

BARNSTORMING BIPLANE

Provide the author with a piece of redwood and a pile of dowels, and before you know it he'll turn out this barnstorming biplane.

By Jim Jacobson



Here's a project that you can build using one 14" long piece of clear 4" x 4" redwood and a few short pieces of dowel rod. Make sure you've got a good clear piece of redwood, because there's a lot of thin cuts involved.

Get started by bandsawing two 1/4" pieces for the upper and lower wing from one side of your redwood block. Rotate the block once and take off a 5/8" slice to cut your wheels and wheel brace from. Keep right on rotating and slice off another 1/4" piece to serve as the rudder and elevator. By now, your block of wood is getting pretty small, but there's only a few key pieces left to be cut from it. Your last cut for the time being is the fuselage. Set the bandsaw fence 1 3/8" from the blade and cut the fuselage out. After subtracting for your kerfs, your scrap should be about 1 1/8" thick. From this you'll cut your engine, engine cover and propeller.

Machining Your Pieces

You now have most of your major pieces rough cut, but there's a lot of sanding and machining to do before transferring the scale drawings of the parts to templates to use for cutting final shapes.

Start by belt sanding both wing pieces to 3/16" thickness and the rudder and elevator pieces to 1/8" thickness. Cut 5" off of the 5/8" wheel/wheel brace piece and sand to 3/8" thickness. Now chuck a 2" hole saw into your drill press to cut out the two wheels from this piece. Drill a 1/4" hole through the center of each wheel and hand sand.

The fuselage should be machined prior to shaping. After cutting to length, follow the scale drawings and use the tablesaw to cut the dado for the bottom wing and the kerf for the rudder. Now switch to the bandsaw and cut the notch for the elevator and the two half circles for the cockpits. Finally, switch

to the drill press and drill a 1/4" hole 1" deep in the center of the front end of the fuselage (for the engine, propeller and nose spinner), and another 1/4" hole 1/2" deep for the tail skid. Sand the fuselage to shape, rounding off all sides to create nice sleek lines.

Start on the wings by cutting both to length and angle drilling for the outside struts, as shown in the scale drawings. Make a template from the scale drawings to cut the wings to shape and sand to 3/16" thickness, rounding off the edges as you go. Chuck a 2 3/4" hole cutter in the drill press to cut the engine out, drill a 1/4" hole through its center and machine as shown in the scale drawings. Drill the seven 3/8" cylinder holes 3/8" deep and sand the engine smooth, rounding off the edges. Using scrap from the rudder/elevator piece, cut the 1 3/4" diameter engine cover on the drill press with a hole cutter, drill a 1/4" hole in the center and sand smooth. Use the scale drawings to make templates for the rudder, elevator, and propeller and cut these pieces to shape. Hand sand and drill a 9/32" hole in the center of the propeller. The last major piece to machine is the wheel brace. Cut this piece to width with the tablesaw blade set at a 45° angle and then cut to length, keeping the saw at the same angle so you end up with both ends and the back beveled. Now drill two 1/2" holes for the landing gear struts at a 60° angle, as shown in the scale drawings.

Finally, you'll want to cut all your dowel rods to length, with the exception of the nose spinner. Before cutting this piece to length, drill a 1/4" hole 1/2" deep in one end of a longer piece of 3/4" dowel rod. Then cut to length and round off the end with a belt sander. The last bit of machining involves the landing gear struts, which each require a 9/16" hole drilled 3/8" from the end at a 60° angle, to hold the axle. Now belt sand the ends of each

landing gear to 30°, as shown in the scale drawings—and you're finally ready to assemble your biplane.

Assembly

After making sure that all your pieces are sanded smooth, start the assembly by gluing the outside struts to the wings. Make sure the wings are parallel and carefully sand the dowel rod ends after the glue dries. Next, glue the seven cylinders into their holes in the engine, lay aside and while they're drying, glue the elevator and rudder into place on the fuselage.

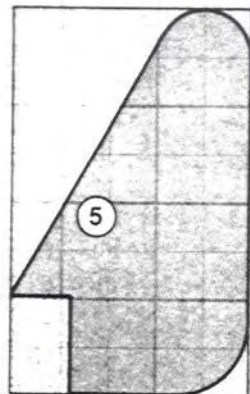
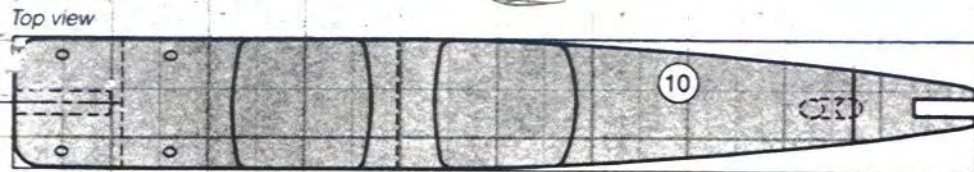
Now glue the propeller rod into the front of the fuselage, and slide the engine and engine cover onto it and glue in place, making sure the top cylinder of the engine is vertical. Next slide the propeller on (no glue) and finish

MATERIAL LIST

REDWOOD	T x W x L
1 Top Wing (1)	3/16" x 3 1/4" x 13 1/2"
2 Bottom Wing (1)	3/16" x 2 3/4" x 11 1/2"
3 Wheels (2)	3/8" x 2" diameter
4 Wheel Brace (1)	5/8" x 1 1/2" x 3 3/4"
5 Rudder (1)	1/8" x 2 1/2" x 4"
6 Elevator (1)	1/8" x 2 1/2" x 7"
7 Engine (1)	1 1/8" x 2 3/4" diameter
8 Engine Cover (1)	1/8" x 1 3/4" diameter
9 Propeller (1)	1/4" x 1" x 7"
10 Fuselage (1)	1 3/8" x 2 1/2" x 10"

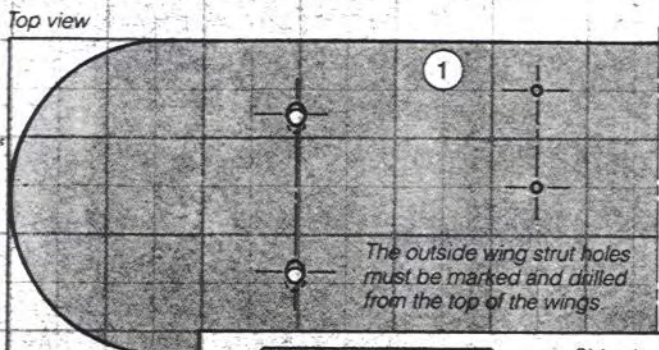
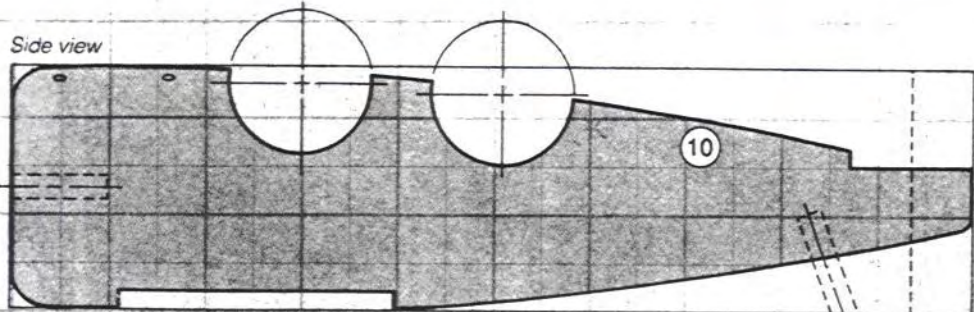
BIRCH DOWELS	Diameter x L
11 Nose Spinner (1)	3/4" x 1"
12 Landing Gears (2)	1/2" x 2 1/2"
13 Engine Cylinder (7)	3/8" x 1/2"
14 Axle (1)	1/4" x 4 1/2"
15 Tail Skid (1)	1/4" x 1 1/2"
16 Propeller Rod (1)	1/4" x 3"
17 Outside Wg. Struts (4)	1/4" x 4"
18 Inside Wg. Struts (4)	1/8" x 3"

The materials in this project are available from: Craftsman Wood Service Co., Dept. TW, 1735 W. Cortland Ct., Addison, IL 60101; or The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374.

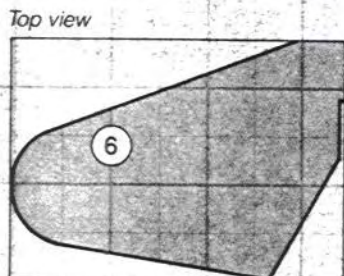
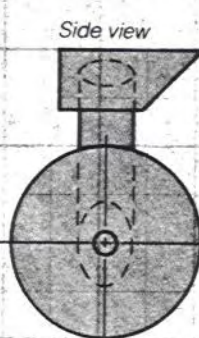
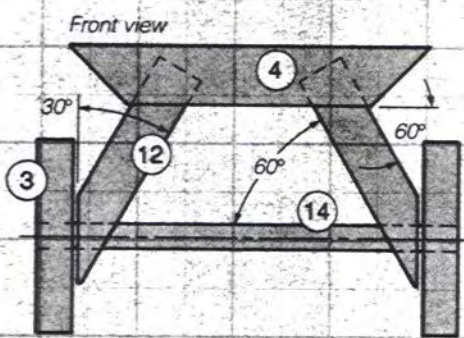
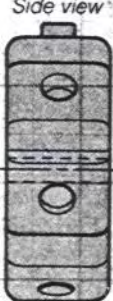
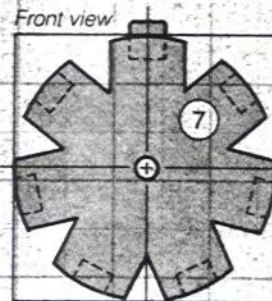
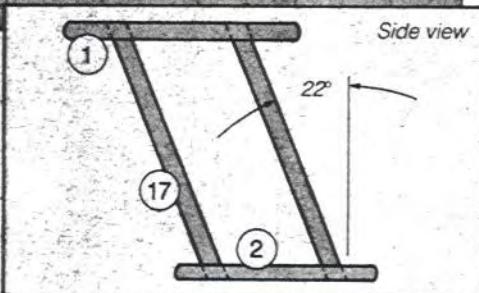
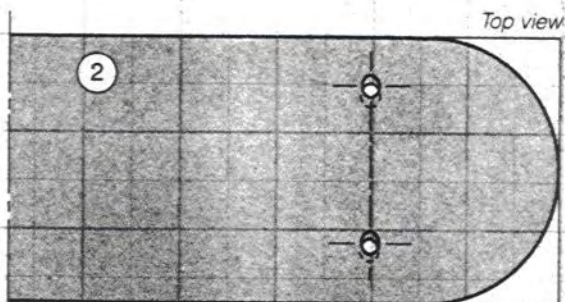


Side view

Scale drawings: Each square equals 1/2".



The outside wing strut holes must be marked and drilled from the top of the wings.



the assembly by gluing the nose spinner to the end of the propeller rod.

Using the scale drawings, locate and mark the four 1/8" hole positions for the inside wing struts on the fuselage. Slide the wing assembly over the propeller assembly and glue into the dado. When the glue dries, use an electric hand drill with a 1/8" twist bit to drill

through the marks on the tops of the wings into the marks you just made on the fuselage. Glue the inside wing struts into place and sand flush.

Finish the assembly by gluing the landing gear struts to the wheel brace, sliding the axle through the holes in the landing gears and gluing the wheels in place, (making sure the axle

doesn't get glued in the process). The last step is to glue this wheel assembly to the fuselage, glue the tail skid into its hole and brush on three coats of high gloss polyurethane, allowing plenty of time for drying between coats.

Jim Jacobson has just retired from teaching Junior High School woodworking.