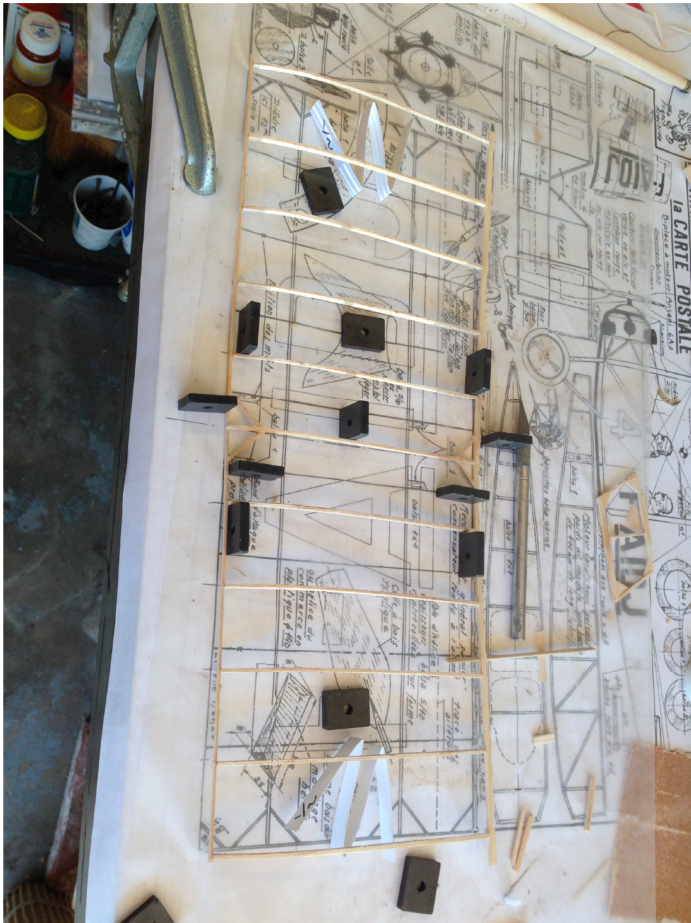


NO-CAL FOR BEGINNERS

By William Scott

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Is there such a thing as a No-Cal for beginners? Sure there is; any no-cal that uses wood with a large cross section, has a high wing and has a proportionally well-sized rudder and stabilizer. This will be the fourth attempt at building a No-Cal that flies well. It is a Fillon Farman Sport from 1926, La Carte Postale. Could this be the answer? The peanut plan version has a wing span of 13" and a wing cord of 5" when the drawing is scaled up to No-Cal and Walnut size, the cord becomes 6". It has a high wing, making the center of gravity (CG) below the center of lift. It has landing gear creating a pendulum affect and lowering the CG even farther below the center of lift. The bad news is this plane has a very small rudder and stabilizer, the plan already has enlarged the rudder and stabilizer by 10% over the actual airplane. When plugging in all of the variables into McComb's Calculated CG formula the CG is located 23% back along the wing cord, 1 3/8-inches from the leading edge.



First, build the wing. The shape of the wing's airfoil was transferred to a piece of 1/16-inch thick stock, it was cut, waxed and pinned to a board. With the airfoil template done, the 22 pieces needed for the 11 ribs, 1/16-inch square, were cut out. They were curved by using a rolling motion of an x-acto blade handle to compress the wood on a hard surface. Two of these pieces

were glued together and pinned to the air foil template creating a single wing rib. Once the glue dried, the pieces would maintain the shape of the airfoil. The wing went together as follows, the left side had 5 ribs, they were lined up and the leading and trailing edges were glued on. A diagonal brace about 1" long was used to strengthen the outer corners. Building the right side followed the same process. Once the two sides were dry, a dihedral was selected and both ends of the wings were propped up and the center rib was glued in place. More 1" diagonal bracing was attached to the center rib to strengthen the dihedral.



Second, build the stabilizer and rudder. The stabilizer is simple and straight forward; the rudder looks simple and straight forward but it was not. On most airplanes, the rudder is split, the

front half is attached to the top of the stabilizer and the back half is left hanging behind the stabilizer. The two parts are hinged; the back half is adjusted to allow the plane to fly in a particular direction. On this model there is no front half, there is only a 1/8-inch wide piece of balsa that extends upward about 60% of the rudder's height. The back half of the rudder is a parallelogram 3-inches tall by 1 1/2-inch wide. All of which is being held on by a gluing surface that is 1/16 x 1/8-inch.

Third, build the fuselage. The fuselage is a straight forward build. The only thinking needed was to determine what direction the grain should run where the front engine section is. Since, the CG was calculated to be located at 23% back from the leading edge, as much wood as possible was put up front and the tail was made as light as possible. There were two exceptions, where the struts attached and where the back of the motor stick attached, those pieces were widened to 1/8 x 1/16-inches, creating a larger gluing surface.

Fourth, roll a motor stick. The whole idea of rolling a motor stick was frightening but by following the steps that were found on line and included else where in this newsletter, it was as simple as building a wing. Many steps, but all very doable.



Fifth, build and assemble the landing gear. Because so much weight was going to be need to balance the plane in the correct location, very little effort was made to keep the weight out of the wheels, so much to the point that the centers of the wheels were thickened up to allow a propeller bearings to be used to ensure the wheels would roll freely and smoothly.

Last building step, final assembly and balancing. This model was probably the most straight forward tissueing project to date. Final assembly was also very straight forward, but in the tissueing process it was discovered that the wing struts pass through about where the motor would need to go. Some adjustments or relocation of the struts will be needed.

The next step was to get the plane to balance at its 23% of the wing cord. Sixteen grams of clay and lead were added to get the plane to balance in the correct location.

The good news is that all of the breaks happened at joints and all were very simple to repair. The second test flight was done with

zero weight added and you can probably guess what this flight looked light. Yep, a stall and tail crash. All of the breaks were minor and simple to repair. On the third try, the balance point was put directly under the highest point of the wings arc and that seem to do the trick. The next step was to make it fly.

The first alteration was to move the wing struts that were interfering with the motor. John Hutchison made a great suggestion to just move them up above the motor stick. Second put more incidence in the stabilizer and finally put some more winds into it so we can get it to make a complete circle.

The goal; get this plane to fly for two minutes in a gym with a 24' ceiling.

