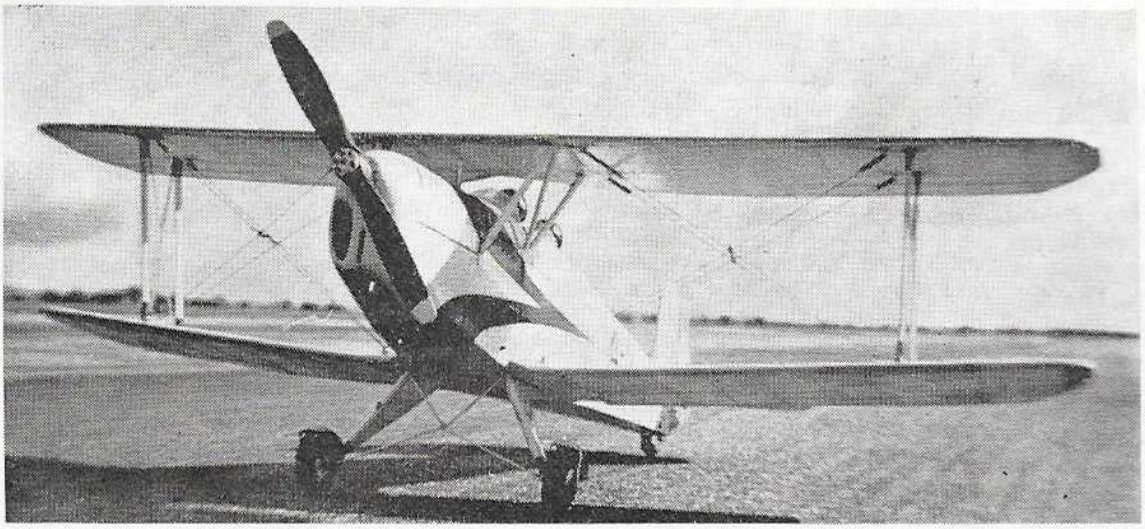


Eric Coates' well tried and tested (six years!) 36 in. span, $\frac{1}{8}$th scale, free-flight model for 1.5 c.c. engines

BUCKER JUNGMANN

WHILST ON HOLIDAY in Socarno, Switzerland, in 1965 I was surprised to see that Bucker Jungmanns were still in service as primary trainers with the Swiss Air Force at the local airfield. I spent a morning there and took several photographs of these machines in their attractive yellow and black colour scheme – reminiscent of the splendid Tiger Moths and Blackburn B2s I remember from pre-war days. It was obvious that a similarly attractive and stable model could be produced.

Returning to England I made a fruitless search for available data, but discovered that one was on the British Register at Jenkins Farm in Essex. Descending on this establishment one miserable wet day that December, at the kind invitation of the machines' owner – Ron Fautley, I then spent the entire day taking measurements and photographs from which I later prepared three view drawings which indeed form the basis of this month's *Aircraft Described* feature.

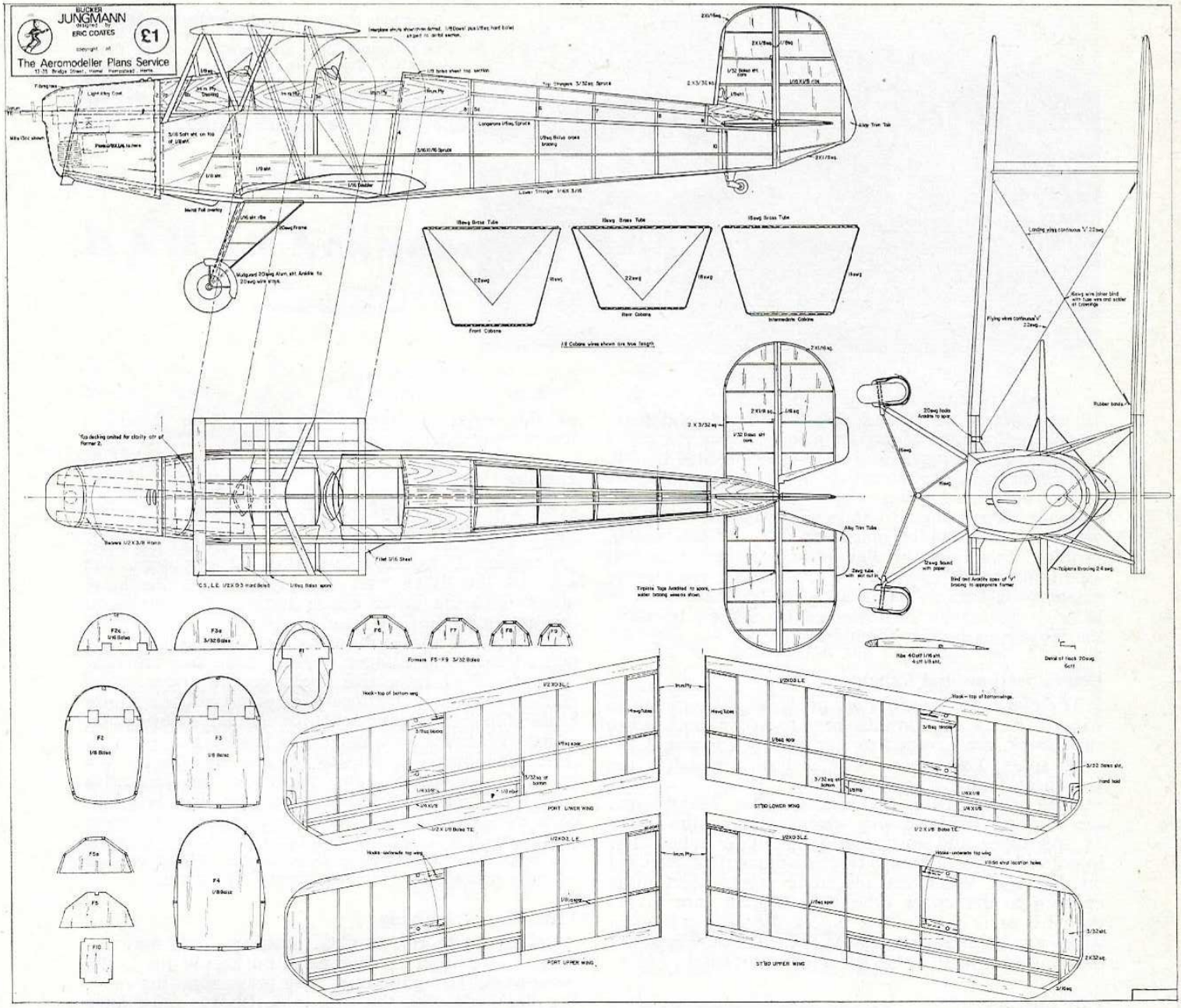
The model was built early in 1966 and enjoyed considerable competition success in the late sixties. It won the *Super Scale Trophy* in 1967; being second the previous year.

Being built some eight years ago some of the structure is somewhat dated in design and does not incorporate my latest thinking on this subject. (The B.E. 12b, for instance, published last March was designed several years later and can be regarded as more in line with my present practice.) Nevertheless, there has been considerable demand for the publication of this design and it is presented as built in 1966 with only a few minor amendments.

All areas and airfoil sections are to exact scale and the structure is as accurate as possible, only notable non-scale feature is the fact that the upper wing has +1° of incidence as opposed to —1° on the full-sized machine as there is no need for a free-flight model to have good inverted performance and with the rather small wing area the extra lift generated is very useful. The engine thrust line is also, by necessity, anything but scale. The only major structural deviation is the large section wing trailing edge. With a relatively small thin wing like this there is really no other sensible practical solution. Thanks to a long nose and sweepback there is, for once, no problem with getting the C.G. far enough forward. In fact, for once I had to use tail ballast.

This is not a light aeroplane and combined with its large fuselage, in relation to the small wings, requires a lot more power than one normally associates with a 36in. span scale model. It needed all the power of a Mills 1.3 c.c. engine for take offs on my original. If fitting a modern engine use something of equivalent practical power. Although a relatively fast flyer it is very stable and mine invari-

Looks real, doesn't it? The Jungmann has ideal properties for free-flight scale, the long nose overcoming the usual rearward – centre of gravity problems, while the swept back wing aids stability. Engine cowl is from glass-fibre and light alloy, but the shapes are simple and should provide no difficulty. Block and sheet balsa could be substituted if necessary but are not so durable in the event of nose-overs or careless handling.



FULL-SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. FSP.1217 PRICE £1 (INCLUDING POSTAGE AND V.A.T.) FROM AEROMODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.

ably weathercocked into wind, on the glide, so the 'approach' speed was quite slow. If built correctly it is a very strong model and should not come to much harm. Mine flew for six years before being 'retired' after it flew into the doors of a garage. . . .

Construction is relatively straightforward and mainly follows the lines outlined in *Flying Scale Models* published in this magazine during 1971-72.

Fuselage

This is built in the conventional fashion using spruce longerons and stringers exclusively. The two sides are built normally with the lower longerons continuous. These are cut away when the fuselage structure is complete and the cut out for the lower wing centre section is being made. $\frac{1}{8}$in. sheet is let in between F2 and 3 and above the lower wing aft of former F3 only up to the centre stringer line.

The lower part of the cowl, between formers 1 and 2, is planked with $\frac{1}{8}$in. x $\frac{1}{4}$in. balsa, soft 3/16in. balsa sheet overlapped over the $\frac{1}{8}$in. sheet allows the nose contour to be carved to blend in with the oval cowl shape.

Undercarriage

This is a torsion bar job, the main legs being bent from a single piece of 12 swg wire attached with eye bolts to the rear of F3 while the spreader bars are 16 swg wire, bound and soldered on. The outlines of the trouser fairings are bent from a single piece of

A couple of pilots in the cockpit really add to the realism of a scale model – nothing looks worse than an 'empty' machine flying sedately down the airfield! The Jungmann is rather a heavy design, and so needs adequate power to get it airborne – take-offs tend to be lengthy, so make sure the undercarriage tracks true.

20 swg wire, also bound and soldered to the main legs. The diameter of the main legs is then increased by binding with paper soaked in epoxy resin – 1/16in. balsa ribs are then epoxied between the legs and the fairing outlines. Fairings are covered in nylon, doped in place. The mudguard stays are made from 20 swg wire and soldered in place after the wheels are in position. Finally the mudguards are beaten from soft aluminium and epoxied to the stays. The whole assembly is free to swing back, under load, so slots have to be cut in the lower centre section to allow the fairings to enter without damage.

Centre Sections and Cabane

The two centre sections are made just like miniature wings. The 14 swg dowels, bent to accommodate the sweepback, are epoxied to the leading edges and the main spars. The lower centre section is glued to the $\frac{1}{8}$in. sheet doublers at 0° incidence.

The cabane struts are bent to exact length over the drawing from 18 swg wire, including the lower 18 swg tubes and sprung into the upper tubes. The lower tubes are epoxied to the appropriate position on fuselage. When set the upper centre section is epoxied to the upper tubes taking great care to see that it is at +1° incidence before the 22 swg bracing wires are soldered in place. The cabane struts are then faired in with balsa epoxied to the wire.

Tail surfaces

These are constructed on the now fairly well-known 1/32in. sheet centre-core method, the spar, outlines and ribs being glued either side and the whole sanded to the required airfoil section. Moving surfaces are attached to the rigid ones by stiff tinplate hinges, while trim tabs are from the same material epoxied to the trailing edges.

Wings

These are absolutely straightforward. The ailerons are built along with the main panels and separated and finished separately. Tips are constructed like the tail surfaces. Handholes are incorporated only in the lower wing tips.

Covering and Finishing

Cover the whole model with lightweight Modelspan tissue and then cover *again* with lightweight silk doped on. The original was doped yellow (six thin coats for an even covering) and decorated as A27 of the Swiss Airframe. For full colour details I recommend the purchase of Profile No. 222.

Rigging

This is a very simple operation, being single bay with only single root anchorage. Landing and flying wires are bent to form 'Vs', with hooks at their extremities, from single pieces of 22 swg wire. The apex of the flying wire 'V' engages with the hook attached to the lower centre section. Two hooks at the extremities of the landing wire 'V' engage with the hooks on the lower wing adjacent to the interplane struts, while upper ends of the wires are connected to their respective hooks on the upper centre section and wings by means of small rubber bands. Scale dihedral is sufficient for lateral stability i.e. upper $1\frac{1}{2}$°, lower $3\frac{1}{2}$°. When this has been rigged correctly the piece of 16 swg wire is laid across the bracing wire intersections, bound to the respective wire with fuse wire, and soldered. Bracing wires for each bay are therefore all in one piece to promote rapid assembly after transport. The incidence wires are best reproduced by rubber bands which engage on pins protruding from the interplane struts.

Trimming and Flying

Ballast up to correct C.G. position – this may appear to be further aft than usual but this is due to the sweepback. Test glide over long grass adjusting for a fast flat glide with the trim tabs (Bucker must have been thinking of future generations of modellers when he fitted them!) Continuing over long grass, commence power flying with the engine at half power to produce a powered glide. Model should fly straight on with slight left turn. Correct any tendency to turn right with a little left rudder. Similarly, stalling tendency with the elevators. Slowly increase power until a climb to the left results but the glide should be almost straight. If large amounts of elevator or rudder movements are necessary to produce the desired powered trim, then the glide will have suffered. Adjustments to the engine thrust line may then be necessary in order that the control surfaces can be returned to the optimum glide trim position.

Take-offs can now be attempted. Because of the high wing loading these are fairly long and acceleration is slow to build up to the required flying speed. It is, therefore, essential that the undercarriage is running free and tracking properly.

Once trimmed this model is a joy to behold in the air, especially if painted yellow!