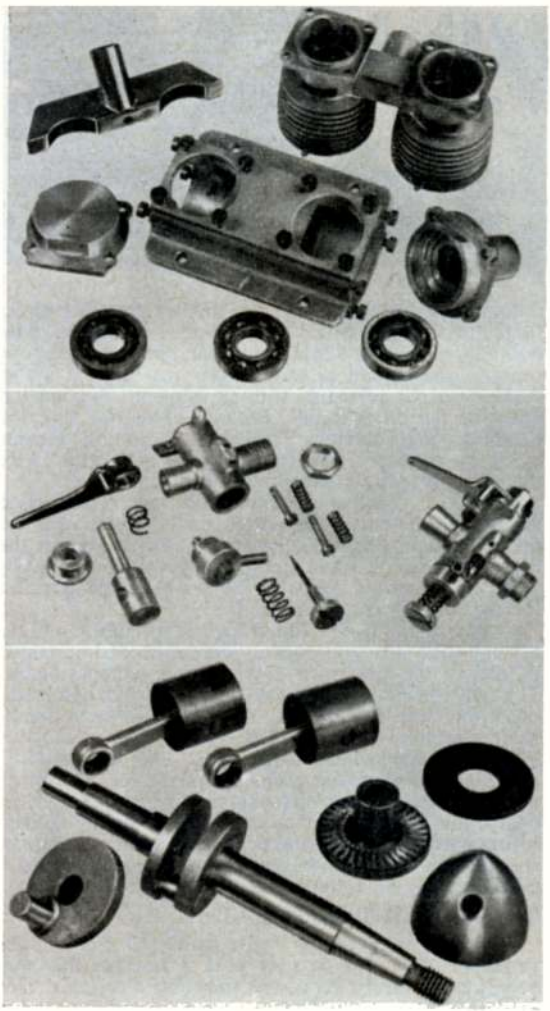
Material specification

Crankcase: light alloy gravity die-casting
Cylinders: hardened steel
Pistons: cast iron
Connecting rods: dural forgings, bronze big end bush
Contra-pistons: cast iron
Crankshaft: hardened steel, split assembly, press fitted hardened steel front drive shaft
Bearings: main crankshaft—twin ball races
front drive shaft—one ball race, bronze bush at front
Carburettor: body—gravity die casting
fabricated components in dural and brass

Manufacturers:

THE BIRCHINGTON ENGINEERING CO. LTD.
Albion Road, Birchington, Kent

Retail Price: £8 12s.

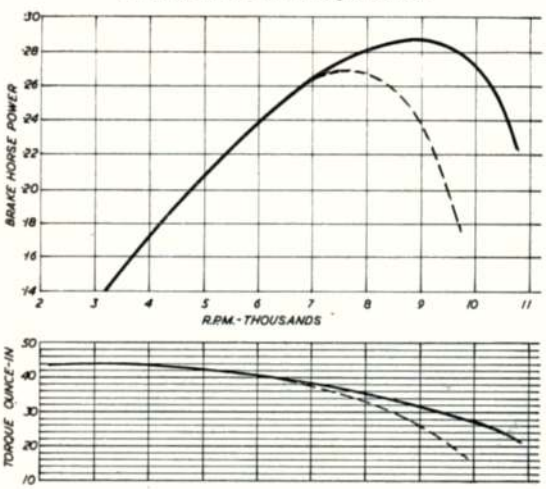


Sturdiness is the keynote of this Twin design. Note the three ball bearings for the crankshaft, the ample cylinder facing area on the crankcase and the stout bridging of the two cylinders with the common intake duct. At top left is the exhaust collector with tube adaptor to lead off all exhaust mess.

At right is a complete carburettor assembly and at left the parts as dismantled. Birchington Engineering specially cold drawn working parts in this very efficient unit on exclusive machinery, ensuring close tolerance work.

"Working" parts of the Taplin Twin show the shaft assembly, plain pistons and drive washer. Some components are adapted from the popular E.D. 346 unit, but it should be emphasised that cylinders in particular are quite different and are not interchangeable with the single cylinder motor.

Below: B.H.P. and Torque curves



shaft is housed in a separate bearing unit bolted to the front of the crankcase. A ball bearing is provided at the rear end, whilst the front end of the journal is bushed with a bronze sleeve.

The two cylinders are joined by a fabricated induction manifold, soldered in place and this assembly bolts directly on to the crankcase. Induction ports are cut in the walls of the cylinders, being of very moderate area. Two transfer ports are machined side-by-side up each cylinder on the opposite side to the exhaust. A fabricated exhaust manifold attaches with a bolt to collect the exhaust and is sealed with a gasket. Gasket edges are very thin and appear rather prone to failure, but the arrangement does produce a basically "clean" engine, particularly as a rubber tube extension can be used to drain away waste. A point of significance here, is that with sideport engines, in particular, an extension of the exhaust in this manner can have a marked effect on performance (both good or bad). By trimming the length of the extension pipe a little at a time, an optimum length can usually be found giving a measurable increase in r.p.m.

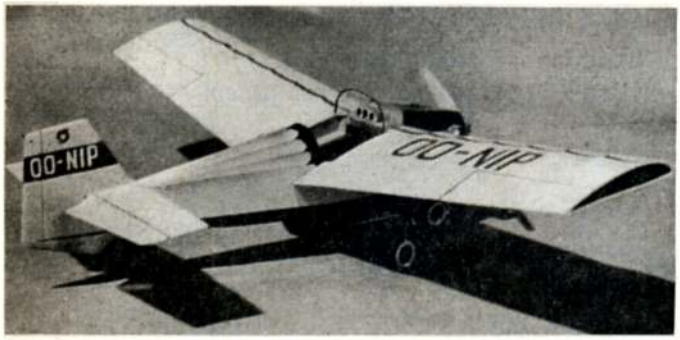
The carburettor body, which screws into the induction manifold, is a gravity die-casting. The barrel valve is cold drawn from dural and the throttle arm locked to it with a grub screw (Allen head). Adjusting screws are brass, also the fuel tube and jet tube. The needle is soldered to a brass screw and the adjusting screw at the top turned from dural and knurled.

The piston and connecting rod assemblies follow standard E.D. 346 practice, also the cylinder heads, the propeller driver and spinner nut are from the same source. Gaskets are used at all crankcase joints.

Summarising, a most interesting design of engine, well made, and with the amount of work that goes into it, certainly anything but expensive at the price quoted for it. In addition it is remarkably economic on fuel.

Radio controllability

The alternate firing cylinders tend to minimise vibration, but we found the vibration level fairly marked on a non-rigid rig. Starting and handling characteristics are exceptionally easy with larger propeller sizes—provided you leave the compression settings alone once established. The throttle control is very sweet and smooth in operation—and you really can let the engine "warm up" on half throttle. Safe idling speed is about 2,000 r.p.m. minimum, at which speed very little thrust is being generated and there is little point in trying to get it to run slower still, and it two-strokes all down the scale. Ideal in this respect for radio control, except that its high weight is not in its favour for a fully aerobatic model. It would certainly fly a large, heavy model through simple manoeuvres and we would advise an all-up weight limitation of about 6½ lb. for full-scale aerobatics including the outside loops. For modellers who have a dislike of "screaming power" and want a really flexible engine, the Taplin Twin should suit them admirably.



There's no doubting the "model" lines of the Nipper prototype. Bottom view shows detachable wing feature and sketches aid simple construction

Build a TIPSY NIPPER

full-size plans overleaf for C. C. Badger's model

AS A MODEL PROJECT the Nipper catches the eye because of its simple lines and ideal proportions. Though rather heavy at eight ounces for its 24-in. span, the model flies fast and is tough enough to withstand those early trimming prangs.

Construction of the wings is quite straightforward following the normal ribs over spar technique, trailing edge, then leading edge additions. Ensure that correct amount of washout (¼ in.) is in each wing panel (made separately) when pinned down for doping. Note that the rear wing dowels are short and the dowel holes in the fuselage are at different heights so that the *port* (left) wing has a greater angle of incidence.

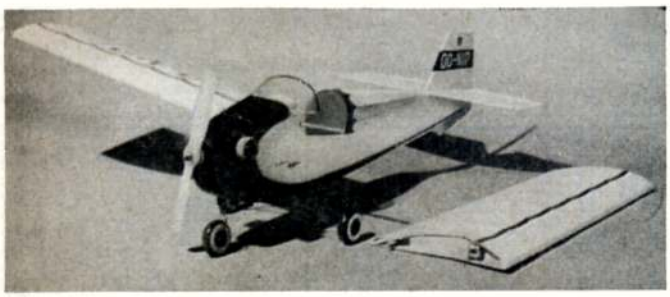
Start the fuselage construction with F.2 and glue the dowel box to it, next fit the 3/32 in. thick sheet balsa sides to the former and also add F.3. Whilst this assembly is drying, glue the ply nose former and engine bearer onto F.1. Now bring the two assemblies together and fill the space between the engine mount and the fuselage side with soft balsa block.

Next pull the rear ends of the fuselage together and add F.4, F.5 and F.6. At this stage the rear dowel plates and the ply support for the rear u/c legs should be glued in position. Now bind and glue the nose leg and the rear leg into position. Next stage is to add the stringers to the top of the fuselage and also the soft block fairings to the base. The Nipper is now ready for the top cowling, instrument panel and the remaining undercarriage leg.

One of the three legs to each rear wheel on the real aircraft has been omitted to save a little weight.

Hinges for the elevator trim tabs can be made simply by pushing a pin right through the tab and into the tailplane and then snipping off the head. The tab can then be bent up or down and will stay fixed. Hinge the rudder tab in a similar way.

Finish the model with two coats of clear dope for flight trials.



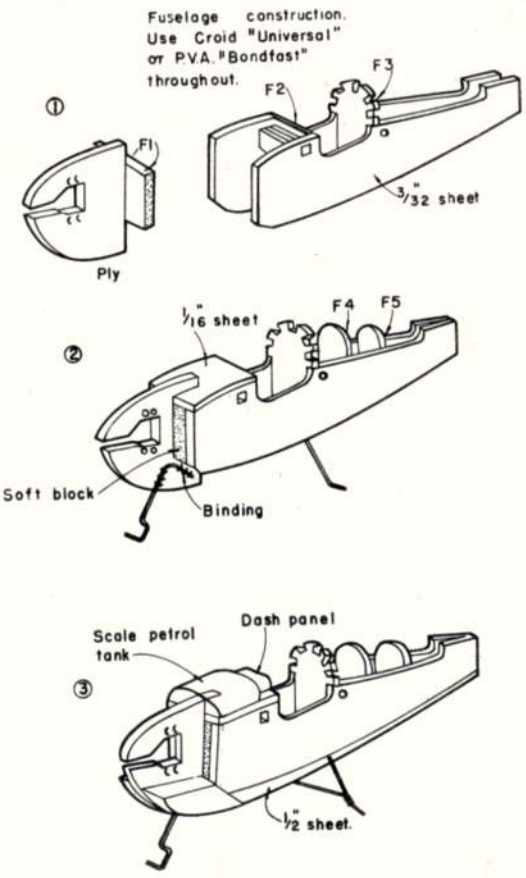
Detailed plans for a 36-in. version to suit 1 c.c. are available as plan FSP/731, price 5s. 6d. from *Aeromodeller* Plans Service.

Add weight to the nose or tail until the model balances where indicated on the plan (no weight was required on the prototype). Check the washout and the greater angle of incidence on the port wing. Now bend the rudder trim 1/16 in. to port (left) and test glide.

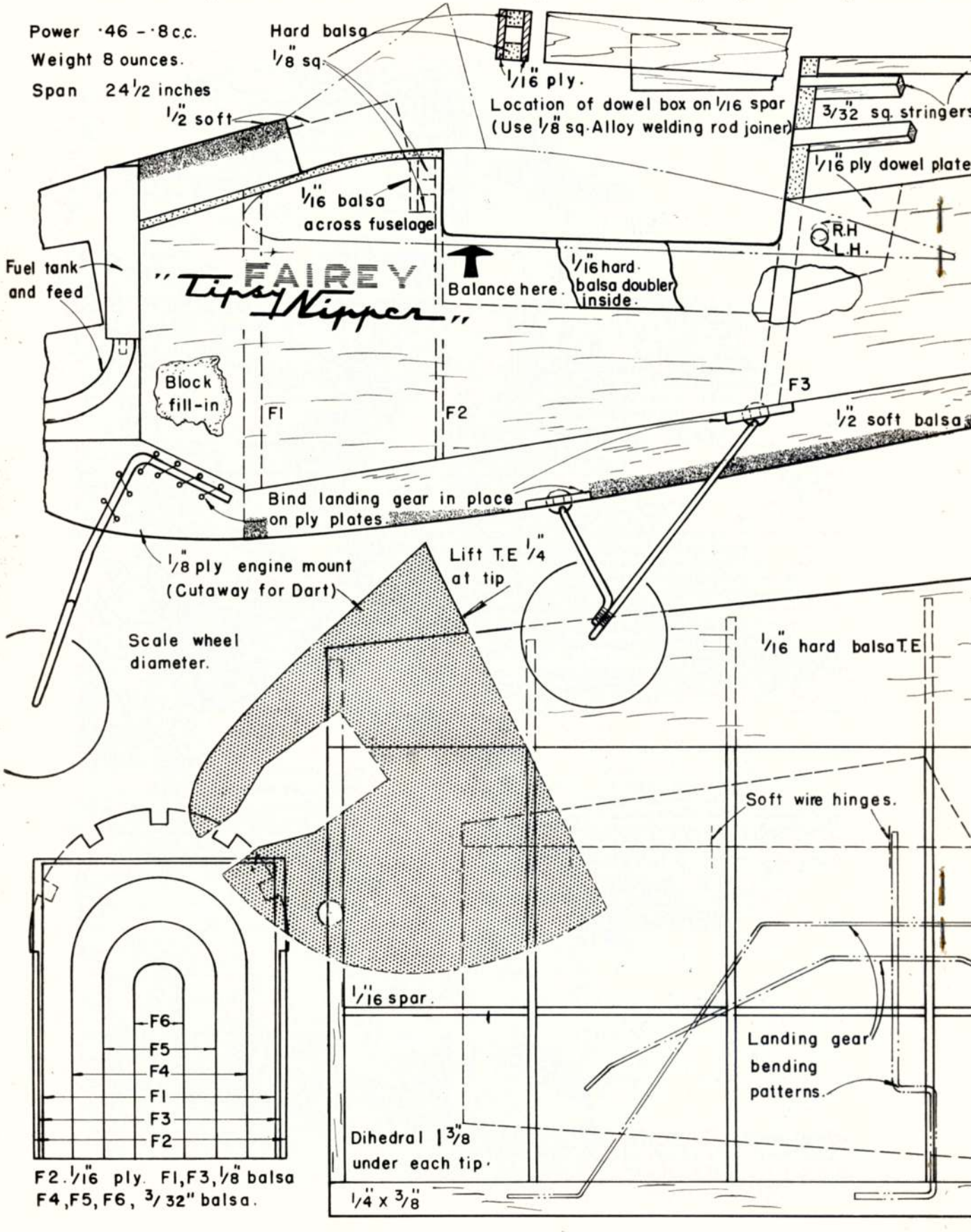
Launch the model fast and level. The glide from a *hand* launch should be *straight* and quite flat. When the glide is reasonable (the prototype required 1/16 in. "up" on each elevator) try a short power flight. Use full power from the beginning with a 6 x 4 in. nylon airscrew on back to front (the actual engine used was a D.C. Dart ·5 c.c.). Launch the model level again and it should go away in a climb to the left in circles of about 80-ft. diameter. When the motor cuts the model will settle into a gentle right hand turn. Correct any stall with the *motor running* by increasing the left rudder, then trim out the *glide* with the *elevators*.

When flying is to a satisfactory stage, the model may be fully decorated. On the prototype model, Powder Blue and Black Valspar was used for the two-colour scheme with green lettering on the wings and white on the fin. Tyre walls are rings of drawing paper!

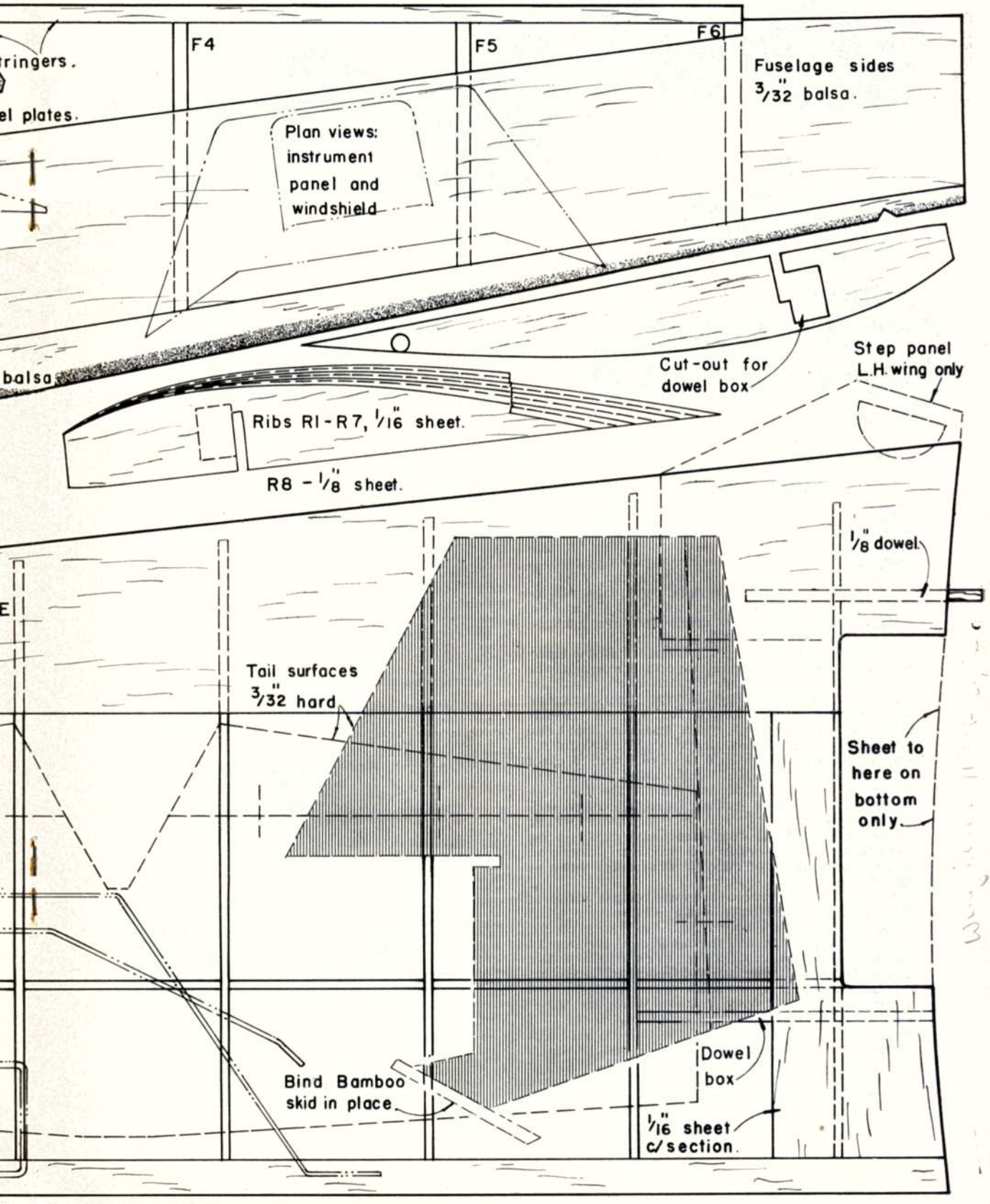
The ⅛ in. square aluminium welding rod for use as the main wing dowel, is easily obtainable from garages or engineering works, where welding is carried out, but can be replaced by round wooden dowel in the event of difficulty.



This drawing is actual size for ·46 to ·8 c.c. (·020-·049 cu. in.) engines. A 1½ times enlar



s enlargement for a 36″ model to suit 1 c.c. engines is available as plan FSP/731, 5/6d.



Tipsy NIPPER

AIRCRAFT DESCRIBED No. 95

... by R. G. MOULTON

"As you can see," said Martin Tips, "it will outmanoeuvre a jeep on the ground"—and so saying, he proceeded to pirouette the delightful little Nipper around its ground-hugging rear wheels, with the Hepu-Volkswagen engine turning the prop at a mere flutter of revs.

This was our introduction to his father's, (Ernest O. Tips whose monogram and fin-mark appear above), sixty-sixth design in its current production form. It sells ready-to-fly and fully instrumented with 40-horse power motor at £818 ex-Gosselies in Belgium, can be bought in part pre-fabbed kits in a packing crate that serves for assembly jigs at £375 for the airframe, and has been the subject of the most intensive design study ever made on a single-seater private aircraft.

But it was not on the ground alone that this enterprising side of Avions Fairey were to demonstrate the Nipper for Aeromodeller. Bernard Neefs, chief test pilot at the Belgian factory took the bright flame and white mini-racer aloft for a "Farnborough" display circuit to show off its 95 m.p.h. maximum speed and admirable manoeuvrability. In special tests, Bernard has had the Nipper through eight turns of a spin in either direction, dived it at over 155 m.p.h. and made pull-outs up to 7·4 G. The strength and stability are thus well-proved, and the clever incidental design features, such as the independent long travel wheel legs on the tricycle undercarriage and the downward vision panels in the wing roots, the disc brakes and nosewheel steering all add up to the result of many years of design study by Mr. Tips.

When it first appeared in open cockpit form, as sketched above, the Nipper bore a utilitarian air. Much as its new lines were appreciated, the pilot exposure, shallow rear fuselage, and the squared-off surfaces did not appeal to potential customers as much as expected. The re-design of the fuselage to "Goodyear" racer lines changed its character immediately, and the additional streamlining improved performance. When one stands beside the little airframe, thoughts of Continental C-85 installation immediately spring to mind: but such cannot be, as it was E. O. Tips' intention that the Nipper was a mount for the relatively impecunious aviator for sport, as distinct from speed flying, and there is an engine weight limitation of 125 lb.

Of mixed construction, the Nipper has a welded steel tube fuselage with perfectly straight bottom longerons and the upper longerons shaped to set the wing and tail angles. Sides are warren braced and at the nose, an apex of tubes supports the nose leg and its simple but most effective steering gear. Wooden stringers are taped to the light gauge hoops which shape the fuselage spine, and glass fibre cowlings cover the Volkswagen engine.

Whilst the first Nipper had a one-piece wing, the second version uses two separate half panels, with flange bolts positioned in a comforting position on the spar centre immediately in front of the pilot. This hefty spar runs from tip to tip in its rectangular form and so flattens off the NACA 23 series airfoil at point of maximum depth—which just goes to show what one can do with airfoils! The leading edges are sheathed in 1 mm. ply, and fabric covering avoids rib taping by the traditional Tipsy system of gluing directly on to wide rib booms.

There is no doubt that with continued development in small engines, the Nipper will appear in increasing numbers in years to come.

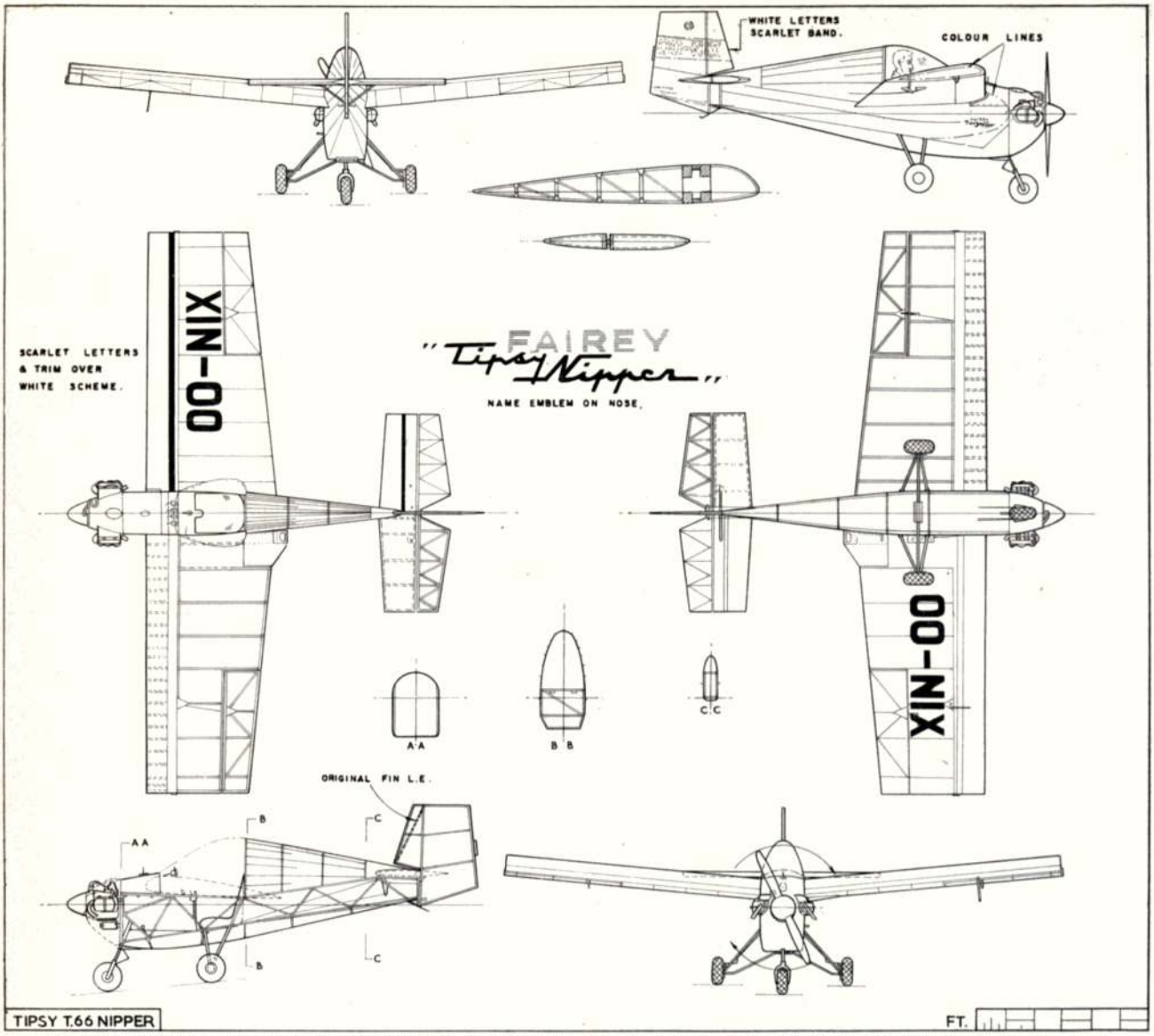
DATA

Span: 19 ft. 8 in. Length: 14 ft. 9 in. Height: 5 ft. 3 in. Weight empty: 360 lb. Engine weight (VW) plus accessories (included above): 125 lb. Maximum designed weight: 660 lb. Wing area: 80·5 sq. ft. Aspect ratio: 4.8. Mean aerodynamic chord: 4 ft. 1¼in. Wing dihedral (spar bottom face): 5° 30'.

PERFORMANCE

Take-off speed: 38 m.p.h. Take-off run: 150 yards. Landing speed: 38 m.p.h. Landing run: 100 yards. Cruising speed: 85 m.p.h. Maximum speed: 95 m.p.h.

Heading pics and this view show small size of the Nipper beside Martin Tips. Compare drawing opp. with other 1/72nd scale drawings for interest. Note novel step in wing root. Cockpit cover hinges to the right for entry



TIPSY T.66 NIPPER

FT.

"J" TYPE 1/72ND SCALE REPRINTS OF THIS DRAWING AND "K" TYPE 1/36TH SCALE TYPE DYE-LINE PRINTS ARE AVAILABLE PRICE 6d. AND 1/- RESPECTIVELY FROM THE AEROMODELLER PLANS SERVICE. QUOTE PLAN No. 2721 WHEN ORDERING AND ADD 6d. POSTAGE

BOOK REVIEW

by P. L. GRAY

A NEW REFERENCE BOOK FOR AEROPHILES:

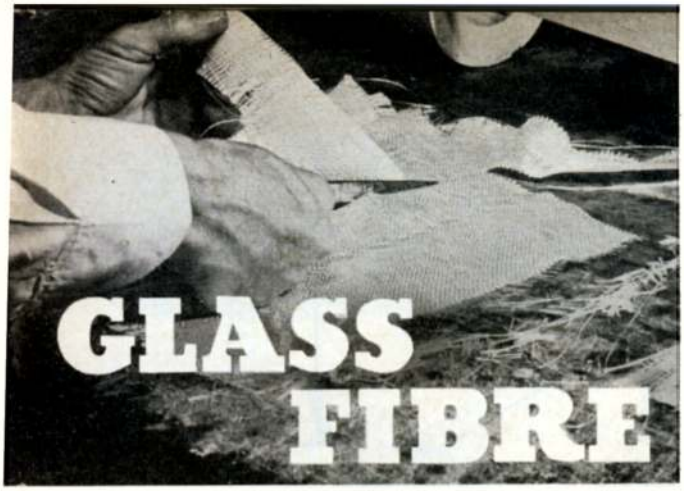
"Die Entwicklung der Flugzeuge 1914-1918" *by* H. J. NOWARRA. 143 *pages*, 145 *illustrations, published by J. F. Lehmanns Verlag, Munchen*, 45*s*.

THIS PLASTIC BOUND 8 in. x 5 in. book of some 144 pages, is printed on art paper and has text in German with English translation of the Foreword and headings to the data columns. It consists mainly of tabulated lists of aircraft built by the major countries involved in the 1914-1918 War, with columns provided for Type, Power, Purpose, Overall Dimensions (which are metric throughout), Weights, Performance, and Remarks. About half the book deals with German aircraft and the remainder with the other powers. Inevitably there are gaps, nevertheless the types listed are reasonably comprehensive, although there are all too many columns devoid of any data. One would have thought that more gen on the German types at least, was available to the author.

There are inconsistencies in the tables, *i.e.*, while the D.H.4 is included in all its variety of engine installations, the Vickers Vimy is not. It is simply listed in its Hispano engined version, the R/R Eagle VIII which fired most Vimys is not mentioned, neither are the Fiat or Liberty versions. Throughout the book columns are included for Take-off and Landing speeds, but there are only sixty-one entries in respect of these (out of a possible 3,500 approx.) which seems to indicate these columns could well have been left out and the extra space allotted to the Remarks column. Complete examination of data for accuracy was not possible, but spot check revealed some errors such as Albatros D. III span being shown as 9·0 m. instead of 9·05 m. and Span and Length of Albatros D. Va being shown as 9·5 m. and 8·26 m. respectively when correct figures should be Span 9·05 m. (wings were interchangeable with D. III) and Length 7·33 m. More use could have been made of the Remarks column to indicate differences between very similar types, *i.e.*, attention could have been drawn to Halberstadt D. II, having angular centre-section cut-out and the D. III having semi-circular cut-out; and that Halberstadt C. IX was virtually a C. V fitted with Austrian Heiro motor, etc., etc.

The illustrations, on which a book of this type so largely depends, are nearly all retouched and very badly done too, in some instances completely altering the characteristics of the aircraft depicted. The D.H.4 is minus tailskid and rear undercarriage legs, A.G.O. C. IV is without complete exhaust manifold assembly, SSW D. I is minus tailskid and fairing, and these are by no means the worst efforts. It is a peculiar fact but almost all of the land machines have had their tailskids removed by the retoucher! In view of the price of this book, it is thought a far superior standard of photo reproduction could have been achieved. Some captions are at fault too, the S.E. illustrated is a Vickers built 5A and not a 5.

To sum up, it might be said that this is a praiseworthy effort to provide a concise pocket reference to all the main aircraft of W.W. I, negatived to some extent by the selection and quality of the photographs.



Make that model indestructible by following this 'how-to-do-it' feature on reinforcement of nose cowls, wheel pants or wing tips

. . . by Pat Wheeler

GLASS-FIBRE reinforced plastics have many applications in aeromodelling and they offer a degree of strength and durability far better than more common materials for certain functions. Its main use is the making of reinforcing for curved surfaces and as it will take much more punishment than the same weight of plywood it is excellent for belly or chin skids. For this purpose it must be moulded direct on to the *wood*, neither silk nor paper; wet dope or thinners will stop its setting, so be sure everything is dry and sanded smooth without any grease marks.

To do a neat job it is essential to have everything ready beforehand. This means cutting the glass material to shape. It pulls easily round double-curved surfaces, but does not form well into or over corners. Try to disturb the weft and warp as little as possible when cutting woven fabrics, as the threads pull out very easily. Whatever you are making, presuming you are not going to all the trouble of a female mould, cut some thin polythene sheet about 1 in.-2 in. larger all round, get a roll of cellulose tape on a self-dispenser, a clean but well-used 1 in. paint brush (if brand new, you may find yourself battling to remove hairs that the resin has pulled out of it). Place another piece of polythene or cellophane flat on the workbench beside the part to be moulded or covered. Using a weighing scale marked in fractions of an ounce (preferably 1/16th), for this a letter-scale is ideal. Clean a tin large enough to take your mixture of resin and catalyst, have a piece of metal or glass as a paddle for mixing (old hack-saw blade), an old spoon for ladling, and thinners in an open tin with a cloth for cleaning up.

This glass fibre hardens (or sets) at "room temperature", between 60-70 deg. F.; on a hot day it will set faster than anticipated and in cold weather you may watch it for hours wondering what went wrong, only to find it all nice and hard the next morning. Generally a cold day is better than a hot one, so in the tropics do it at night and in the Arctic wait for summer!

Nevertheless you have a measure of control over the setting time by determining how much catalyst (hardener) you add. This is almost always methyl-ethyl-ketone-peroxide. Two per cent. will solidify the mixture in ten minutes, ¼-½ per cent. will give from just under an hour to several hours to play with. Aim for ½ per cent., say between $\frac{1}{16}$ and ⅛ oz. per ounce of resin. Kits of resin and glass give instructions regarding the number of drops per ounce to use; if you buy it this way, follow these directions, of course, erring on the side of too little.

Prop the model firmly with the part to be done upwards and as near flat as convenient. Lay the tailored material on the polythene on the board. Weigh out 4 oz. of resin per square foot of material, not forgetting to weigh the tin first; add the right amount of catalyst and stir thoroughly *at once*. Using the brush or spoon, ladle the mixture on to the glass and start to work the resin through until the glass "disappears" showing that the resin is soaked. As soon as you have an even coat right through, brush a coat on the model, then pick up the glass by holding the edges of the sheet and turn it over on to the resin-coated part. With the sheet still on top move the glass around until it is in the right place.

Starting at one end and working steadily towards the other, push it down firmly into place. If the coat of resin is very thick you may not need to remove this sheet of polythene so as to add more resin. Add more resin to the top surface only if there does not appear to be enough to fill the glass, but do not replace the old sheet of polythene—use a fresh piece. The idea behind this procedure is to finish up with just enough resin to fill the glass without there being any air bubbles in it; getting rid of the bubbles is the trickiest part. It has to be done fast as the resin sets up much faster away from the inhibiting influence of air.

As soon as you are satisfied that you have everything in the right place tape down one end of the polythene to the model so that it cannot be moved when pulled. The air bubbles will be visible through the sheet; working again from one end along the middle and from the middle to the side edges, push the air bubbles to the edges with your thumb, finger, clean spoon or some other rounded object. As the bubbles leave one section, tape it down round the edges, pulling them to get rid of wrinkles in the sheet. You will be surprised how far you can pull the polythene without breaking it provided you don't snag it on something. Here also you are aiming at a smooth finished surface that does not need sanding when finished. Keep your fingers clean with thinners and wipe away excess resin that gets pushed out from the edges. Work quickly as once the resin starts to gel you've "had it".

As it gells it gets warm (called an exotherm); this is the result of the chemical reaction called polymerisation,

Heading: Cutting cloth to shape. (2) Items prepared, weight of tin balanced, resin, catalyst, tools and two fuselages. (3) Measuring resin and catalyst into mixing tin. (4) Spreading resin on glass cloth over polythene with spoon



(5) Laying cloth over model with rolling action to remove air bubbles. (6) Spreading firm prior to taping polythene in place. (7) Forty minutes later, polythene is peeled off when resin has gelled

i.e., forming the resin molecules into long strong chains which give the compound its strength. Wait for this to pass, about two hours, before taking off the top sheet. After peeling it off trim away excess resin around edges with a blade; this is easiest to do if you catch it while it is still quite soft; at this stage, too, you can leave finger prints, so be careful.

Wait at least 12 hours before covering or painting; the resin is quite fuel-proof once it has aged in three weeks, but a week will do.

Making cowling, wheel pants, wing-tips or even complete fuselages is a longer process because it must be done in two stages to make it worthwhile. First make a pattern of the finished article in any material you prefer, the outside surface of which must be reasonably hard and as well-finished as the piece you want to reproduce. Balsa is suitable provided it has at least six coats of filler and paint properly rubbed down to exclude any grain or joint marks. Mount it on a board so that it will stand. Mark where the joints in the female mould are going to be and make and attach "fences" of balsa, cardboard or aluminium with tape and struts to the board. They must fit very well indeed to the pattern so that no resin can squeeze under them.

The next step is to wax the mould and the fences thoroughly: use a hard wax containing a high percentage of carnauba wax and polish several times using elbow grease. This prevents the resin sticking to the pattern, called a "release agent". If the wax is "white" it may prevent the resin from setting. A liquid that can be used (best in combination with wax) is polyvinyl alcohol mixed with water so that several coats can be sprayed on, then waxed after. The advantage of this stuff is that it can be dissolved out to release the mould by pouring in water. There is then less chance of the fibre-glass being broken when the mould is "sprung" away from the pattern.

Done all that? Right! Mix a small quantity of resin-catalyst and paint on a couple of coats on the waxed pattern and let it dry. Straightaway apply another coat and put on your tailored, resin-filled glass, either ·009" cloth or 1 or 1½ oz. mat. Don't worry about the look of the outside, just be sure there are no wrinkles in the material and as few bubbles as possible; work the resin well in with the brush. When the first section has set, remove the fence and polish the section exposed by its removal so that it will not stick to the next.

When all sections are complete, drill and bolt through all flanges and leave to harden overnight. Remove the bolts and insert a table-knife between the flanges to spring the parts apart. Go carefully for you do not want to cause any cracks in the surface. It may spring a bit and then suddenly flip off. If you have to use any real strength it means it has stuck to the pattern somewhere; your polishing wasn't good enough. If the mould peels off or is tacky on the inside, your polish wasn't rubbed hard enough or it's the wrong polish. Damaged parts of the inside surface of the mould can be repaired sometimes by scraping away the "bad" part and filling with resin and sanding smooth.

Examine the inside of the mould for bubbles larger than $\frac{1}{16}$ in. near the surface; see if you can prick them with a pin. If so, clean them out and fill and sand smooth.

It is handy now to bolt the mould parts back together and build a jig around them of wood that will help hold it steady while you make the finished article inside it, unless it is so small you can hold it in one hand while you work with the other.

Here you repeat the female process inside out; the female must be polished up (including the flanges). Give it two gel coats for this is your finished article and no glass must show on the surface; use a light weave of glass cloth or reinforce. The more trouble you take in tailoring it the easier your job inside the mould. As soon as a portion is covered add pieces of polythene to smooth the inner surface and to exclude air.

Trim with a hacksaw blade and file but be careful of *glass dust:* DON'T blow it about, it can give you a nasty rash on the skin at your collar and cuffs. Remember to put all utensils into thinners straight after use, wash in soap and water, rinse and dry well before using again.

If your pattern was good you will be amazed at the finished job.

(8) Whilst still soft, excess resin is trimmed away. (9) Work at different angles to obtain smooth edge to glass covering. (10) Now leave to harden, fill pores, if any, sandpaper and paint



TOP COMBAT DESIGN OF 1958 . . by P. N. TRIBE

RAZOR BLADE

INTRODUCED WITH THE STORY BEHIND THE OUTSTANDING SUCCESS OF KENTON AND NORTHWOOD CLUBS IN 1958 COMBAT

1st, 2nd, 3rd, 4th, 5th, *High Wycombe.*
2nd,* *Nationals.*
1st, 2nd,* *Godalming.*
1st, 2nd, *Enfield.*
1st, 2nd, *Halton.*
2nd*, *Cranfield.*
2nd*, *Wanstead.*
1st*, 2nd*, 3rd, *Dagenham.*
1st*, *Beaulieu.*
1st, 2nd, 3rd, 4th, 5th, *Ashford.*

* WITH RAZOR BLADE

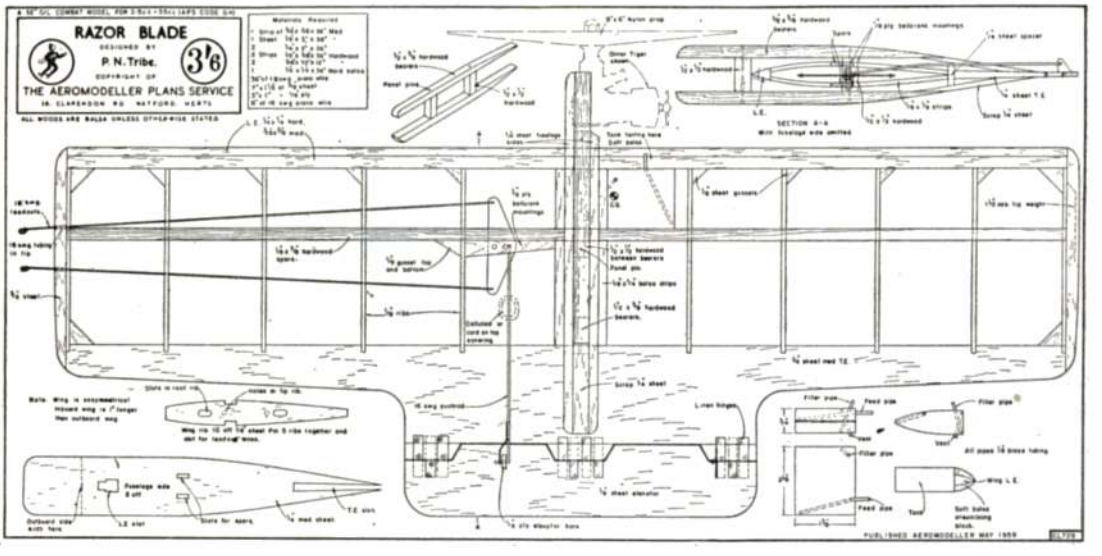
COMBAT TODAY is rapidly becoming a specialised branch of aeromodelling, and one needs more than luck to gain consistent places at rallies. Over the past few years both speed and manoeuvrability of models has increased tremendously, and the winner of a heat is not now the one whose model stays in the air longest, but the one with the greatest ability. Pit-crews, too, must now be competent and their co-operation is vital to success. Indeed, their role has become as important as the put-crews in team racing.

Sooner or later, anyone who can fly a control-line model reasonably well is tempted to try his hand at combat flying, but it is useless to enter contests in this haphazard fashion as one should certainly have some previous practice with one's club mates.

To enjoy combat one must be prepared to lose models and lines, and, on rare occasions, even engines. The rate at which models are destroyed is sometimes astonishing, and it is for this reason that models such as "*Razor-Blade*" have been evolved, which, while being both cheap and extremely quick to build, retain the speed, manoeuvrability and strength required of a modern combat model. It is here that the wing has innumerable advantages over the conventional model. They can be made smaller and lighter than their tailed counterparts which makes them far less susceptible to damage, and this fact has been proved repeatedly during line tangles and mid-air collisions.

The wings used by Kenton and Northwood Clubs in combat are definitely not for the beginner as they fly at a speed approaching 80 m.p.h., and are unexpectedly snappy, but after their characteristics have been learned they prove formidable weapons in any company. To attain these high speeds a good racing diesel is indispensable. Engines such as these are rather expensive, but are really essential to achieve the first flick starting and power that is now necessary. It is advisable to experiment with fuels and settle on one formula to obtain maximum performance, and having found the correct mixture one should keep to it so that the engine settings

FULL SIZE COPIES OF THIS 1/6th SCALE REPRODUCTION ARE AVAILABLE AS PLAN CL/729, PRICE 3/6d. PLUS 6d. POST FROM AEROMODELLER PLANS SERVICE



need never be altered. Naturally, really hot fuels are not cheap, but if they afford any additional power they are well worth the added expense.

The basic idea in combat is to get behind your opponent's model with your own and the best way to do this is to have a model which is capable of flying high while maintaining speed. One can in fact win a combat by using this method alone, without resorting to complex manoeuvres, although this depends on the individual. Basic stunt manoeuvres are, of course, advantageous if one gets into difficulties. On no account should one fly low to avoid an opponent as he will almost certainly seize this opportunity to obtain a few easy cuts. This fact cannot be stressed too much. If you fly low you make an easy target. If you fly high you go round the circuit faster and therefore catch up with your opponent's model much quicker and can cut up and down through his streamer and be away before he is able to take avoiding action.

If one is unfortunate enough to be on the defensive, it is always better to do the unexpected, such as a bunt. But a word of warning! If you loop or bunt, always fly half a lap inverted before you pull out, or you will be in as bad a position as before, and if you judge it correctly you can completely reverse the position.

A word here about contest procedure. When one arrives at the venue, after making certain one has entered, it is a good plan to have a test flight to make sure everything is as it should be. Having completed this, several spare sets of lines should be made ready, and a final check on tool-kits made, to ensure that everything is in its correct place for immediate access. These tool-kits should contain anything that can conceivably help to repair a damaged model and get it flying again. A short list of the most needed of these are:

(*a*) Spare propellers (9 x 6 nylon advised) with spinner fitted and spanner to fit.
(*b*) Several spare sets of lines with handles.
(*c*) Screw-driver.
(*d*) Heavy pliers in case shaft gets knocked back.
(*e*) Spare compression screws, spray-bars and needle-valves.
(*f*) Several pieces of fuel-tubing cut to the correct length.
(*g*) Spare elevator horn mounted on hard balsa so that it can be pinned on elevator in seconds.
(*h*) Box of pins.
(*i*) Half a sheet of tissue for wrapping around a damaged wing.
(*j*) The little tin that most aeromodellers have containing the odd bits and pieces accumulated over the years.

Many of these things may seem unnecessary, but many a combat has been lost through not preparing this simple layout.

After being called for your heat, one should proceed to the flight circle. The pit-crew attach the streamer and warm-up the engine, while the pilot has a last-minute check on the control system and lines. Individual engines need different periods of warming-up, so that they start instantaneously and do not "miss" during the first few circuits. The pit-crew must practice until they attain perfection. Every effort must be made to be the first in the air, as it undoubtedly gives one the advantage.

Now for building your combat model:

Two medium-hard balsa fuselage sides are first cut from the opposite ends of a quarter-inch sheet (the T.E. is formed from the remainder) and the slots cut. Engine bearers are planed to shape and the two hardwood cross-pieces are cut to length and then glued and nailed to the bearers as shown. Fuselage sides are then stuck to each side of the bearers, after pre-cementing and firmly pinned. While this is setting the ten ribs can be cut from the medium $\frac{1}{8}$ in. sheet and the spars and L.E. can be cut to length.

The wing T.E. is cut to shape from the $\frac{1}{4}$ in. sheet and is sanded to a streamline section on the wing and ending $\frac{1}{8}$ in. thick at the centre-section. The $\frac{1}{8}$ in. slots are also cut into the T.E. for the ribs. When the fuselage has set it can be sanded smooth and the L.E. and spars can be slotted through and stuck firmly. The two end ribs are then added to line-up the spars, and great care must be taken to prevent warps at this stage. The T.E. is then stuck in and the ribs forced in and glued firmly.

The elevator is then attached using $\frac{3}{8}$ in. tape. Add the control system and adjust this until there is not more than 30 to 40 degrees total elevator movement or the model will "shudder" while looping. Gussets, wing tips and $\frac{1}{8}$ in. x $\frac{1}{4}$ in. strips are then added to the model and the tank is also placed in position and soft balsa block placed around to streamline it. The whole model is then sanded down prior to covering.

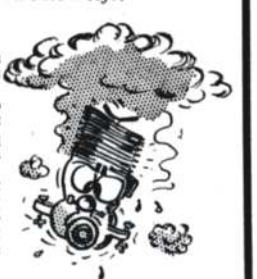
Covering

The method found best for covering was to cover the model in the usual way with silk and give this a light coat of clear dope. Strips of bandage are doped along the total length of the fuselage, and also on the outboard wing-tip (fibre-glass can be used). After the dope has dried on the silk, a piece of "lightweight" tissue is cut to the approximate shape of one wing-panel. It is then placed flat in a bowl of water, lifted out carefully and laid on the wing and then pulled tight. Dope is then applied around the edge. This is done to the three other panels. When the tissue is dry it is given two or three coats of clear dope, and can then be colour doped. Alternatively, coloured "lightweight" tissue can be used to produce different colour schemes. Several coats of clear dope on the bandaged fuselage, or balsa cement smeared on, produce a good finish when colour doped.

what's the answer?

I WISH you could help our radio section with this particular problem. We are all plagued by engine vibration, despite the fact that we have got down to balancing propellers carefully and the like. Could not engine designers help by producing properly balanced engines in the first place?

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



Answer.—It is a practical impossibility to produce a perfectly balanced single-cylinder reciprocating engine. Offsetting the weight of the reciprocating parts with a balance weight (or counterbalance section) on the crank web is really only a gesture, not an answer, although it can help in reducing some of the vibration. Reducing the weight of the reciprocating parts is also a help (*e.g.*, a light piston).

Usually a wooden propeller is less likely to enhance engine vibration than a plastic one, first because it is lighter and second because it can be balanced quite readily. Even plastic mouldings are not perfectly homogeneous and may often be badly out of balance, as manufactured, or even asymmetric in the geometric sense through warping.

If an engine does vibrate badly with a particular propeller, then re-positioning the propeller half a turn round on the shaft (*i.e.*, turning through 180 degrees before tightening up again) may help.

SE-5003 Baroudeur

Described by C. W. Cain
Drawn by M. A. Badrocke

NOT ONLY IS THE word Baroudeur hard to spell, it is hard to find in standard French dictionaries*—further, it is hard to find a good reason why this revolutionary single-seat, low-level attack fighter-bomber is not now in full-scale production for N.A.T.O. air forces. Despite vigorous campaigning and practical demonstration to supposedly interested parties, the SE-5003 Baroudeur was not considered for acceptance in the protracted N.A.T.O. trials for a standard lightweight strike fighter. In July, 1955, the only design studies accepted were for the French Breguet Br. 1001 Taon and Dassault Etendard VI, and Italy's Fiat G.91. Following the competition at the *Centre d'Essais en Vol*, Bretigny, in September, 1957, the G.91 was selected as the "first generation"—48 will go to France and 50 each to Germany and Italy. A "second generation" low-level strike fighter will be competed for in the same way in 1960-1. Perhaps we shall see a remodelled version of the Baroudeur in these trials.

What puts the Baroudeur in the category of "revolutionary"? Simply that the design dispenses with conventional methods of take-off and landing. No tricky problems associated with nosewheel-type wheeled undercarriages—just a couple of magnesium main skids, fully-retractable, which have expendable steel shoes and retractable braking and ground manoeuvring hooks fitted in each aft end of the main skids. A retractable skid is also fitted, between the ventral fins. A ribbon-type braking chute is housed in a tail cone just below the rudder. Leading-edge wing slats and B.L.C. plates provide additional aerodynamic control. Otherwise the S.E.-5003 is a straightforward, all-metal design, tailored for its basic low-level high-speed role.

Creator of the Baroudeur is W. J. Jakimiuk, who until the Germans invaded Poland was chief designer of P.Z.L., and whose last Polish fighter was the prototype PZL.50, a radial-engined interceptor like the F.W. 190. Readers will probably know him better as the designer of the DHC-1 Chipmunk.

The home of the Baroudeur is Sud-Aviation's plant at Marseilles-Marignane, where two prototypes and three pre-production aircraft have been constructed.

Baroudeur Chronology—May, 1951, Jakimiuk's first design study for a tactical fighter-bomber (capable of operating from rough terrain unsuited for conventional jet aircraft) found favour with the B.P.M.† From the start the skid undercarriage was envisaged, and in April, 1952, evaluation was started at Persan-Beaumont.

SE-5000 No. 01.—First flight at Istres on August 1st, 1953. Individual letter "B". Power, one 5,280 lb. st. SNECMA Atar 101B. Tested with rocket-powered, tricycle-wheel cradle for take-off. Mach 1·0 on 15.7.54.

SE-5000 No. 02.—First flight, May 12th, 1954. Index letter "J". Power, one 6,170 lb. st. Atar 101C. Max. speed, 646 mp.h. at 19,685 ft. In October, 1955, following certain structural modifications, both aircraft were prepared for a second series of evaluation flights.

SE-5003 No. 1 and No. 2.—These two pre-production Baroudeurs joined the prototypes in a series of tactical tests (May, 1956) conducted by C.E.A.M.‡, during which the Baroudeur was compared favourably with the Dassault Mystere IV A. Ind. letter not known for No. 1 Letter "T" for No. 2. Power, one 6,380 lb. st. Atar 101D-3.

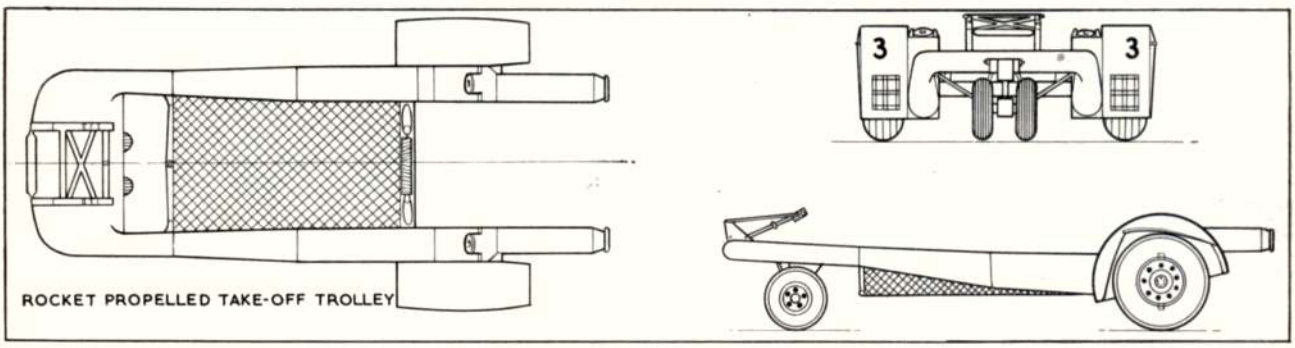
SE-5003 No. 3.—Last of the pre-prod. Baroudeurs. Ind. letter "V". Power, one 7,717 lb. st. Atar 101E-3, later replaced by 8,158 Atar 101E-4. For hard runway use, a wheeled cradle can be fitted and retained in flight, though performance is reduced. *Performance with Atar* 101E-3: Max. (sea level) 683 m.p.h. (Mach 0·98); transonic (in shallow dive) Mach 1·03; climb to 40,000 ft. in 6 min. 50 sec. Take-off on skids, 1,640-1,968 ft. (dry or frozen grass), 1,968-2,132 ft. (thick or very thick grass), 2,625 ft. (muddy grass). 3,280 ft. (heavy chalk soil). Landing on skids, 1,312 ft. (frozen grass) and 1,416-1,968 ft. (very thick grass). *With Atar* 101-4: Gross weight, 13,500 lb. (with 441 Imp. gallons of fuel). Max. speed, 714 m.p.h. With full combat load of two 30 mm. cannon, and underwing two 500 lb. bombs, or Napalm containers, or two multi-rocket pods, grass take-off run is 3,300 ft. and landing run, 1,500 ft.

Span 32' 9½", Length 44' 3", Height 10'.

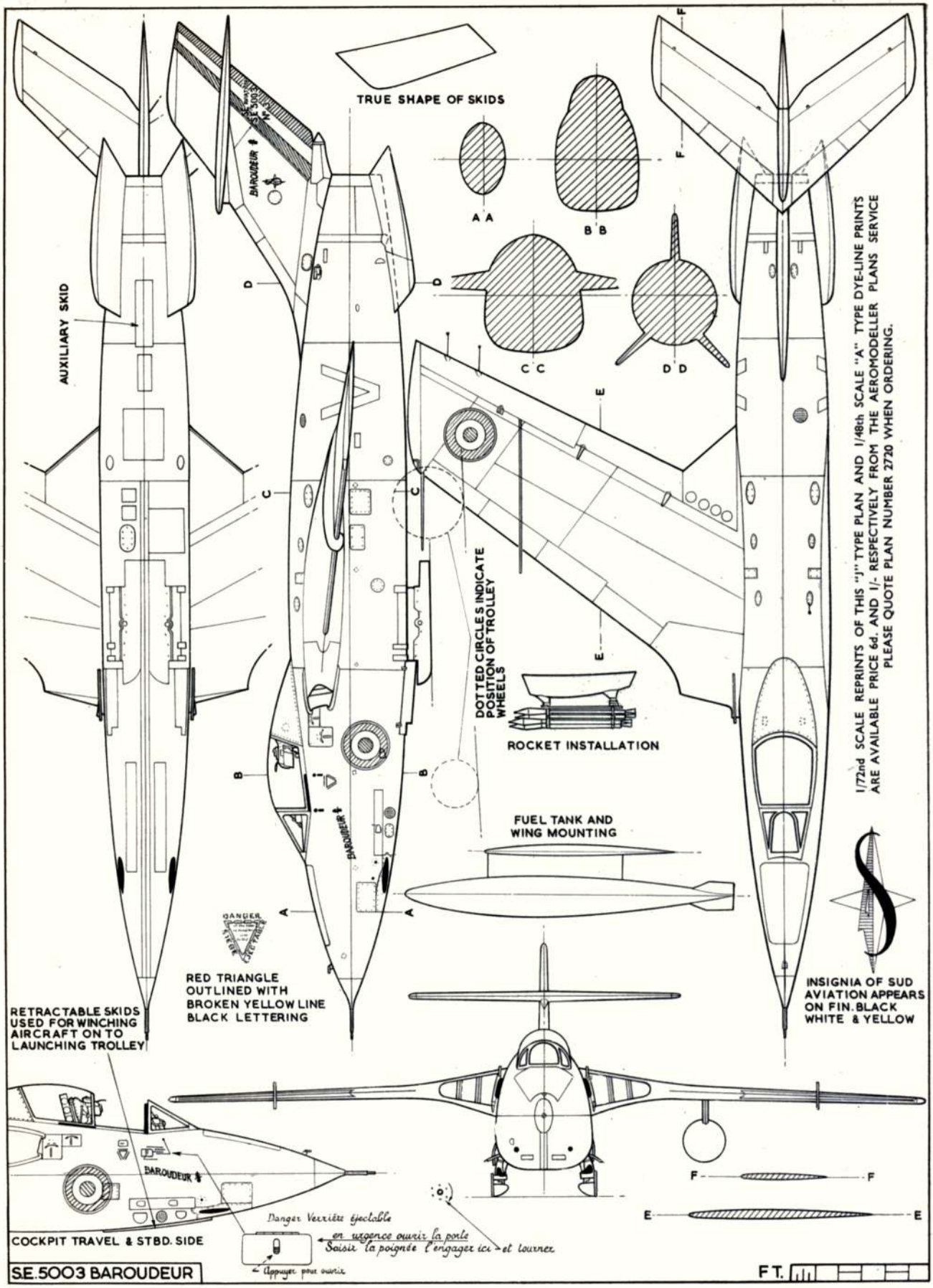
* Baroudeur—*Slang phrase to describe individualistic fighting qualities of the famous French Foreign Legionnaires. From the Arabic* baroud—*battle.*

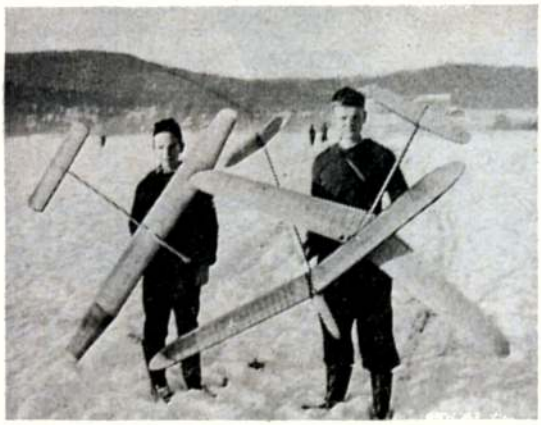
† B.P.M. *or* Bureau des Plans du Materiel *of the French Air Ministry.*

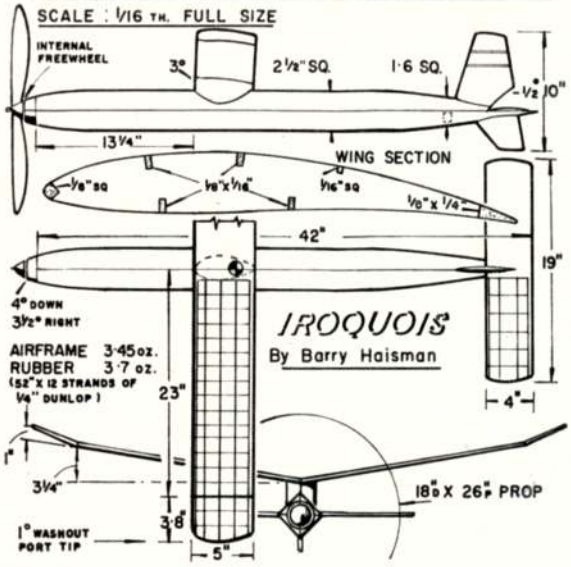
‡ C.E.A.M. *or Centre d'Experiences Aeriennes Militaires, Mont-de-Marsan, the French Air Min. pre-Service evaluation base.*



ROCKET PROPELLED TAKE-OFF TROLLEY


TRUE SHAPE OF SKIDS
AUXILIARY SKID
BAROUDEUR
A A
B B
C C
D D
E E
F F
DOTTED CIRCLES INDICATE POSITION OF TROLLEY WHEELS
ROCKET INSTALLATION
FUEL TANK AND WING MOUNTING
DANGER
RED TRIANGLE OUTLINED WITH BROKEN YELLOW LINE BLACK LETTERING
RETRACTABLE SKIDS USED FOR WINCHING AIRCRAFT ON TO LAUNCHING TROLLEY
INSIGNIA OF SUD AVIATION APPEARS ON FIN. BLACK WHITE & YELLOW
1/72nd SCALE REPRINTS OF THIS "J" TYPE PLAN AND 1/48th SCALE "A" TYPE DYE-LINE PRINTS ARE AVAILABLE PRICE 6d. AND 1/- RESPECTIVELY FROM THE AEROMODELLER PLANS SERVICE PLEASE QUOTE PLAN NUMBER 2720 WHEN ORDERING.
COCKPIT TRAVEL & STBD. SIDE
Danger Verrière éjectable
en urgence ouvrir la porte
Saisir la poignée l'engager ici et tourner
Appuyer pour ouvrir
SE.5003 BAROUDEUR
FT.





World News

THE 11TH NATIONAL Championships of **New Zealand** were held at Hamilton over the New Year period and although we have yet to receive our official report, news comes from John Sheppard of events which took place in perfect weather. On the first day some of the Class A team racers were being timed at 92 m.p.h., although this does not reflect in the winning time of 9.47 by E. Arkinstall. The sun was so hot on the second day that fuel bottles were beginning to pop and in the dead calm of the evening ·8 c.c. and 1·5 c.c. models out-numbered the traditional 2·5s in the F.A.I. event. Eventual winner was John Sheppard at 14:3, using a *Dream Weaver*.

Radio Control was unfortunately afflicted by strong winds, even the famed Alan Rowe lost his 8-ft. radio glider down-wind o.o.s. In A/2 junior Peter Levat was leading the field with his *Nebula*, but, unfortunately, launched down-wind in the novel conditions and made a poor fifth flight. Seeing this, our correspondent John Sheppard promptly swapped ends of his towline and got away in the right direction to win at 13:24 with another *Nebula*.

For the first time the A/1 Class was introduced as a competition event and the fact that there were sixteen maximums in the first round helps to illustrate climatic conditions and standard of performance. Incidentally, John Sheppard is planning to come over to England during July and having qualified for New Zealand team representation as winner in Power and A/2, will be showing the flag for his country at the World Championships.

The annual winter contest at Helsinki, **Finland,** became an inter-city match between Norkopping, **Sweden,** and the home club. In A/2 it was a battle between the two renowned A.P.S. designs, *Aquila* and *Sans Egal*, flown by their respective designers, with Thomann coming out top in the low cloud conditions over frozen sea. This low cloud hampered power performance considerably, making Finnish models go o.o.s. on the power run and the eventual result was a win for Norkopping with 4,804 secs. over Helsinki's 4,305. An indication of the very high standard can be gained by the following top times. A/2: H. Thomann, 875secs., 2nd G. Kalen, 870 secs. Wakefield: R. Hyvarinen, 888 secs.; 2nd R. Johansson, 859 secs. Power: I. Jokinen, 851 secs.; 2nd P. Salovaara, 828 secs. Two outcomes of this conclave of Nordic countries experts are sketched below, right. "Thermic" Johansson props are always admired (as were his superbly finished airframes at Cranfield) and the use of his boundary layer control fences make interesting design study.

Hansheiri Thomann's BL experiments are even more fascinating. He uses a stethoscope and rubber tube connection to a fine bore "sounding" point to assess the value of triangular celluloid turbulators on the leading edge of his glider. Hansheiri explains: "In a turbulent boundary layer the velocity fluctuates. If you hold the tube against this flow, these velocity fluctuations are transformed to pressure fluctuations which you can hear if you put the other end of the tube in your ear. This gives one an excellent way to localise the transition

Top left: Chairman of Oslo Club, NORWAY, and his younger brother with their A/2s over frozen Bugstad Lake, their winter flying base. Below: Barry Haisman leaving the Hawkesbury snow-bound field in CANADA with his open rubber model Iroquois, Canadian record holder, 1st and 2nd 1958 Canadian Nationals; 1st and 2nd 1958 Eastern Canada open event. The drawing at left gives main constructional detail of this potent design

A/2 at right is a leading design from SWEDEN. Was first to make perfect 900 secs. total in 1957, has a long string of contest successes through last two seasons including 2nd place in Saar Cup, 1958, and 2nd at Helsinki International this year. Below: Actual winner Hansheiri Thomann with "Aquila" and 2nd place Wakefielder Rune Johansson on frozen sea at Helsinki

point. One hears nothing if the opening is in the laminar region and a "thunder" if it is in the turbulent region. You can therefore investigate the influence of turbulators on the transition and so forth."

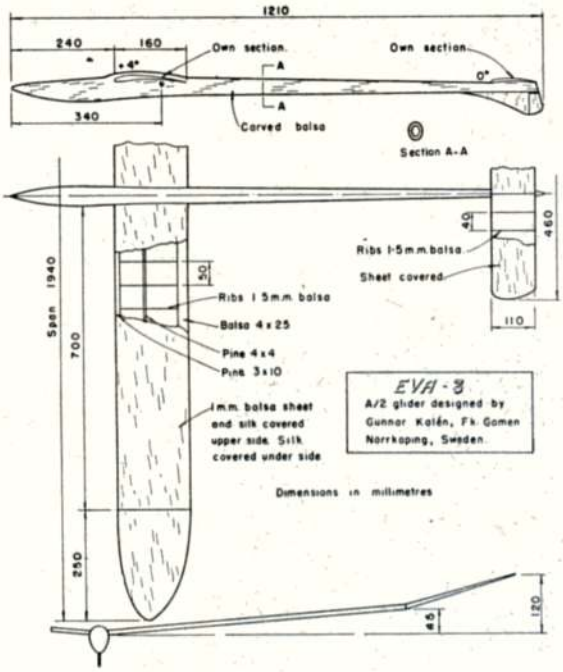
He uses the rubber tube as a towline and operates on a slope with slack line to obtain normal flying speed and Reynolds number.

An early spring has had an influence on the Finnish contest programme, the March 29th meeting having been cancelled because the ice at Hanko was vanishing! At Tampere over the previous week-end weather conditions were simply terrific for the third International Eliminator. Imagine 50 square miles of ice, no wind and a brilliant sun in a temperature of 45 deg. F. Top A/2 time was 874 secs. by P. Ella, only ·3 of a second ahead of E. Hamalainen, showing how close was competition in A/2 and in Wakefield and Power, Hyvarinen and Niemi placed top with perfect totals.

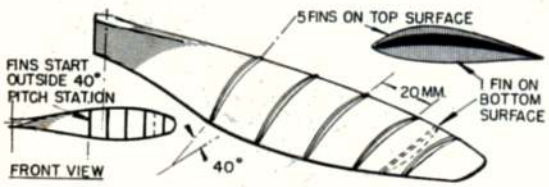
There has also been over-ice activity in **Canada.** Lake St. Louis is nine miles long and six miles wide with a snow crust only ankle deep and the boys have just tumbled to this new flying site near Montreal.

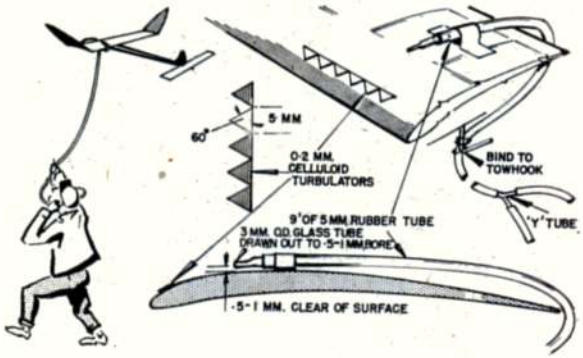
In the February Montreal Flying Club bulletin we hear of an R.C.A.F. study of the organisation requirements for a World Championships. This is our only news to date, of any country making an offer to consider running the events for 1959 but we feel that the lack of certainty in the bulletin announcement "*If* the Champs were held here, we *could* always give away half built Arrows as prizes," sums up the probability factor.

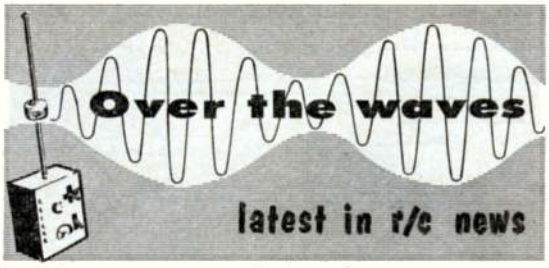
Over in California **U.S.A.** "The Flier" is the only newsheet we have seen that regularly carries pictures, printed by Multilith. News item from this Walnut Creek group concerns arrival of the first Taplin Twin in those parts, the throttle, and exhaust collection calling for much praise. Like most American clubs, the Diablo Fliers are concerned with recent A.M.A. rule changes which have stirred up many strong individual opinions, and inferences from well-known fliers that the voting did not entirely justify changes made. Such is inevitable in so large a country especially when, as Bill Winter has so neatly exposed in his April *Model Airplane News* the member response to A.M.A. was so apathetic that 94 per cent. did not bother to respond to the rules questionnaire!



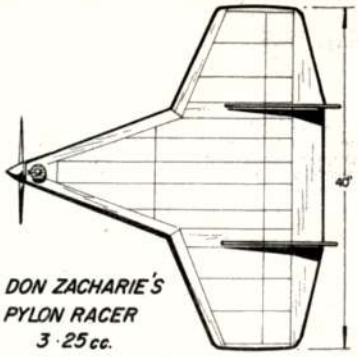
Sketches below and right show Wakefield prop fences used by Swedish expert Rune Johansson and the boundary layer experiments being carried out by Hansheiri Thomann



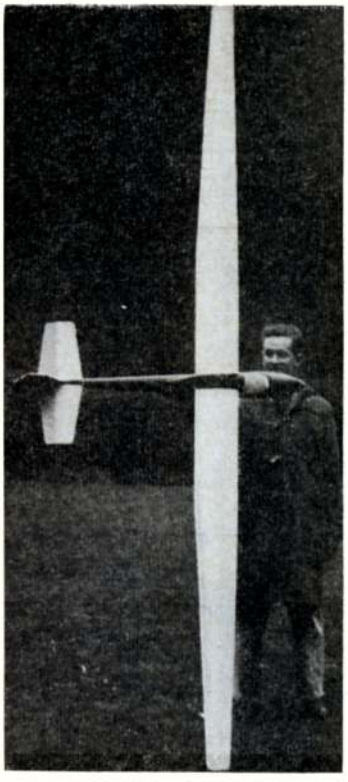




Stationed with USAF in Japan, Don Zacharie has new approach for racing and is testing layout with ½ A free-flight version



THE "BRITAIN CAN MAKE IT" dept. of this feature brings us yet more news of fully transistorised Rx's including two that are due on the market shortly. One by Mannings of Wellingborough will operate off 7½ v., is capable of 30 m/A current change, has three transistors and fits in a matchbox. It was primarily designed for the first stage of a pulse Rx for multi-simultaneous and will retail around £12. The other is larger, and has been introduced for boats; but its low price and light battery weight (9 v. with 4 m/A drain) will make it attractive for larger aircraft. Three special purpose transistors are used and a Siemens 1,000 ohm relay fitted to the base, all at £5 18s. The unit is known as the "Ess-Vee", and is made by Super-Vision of Malmesbury. Third new set is Dave McQue's all-transistor Superhet, eleven of which can be safely operated *simultaneously* in the 26·96-27·28 Mc/s band. Pictured below is a prototype and there is a possibility of designer-built duplicates being made to order for £25. Ten transistors, 4 R.F., 6 A.F., and 5 diodes are used. The line up is a balanced diode mixer, three 465 Kc/s I.F. stages diode detector, A.G.C. amplifier and two audio stages. Final stage passes no current until tone is sent. Can be used with up to 1,000 ohm relay for single, or low impedance multi reed unit. On six DEAC 225 it runs for 24 hours.

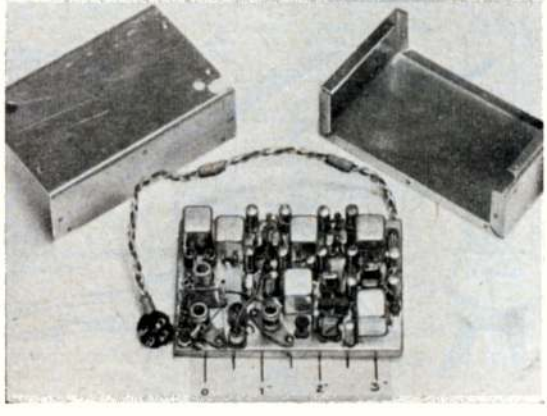


As far as models are concerned, there's little to report on *new* British designs other than Chris Olsen's stimulating flying with the ETA Mk. VI-powered *Uproar* in impossible weather at Chalgrove, Easter Sunday, and Chas. Riall's fine Galloping Ghosting with E.D. 246 and Mills-powered ¾ Hogs (soon to appear in Plans Service). That is, apart from the superb scale sailplane built by Fergus O'Brien for fellow Cambridge University Gliding Club member Bill Merkevitch. Bill has taken it back to his native U.S.A. where it will doubtless cause more than a stir. Surely it's the largest multi R/C scale glider yet made? Wings split at scale joints, control surfaces are true scale size and the fuselage parts on a horizontal line at the nose to reveal the "works". Unfortunately the model was only just finished on the airframe side before it had to leave Britain, so no tests have been made.

Over in California a name new to outsiders suddenly broke through the Bonner/Dunham/Dunn/Deans familiar listing at the Larks annual contest and also in top spot at San Diego. This was Doug Spreng and

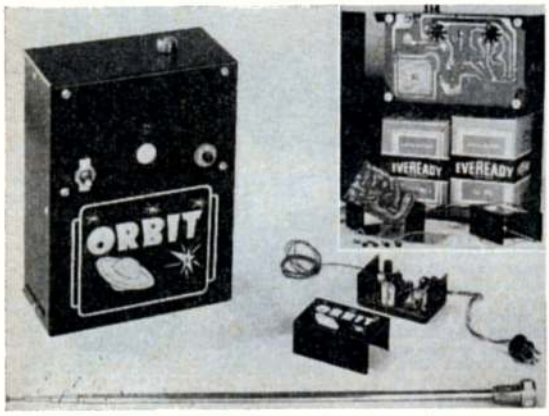
Left:
Fergus O'Brien's scale Skylark is 10-ft. span. Below: Bill Verney's Superhet to Dave McQue's design weighs 5½ oz. Operates on 7½ to 9 v.

Right:
Doug Spreng and "Gambler" and Bob Palmer with Firebird over in sunny Los Angeles in February



his plane is Don Mathes's design, the *Gambler* which carries Doug's own radio gear. This is virtually a standard Hog wing and fuselage; but with deBolt tail surfaces. Checking with the Lark's progressive score totals in contests we find Don Mathes in top place, at 1,656 and Doug third with 1,250 points, so it is a wonder that we've not heard of the winning pair before, especially considering that a 280 score in multi means "the lot" in most events. Use of the larger tail surfaces on a Hog (together with 2 in. longer nose on kitted version) prompted Bob Palmer to put some features on his *Firebird*, which is noted for its yaw-less rolls. It has the wing 2 in. lower than a Hog, at 1 deg. incidence with zero tail. 1 deg. down and 5 deg. right on the Veco 35, weighs 6 lb. 11 oz. and might be kitted. *See* photos of both models on opposite page. Incidentally, the Larks are going to be busy people at the U.S. Nats this year. Over 200 entries are expected at this end-of-July meeting in L.A. and with King Kong, the local 27 Mc/s traffic light control, swamping 750 watts through the air at hourly intervals, etc., the organisation is due for a rough ride.

Up the coast at Oakland in San Francisco area, the East Bay Radio Controllers had a fine demonstration of Dale Root's dive brake descents for spot landings in their January precision contest. Dale touched the spot three times using Servo-actuated brakes that extend 30-45 deg. either side of the fuselage. Sounds like a use for that tenth channel! EBRC club records stand at 53 m.p.h. for a two-way run for speed, and 16 miles for point-to-point distance, and they fly off a narrow field as yet un-named. "Burlesque Field—the best strip in California" was turned down. Shame! We always did fancy "Dixey" or "Gipsy Rose" as model names and they would have put up a fine display on so worthy a ground.



Radio Review—ORBIT 1

Transmitter: Lt. Alloy case, anodised black. Printed circuit, 3A5, audio osc., 3A4 XTAL osc., 27.225 XTAL.
Tuning condensor, neon tuning bulb. 2 x 67½v. H.T. 1½v. L.T. Min. volts, 100v. and 1.2v.

Receiver: 22 S.W.G. Lt. Alloy case, 2⅜ x 1⅜ x 1 in. Slug tuning: leads attached to 6-pin plug with socket, 30 in. aerial wire.
1 Hivac XFY34, 3 x 2N217 transistors. 5K Gem Relay spark suppressed. Transformer 5 : 1. Wt. 2¼ ozs. 1 x 1½v. pencell. 1 x 22½v. H.T. Min. volts 1.2v. and 18v. Idle 1 Milliamp, on signal current 4.5 milliamps.

"ORBIT", THE trade-name of Bob Dunham, U.S. R/C National Champ., is justly famous. It is a safe bet that more contests have been won in multi class than with any other make.

Having seen the Orbit-8 used with never a failure, a friend jumped at the chance of getting a second-hand "—1". The original packing was around it on arrival, protecting it completely; both units were still on tune, which is more than can be said for most sets arriving in S. Africa from the makers. Only the tuning light had suffered from previous handling and this made no difference that we could detect.

The two 67½v. H.T. and 8-cell 1½v. blocks are held firmly in the case by a foam plastic pad on the back cover of the Tx; no more disturbing thumps during pilot manoeuvres. Tuning is adjusted through a button-covered hole in the front of the Tx with a non-metallic wand. A four-section collapsing aerial fitted with the standard co-axial connection screws into the top. The superior action of the micro-switch push-button ensured that any number of "blips" would always bring the right control.

Photos show best the excellent layout of the receiver parts; components are one side of the base. Even the "labyrinth" of the etched circuit is easy to follow. The only doubt about anything going wrong was the way the valve (a British Hivac) is stuck so firmly to the board; in a model-destroying crash this would cause the envelope to disintegrate whereas nothing else would suffer. A sliver of foam plastic between might save it and yet maintain sufficient rigidity. The well-known Jaico Gem relay is so positioned that it is easy to clean. Tuning has never varied by more than an unmeasurable fraction. One pencell and one 22½v. keep the total weight to a bare 4 ozs. Receiver operates on 300-700 C.P.S. Tone, 80-100 per cent. modulation.

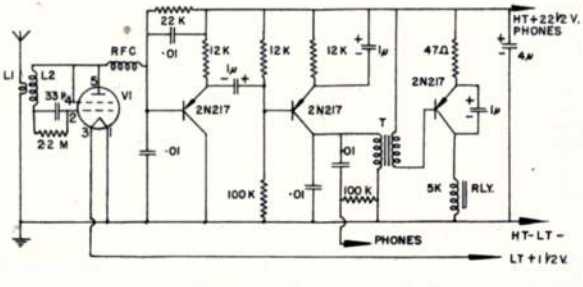
We installed the outfit in a deBolt Super Cub with Varicomps and SN escapements for "full-house".

In these parts it is maintained, that if a receiver works properly at 200 ft. from a hand-held TX with the model on *concrete*, there will be no trouble in the air, no matter how low the flying. The tone signal in the Orbit-1 comes through full-strength, the "silent spot" width being about 50 per cent. of that at 20 ft. Under 5 ft. distance one needs a finger on the Tx aerial base to prevent swamping. The "cycling through" of the receiver without the Tx being on, was unnerving until we remembered to switch the Tx on first, but it points up the sensitivity of three stages of gain in place of the usual two. The degree of amplification obtainable is not altogether necessary and is put to the much better use in this set of stabilising the transistors against the extremes of temperatures often met in aeromodelling. The set in question has never had to operate under 45°F. so far, but mid-day temperatures in the sun are sometimes around 120°F. and no difference has been noticed.

The generous width of the plating and ample soldering ensure long lift for the printed copper of the circuit board; the bottom half of the case has an insulating sheet next to it and the board is screwed onto it with self-tappers spaced by ⅛ in. lengths of neoprene tubing, an ideal arrangement for protection from sea-air.

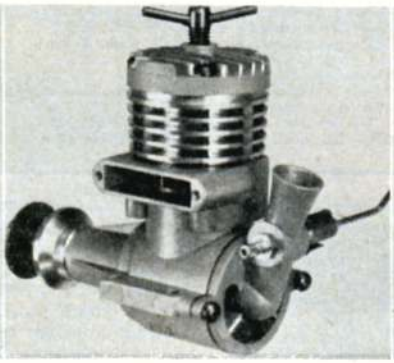
Like clothes and cars, *quality* in R/C outfits is the economy way. This outfit is expected to last a very long time despite the "hazards" of R/Cing. Retail price in U.S.A.: Transmitter $29.95, Receiver $34.95.

Pat Wheeler

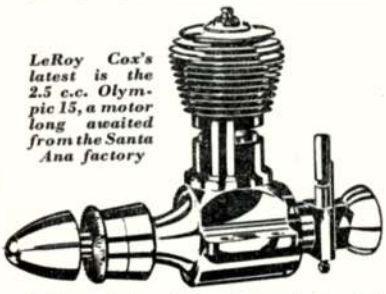


Motor Mart

HIGH QUALITY THE KEYNOTE OF THIS MONTH'S RELEASES



THOUGH MORE than a decade old in design, the **Anderson Spitfire 65** (*top left*) can more than hold its own in the 1959 market. This 10·6 c.c. engine was recently put back in production as a glow unit by McCord Precision Products of Anaheim, California, and can also be bought with spark ignition. Weight is 13¼ oz.; it comes with either ringed or lapped piston, and for radio, can have an intake throttle. We checked the glow version at the following r.p.m. and have nothing but praise for the quality of workmanship and the way a brand new motor started very first flick and continued to roar its way through a wide range of needle control. 14 x 6, 6,600; 13 x 8, 7,600; 12 x 6, 9,200; 12 x 4, 10,500. These figures can be expected to improve with running-in. Next on our bench was the new **Frog 349 BB** which must take the honours for the best crankcase casting yet seen on a British engine. The exhaust note of the loop-scavenged Frog is deceptive, and likewise the way it picks up revs in the air. Already



LeRoy Cox's latest is the 2.5 c.c. Olympic 15, a motor long awaited from the Santa Ana factory

it has raised a few eyebrows in combat circles, and with provision for exhaust baffle fitment and intake throttle (*see above, centre*) it will appeal for R/C. While on that subject, we come to *top right*, and the **K & B 45**. Now this is one of the most impressive glow engines we have handled. Coupled controls on this specially ported motor enabled us to hold a running speed of 1,100 r.p.m. on a 14 x 6 and this opened up to 6,200 when wide open. On some props it offers no more than the 35's, in fact the OS Multispeed is faster all along the range: but certainly the K & B 45 possesses a degree of controlability that is as reliable as it is remarkable. Secret of smooth running is Brodbeck's patented rear balance weight, a blob of lead keyed in a nylon disc and driven by the crankpin (*see close-up*). More on this engine later. The effect of a rear counterweight was also obvious when we checked Sqdn./Ldr. Eric Cable's K & B 35 before and after fitting an F. Rising vacuum pump (*see right*) for Stegmaier R/C gear.

The 35 ran down to the usual reliable minimum of 3,800 on a 12 x 4, and with pump fitted, down to 2,500 r.p.m. At top end the pump knocks off 10 per cent. performance, reducing 8,900 to 8,000 r.p.m., but this is still useful power on a 12 x 4, and the 10-oz. R/C weight-saving more than compensates.

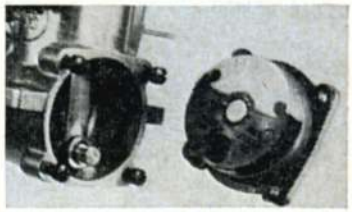
The **Merco** has arrived. *Below* is a prototype of the flame-headed 35 with grey metal blasted c/case. It is as handsome and as potent an engine as one must expect from the expert team responsible for its production and at £5 19s. 6d. will soon be a familiar sight in the stunt and radio fields. Many new features are incorporated, and the workmanship is of the highest standard. Typical of this is the way the intake gleams like chrome, and the needle control is as sturdy and positive as a T V channel selector.

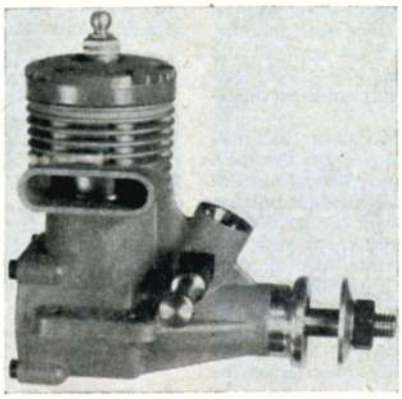
The contest boys will be all agog (like us) to assess the **Cox Olympic 15** (*sketched left*). With bore and stroke close to that of the E.D. Racer at ·585 x ·556, twin races, triple periphery jets for reed induction and traditional Cox construction, it sells at $12·98 for the BB version and $7·98 for plain bearing.

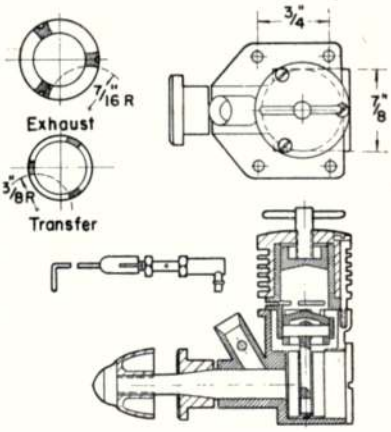
Design Contest

Lastly, our "Ideal Engine" contest. Entries are disappointingly stereotyped and most, including G. C. Pye's 1·49 winner this month (*below right*), carry porting overlaps that manufacturers want to avoid. Wot, — no spinner intake, turbo crankweb specials ? ? C'mon the *inventors* !

There's a free Aeromodeller subscription to the best entry each month.







TRADITION has been broken! For years the Gamage Trophy has opened the British Contest Season with typical blustery, often very wet and windy conditions—but not in 1959! A glance at the string of fly-off times emphasises what a wonderful day we had on March 1st—and in no less a manner illustrates how high is the standard of contest model flying in this country. Let's hope it augurs well for a brilliant season.

Northern

TEES-SIDE M.F. GROUP enjoyed their March 1st meeting. K. Harrison of Darlington scored maximum time with his glider in the Pilcher Cup. Harrison also placed top in the club "all-in" competition, with D. Woolnough of West Hartlepool placing second. In the Rubber contest A. M. Robson of Stockton took first place; this was his thirteenth entry in the annual contest! Tom Chambers took first place in the area in the Gutteridge, in spite of rough conditions at Church Fenton. Mart Robson has an application in for a new British record for the indoor tissue class, set up at Manchester.

WHARFEDALE AND D.A.C. juniors can no longer say they are neglected. Two C/L contests are being organised for them by senior members with motors as prizes. The first will be Combat at the Linton-on-Ouse Area Meeting on March 29th, the other, a ½A event, has yet to be arranged. A scheme to raise money to subsidise juniors on coach trips is also going to be put into operation.

Midland

WALSALL M.A.C. visited the Midland Area Rally on March 8th at Loughborough, but bad weather kept many models in their boxes. J. Burke managed to get through the first round of Combat but general opinion is that until Combat organisation emerges from its present chaotic state they will be better off to save the entry money! Bad site selection for the event was a handicap. I wonder if these lads realise what contest organisation entails—and whether they have ever offered assistance. **DERBY M.A.C.** took on the onerous task this time and the event did at least finish in daylight! Mac Grimmett

For Your Diary

April 26th
High Wycombe C/L, F.A.I., B, T/R, Combat, all S.M.A.E. rules, at R.A.F. Booker. Pre-entry by April 20th to 24 Carrington Road, High Wycombe.

May 3rd
Macclesfield Advertiser Rally, all classes. Woodford, Manchester.

June 7th
Dartford C/L Rally, Combat, A, B, T/R, at Central Park.

June 14th
C/L Rally, Combat 2·5 - 3·5 c.c., T/R, F.A.I. and B, Laindon High Road School Field.

June 21st
Northern Heights Gala, all classes except T/R, Stunt, Queen s Cup for Wakefields at R.A.F. Halton.

June 21st
Clwyd Slope Soaring, Moel Ffamau, N. Wales. Open, A/2, Jr. and R/C events.

June 28th
Combat Rally, Ashford (Kent). Victoria Park, Ashford.

August 2nd
Surbi.on Gala, open free flight, at Chobham Common.

August 16th
Devon Rally, F/F Rubber, Glider, Power, R/C, Combat at Woodbury Common, Near Exmouth.

August 23rd
South Midland Gala, all classes at College of Aeronautics, Cranfield.

September 27th
Midland Area Rally. Venue to be announced.

October 4th
South Coast Gala. Venue to be announced.

CLUB NEWS

of **WEST BROMWICH M.A.C.** placed stunt at the same meeting with his *Midlander*, followed by Tony Day into third place with a modified Frog *Condor*. Mike Kendrick reached the semi-finals in the combat. First place in the stunt was taken by Brian Horrocks who is an Australian working with a local firm. He flew his O.D. model to good effect in the gusty conditions. The club recently held a free-flight power contest with **BRIERLY HILL M.A.C.** in which Peter Ashmore of Brierly Hill emerged the winner. **OUTLAWS (CANNOCK) M.A.C.'s** Annual combat comp. for the R.A.F.A. Cup resulted as follows: 1st Alan Cooper; 2nd Derek Gater; and 3rd Roy Lockley. All used *Peacemakers*, Oliver-powered. The final was just about the roughest on record—some six models being wrecked before a decision was reached!

Seven Midland clubs attended the second "open" club meeting on March 9th, at the **GEE DEE M.C.** headquarters, Nottingham—which, I'm told, is more than they get at S.M.A.E. events. Seems like there's a moral there and a very poor reflection on Midland club enthusiasm for getting themselves organised.

A film show will be held by **LEICESTER M.A.C.** at their clubroom on April 22nd. One interesting aero film will be on the development of the De Havilland Mosquito.

North Western

CHESTER M.F.C. announce the Clwyd Slope Soaring Contest will be held on June 21st on the slopes of Moel Ffamau in North Wales. Events will be Open, A/2, Junior and Radio; entry fees of 2s. seniors and 1s. juniors. Rules for the Radio event will be chosen to suit the conditions of the day. For further details please write to C. R. Filtness, 26 Raymond Street, Chester.

A few **OLDHAM AND D.M.A.C.'s** club records have been broken, most promising being 8 min. 52 sec. O.O.S. by Mr. Birch with his *Inchworm*. The club has been very fortunate in obtaining a second flying field, and the owner of a local boating lake has given sanction for flying floatplanes, from his water, which is surrounded by meadowland.

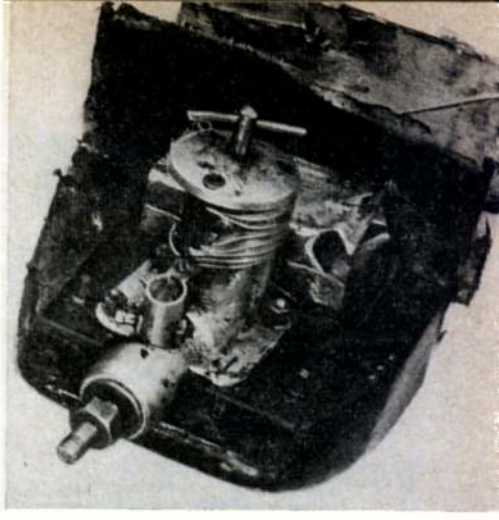
At the **SHARSTON D.M.S.'s** highly successful concours competition on February 27th, results were as follows:
1st, R. Brock, 209 pts. Own design stunt.
2nd, J. Feeney, 205 pts. Own design F/F.
3rd, E. Helliwell, 175 pts. *Thunderchief*.
Judges: J. O'Donnell, W. Nield, P. Royle.
E. Helliwell upheld the club prestige in the contest field when he topped the K. & M.A.A. National results at Stretton with his Mk. 8 *Zebec* making a total of 13·07.

John Done of **WALLASEY M.A.C.** was very unfortunate in the same event to lose his A/2 on a maximum after rebuilding the fuselage nose. Len Hutton was away a large part of the day after his A/2, but returned without it to fly another model: Len has never worked so hard before!

This club's first radio model was tested at Stretton on March 1st and proved to be very successful until lack of difference in incidence between wing and tail showed itself with no recovery from a spin very high up. The bang was heard all over Stretton! Model is now being rebuilt.

East Anglia

ANGLIA M.F.C. (Chelmsford) have a trophy for the area championship. G. Read started off well by winning the f/f section of the Area Gala. Combat is practised at Baddow Meads and any new members would be welcome at Broomfield Scout hut on April 16th. **LAINDON M.A.C.** announces a control line rally to be held on June 14th at the Laindon High Road School Field. Events will be: Combat (2·5 c.c. - 3.5 c.c. only); A and B Class T/R run to new rules.



All that was left of G. Balmforth's PAW after being shot out of a tree by a farmer with a ·22. Needle went through tank and glass fibre bulkhead!

Membership of the club has now increased considerably, now standing at 22.

CAMBRIDGE M.A.C. members took part in the Area A/2 trials at R.A.F. Debden, and finished with Clive King in third place and one model lost without D/T. New models on the way or recently finished are two *Eurekas*, one *Topscore* and an E.T.A. 29, 52-inch span, stunt model, and numerous *Lucifers*. (Clive King has six already.)

Local hardware shops around **NORWICH M.A.C.** report a demand, unprecedented in March, for the lamp wick with the well-known red thread. This after the midsummer atmosphere of the Gamage day at Thetford Heath where an entry of eight was the club's biggest dabble in an S.M.A.E. comp. for some years. How honest can a timekeeper get? Mike Woodhouse, who totalled 8 min. 53 sec. with his very promising O/D A2, must be pondering this question. Since studying AEROMODELLER articles on towing technique the Nordicites are becoming adept at walking about with models on the line. Which brings us back to D/T fuse length and Mike's missing seven seconds—and yet another award to this club from me for the best report of the month.

South Midland

There was great despair in **ABINGDON AND D.M.F.C.** when Ginger Balmforth's radio model, which had been tree'd up a 100-ft. elm for two weeks was handed in at a local police station in very battered condition. It was evident that someone had been taking pot shots at it with a ·22. They think farmers should restrict their shooting to less expensive targets! **LETCHWORTH** lads G. Castell, C. Thorne and S. Rees flew early in the Halfax Trophy to avoid the wind which never came! At Henlow for the S.M.A.E. Glider elims. H. E. Males, the designer of the A.P.S. *Dunne Tailless*, took along his and Bob Devereux's latest, a twin engine R/C model with the engines mounted *on the tail*, angled so that their thrustlines intersect the C.G. Model is fantastically stable and the noise of two 1·5 c.c.s made quite an impression. **NORTHAMPTON M.A.C.** had a strong entry in the Area elims., D. Gibbins placing second in the local results for A/2 which is the club's strongest class at the moment. **OXFORD METEORS** hope to have at least one entry in the Gold Trophy at the Nationals and Wal Barnett's twin *Invader* will soon be taking to the skies. Messrs. Harding, Crisp, and other free flight "competition minded" members, have formed a team, outside the club, and are now flying as the **MARTYRS.**

London

ENFIELD AND D.M.A.C. held a combat event for junior members, results were extremely encouraging and the final was

S.M.A.E. Contests

April 19th

F.A.I. Power Eliminator ... } *Area*
Weston Cup (Wakefield) ... }
Lady Shelley Cup (Tailless) R.A.F. Henlow

BRITISH NATIONALS

May 17th/18th

Thurston Cup (U/R Glider) }
Gold Trophy (C/L Aerobatics) }
Knokke Trophy (C/L Scale) } Sunday,
S.M.A.E. Trophy (Radio/C) } 17th
Davies "A" Cup (F.A.I. t/r) } R.A.F.
Speed (Classes 2 and 3) ... } Scampton
Combat (Prelim. Heats) ... }
Short Cup (Pay Load) ... }

Sir John Shelley (U/R Power) }
Model Aircraft Trophy }
(U/R Rubber) }
Super Scale Trophy } Monday,
(F/F Scale) } 18th
Ripmax Trophy (Radio/C)... } R.A.F.
Davies "B" (Class B T/Race) } Scampton
Speed (International Class) }
Combat (Finals) ... ... }

May 30th-31st-June 13th-14th

World Championship Team Trials. Selection *Centralised*

between D. Powell and A. Ewen, the latter being the eventual winner. On the same day, senior members R. Moore and R. Salter went to Chobham to fly in the Gutteridge. Although they did not put up any spectacular times they had an enjoyable day's flying, and gained valuable experience for the Wakefield Eliminators.

It has now been decided that there will *not* be an Enfield Rally this year. They apologise to the many fliers who regularly attend this hitherto annual event. There will definitely be a meeting in 1960.

Recent top timer in **ST. ALBANS M.A.C.** include George Fuller in the Gamage with a perfect score plus a 5:12 fly-off; and B. Bowling, a new member, with three maxs plus 1:32 in the K.M.A.A. member. Interest in radio is on the increase in the club since R. Pask, the new treasurer, joined last year.

KENTON M.A.C. held a club combat rally up to 2.5 c.c. Hon. Sec. E. Rowntree furthered his stirling club work by organising this Sunday with commendable efficiency. After a close final the event was by won G. Copeman flying an A.P.S. *Rogue* and second was D. Wilson with a modified A.P.S. *Duellist* (Oliver Tiger).

CROYDON D.M.A.C. report that it seemed very strange eating ice lollies on March 1st! Den Partridge did 9:00+7:48 in the Pilcher, and Ken Smith 12.00+3:08 in the Halfax. Gordon Cornell and Pete Fraser have made a special 1·5 c.c. engine for ½A team racing which sounds promising. The club wishes the best of luck to B.B.C. Television who now have Martin Dilly working for them! New members are always welcome at Norland Road School, on Tuesday nights.

MILL HILL have once again embarked on what is hoped to be another successful season. Over the last few months our membership has been on the increase, but there is still room for more members at Dollis School, Pursley Road, Mill Hill, N.W.7, any Tuesday evening at 8 p.m.

S.M.A.E. Results

GAMAGE CUP (Open Rubber)

1.	D. Morley (Lincoln) ...	12.00+7.01
2.	E. A. Barnacle (Leamington)	12.00+6.49
3.	R. Draper (Coventry) ...	12.00+6.36
4.	G. Fuller (St. Albans) ...	12.00+5.37
5.	D. Greaves (Leamington)	12.00+5.04
6.	R. Heywood (Coventry)	12.00+4.36

96 *entries, four returned no score.*

HALIFAX TROPHY (Open Power)

1.	D. Bainbridge (Foresters)	12.00+8.20
2.	D. Reid (Edinburgh) ...	12.00+6.52
3.	V. Jays (Surbiton)	12.00+4.55
4.	J. R. Shaw (C.M.) ...	12.00+4.33
5.	M. Green (Foresters) ...	12.00+4.33
6.	D. J. Wain (Oxford Martyrs)	12.00+3.50

106 *entries, ten returned no score.*

PILCHER CUP (Open Glider)

1.	D. A. Partridge (Croydon)	9.00+7.48
2.	P. Perry (Birmingham) ...	9.00+7.15
3.	C. M. Allsop (Birmingham)	9.00+6.50
4.	E. R. Shirt (N. Sheffield) ...	9.00+4.37
5.	E. Hobson (N. Sheffield) ...	9.00+3.46
6.	T. Woodward (Foresters)	9.00+2.30

163 *competitors, twelve returned no score*

GUTTERIDGE TROPHY (Wakefield)

1.	Roberts, L. G. (Lincoln)	13·04
2.	Monks, R. (Birmingham) ...	12·57
3.	Wilkes, T. L. (Cheadle)	12·55
4.	Chambers, T. B. (Teeside) ...	12·22
5.	O'Donnell, J. (Whitefield) ...	12·10
6.	Wade, S. A. (C.M.)	12·09

60 *competitors, 5 returned no score*

K. & M.A.A. CUP (FAI Glider)

1.	Helliwell, E. (Sharston)	13·07
2.	Hinds, S. (Wallasey)	12·49
3.	Stokoe, P. (Wakefield)	12·38
4.	Farrar, A. (Wakefield)	12·10
5.	Manville, J. H. (Bournemouth) ...	11·39
6.	Rennison, P. (Baildon)	11·31

182 *competitors, 5 returned no score*

South Eastern

COSMO A.M.C. members are working hard for their annual exhibition and social. I. Robinson has recorded yet another combat win with his "SR Special" powered *Zephyr* flying for his R.A.F. Comp. against **EASTBOURNE M.F.C.**

EAST GRINSTEAD activities over the past few weeks show that many of their members are at last emerging from winter hibernation to join the regulars at the flying field. Richard Vincent continues to put up some extraordinary performances with his A.P.S. *B.G.*-44 glider. On March 1st it was released from 100 ft. line and caught such a thermal that it nearly took owner and winch up with it. It continued for 15:00 out of sight. An hour later he returned with it intact, after finding it about two miles away. It was subsequently flown again—still without using a D/T! Brave lad!

Southern

MAIDENHEAD held their first quiz of the present modelling year. Winner was appropriately R. Leader and questions included 35 aeromodelling abbreviations, ten thicknesses of wood to guess the recognition of various modelling personalities and famous aircraft and a few miscellaneous photographs put in to increase the scope of the quiz. Sounds like a good idea.

SOUTHAMPTON M.A.C. members went to Stoney Cross for the "Gamage" and "Pilcher" cup competitions. Only competitor with any success was Norman Elliot who did 11 min. 38 sec. in the Gamage. The following week a car load of lads ventured to Larkhill for the Glider and Rubber Elims. Once again N. Elliot topped the Wake results with just over 11 minutes, in gale force winds, and N. Worley bent a wing tongue double, he totalled 7:59 in A/2. **ALTON AND D.M.A.C.** has been reorganised after a lapse of some six years. Present membership stands at 20 all of whom are very enthusiastic combat flyers. Meetings are held at the Crown Meeting Room every Friday, 7.30 p.m.

The newly-formed **WOKING AND D.M.A.C.** would like anyone in the district with aeromodelling tendencies to contact the club secretary at 7 Mayford School Cotts, Mayford Green.

Western

WESTON-SUPER-MARE M.A.C. put in a good attendance at the West of England Championships at R.A.F. Colerne, one of their teams winning the Bath Abbey shield. All the members enjoyed themselves, in spite of the cold wind, and the fact that W. Evans was unable to fly his twin O.S. Jet-powered *Blackburn N.A.* 39 due to the unfortunate illness of B. Hopkins, who was going to bring the starting equipment.

In **BRISTOL R.C.M.A.C.** Mike Barnett's 6-reed machine took the air recently, without difficulty, and soon had its aerobatic qualities demonstrated (intentionally!). John Mardon's 8-reed (Orbit equipment) model (also his own design) also got airborne without difficulty or damage. These two members are setting the pace for the rest and with one other Multi, Don Cole's *Smog Hog*, and another nearing completion—Doug. Sheppard's low wing-single-channel button-pushers will have to watch out.

BRISTOL BULLDOG members proved that they can fly as well as anyone at R.A.F. Colerne. In a very strong wind the Area Open contests were more or less carried off by Bulldogs. The Colston Cup for gliders was won by C. R. Foot, and Gordon Bunney, flying for **BRISTOL ACES** although a Bulldog member, won the Totterdown Cup in rubber, with C. Leyman, Bulldogs, second.

The club glider record has now gone to Tom Markham at 8-21.5, with an *Inchworm*. Membership is now steady at around 20, and may be an illuminating indication of the interest shown in the hobby generally at the present time. With membership restricted to Bristol Aeroplane Company personnel only, and with a staff in excess of 20,000, it gives them less than one member per 1,000 staff. And this in an *aircraft* company, too. Makes you think, doesn't it ! !

EXMOUTH AND D.M.A.C. f/f boys were put off by the high wind at Colerne. Two entries were made in Combat. Ken Bellingham, who was the eventual winner, and Alan Parker, who got as far as the quarter finals. Anyone requiring details of the Devon Rally on August 16th at Woodbury Common can obtain all the gen from Club Sec. D. G. Baudet, 80 Moorfield Road, Withycombe, Exmouth, Devon.

Services

With the repatriation of F/O Masterman, no interested officers remain in 2nd TAFMAA and activities appear to have practically ceased. As there is no record of practising modellers in the Command, any interested modellers desirous of keeping the movement going should write to: Cpl./Tech. Anderton, ASF2, R.A.F. Wildenrath, B.F.P.O. 40. If any response is forthcoming, an attempt will be made to circulate a newsheet, and get something done.

Northern Ireland

The **BELFAST M.F.C.** held its annual prize-giving and film show, the day before the "Gamage". M. Taylor went up early next morning by taxi to find the flying-field shrouded in mist. He was so fed up that he left at 12.40 after waiting for 1½ hours. Meantime the rest of the flyers travelling on bicycles arrived at 1.15 p.m. and found bright, cloudy conditions with thermals bumping off regularly!

Wales

Where and oh where has the South Wales Area gone? This once very active area seems to have been really deaded! **PORT TALBOT** are building for this season's contests, but now no Area, no contests. Where are the other clubs? At the last Area meeting only five turned up: five from how many? Bargold Eagles, Cardiff, Dragons, Builth Wells, Aberdare, Swansea, Neath, Penarth, Llanelly, Milford, and the rest, where are you?

A.G.M. of the Area is on Saturday, April 18th, at 7 p.m., at **DYFFRYN GRAMMAR SCHOOL, PORT TALBOT** (only 200 yards from railway station). *All* club members are asked to attend, not only officials.

See you at the *Nationals*.

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Hard balsa 1/8" sq.
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Location of dowel box on 1/16 spar (Use 1/8" sq. Alloy welding rod joiner)
3/32" sq. stringers.
1/16" ply dowel plates.
F4
F5
F6
Fuselage sides 3/32" balsa.
1/16" balsa across fuselage
R.H.
L.H.
Plan views: instrument panel and windshield
Fuel tank and feed
Balance here.
1/16" hard balsa doubler inside.
Block fill-in
F1
F2
F3
1/2" soft balsa
Cut-out for dowel box
Step panel L.H. wing only
Ribs R1 - R7, 1/16" sheet.
R8 - 1/8" sheet.
Bind landing gear in place on ply plates.
1/8" ply engine mount (Cutaway for Dart)
Lift T.E 1/4" at tip
Scale wheel diameter.
1/16" hard balsa T.E.
1/8" dowel.
Tail surfaces 3/32" hard
Soft wire hinges.
Sheet to here on bottom only.
1/16" spar.
Landing gear bending patterns.
Bind Bamboo skid in place.
Dowel box
1/16" sheet c/section.
Dihedral 1 3/8" under each tip.
1/4" x 3/8"

F6
F5
F4
F1
F3
F2

F2. 1/16" ply. F1, F3, 1/8" balsa
F4, F5, F6, 3/32" balsa.