Radio Models

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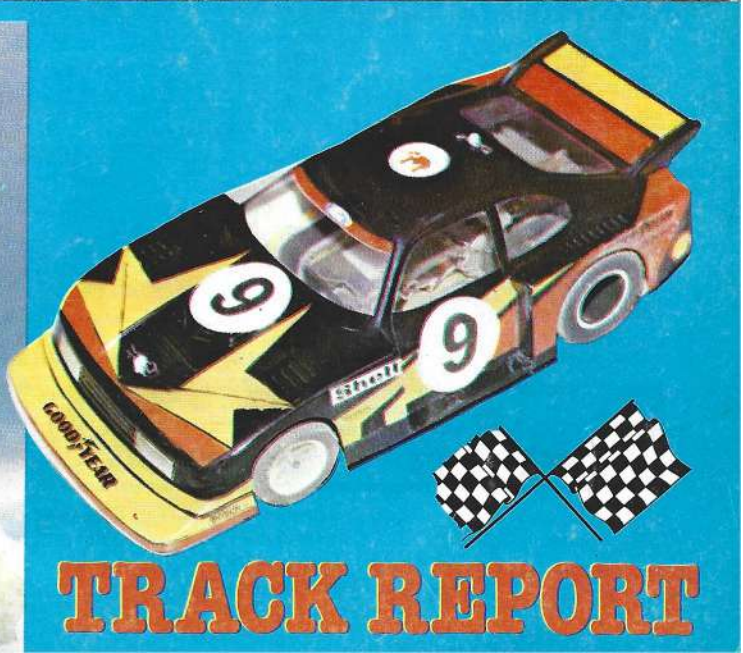
JUNGMEISTER PLANS



TRACK REPORT

Bucker Jungmeister

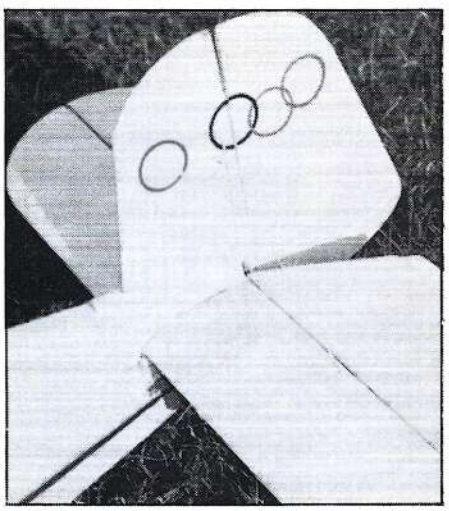
A 43in wing span sports scale model for .35-.40 cu ins engines and 4-function R/C

Designed by GERALD CURD

Advanced aerobatic trainer aircraft are an essential part of any military airforce and the German authorities recognised this need when rebuilding of their armed forces started in the mid 1930s. Based on the two seat 'Jungmann' the 'Jungmeister' was produced by the *Bucker* concern in 1935 and, some forty-five years later is still reckoned to be an excellent aerobatic aircraft. Because of the power limitations, it was fitted with a 140 or 160 h.p. engine, it is no longer competitive in top class international aerobatic contests, but it is hoped that the distinctive lines of this delightful biplane will be seen at airshows for many years to come. Roy Legg, owner of the prototype featured here in the seventies, will be remembered for his spirited displays with the 'Jungmeister' his speciality being a one and a half flick roll from knife edge on the starboard wing to knife edge on the port wing — a manouevre to delight the informed spectator, and show the remarkable agility and controllability of this classic biplane. Gerald Curd, designer of the model, explains how he succumbed to the charms of the 'Jungmeister' and his approach to the design, building and flying of this practical and very flyable replica.

MY FIRST ENCOUNTER WITH a Bucker Jungmeister was at a Popular Flying Association meeting at Thruxton, where I had the opportunity to examine G-AXIH and chat with her pilot. Thus enthused, scale drawings were obtained and plans drawn up for a 1/6th scale model of 43in wingspan.

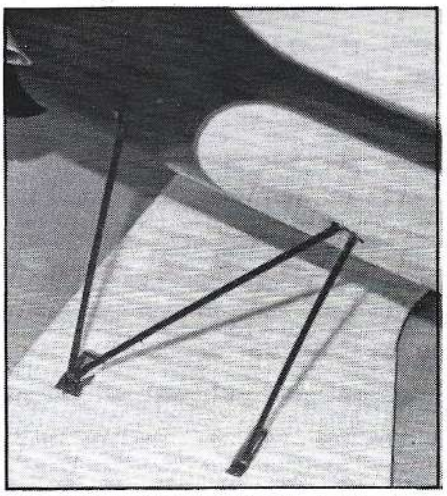
A sprung undercarriage is essential so that she sits correctly on the ground but retains the stalky appearance in the air. The top wing fixing is my own idea and has been fully proven on two other 'bipes' without any flying wires at all. It does away with rubber bands, and is easy and quick to rig, and fairly crash resistant.



Wing Construction

Building should be started with the top wing, as this is needed to check the strut alignment before the fuselage is completed. The wing outer panels are built flat on the plan, first pinning down the front lower and $\frac{1}{8}$in × $\frac{3}{8}$in spars, followed by the ribs, then add T.E., front top spar and finally the soft L.E. and wing tips. The ply ribs have the strut holes drilled for the top wing, and the aileron pushrod holes for the lower. The underneath of the centre section T.E. of the top wings is shaped to maintain the same thickness as the outer panels, the top being left at the same aerofoil section.

The underneath of the lower centre section is $\frac{1}{16}$in ply and hand launching cut-outs are made either side of the two middle ribs, these ribs can be adjusted in width to suit the servo used. The wings should be rigged with nylon kite string with a fair tension as a safety

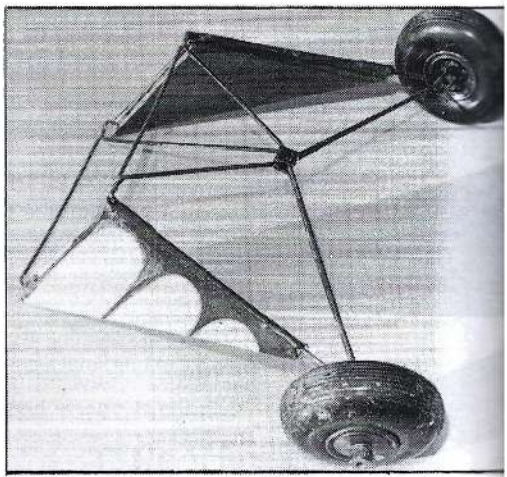


precaution and to retain the struts. The struts should be drilled at the lower end only at first, and checked in position, before drilling the top holes. As it is easier to cover the wings without the strut hooks in the way, cover the underside of the top wings and the top of the lower then install the hooks before covering the rest.

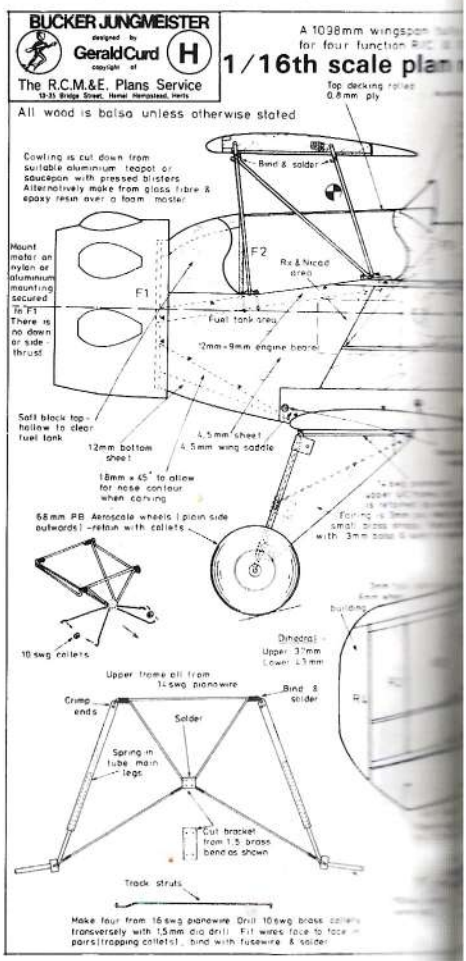
Fuselage

Build the fuselage sides flat on the plan from $\frac{3}{16}$in square spruce, $\frac{3}{16}$in balsa sheet and $\frac{1}{8}$ × $\frac{3}{16}$in balsa diagonals. When dry, lift from plan and glue the $\frac{1}{32}$in ply doublers to the insides (these should have the centreline marked on) and then the $\frac{1}{2}$in × $\frac{3}{8}$in beech strut mounts making sure these are accurately aligned.

Join sides with F1 and F4 making sure all is square and in line. When dry pull in rear and add remaining formers and lower cross-pieces, then add $\frac{1}{8}$in curved rear top and stringers. Now mount the centre section struts, checking alignment by fitting the top



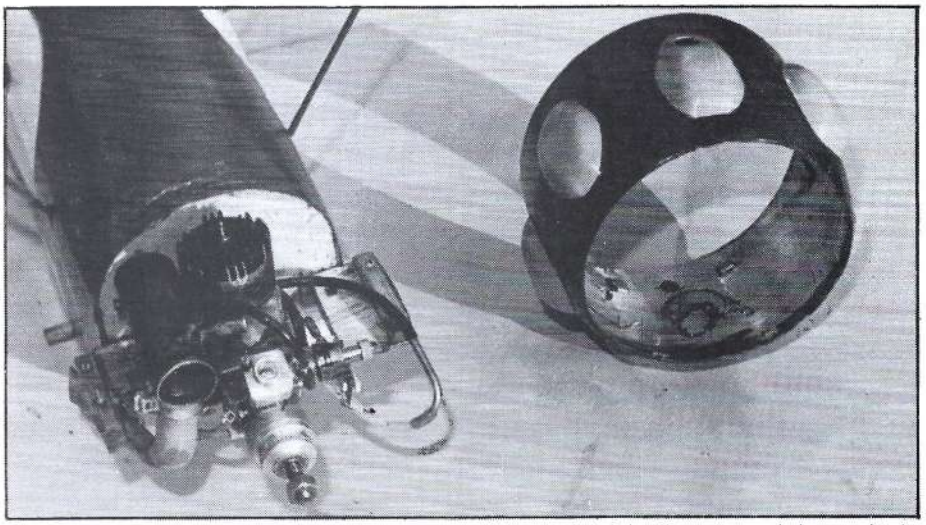
Note the assymetric strut to the upper port rear fixing point of the fully sprung undercarriage. Upperwing attachment shown left, is practical and rapid in operation.

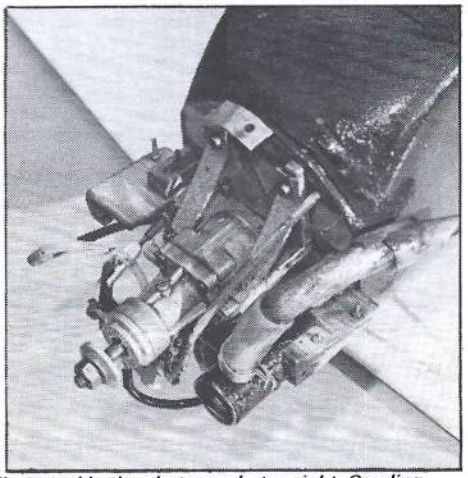


wing and measuring to the centre line on the ply doublers. The underneath of the wings should be parallel to this, if not, pack up between struts and bearers and when correct bind and solder brace struts to front struts not forgetting to include the rigging hooks. Add soft block between F1 and F2 and 1/32in ply decking between F2 and F4, plus baggage locker on left side from F4 and F5.

Finally, fill in lower front with triangular fillets and sheet, plane and sand to shape. The tailplane and elevators can be made from soft 1/4in sheet with the elevators joined with 1/4in square hardwood and hinged with commercial hinges. Alternatively a central core of 1/16in sheet with L and TE and tips and ribs added top and bottom and sanded to shape. The separate elevators are hinged to scale requiring separate horns and split pushrod.

The cowling was made from an aluminium tea pot with pressed aluminium blisters attached with tongues front and back then epoxy glued in place. If you can't find anything to the right diameter and shape, obtain a larger diameter saucepan and cut out a section to make a joint at the bottom. Now put the cowling back together and bridge the inside with thin aluminium rivetted in place.





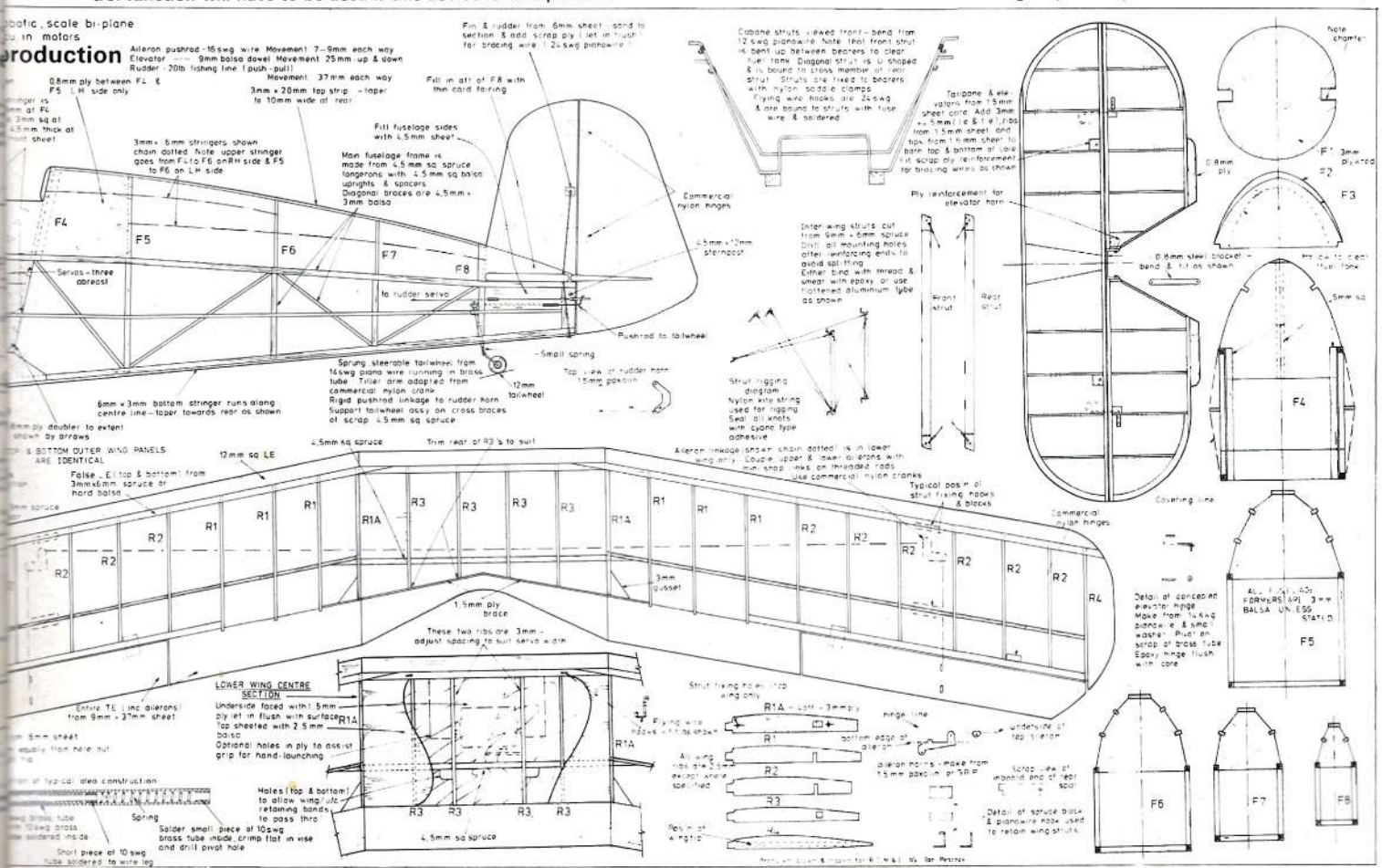
Cowl construction, fitting and silencer arrangement illustrated in the photograph, top right. Cowling blisters are separately formed from aluminium and secured to the main cowl with tabs and epoxy. In the engine installation illustration (above) the 'in-flight' mixture control can be seen - a fifth radio control function will have to be used if this device is incorporated.

Undercarriage

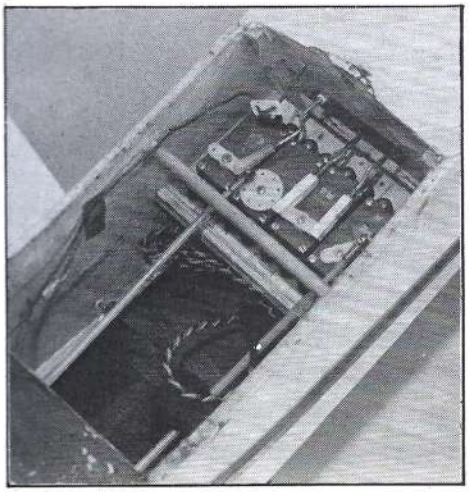
The undercarriage main frame is bent up from the position of the track strut hinge, to where the top of the oleo struts hinge. The oleo struts, complete with the tinplate attachment plates, soldered on and bolted or riveted to the 1/8in ply, are then slid into position; followed by the rear brass tube hinge assembly which can be pushed forwards to allow the final bends to be made. The rear hinges are then pushed back into position and attached to the ply.

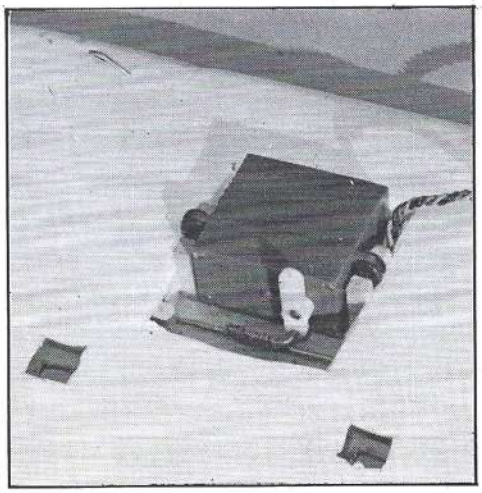
Flying

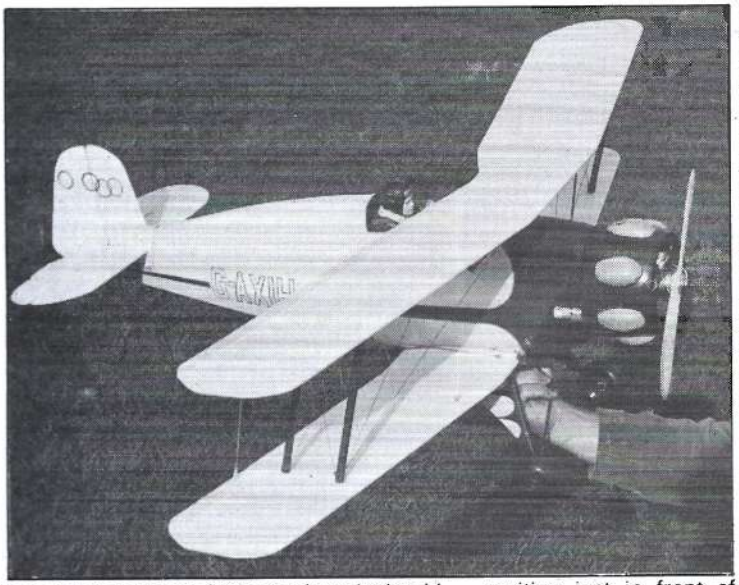
Test flying was commenced with caution. The cowling was removed and the sprung undercarriage replaced with a simple wire job. After damaging a previous biplane design by having the C of G too far back, and



Full-size constructional plans for the Bucker 'Jungmeister' biplane - shown to 1/6th scale - are available from our RCM&E plans service, PO Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE. Quote Plan No. RC1392, the cost is







With room for four servos abreast, the fuselage of the 'Jungmeister' can hardly be termed small. Note the closed loop arrangement for the rudder. A conventional aileron servo fitting is used in the lower wing, top and bottom ailerons are connected by adjustable rods. Some impression of the airborne character of the model can be gained from the flying photographs below.

because I could not find out where it should be on this wing configuration (its bound to be behind the wheels), I settled for a position just behind the leading edge of the lower wing centre section. This was obviously too far forward but I was not taking any chances.

So with the engine running rich I launched slightly downwards, it flew in a shallow dive towards the ground and by the time I had pulled the stick back it had landed. At this point I should perhaps mention that I am a lone hand flier and launch my planes myself. This is the reason for the hand hold in the lower wing centre section, for single handed launching this should always be in front of the balance point. Gradually the centre of gravity was moved rearwards, each move achieved by respositioning the gear until a position just in front of that shown was obtained. A couple of flights still with the cowling removed proved successful so the cowling and sprung undercarriage were replaced. Here I ran into trouble for the engine still needed to be run rich, and had barely enough power to overcome the extra drag of the cowling. So more running-in of the engine was carried out before further attempts were successfully made. In its present form the model incorporates new wings with a stronger structure, modified interplane strut fixings, and a change in the aileron hinges. With in flight mixture control also added, the model is a delight to fly.

Aerobatics

Because of the high drag of this aeroplane's configuration speed quickly stabilises during manoeuvres and a good reserve of power is needed rather than diving to gain speed at the start. Loops can be made large or small and need very little if any correction with rudder.

Rolling manoeuvres are excellent, it is a good idea to practice rolling only as far as the inverted position at first. This will allow you to find out how much down is needed. Once this is established slow down this half roll and bring in the opposite rudder to keep the nose level as she passes through the knife edge position. Centralise the rudder before reaching the inverted. Now the next half of the roll requires rudder in the same direction as the ailerons and has the effect of speeding up the roll rate, so the aileron movement must be reduced. With practice accurate axial slow rolls can be performed with ease.

Hesitation rolls are as easy once the above has been mastered, I can manage 'four pointers' but the 'eights' need constant practice. Knife edge 'flight' is just the first quarter of a four point roll continued, but more rudder needs to be fed in to maintain lift when sideways on, I usually chicken out after five or six seconds.

Flick rolls. Don't blink trying these as you may miss your first 'attempt'. Up elevator and rudder are applied simultaneously, with the elevators being released half way through, and the rudder released to stop the roll. Less than maximum straight and level speed is needed, but with full power applied at the inception of the roll. For stall turns, keep full power on for a good climb up, and when she's hanging from her propeller apply full rudder and about one third opposite aileron to stop any rudder induced rolling. As soon as she is pointing straight down release the sticks and allow the speed to build up before pulling out into level flight again.

On the landing approach, as soon as you chop the throttle the nose will drop into a steep glide. Prevent any speed build up by easing in some up elevator. Ease back on the stick to flair just before the wheels touch, at the same time opening up the throttle a few notches to increase the airflow over the elevators, and stall her at touchdown.

This model represents eight years in the field of lonehand R/C flying from the humble beginnings of learning to fly with home built Galloping Ghost radio, to learning aerobatics with digital proportional in two own design biplanes and then, to designing, building and flying the Bucker.