

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

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

Irrespective as to how effective this mongrel mixture of components was as a night fighter, it certainly makes a very stable flight model for day time flying. All B.E.s from the 2c onward are stable subjects, but it is virtually impossible to completely hide

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

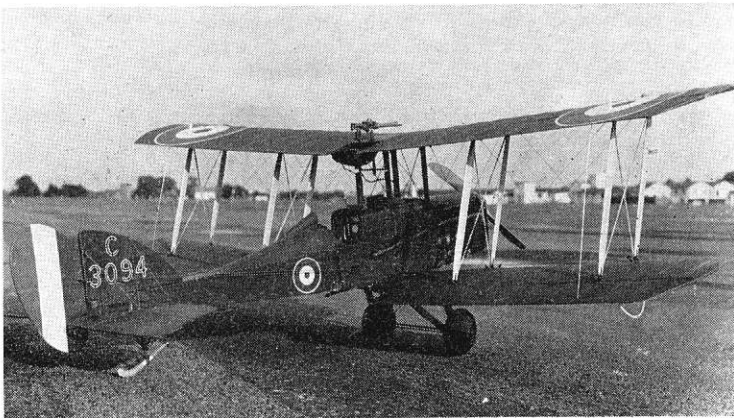
a model engine effectively in any of the R.A.F.-powered machines; however, almost any inverted engine can be hidden in the 12b. I used a 1947 vintage Mills Mk. 1 1.3 c.c. in mine which is the perfect power unit for this type of model with its long stroke ability to swing a large-scale diameter propeller and rear induction allowing easy choking and needle valve adjustment. Alternatively, if one of these old masterpieces is not to hand, one of the current production 1-1.5 c.c. diesels may be fitted. Unfortunately these are nearly all front induction engines, therefore arrangements will have to be made to choke them and the needle valve will have to protrude through the cowl sides. The engine is not mounted directly to the bearers but on a 10 s.w.g. light alloy plate in order to allow trimming adjustments to the thrust line to be made.

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

Fuselage

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

The front end is a most distinctive feature, and is bent from 22 s.w.g. aluminium plate in three pieces – the horseshoe-shaped main section, the bottom section and the plate behind the airscrew driving disc. These are quite easily bent to shape over a hardwood former and the pieces then assembled using epoxy resin. The brass gauze is held up flush to the front face by means of $\frac{1}{16}$ in. balsa side cheeks epoxied in place. The top cowl is simply bent to conform to the upper contours of formers F1A and 2A and trimmed to be a close fit around the engine banks and shrouds. It is held in place by means of a large



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

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

The undercarriage itself is a torsion bar unit bent from a single piece of 12 s.w.g. piano wire – in order to allow the torsion bars to work correctly the rear struts should *not* be anchored but be allowed to move freely backwards. The $\frac{3}{8}$ in. sheet fairings are epoxyed to the rear of the 12 s.w.g. legs after the spreader bars have been bound in place with fuse wire and soldered securely.

Tail surfaces

These are made by first making the position of all spars and ribs onto medium 1/32in. sheet then cutting the sheet to match its outline shape. The profiles are then turned over and the structure again marked on the opposite side – this is best achieved using carbon paper between the plan and sheet; just tracing over the drawing. The structure is then built up on either side of the sheet and then sanded to section. This method of construction may appear strange to some people but I recommend it to be well tried; no other method will produce such a strong, warp free structure, with very small section edges and scale thickness. The curved edges can best be produced by nicking the inside edge of the strip at about $\frac{3}{8}$ in. intervals with the thumbnail.

Wings

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

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

Covering

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

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

Rigging

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

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

Flying

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

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

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

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

