Eddie being prepared for the next hunt.

Eddie the Eagle

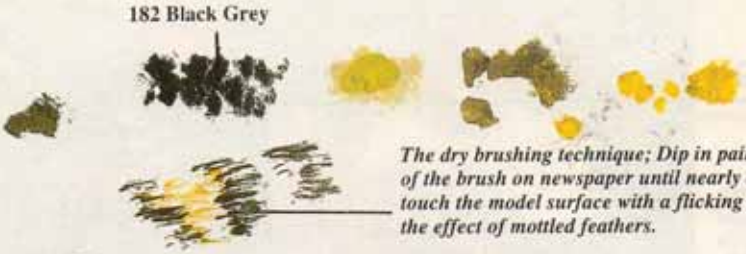
Jack Edwards details his experiment in radio controlled falconry

Eddie the Eagle on patrol.

I have always been interested in birds. My dad used to breed and show canaries, so we always had singing birds in the house, and they fascinated me. As a young Aeromodeller I made small bird gliders and later tried my hand at rubber powered flapping wing types with some success, but stability was always a problem.

Last year Reg Stahel one of our "Veteran Flyers Group" produced a buzzard glider which inspired me to have a go at some sort of large bird. I was watching the Anglia TV showing of the "Survival" series called "Hunters of the Skies". Amongst the many birds this excellent programme featured was the white tailed Sea Eagle, so I set about making sketches for the construction of a full size model of this magnificent bird.

Having made many foam wings for gliders and fuselages for my PSS models the construction should be straightforward but the flying would be experimental. I considered the following features:- the swept up wingtip feathers of the Eagle would provide some fin area (and probably a lot of drag). There could be differential ailerons and the elevator mounted on a "T" bar coupled mechanically to the aileron servo. Then there was the addition of chicken legs underneath as cheater fins, and a home brewed wing section with a lot of reflex. The project was beginning to gel, so I drew up a structural plan.



The dry brushing technique; Dip in paint then dab the end of the brush on newspaper until nearly dry. Then lightly touch the model surface with a flicking motion to produce the effect of mottled feathers.

Don't forget to check the c.g. when finished; painting certainly made a difference on the prototype.

All colours are Humbrol enamels.

Outline the feathers with a black, broken line.

Construction

Wings - Assemble two main spars from hard 1/4 inch sheet balsa. Position the wing rod tube at the wing root end and add plywood supports on each side and epoxy in place. Each wing panel is then built up with eight pieces of shaped blue foam which are cut out using templates and a hot wire foam cutter. These are attached to the main spar in pairs taking care to square up all joining surfaces with a sandpaper block before applying epoxy.

Cut out the ailerons, trim them and add balsa edging to both the aileron and the recess for structural support. Fit hinges along the top edge. The control snake is buried along the wing underside and emerges at the upper surface in front of the aileron recess. A clevis on the snake end fits into a home made slotted horn made from brass sheet. Stops are fitted in the aileron recess corners on the wing underside to prevent any down movement, and a clear plastic "drag brake" attached to the underside of the aileron. The servo end of the snake has a socket/ball connection for quick assembly and release, aileron movement is about +30 degrees, - 0 degrees.

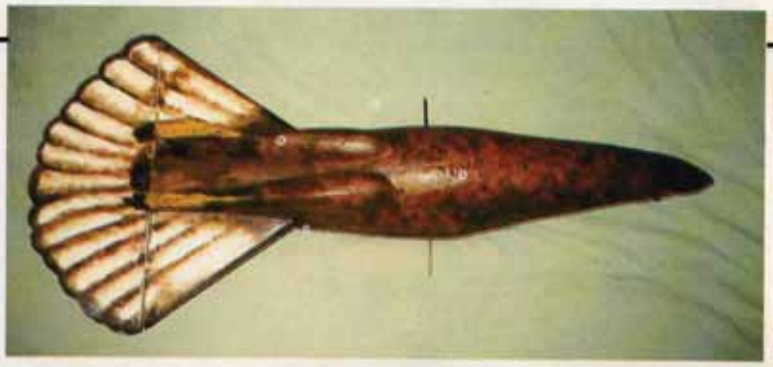
Each of the wingtip feathers is made from two pieces of 0.5 mm ply epoxied together and formed on the curved surface of a parallel sided pan or jar, making sure that the axis of the curved surface is in line with the direction of flight. The right and left hand set of wingtip feathers produced are fitted edge to edge and epoxied onto the underside of each wingtip. The 1/8th inch sheet balsa root rib is added and the 1/4 inch dowel pegs with small hooks for wing location and retention are epoxied into place.

Fuselage - A 1/8th sheet balsa frame is assembled onto the plywood formers. Pieces of blue foam are epoxied to the outer surfaces and suitably shaped, together with a block on the front to produce the head. The tail pieces are built up on the plan from strips of balsa and 1/2 inch blue foam. Epoxy the tail pieces to the body sides and locate the elevator piece on hinges. The movement of plus/minus 10 degrees is via a push rod to a horn on the elevator underside. The wing location ribs are faced with 1 mm plywood for added strength after fitting the wing support rod to the centre plywood former. Two legs from 1/4 inch hard balsa sheet with blue foam side pieces are positioned in parallel on the underside. Two servos are fitted and the two hatch covers are from hinged blue foam pieces.

Start with a fairly dark background then paint on darker feathers. There seem to be five rows from l.e. to t.e. – note the increased angle towards the tip. Outline the feathers with a light or dark line.

Some books show very ragged trailing edge feathers (as above). The important thing is not to get the feathers too perfect otherwise they will look more artificial. If you think this has happened, try blurring the edges with a dry brush technique. Painting notes: Reg Stahel.

Jack Edwards launches Eddie the Eagle over Parlick Fell.



Realistic colouring repays the time and effort; practice on scrap material before painting the model. Keep the colours subtle; reference to colour photographs and bird book artwork is important here.

Flying

The finished model was balanced laterally and weight added into the head to establish the C.G. For test flights a clear plastic fin was used to aid directional stability. In a light wind on Parlick Fell first flights went well. Eddie flew off in wide circles, elevator response was ok but he would not turn. The twisting tail and differential ailerons appeared to work in the wrong way.

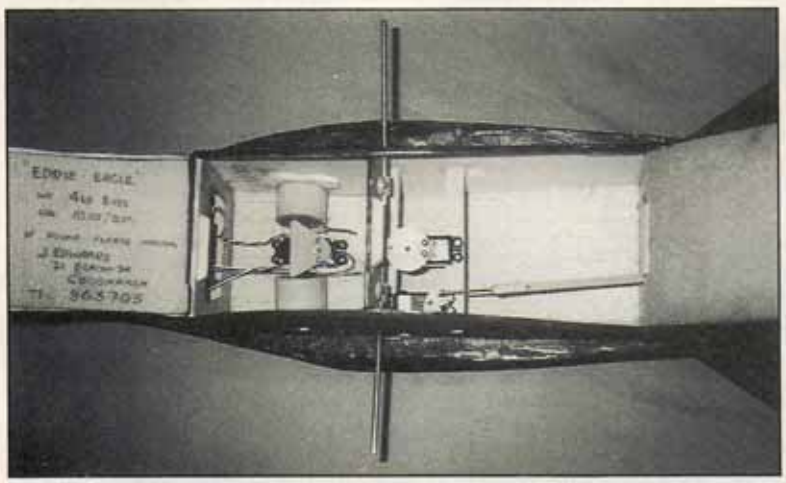
The first modification was to add small drag plates to the underside of the ailerons. Stops were added to the recess and the slotted horns fitted. This improved matters, but I felt sure that the twisting tail was wrong. After watching the TV programme again and talking to Reg Stahel I went back to a standard fixed tail with elevator. The fin was removed, the larger drag plates were fitted, and the steering proved to be satisfactory. With some practice fairly tight thermal turns can be maintained, but the regular flight is large circles. Application of full aileron can be used when Eddie is attacked by stooping buzzards etc. Full aileron and drag plate produce a flick roll and a dive very quickly.

Early this year whilst on holiday in Lanzarote I bought two "press to work" voice boxes of animal sounds. These were fitted against the inside walls of the fuselage with holes cut through to allow the sound to escape. A servo mounted between the two boxes was fitted with a cam to operate them separately. The sounds are either "chimps screaming" or "goats bleating". Occasionally buzzards and falcons appear to be interested in Eddie the Eagle but I don't think that they understand his foul language!

There is room for improvement in this design and a mark 2 version may be constructed next year. At present I have two all sheet balsa birds flying satisfactorily and am working on a gull design. Why don't *you* have a go at a bird!

With careful painting, the ailerons and dragplates disappear; tip feathers from laminated 2mm ply are upturned by forming around various sized cooking pans!

Full-size copies of the plans (two big sheets) are available as SF418, price £10.50 including post and packing, from ASP, Argus House, Boundary Way, Hemel Hempstead, Herts. HP2 7ST. Model Pilots Association members need only send £9.45.



Covering and Finishing

Apart from the wingtip feathers the whole model is covered with medium dressmakers interfacing using wallpaper or flour paste. When dry a base coat of light brown undercoat, oil based or emulsion paint is applied to the covering. Then using matt or undercoat colours of dark brown, tan, black, and white, you outline and paint the feathers. This takes a lot of time and patience. Use a bird book showing the arrangement of feathers for reference. With practice even I managed to make it look effective. The results are better when viewed from a distance. Recently a local full size glider pilot apparently asked his pupil to "follow that bird" when looking for lift near to Parlick Fell. Only when he remarked "Look at that beautiful plumage" was he told "That's a model, I've seen it before".

Launch Action, Jack Edwards gets Eddie on his way.