

Sperry "Messenger"

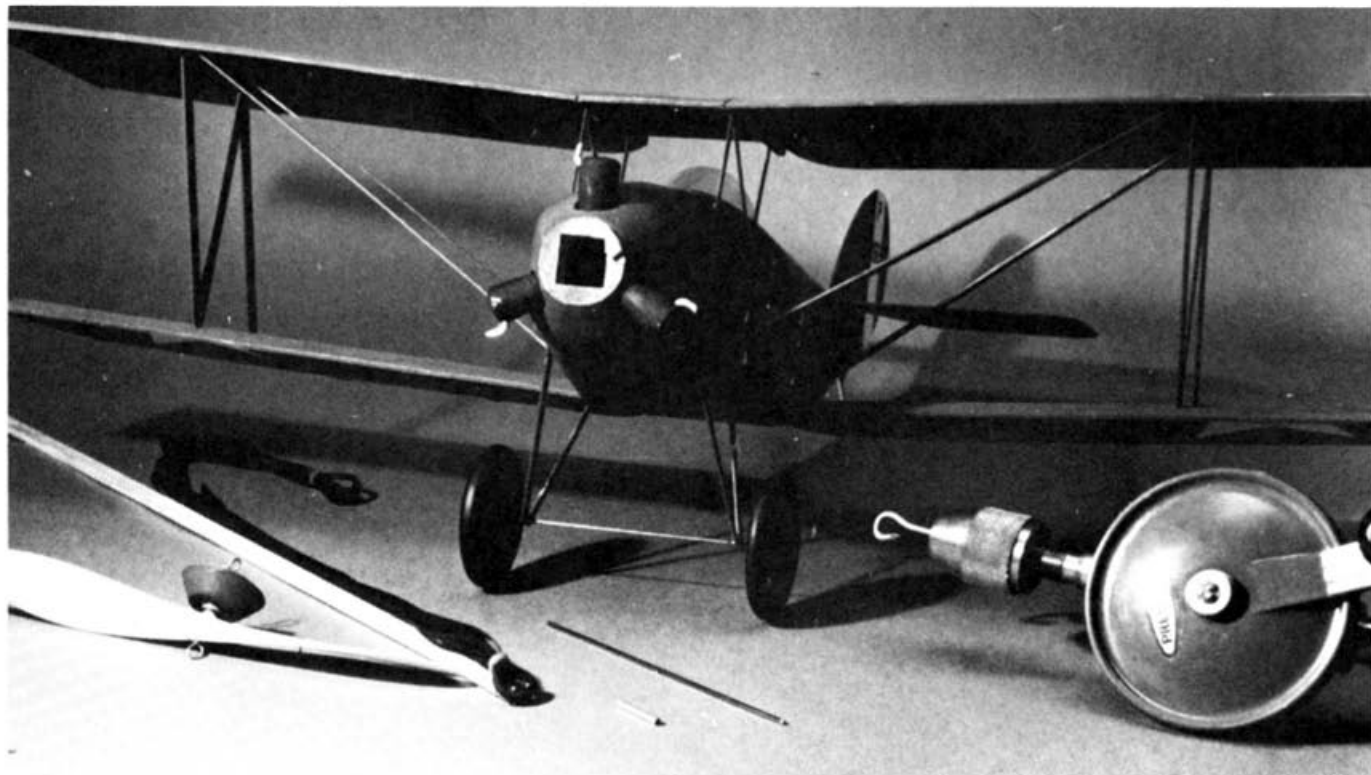
by John Blankenship

Turn the clock back a few decades with a famous old biplane that's easy to build. Crank in 400 turns of quiet type power and the nearest clearing is all you need. 20" in span, realistic and a good way to get a flyer started.



John and his Sperry "Messenger." Wing surfaces are of sheet, saves time for paint detailing. Keep it light, balance and trim the ship with care.

Feed it rubber. Plastic prop, motor ready for insertion and a hand-drill winder at the right. Secure the winding hook in such a way that it cannot slip the jaws. Hand winds for the ballpark, a winder for all-out flight.



In 1920 the Lawrence Sperry Aircraft Company won a U.S. Army contract to build the "Messenger," which had been designed by the Army Air Service Engineering Division. The "Messenger" was destined to be widely used for experimental programs and became a well remembered aircraft, representative of its era.

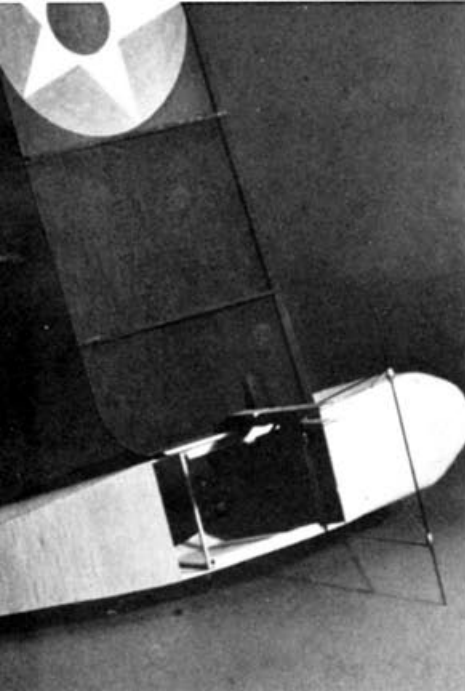
Some simplifications were made in the scale views to suit the type construction used on this model and dihedral was increased. The design is well suited for rubber powered flying, having simple lines and excellent proportions for all types of flying scale models.

Fuselage

Trace the fuselage side outline onto a sheet of white paper for a pattern. Cut both fuselage sides from the same sheet of uniform quarter-grained 1/32" balsa. Select the wood carefully to insure good fuselage alignment. Pin the two sides in position on the plan and glue the 1/16" square side stiffeners in place, using the marks on the plan for alignment. Glue the 1/8" balsa pieces "F" and the 1/32" rear motor peg reinforcements in place. The sides can now be removed from the plan and the side stiffeners trimmed. Cut the 1/16" sq. and 1/16" x 1/8" fuselage cross members to length,

using the fuselage top view as a guide, and begin assembly by pinning the inverted side pieces over the plan. Building the basic fuselage directly on the top view allows frequent and easy alignment checks. Glue in the forward fuselage cross members and pin in place. After the forward fuselage has thoroughly dried, pull the rear ends together and glue, checking alignment carefully. A clothespin can be used to hold the rear ends together while the glue dries. Now glue the remaining cross members in place.

The landing gear struts and wind center-section struts should be bent and bound in



place with cotton thread. Wrap the wire joints with fine copper wire. Use the template to set the front strut angle before soldering. Coat the cotton thread wrapping with cement.

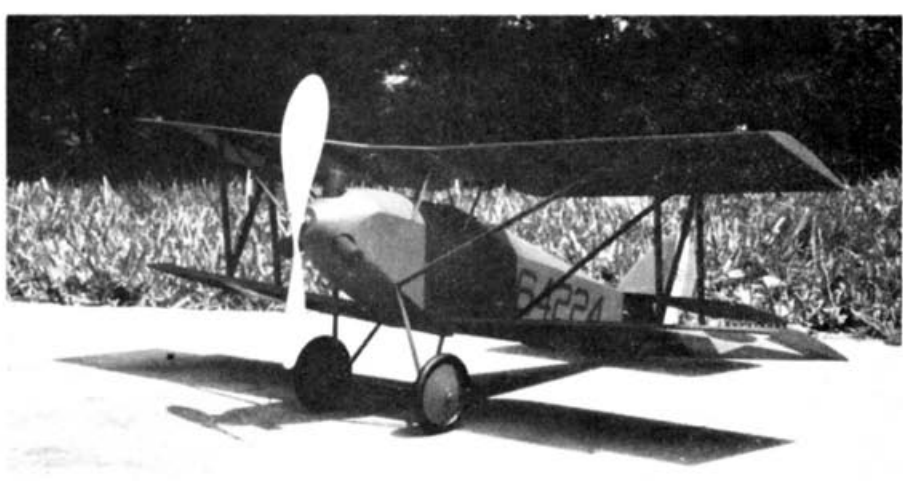
Cut and mount the top fuselage formers and sheeting. The top sheeting should be flexible A-grain balsa. Make small grain-wise cuts in the top front sheet between formers A and B to form the curvature. Note that two "C" formers are used, in front of and back of the cockpit. The lower fuselage block is 1/2" x 2" balsa sheet. Cut a small groove across the grain to clear the forward landing gear strut.

The front fuselage block is 1" x 2" x 2-1/4" or it may be built up from two pieces of 1"x1"x2-1/4". Glue FF-2 and FF-1 to the front fuselage block and set aside to dry. Assemble the nose block pieces N-1, N-2, N-3, and N-4. Cut the square hole through the fuselage block to fit the nose-block keying piece N-4, mount the nose-block assembly, and glue the fuselage block lightly to the fuselage. The complete forward fuselage can now be carved and sanded to shape. Remove and hollow the fuselage block, then glue permanently in place.

The bottom sheeting can now be glued on with the grain running crosswise to the fuselage. Omit the sheeting directly under the wing; this is left until after the lower wing panels have been mounted. The area directly under the rear motor peg back to the tail skid is left open for motor access. Add the 1/32" fairings to the center-section and landing gear struts and mount the tail skid mount H, and the spruce tailskid.

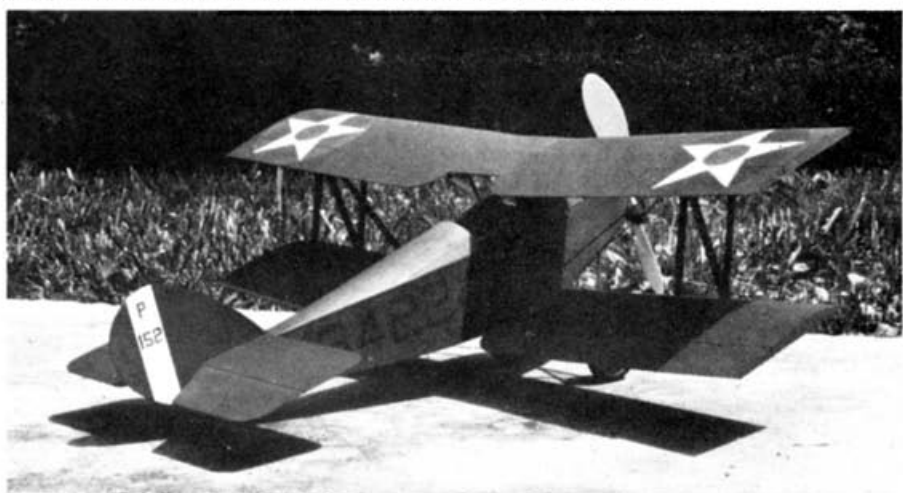
The Wing Assembly

Cut the four wing panels from a 4" wide x36" long sheet of B-grain medium weight balsa. Glue the 1/16"x1/8" balsa stiffeners to the leading edges. Cut 14 ribs from 1/16" sheet and two from 1/8". The 1/8" ribs are for the upper wing center-section. Pin the ribs in place, noting the different rib positions on the upper and lower wings. Apply glue to all except the root ribs and pin the 1/32" panels in place.



A plastic prop is adequate here, churns the ship into the air. Note dummy engine cylinders, strut arrangement. Good project for budding builders.

Insignia is hand painted, with help of drafting instruments and straight edge. Note strip along leading edge. It must be built with a light touch.



An angular, easy type to build. The semi-scale, "Messenger" is distinctive, assembles fast. A good biplane for calm-air evening flights close to home.

Pin the root ribs for the bottom panels to the board and check to be sure they are perpendicular. Add glue to the ribs and put the wing panels in place, blocking the tip 5/8" to form the dihedral. When the joint is dry, trim the sheeting flush with the root rib.

Build up the upper wing center-section in the same manner as the outer panels. Note that both the center-section sheeting and outer panel sheeting glue to the top of the 1/8" rib. Trim the outer panel sheeting to butt against the center-section sheeting with the 5/8" dihedral block under the tip. Glue the wing panels to the center-section and when dry, remove from the board and add the dihedral braces to all wing panels as shown. Ribs may now be trimmed along the bottom, even with the leading and trailing edges.

The wings are more easily painted before assembly to the fuselage. I used Olive Drab Polly S plastic model paint, which can be thinned with water, covers well, and is waterproof when dry. The insignia can be made up from red, white and blue decal sheet. Insignia on my model was painted, using a draftsman's ruling pen and compass on outlines, filling in with a brush. If you choose to paint the insignia, this should be

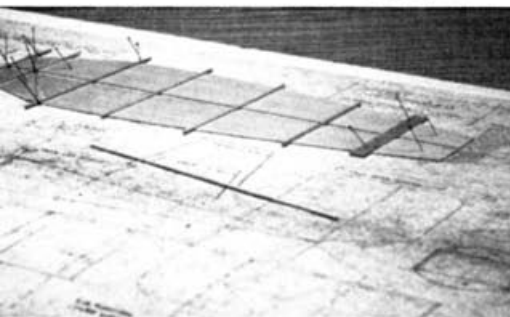
done before the Olive Drab paint is applied. After the wing panels are painted and insignia applied, mark the aileron outlines with black India ink.

Locate the mounting points for the center-section struts on the bottom edge of the upper wing root ribs and pierce holes to receive the strut ends. Carefully enlarge the holes for the wrapped front strut joints and temporarily mount the upper wing, checking for alignment and making adjustments as needed.

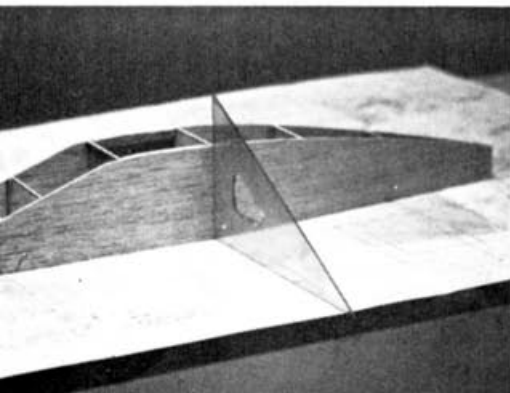
Mark the lower wing root rib locations on the fuselage sides and glue the lower wing panels in place. Clothespins can be used to clamp the root ribs tightly to the fuselage sides while the glue dries. When the lower wing joints are dry, the remainder of the bottom sheeting should be added. Then the fuselage should be painted and the black numerals applied to the fuselage sides. Mount the top wing permanently by applying epoxy glue to the top ends of the center-section struts and pushing into the holes in the root ribs.

Tail Surfaces

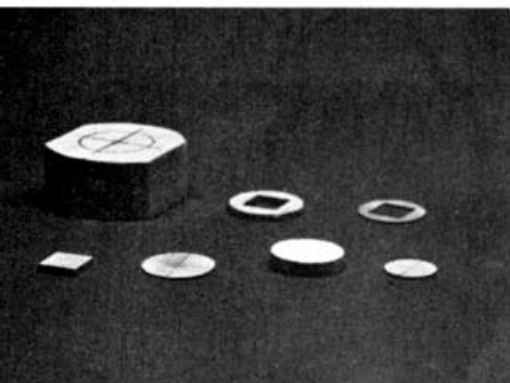
The tail surfaces are cut from 1/32" or very light 1/16" quarter-grained sheet. If possible cut the horizontal stabilizer



Fuselage sides are assembled in order. A method helpful in aligning. Select the wood carefully.



Square up, start with good alignment. It saves time later. Fuselage is quite easy to build up.

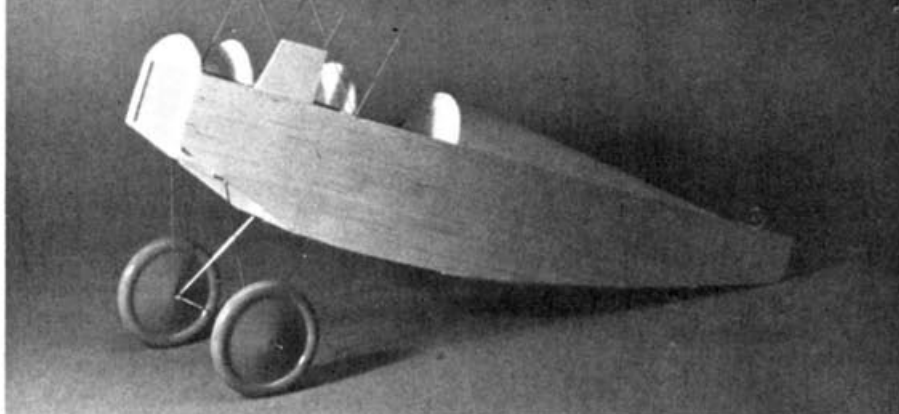


The nose block pieces in the making. Discs are sandwiched to nose and block. Pull out to wind.

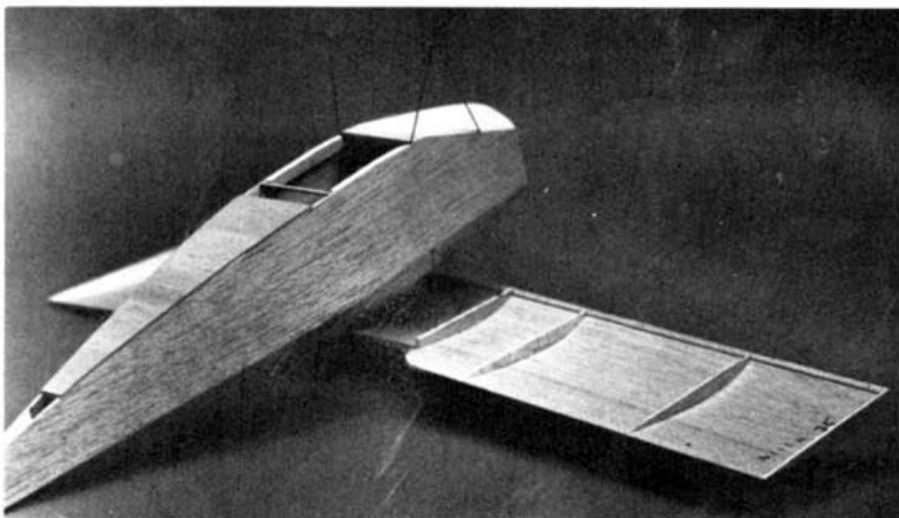
from 4" wide sheet; otherwise, butt glue 3" sheet to get the required width. Note the difference in grain direction for the vertical stabilizer and rudder. These are cut separately and butt glued before painting. The tail surfaces should be painted before gluing to the fuselage. The procedure I used on the rudder was to first paint white overall, then outline the red and blue bars using a ruling pen, then fill in with a brush. The black India ink numerals were applied with a lettering pen.

Miscellaneous Items

The "N" struts are built up on the plan, then glued in place. Check the fit carefully and trim as needed before gluing. Cut the flying struts slightly long and trim to fit. The 2" wheels are from a Guillow WWI



The nearly completed fuselage tries its wheels. Use soft flexible grade balsa to negotiate the curvatures. Sand it with fine grits at this stage.



The struts support the wing. Alignment being checked and adjusted here. Templates help with the task. Build your mounting struts up with care.

model kit. Retaining washers should be carefully soldered or epoxied in place to avoid binding or melting of the plastic wheel. Brown surgical tubing split lengthwise with a sharp razor blade serves as cockpit combing. Draw the instrument panel as shown on white paper and cut an overlay from black paper with holes for the instrument faces. Glue the black paper over the white panel and mount the completed instrument panel to the front cockpit former. Carve the dummy engine cylinders from balsa and mount on the front fuselage block. The stacks on the engine are carved from 3/32"x1/4" spruce.

Drill a 1/16" dia. hole through the noseblock for the propeller shaft and insert a short length of 1/16" O.D. aluminum tubing for a bushing. Assemble the 7" dia. plastic propeller with smooth metal washers on the 1/32" dia. music wire shaft. Next bend the winding loop in front and the hook for the rubber motor at the back. Needle nose and round nose pliers are a big help here.

Flying

Cut a piece of 1/8" flat rubber long enough to form three 13" loops and tie the ends in a square knot. Lubricate with Castor Oil. The fuselage is very narrow at the rear, and loading motors can be a frustrating and destructive experience. Insertion of motors is easy using the tool shown

in the picture. The stick is 3/16" spruce, and the end is made up from small copper wire. For details of this tool, see the "Islander" Unlimited rubber model article in the March, 1969 issue of Flying Models. The rear motor peg is 3/32" dia. aluminum tubing, allowing for easy and safe anchoring with a length of 1/16" dia. music wire while winding. With the motor installed, add clay to the nose of the model to bring the center of gravity to the indicated position. Make a few test glides to check trim and adjust the elevator to correct stalling or diving. When the correct C.G. is established, replace the clay with an equivalent amount of wire solder glued inside the hollow front fuselage. Some down and right thrust will be required for power trim. A 3/32" shim behind the noseblock, just left of top center to give approximately equal right and down thrust, was required on my model.

Because of its weight and drag, this model will not give high endurance flights, but very realistic and pleasant hand-launched and ROG flights are possible. Use a hand drill converted to a winder for maximum performance. (Hook should be tied to the chuck... Ed.) While a helper anchors the rear with a length of 1/16" dia. music wire through the 3/32" aluminum rear peg, stretch out the motor to two or three times normal length and wind in about 400 turns, moving in as you wind. The model will ROG from a smooth surface after a very short takeoff run.