

Test Pilot

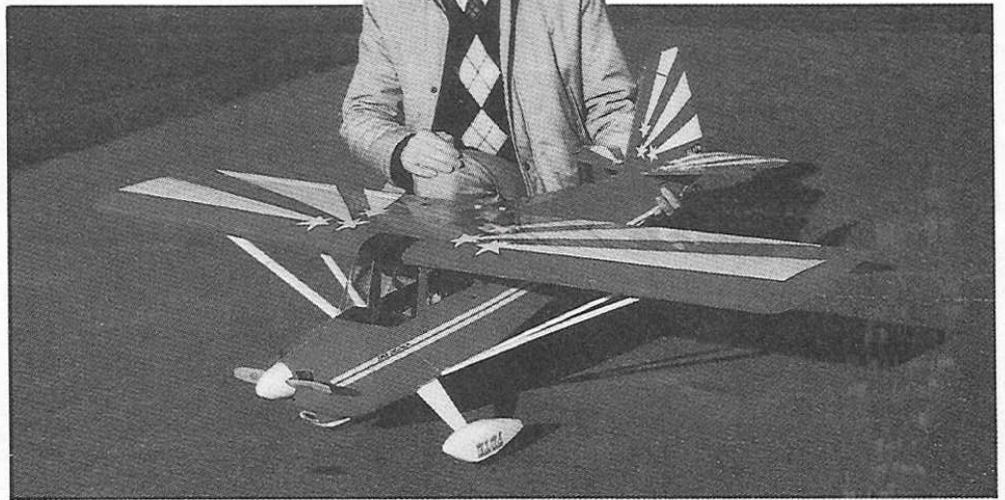
Great Planes 'Super Decathlon 40' reviewed by Jeff Barringer

CITABRIA is Airbatic spelled backwards. Everyone knows that! Well actually, I didn't until it was pointed out to me after I had completed this Great Planes kit. To give it its full title, its called the Bellanca Citabria Super Decathlon. The full size aircraft was developed over many years from the Aeronca Champion and Sedan Aircraft of the 1940s. Seating is for two people in tandem and various versions have been used for basic training (notably by the Turkish Army), crop spraying and there is a floatplane version – so plenty of scope for Scale. The Decathlon is FAA cleared for unlimited aerobatics and the Super Decathlon, the subject of this particular Great Planes kit, is powered by an Avco Lycoming 180hp engine with constant speed prop and a rather sexy paint job.

Rather than the usual anonymous cardboard box with a printed label, the Decathlon comes in a strong, full colour printed box, which, when opened, continues to impress. A stapled-in compartment separates the crushable cowl and canopy mouldings from the rest of the materials.

First a look at the literature, a 44 page Manual filled with instructions, diagrams, and photographs. Each step has a small tick-box beside it to follow progress.

The plan is black-on-white and very well printed. There are two sheets, the back of the fuselage plan carrying full details of the



colour scheme also well illustrated on the box. A sheet of attractive decals is enclosed.

Delving into the materials, the wood is all of good quality. One particular piece which attracts attention is a strip of machined balsa, which on investigation is the leading and trailing edge for both wings. By routing these from the one solid block, we are assisted in an accurate build and match for the two wings.

All of the ply parts are beautifully die-cut and each removes without resistance, sure sign of quality. Four vacuum sealed bags hold a comprehensive selection of minor

components. The mouldings for cowl and canopy are of good quality, as are the wheel pant mouldings.

Opening the Manual to begin construction, there is a comprehensive list of tools required, and any parts not supplied. As I had a Magnum .40 engine unused and waiting I decided to build to fit this, although I wanted to leave my options open for a larger four stroke motor later.

Tail Feathers

Both the rudder and the elevator overhang the fin and stabiliser respectively to give

aerodynamic balance and both are built up from quarter inch balsa materials of an excellent grade. The only thing I would add to the instructions is to put the 'V' onto the hinged sides of the rudder and elevator before assembly so that the 'veeing' can be done with a plane rather than trying to sand it later.

Mainplane

This is a built-up structure with a symmetrical section, and very well engineered indeed, the die-cut ribs drop easily from the balsa. The leading and trailing edges are machined from a single piece of balsa to ensure accurate alignment as mentioned above, and Great Planes provide further alignment tools in order to ensure accuracy.

The 3/8in square lower mainspars are pinned to the plan, ribs are added, and then a supplied trailing edge jig stick is pinned to the trailing edge to hold it in the correct position for wing assembly. The text at this point has the only mistake I detected in the whole 44 manual – the jig stick is described as 1/8in x 7/8in x 32in whereas a search of materials and then a check in the parts list at the rear yielded a 1/8in x 3/4in x 32in balsa strip. Having fitted the ribs and trailing edge, the leading edge follows, pre-slotted to ensure alignment. Trailing edge and leading edge sheeting follow, all described extremely well in the text.

Good strong ply dihedral braces are epoxied into slots with the help of supplied 1/2in square x 2in balsa spacers for the tips and the trailing edge and then centre section sheeting is added top and bottom. The ailerons are trial fitted and shaped and then the centre section is fibreglass taped. The wing is already very strong indeed, and left to my own choice I would have omitted the fibreglass, but this is a review model, and Great Planes insist that the tape be fitted, so it was. Later in the manual, they say that the wing bracing struts are only for scale detail and may be omitted, obviously with the fibreglass tape the wing is considered quite strong enough.

The wing tips are straightforward balsa blocks in the scale version I was building. The wing tip shape for the Super Decathlon ex-factory is shown on the plan. The final work on the wing is the mounting plate and dowels for the fit to the fuselage, as far as it can be taken at this stage.

Fuselage

The two fuselage sides come as three parts each of which are spliced together using pre-cut castellations. The fit is superb and the resulting structure very strong.

A liteply box section formed from doublers, formers and top and bottom members slots together in such a positive manner that you would be quite hard-pushed to make anything other than a square, true fuselage. The after formers are glued to strengthening pieces on the plan and then the tail end is pulled together. The front bulkhead is fitted to give an element of sidethrust to the engine, which itself raises an interesting design point. In

order that your Super Decathlon can use both two-and four-stroke engines, a spacer is built onto the bulkhead for two strokes and omitted for four strokes. As I intended to use a two stroke initially, but later to have the option of a four stroke, I drilled the bulkhead for the four stroke at this stage and then fitted the spacer. In fact, because I intended to use the Magnum .40, which is nearer to a .25 in size and weight, I had to extend even the spacer to 7/8 inch.

The sidethrust itself is obtained by designating the sidepieces left and right and then marking each before fixing the doublers to the lines marked, butting the bulkhead onto these in turn. Its described an awful lot better in the manual than I can manage here.

Liteply formers for the bottom and top shaping of the passenger area are fitted, and a series of triangular balsa strips are used to create a close resemblance to the full-size machine. A substantial ply plate provides the undercarriage location.

The bottom is then cross-grain sheeted using 3/32 inch soft balsa and sanded to the angular profile of the full-size. The top and bottom front is sheeted over ply formers, followed by the cabin area, which is formed from pre-cut liteply panels. The wing-retaining bracket is glued in using epoxy and then the wing is trial fitted so that the holes for the bolts can be drilled. The instructions suggest that the ply should be tapped directly to take the bolts, but it's easy to overtighten and strip the threads in the field, so I fitted a couple of 1/4in bsw captured nuts instead, readily available from the local Model Shop.

Continuing with the fuselage now, the rear. This uses a pair of stringers as base, followed by triangular section then sheeting, again sanded to an angular finish.

Once this has been done, its time for the stabiliser and fin. The instructions show how to mark and measure to accurately locate these, a quick mix of epoxy and they're on. In order to get a feel for the complete machine, I fitted the ailerons, rudder and elevator at this stage, and very nice it looked too. I had the feeling during the build that the machine was going to be overweight, from the massive feel of all the component parts, but when I had the finished aircraft in my hands it felt quite light, and looked very tough.

Finishing

The engine went into the aircraft rather easily, there being plenty of room under the cowl for such a small unit. The cowl and wheelspats are easily cut from plastic, and are lightweight. If, as we do, you fly from a rough field, take care to reinforce these well. When cutting the hole for the cylinder head I made it oversize so that later larger engines could be fitted. Given more time, I would bulge the cowl so that the engine could be wholly accommodated within it (or fit the engine inverted).

The tail-wheel carrier supplied is held into the rear of the fuselage on a nylon tab and slots into a hole in the rudder for steering. As a grass field-flier I am

conscious of the loading on the rudder servo during ground-handling, so I habitually spring-connect the tailwheel to the rudder as in full-size aircraft. There is a rather ugly slot beneath the undercarriage which screams out to be filled and indeed the instructions suggest that it might, so I made up a lightweight cover from balsa and covered it to match the fuselage.

The control linkage runs are supplied, being piano wire pushrods running in plastic tubing. When I built the Big Stik (also by Great Planes) the same method was used and I was suspicious of it, but the Big Stik having given faithful service I was quite happy with the system. To fit, all one does is to make the run for the control as straight as possible and then to fit the continuous piano wire rod with some small bushes cut from a supplied nylon tube. This ensures a friction and warp-free run. The two ends of the wire are then terminated at the horn with a clevis and at the servo with a double bend. The throttle servo I connected using bowden cable to give flexibility for later engine fits. There is very adequate space for the servos within the fuselage. The wing-bracing struts are for scale appearance only and the model may be flown without them. They are made from supplied hard balsa and shaped to an oval section, the ends are reinforced with glassfibre tape and then the assembly is painted.

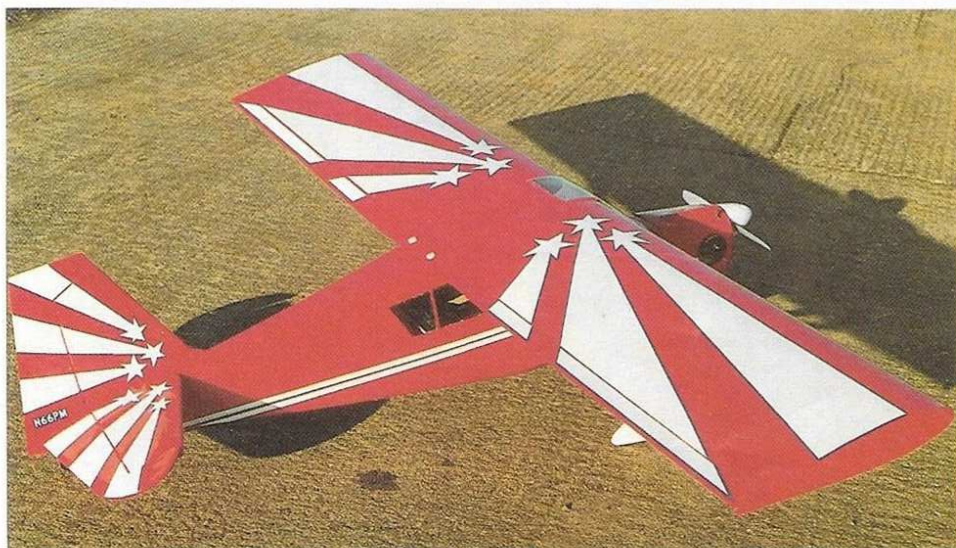
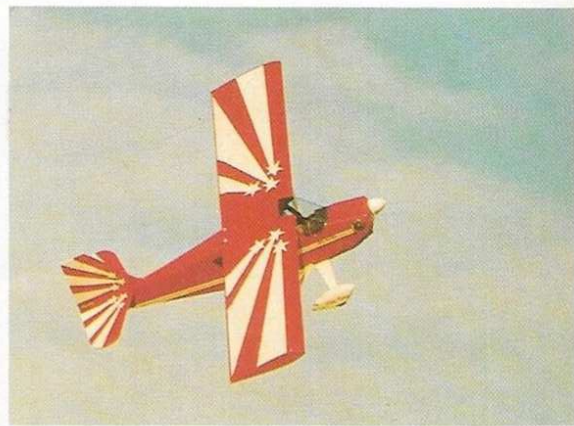
Covering

Solarfilm Dark Red was used, as the structure was considered sufficiently rigid not to need support from the covering material. The cowl was sprayed with the matching Solarlac colour. The stars on the model are supplied by Great Planes and their placings taken from the plan. The white flashes were then added using Solarspan and the blue bordering from Solartex cut into fine strips. Both White and Blue were fixed using Solarfilm Solvent, with a small touch of the iron on the ends.

The wing/fuselage joint was made using silicon compound (or bath sealant) to ensure an accurate fit between the two – much better than foam strip and much harder wearing too.

Flying

The all up weight without fuel turned out to be 2.65kg, or 5.83lbs. The Centre of Gravity was well forward for the initial flight testing in order to reduce skittishness, and it is fair to say that the Decathlon does not like forward c of g. It was very cold with a gusty north-easterly blowing on the December day chosen for the test flight. The brand-new Magnum .40 was a little rich, and although the model soon accelerated to flying speed, it was reluctant to rotate. After climb-out and application of full aft trim the model flew straight and level hands-off. In the stall with partial power the right wing dropped smartly, a tendency which was soon to prove our undoing. Flypasts for the camera once more exhibited the reluctance to climb, and when the engine quit in a most unfortunate spot, followed by an attempted downwind



Looking the part as posed on the apron at Sywell aerodrome, the Decathlon has a truly sporty image for a high wing cabin model. The fact that the model was flown by the Editor and the in-flight photos were taken by Jeff (unused to such activities) proves the flying characteristics of the model – once the correct C of G had been attained.

landing, the right wing dropped and the model cartwheeled twice before coming to rest. Most amazingly, the damage was superficial everywhere apart from the port stabiliser, which was crunched but repairable.

The very next day we tried again. Now we had the c of g in the centre of the range and a little more time on the engine, and the model was transformed. The Super Decathlon would happily loop and roll and within minutes was being flown with confidence and verve across the patch for photographs. The stall was a total non-event, just a wings level nose drop recovered with forward stick. In the glide the model was in no particular hurry to come down and the landings were totally predictable. Given more time on the engine so that we are getting full power, I see no reason why the model should not be a very satisfactory Scale and Aerobatic performer.

Overall impressions

When I first began building, looking at the generous tail portions and the amount of

work in the wings etc., I felt sure that a 'forty' was not going to be powerful enough for this model. However, the sturdy appearance belies the overall weight. The model was very adequately powered on the Magnum, which admittedly is Schneurleported and ABC engine, but any reasonably hot .40 would do. The megalomaniac element who must overengine will be well pleased with the amount of room within the cowl and the resulting performance from what is a sturdy scale aircraft. The wealth of detail in the building instructions and the positive location and fit of all the parts make the Great Planes Super Decathlon a pleasure to build for the experienced and not-so-experienced constructor. In the air it is big enough to see and fly accurately without being too big to fit a normal car boot. I would suggest that the modeller who, like me, flies from a field and heaves models in and out of the boot of his car should take particular care with the following:-

The aforementioned overhang on the elevator is prone to be knocked, so add extra strengthening braces during

construction.

With the heavy wing the cabin area could be crushed in a heavy landing. Dowel pieces from floor to wing-mount would strengthen the structure and would not show.

Add strengthening to the cowl and spats, indeed, if you have time, line the entire cowl with fibrecloth.

The above are not criticisms of the kit, merely observations of one who spends a lot of time repairing due to ground handling rather than flying.

The only minor winge-ette, and it really is minor, is that I would have liked the instructions to have included some detailed photographs of the full-sized aircraft for scale purposes. A keen modeller anxious for scale detail would doubtless obtain these himself anyway.

All in all, an excellent kit, great fun to build, and above all, a Great Plane to fly.

Although this particular kit was reviewed for the European 'Model of the Year contest', Great Planes kits are imported by J R Perkins and should be available from model stockists.