

The Bristol Scout

Get ready for the winter indoor R/C scale season with this Depron foam scale model from the building board of Mike Roach

Along with the Sopwith Pup, this aircraft was the most highly regarded 'pilot's aeroplane' of the period and has been almost as popular with modellers. Its proportions are perfect for free or radio controlled flight, as it has a longer nose and a larger tailplane than the Pup and one can see why Eddie Riding chose it for his famous free flight plan all those years ago.

The Sopwith had 6" more wing chord and 12" more span, which gave it 15% more

wing area, so perhaps this is why we see so many Pups around. I used the PL Gray 'Aircraft Archive' drawings as a basis for my Bristol Scout C. I don't think the drawing gets the fin quite right: there is definitely some reverse taper on the leading edge. You could easily build a Type A (never modelled before, I believe, but it has some charm) or a B, but the C or D have the most dihedral. I chose the RNAS Type C serial 1246, for no better reason than it had fin stripes, Union Jacks and RNAS roundels for

a bit of variety! Scouts were also seen in PC10 upper surfaces as well as the natural fabric of 1915, so there is lots of choice of markings.

The model is drawn to 1/10th scale, which gives a wing area of 2.3 sq ft, so if you build it to fly indoors, it must weigh less than 7 oz to fly well. If you can get down to 6 oz, then really slow and realistic flight is much easier to achieve. The GWS hardware weighs 3.5 oz, so you must be very much on the ball to make the lower figure! I think that enlarg-



ing the plan to 110% to give a wing area of 2.75 sq ft might well be the best trade-off. Apart from the wing section, I have only made one compromise in the interests of slow flight: both wing and tailplane incidences are two degrees greater than scale, which gives a better 'sit' in the air when flying slowly.

The model is built almost entirely from Depron 3 mm foam sheet with carbon fibre rod for the struts and the thinnest plywood in stressed areas such as the motor mount and wheel hubs. The total weight of these parts, including all the paint, but excluding the undercarriage, was exactly 2 oz, so perhaps a 6 oz model is not completely unrealistic. Although I used Depron, you could use blue or pink insulating foam cut into sheets instead, or even go the traditional route and make it with balsa strip, tissue and dope. I've shown all the rib and spar locations, should you wish to do so.

This is my first entirely Depron model and I have been very impressed with its ease of use and strength as compared to

other foams, so much so that, apart from hot-wire-cut (HWC) wing sections, I shall probably stick with it in future. It needs very little preparation - you must sand off the slightly greasy surface layer to make a firm glue joint, but it takes sprayed or brushed acrylic paint really well, to make a convincing 'fabric covered' surface. Masking tape sticks much better than to pink foam, so it is easy to get a decent edge to markings.

Making a start

Contrary to my normal practice, I cut out a kit of parts (photo 1). This took part of a morning. In the afternoon I masked out the RNAS roundels on the wings and the Union Jack rectangle on the fuselage, and sprayed the whole lot with Ford Ivory from Holt's Duplicolour range. This is an acrylic spray paint that does not affect the foam, but the propellant will attack it if you hold it too close. If you follow the instructions and keep the nozzle 8 - 10" away from the work, it should be fine and the Ivory is a good

match for varnished natural linen. Another couple of hours and I had marked all the rib tapes and former lines with an 000 brush and 90% watered down Tamiya 'Desert Yellow'.

Then I finger painted some more of this wash between the ribs and behind the formers to add a bit of life to the structure (photo 2). The roundels were hand painted (but I would use transfers made with Microsoft Word next time - see my article), as were the fin stripes (photo 3) and the Union Jacks.

Purists will note that the UJs must be the correct way round on each side of the fuselage, ie with the wider of the white diagonal stripes to the front. The plan makes all this clear, but you could choose one of the many simpler schemes that are shown in the Albatros publication.

The struts are all 1.5mm dia carbon fibre rod, sleeved with 0.2mm (ultra thin) Depron, folded round, glued and painted. The end of each strut is faced with ply, which serves as a mounting reinforcement. The rod sim-



ply pushes into the wing and is cyano'd in position with the ply flush against the surface. With the model's low inertia, light loads and full rigging, this method has proved just about adequate, but if you are a clumsy flyer or handler (believe me, I know exactly what I'm on about!) you might like to try a more secure method.

The cabane struts are cyano'd in place and reinforced with small Depron patches, but after a lot of bad language, I fixed their ends with more CF rod (photo 4) to provide more rigidity.

Building the model

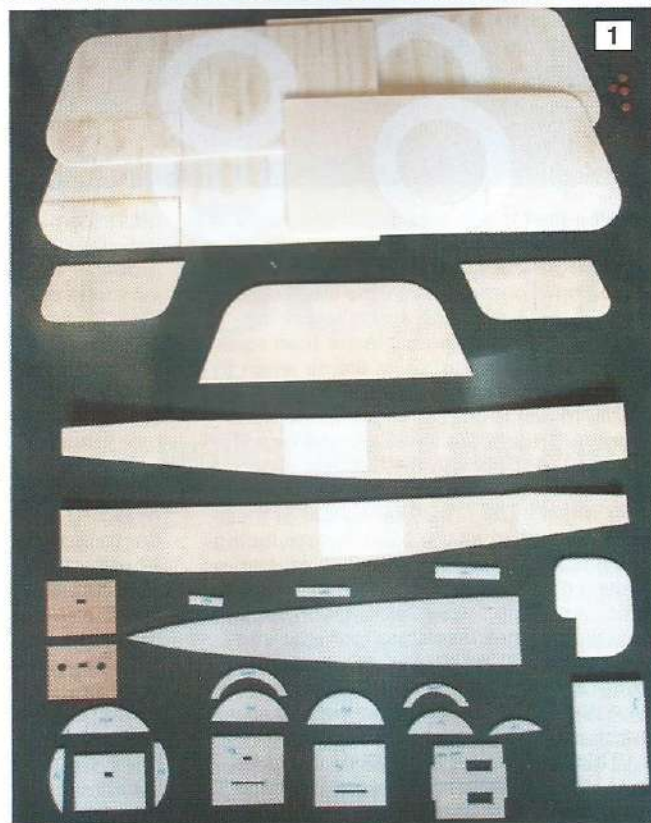
Once all the parts are painted and decorated, construction can begin. Assemble F1, F2 and the laminated floor onto one fuselage side, then add the servo tray and F3. When this is thoroughly dry, add the other side and the lower rear floor, leaving the servo hatch until later. The shaped rear floor makes it very easy to get the fuselage squarely assembled without a jig, but care is still necessary....(photos 5-8)

The servos should just push into their slots in the tray and a dab of

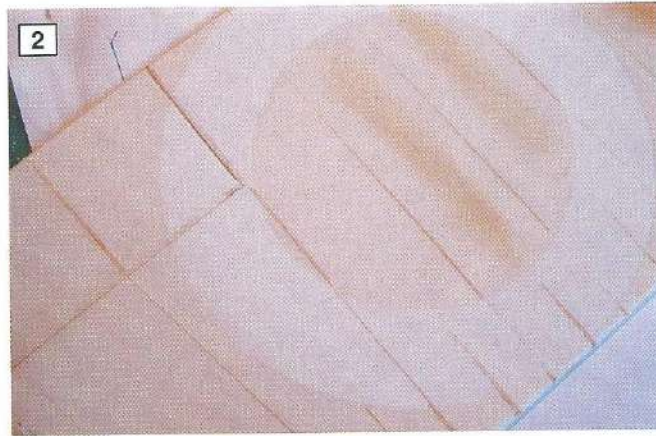
epoxy or cyano is enough to secure them. Fit the control threads (or whatever system you prefer) and the motor, speed controller and receiver while the fuselage is still open and easy to get at. I like to fit the top formers and the decking now and get the cockpit looking right, again while there is still room for fat fingers. The decking actually fits over the cabane struts on this aeroplane, so a few minutes spent with a paper pattern before you cut and paint the 0.2 mm Depron is time well spent. Note that Depron bends more easily one way than another, and don't try to bend it against this grain or it will just snap. If you have a suitable former, a little gentle heat will mould the decking to the correct curve and make glueing far easier. With such thin sections, it is difficult to get sufficient glueing area particularly at the rear fuselage. I inserted some strips to make a rebate for the decking to fit against.

Fixing the wings

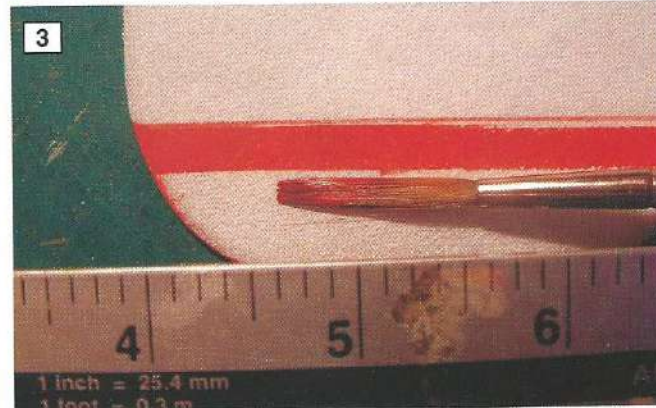
I cyano'd pins into the wing as incidence pegs, then epoxied each wing panel to the fuselage, using a



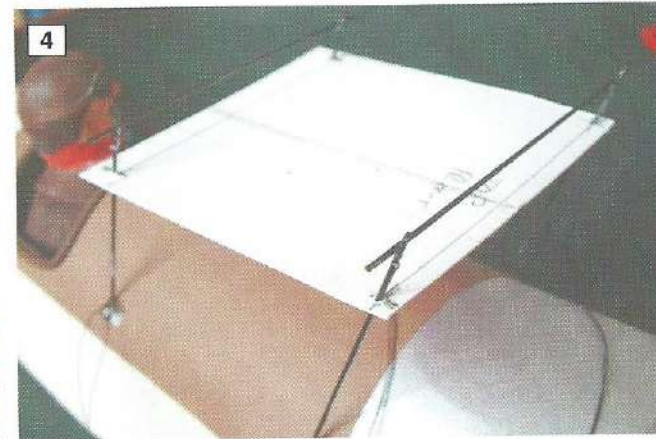
1: Most unusual for me – a kit of parts.



2: 'Rib tapes' painted onto sprayed wings, roundels masked off and weathering added with 90% thinned paint applied with a wet finger.



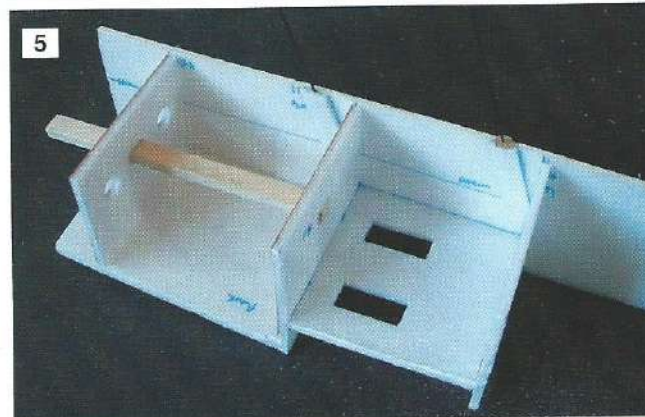
3: A flat brush is the best for painting up to lines and makes this task very easy.



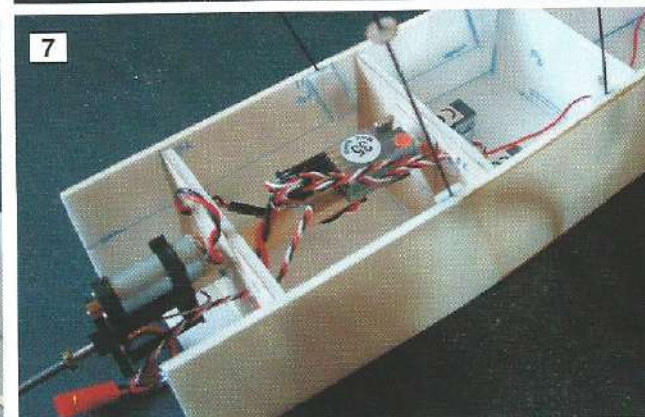
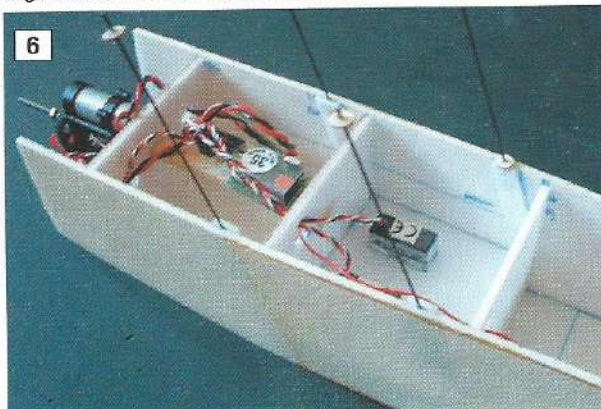
4: Carbon Fibre rod cabanes needed reinforcement before they were rigid enough. The interplane struts were less of a problem.

card pattern to ensure the the correct incidence. The top wing is assembled into one piece, using the same techniques and is epoxied to the cabanes in the 'all square' position. The interplane strut sets are made up and inserted, first into the lower wing and, when the glue is dry, into the top wing. These three sentences hide a lot of 'cut and fit' and more bad language. I'm still not the master of biplane rigging I'm afraid, but after a while it didn't look too bad. Talking of rigging, the thread flying and landing wires are essential if the model is not to fold up in flight, and once committed to those, you may as well enjoy another couple of hours of fiddling about and add the rest. It looks a lot better and is far stronger than a bare airframe!

After making the undercarriage from hard balsa (photo 9), wire spreaders and some heat-shrink film, have a go at the wheels. These are made from Depron discs,



5, 6 & 7: Fuselage assembly follows standard practice. The Depron front and rear floor makes alignment very easy.

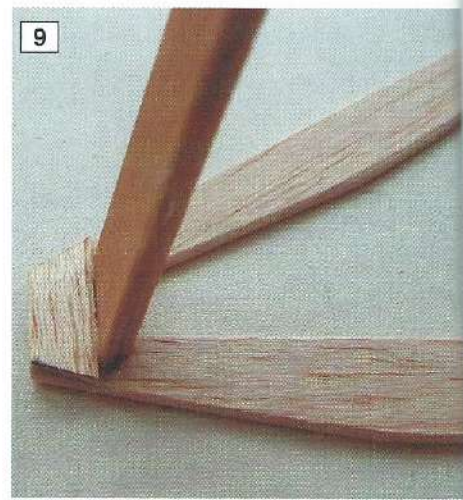




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8: Full view of the fuselage with radio and motor installed, prior to covering over the top decking.

9: The undercarriage legs are hard balsa with a joining piece housing the axle plate



ply and alloy tube, with paper covers (photos 10-14). I stained the undercarriage legs with *Coloron Antique Pine* wood dye, which gives a very convincing 'ash' colour to them.

Moulding a cowl

All that is left is the cowl. I made a former from four layers of 1/2" balsa sheet circles, sanded and filled to represent the rather flat-fronted cowl of the early Scouts. Later models had a more rounded, Sopwith-like cowl, and the D Scout had one of increased diameter to house a more powerful engine. The now traditional method of making the cowl itself is to buy a large bottle of cider, drink the contents and heat shrink the empty bottle onto the former. I suppose you could use a lemonade bottle instead, but without quite the same fun factor or care-less abandon. I did take the precaution of leaving a drying out period between the drinking and the shrinking because the last time I tried this technique on my Sopwith Sparrow, I found it impossible to get the moulded cowl off the former, and had to cut it away. This time, the scale cut-out under the cowl allowed it to relax and be eased off without damage.

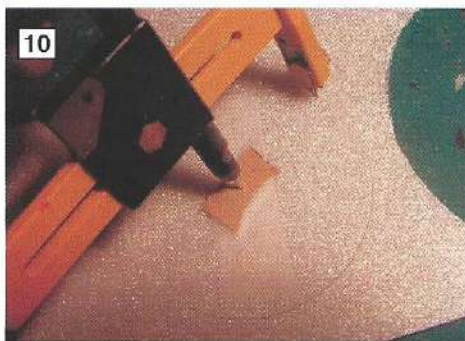
I have a few tips for first-timers photos 15 & 16:-

- * Mark accurately on the former the cutting lines for the rear of the cowl, any scale cut-outs and the hole in the front. Mark the centre of the front of the cowl very accurately and glue a patch of ply over it to allow you to use an Olfa cutter.

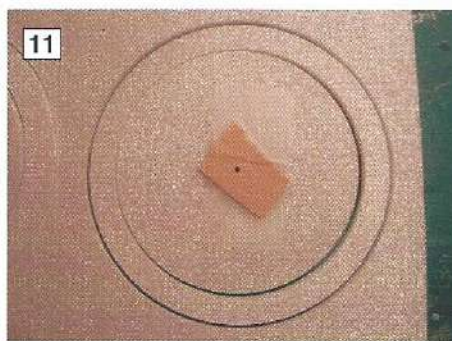
- * Use the neck end of the bottle. The base won't shrink properly, unless you are lucky enough to have some very early-style plastic bottles.

- * Cut the neck of the bottle off (it won't shrink and will distort the shape if you leave it on)

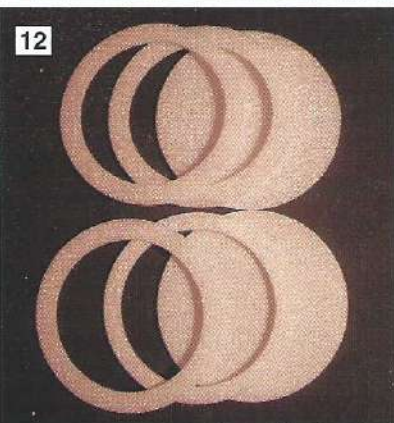
- * Then cut off the base. All this cutting is good practice for the last stage, so take it easy, cut very carefully with a sharp blade



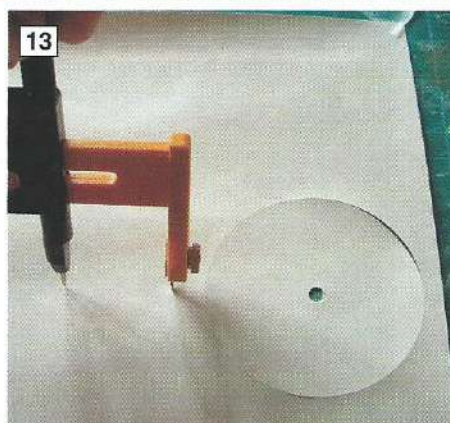
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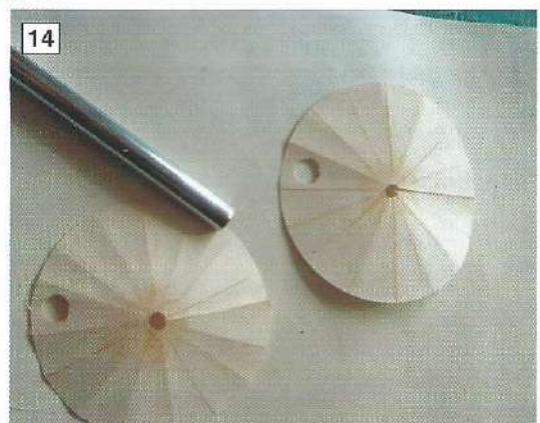
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10-14: Making Depron wheels is simple and very lightweight. An 'Olfa' cutter is essential for perfect discs and circles.



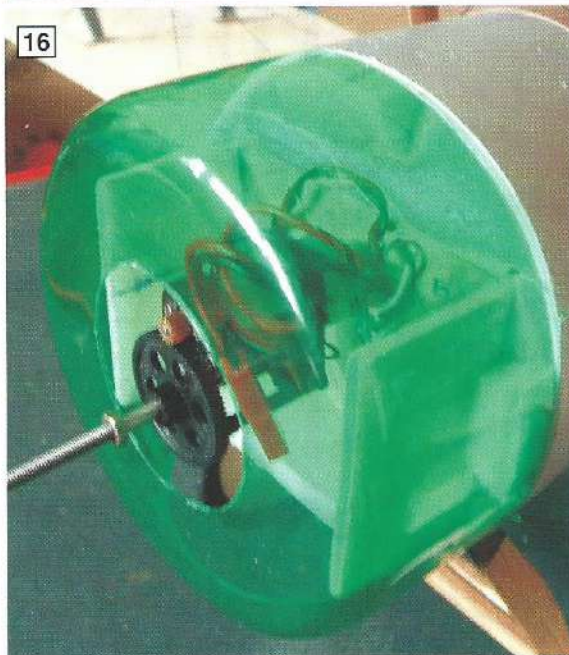
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15: The cowl is easily made from a plastic bottle, shrunk onto a balsa former.

16: The cowl blocks, ready for marking for the locating pegs



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17: The tailpost, showing the cotton thread control surface hinges.

18: A further view, showing the electric motor installation.

and make three or four passes, not just one.

* Press the former into the bottle and use a heat gun or hair dryer to start the shrinking process. Play the heat evenly all around until the bottle end is fully shrunk onto the former (with lots of creaks and groans!)

* Cut the rear of the bottle off the cowl, with great care and accuracy. Cut the front circular opening using an Olfa cutter. The cowl might push off the former now, but it's more likely that it will not. See my solution above.

Before you do anything else, drill three holes in the cowl as shown on the plan, then glue the 5mm foam inserts onto F1. Fit the cowl over the inserts (it should line up exactly with the top decking and the side cheeks) and push a felt-tipped pen through

the holes to mark their location.

Shape three short dowel pegs and push them into the inserts at the marked positions, check fit the cowl and finally glue the pegs securely into place.

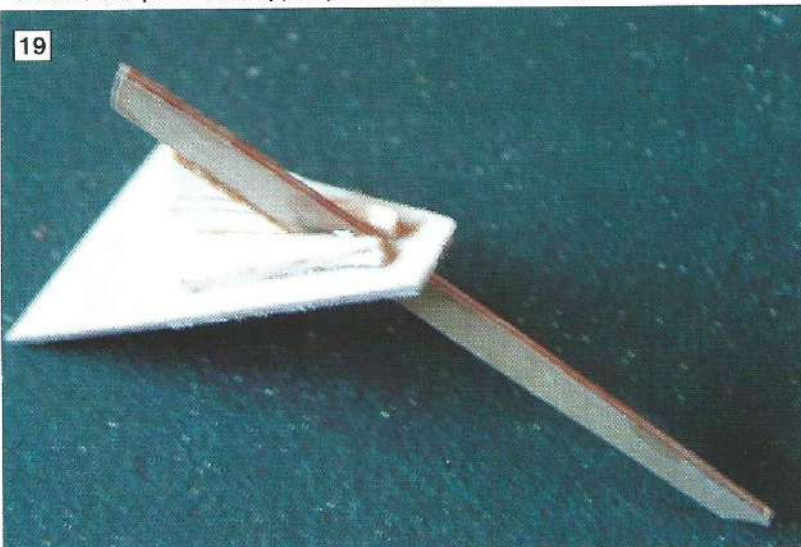
Flying

I used a 10 x 4.7" prop on the 'A' series GWS motor and, early one morning, just as the sun was rising (a lie, the sun had been up for hours, but it was early by my standards) the little model took off from the cricket pitch just down the road and climbed at about scale speed on full throttle. At 50 ft I eased back to half throttle and started a gentle circle. The rudder is effective but needs slightly more than scale movement to make tight 'indoor' turns and the elevator

has plenty of power and needs no more than 10mm movement each way. Loops are possible, but need a bit of dive to get all the way round. Despite the slightly smaller wing area than my earlier Sopwith Sparrow, the Scout can fly very slowly (it's an ounce lighter, thanks to the Depron wings, the very light decking and the carbon fibre struts) and looks very realistic against a blue sky. The first indoor flight was at our Oakmead sports hall in Poole. I cut away the elevators to give more rudder movement, as shown on the plan, and turns in the restricted space were much tighter. The little plane does look good in the air, and in the 'natural fabric' finish with the large RNAS roundels orientation is easy. A slight problem with the cowl locating dowels curtailed further testing so a wait for another calm sunny morning was needed and gave me a chance to draw up the plan. My photographer was in dock having his back repaired (get well soon, Trevor) and my camera chose this time to freeze up, so flying shots will have to wait.

On finals now...

The Scout is a lovely little aeroplane, easy to build and fly and looks really good inside or out. If you aim for an all-up weight of about 6 oz you will be rewarded with a realistically slow flight pattern and mild aerobatics on the hobby-standard GWS motor with a twin-cell lithium-ion battery. As a bonus, I have enough Depron left over to make a Sopwith Pup at the same scale - interested? I'm very happy to chat to builders: contact me at roachfoxwood@aol.com or give me a ring on 01202 477553. ■



19

19: The tailskid assembly - a mixture of lightest possible plywood and balsa.