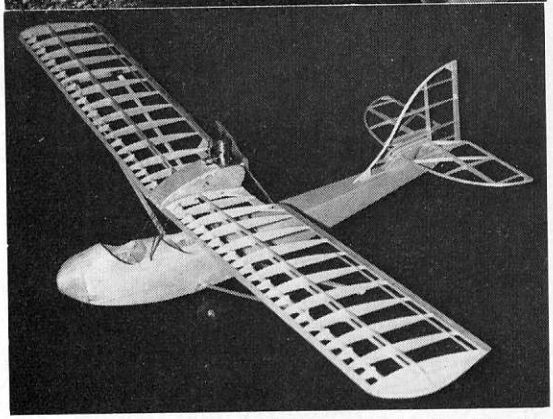


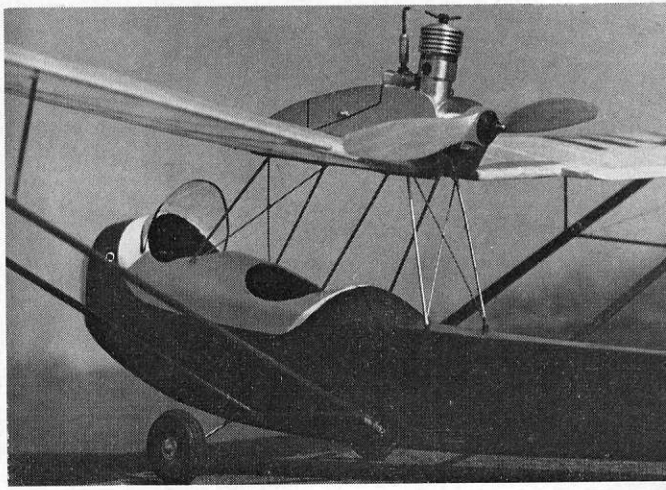
From America's Golden Age of Flight in the thirties –

The Curtiss Wright CW1 "Junior"

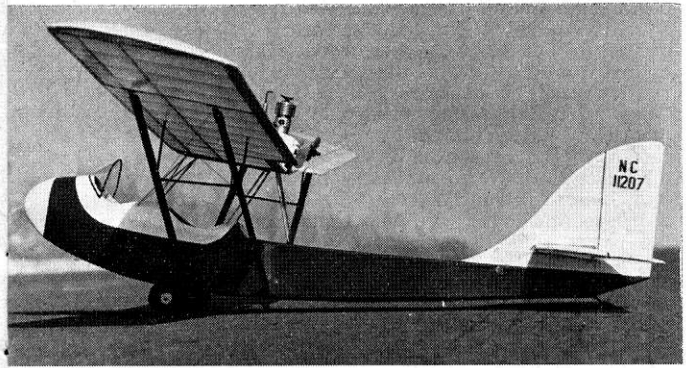
Flying scale model for free flight using 1 c.c. engines, designed by JACK HEADLEY

THE DESIGNER stumbled upon his first Curtiss-Wright Junior quite by accident. While looking around the hangars at Porterville Airport for a Sopwith Pup replica, he came across a small collection of very well-kept Waco Biplanes. After taking several pictures of these, he saw in the back of the hangar a curious welded tube fuselage with a three cylinder engine mounted on top. A pair of wings were stuck somewhere in the rafters, also a little worse for wear. It wasn't until some time later that it was identified as a C-W Junior, Jack being more interested in the Sopwith Pup at the time.

The next one was discovered at the Orange County Air Museum, looking very wrong, painted silver with



Heading photograph shows Jack Headley in his natural surroundings – note the sunny Californian foliage! Below, the lady unclothed displays her simple wing structure and box-like sheeted fuselage. Ample room for single channel R/C if desired. At right is a close-up of the Em Bee .75 c.c. engine mounting. This engine being of the sideport induction type runs in reverse, which accounts for the backwards mounted prop.

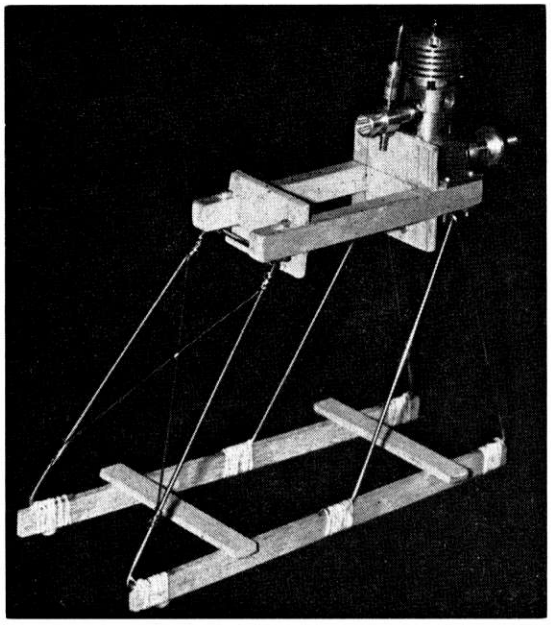


Left, nose pointing skywards the Junior prepares to 'make like a bird'. This high parasol wing is an ideal layout for stable flying.

Maltese Crosses all over. It was in the process of being prepared for a film, although which one was never discovered. This was a re-engined version, having a flat four in place of the Szekely radial, and a revised front fuselage.

Although quite a popular ultra-light aircraft in its time, only seventeen examples appear to remain registered today. In 1931, three hundred of these aircraft were made, powered by 45 h.p. three-cylinder, air-cooled radial engines.

This one-tenth scale model is a beautifully stable flyer – as it should be with such a high wing layout and ample tail surfaces! With the 'pusher' arrangement the builder has two choices over the propulsion



The nacelle unit, complete with engine, is supported on the fuselage simply by the wire struts bound to hardwood spars. Accuracy is essential here – use the cardboard jigs as detailed on the plan.

unit. Either the engine may be run in the usual way with a pusher propeller, or else the engine may be run in the reverse direction with a 'normal' airscrew. Not all engines will run backwards in this fashion, but sideport engines such as the Mills .75 c.c., and reed induction glow engines are equally happy whichever way round they are running.

The model has been designed to follow the full scale construction, except for the tailplane, which has extra diagonal ribs to give the required warp resistance. If you are interested in a true scale model, these diagonals can be omitted, but take care. As we are discussing the tail, let's start with that. Make a corrugated cardboard former for the leading edge, and mould four laminations of $\frac{1}{8}$ in. x 1/32 in. strips to this contour. Leave this overnight to dry before adding the ribs and spars. The wings can be made next. Pin down the lower spar, the leading edge and the notched trailing edge. Cut out the required number of ribs and sand to shape. It's easiest to make all the ribs together and then modify the root ribs to the revised shape later. Make the leading edge riblets. Cement all the ribs and riblets to the spars, then add the upper spar, and wing tips, together with all the gussets. Don't put on the plywood root ribs yet, these will be attached later.

The basic fuselage frame is made of $\frac{1}{8}$ in. square strips. The bottom longerons should not be too hard, as they have to be bent quite a lot. Make two side frames at this stage. Next comes the engine nacelle-wing strut assembly. First attach the engine to its bearers. The original model used an Em-Bee .75 c.c., which is quite a large engine relative to its capacity, and the plans show this installation. For any other engine modify formers N1 and 2 to suit. If using a radial mounted engine, use former N2 for the mounting, but keep the hardwood bearers forward of this frame to serve as the nacelle mounts.

The nacelle is attached to the fuselage by wire struts bound onto two hardwood spars which are themselves glued into the fuselage frames. Make the cardboard jigs as shown on the plan, and assemble the nacelle relative to the spars. Now make the wire struts and fit to suit. When all the bends are satisfactory bind the lower wire ends to the spars, and bolt the upper ends to the engine bearers. Four small tinplate straps are required for this. When the correct alignment has been obtained, solder these straps to the wire and the 8 B.A. mounting nuts and bolts. Add the cross bracing to the front and rear struts, then remove the card jigs and the temporary spacers.

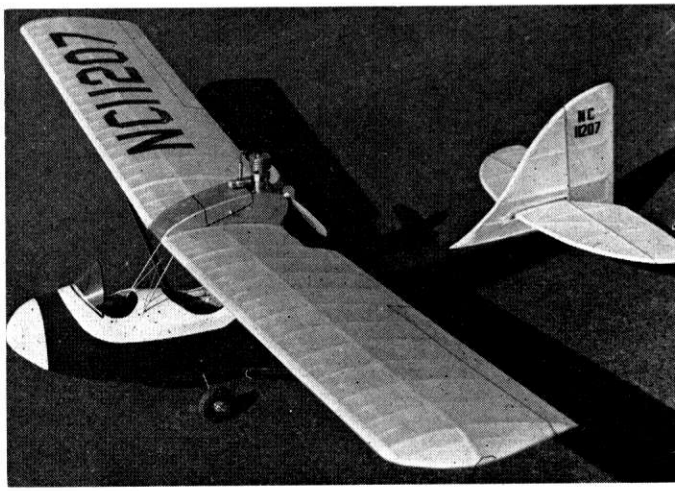
This assembly can now be glued to the fuselage frames, and the fuselage sides can be attached. Cement in the remaining frames, gussets, etc. and then cover with 1/16 in. sheet.

The plywood root ribs are cut out next, and drilled together for the mounting dowels. Glue these to the wings and the nacelle sides; then attach the nacelle side plates to the nacelle.

At this stage a trial assembly of the wings-nacelle can be attempted. If everything is satisfactory, complete the nacelle structure, not forgetting to include the fuel tank.

Next the tailplane mount can be made and attached to the fuselage. Glue the tailplane in place and finish off the fin and rudder assembly. The model can now be tissue covered, doped and painted. The original had a green fuselage with white wings and tail.

As the tailplane and wings are fixed in position the only trimming device left is moving the centre of gravity. First balance the model as shown on the plan and attempt a few test glides. Correct any stalling tendencies by adding nose weight, or remove weight if the glide angle is too steep. When a satisfactory glide is obtained try a powered flight. Don't let the engine run be too short, as there is nothing worse than a two-second engine run followed by a swift dive into the ground. Be careful about making large adjustments to the rudder tab, as this is located in the slipstream, and is quite powerful. Aim for a realistic flight; a scale model is not supposed to climb like a rocket, or fly around with its engine screaming.



The original model was finished with white flying surfaces and green fuselage. The cover photographs of Don Gugler's Curtiss (full-size that is!) shows how striking and eye-catching this simple colour scheme can be.