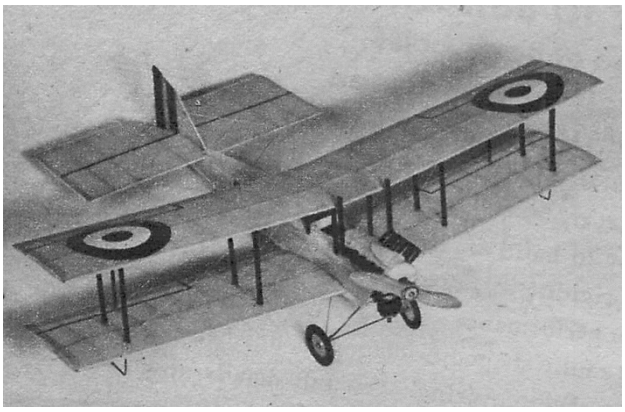
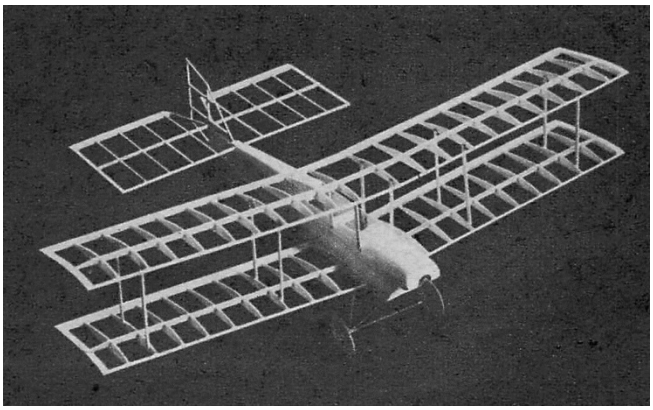
De Havilland DH6 Trainer





She may be a "square" but she sure gets around, you've a choice of free flight pr U control with this WWI bipe by Warner Frake.

This “old-timer” provided primary training for many pilots during the last two years of World War I. When the Royal Flying Corps specified the need for a trainer that was easy to fly, economical to build and simple to repair or replace, De Havilland came up with this rather squarish plane that complied with all the requirements.

The DH-6 was designed primarily for rapid production, and hence items like curved wingtips and empennage or engine cowling were eliminated. This plane was powered by the 80 hp French Renault eight-cylinder, V-type engine. In spite of its awkward appearance, the De Havilland 6 trainer was a very efficient airplane and, although not a combat plane, it was a decisive factor in winning aerial superiority for the' Allies by giving many combat pilots their first taste of flying.

The novice model builder will welcome the angular construction of the DH-6; no stringers or intricate cutting or bending are required. Our model is a beautiful free flight performer. Built to a scale of 3/4" = 1 foot, the total projected wing area is 168 square inches. Total flying weight is five ounces with an O.K. “Cub” .049 engine in the nose. Although our model was designed for free flight, the plans and article insert describe the minor changes required to construct the DH-6 as a control line job that will please the “circle set.” We can guarantee the results.

It is advisable to begin construction with the fuselage. Select medium 1/20" or hard 1/32" sheet balsa and cut out the fuselage sides and formers. Cut the

Construction is fairly easy, the "flying" and "landing" wires add a nice touch of realism and aren't too hard, so don't leave 'em off.

hardwood engine mounts to size and cement firmly to the fuselage sides. The engine can be radially mounted to bulkhead if desired, in which case the bulkhead must be made of 1/16" plywood. Cement the fuselage sides to each other at the rear and cement former E in place. The remaining formers and bulkhead are installed next.

Cut the nose piece and cement in place. Bend the landing, gear and bind and solder all joints lightly to avoid excess weight. The landing gear is mounted to the bulkhead and a hard 1/20" x 1/2” support. A strip of crinoline cemented to each side of these supports and passing over the landing gear strut provides an excellent method of attachment. Cover the entire bottom of the fuselage at this time with 1/20" sheet balsa. It is suggested that the grain run span wise on the fuselage bottom, for this seems to make the fuselage more rigid.

The fuselage top is covered with 1/20" soft balsa, the nose is bent to shape and the turtle deck is applied in three pieces. Install the top piece first, followed by the sides. The portion forward of the cockpits may require a little damp ening in order to bend without splitting. Use pins to hold this in place while the cement is drying. Round off the nose piece and sand the fuselage lightly with 3/0 sandpaper. Out the cabane struts and attach to the fuselage sides, inside of the fuselage. Note the amount of overlap shown on the front view. Cement well.

The empennage is constructed by pinning the balsa over the plan and cementing all joints. Sand to shape

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carefully and cover with “Sky-Sail” tissue, using clear dope as the adhesive. Cover both sides of the stabilizer and fin. Pin to the work table and water one side at a time. Apply two thin coats of clear dope while pinned to the table. Cement the tail surfaces to the fuselage.

Cut the wing ribs from 1/20" medium sheet balsa and sand smooth. Either the NACA 6409 or Clark “Y” airfoil can be used. The former will increase the flight duration of your model. Select medium hard balsa for the spar. Pin the ribs over the plan and cement the spar in place. Four wing panels are required, two each of port and starboard. The addition of the medium balsa leading and trailing edge will complete the panels. Cut the two 1/16" plywood wing joiners (upper wing only) and join the panels to the required dihedral, using plenty of cement.

Trim the leading and trailing edges to their proper shape and sand the entire wing framework lightly. Cover with “Sky-Sail” or similar tissue. Pin to the work table and water and dope one section at a time. We applied two coats of clear dope.

Mount the upper wing at 3/16" incidence. Cut away a small patch of covering to allow the cabane strut to be cemented to the side of the rib; note the overlap shown in the front view. Do not spare the cement. When this is thoroughly dry, the lower wing panels are securely cemented to the fuselage sides at 1/8" incidence. Meanwhile the inter plane struts can be cut and sanded smooth. Patches of tissue should be cut away on the bottom of the top wing and the top of the bottom wing at the strut locations.

It will be found that the wings are flexible enough to stand slight spreading apart in order to install the inter plane struts. Again use enough cement for a secure joint. Bend the tailskid and cement in place. We used lightweight air wheels (Trexler) and found they absorbed the shock of landings very nicely. A pair of 1/16" plywood wheels were tried and the flight performance was slightly improved, however, the landings were rougher on the model. We recommend the air wheels for sport flying.

The dummy engine and exhaust should be made as light as possible. Carve the cylinders from very soft balsa and paint black. Cement in place. The exhaust stacks are made from plastic or paper straws with a soft balsa elbow. Paint black and cement to the cylinder heads. Cut the cooler scoop from thin card and cement in place. Silk thread is used for rigging though the rigging is optional.

DH-6 CONTROL LINER: The uppermost section of the plan illustrates the requirements for a control line model of the DH-6.Construction steps are identical with the free flight version except for the following items.

Using the sizes specified on the plan, construct the fuselage. Notice the heavier engine mount. Before the top covering is added, the control system must be installed as well as the fuel tank. Bolt the bell crank to a piece of plywood which is securely cemented to both sides of the fuselage. Test the system. The "Cub" stunt tank should fit perfectly and the "Cub” .099” engine is ideal for this model, although most engines from .09 to .10 can be used. Instead of the sheet balsa nose, it is suggested that a balsa block be hollowed as shown for extra ruggedness.

The tail is entirely of 3/32" sheet. Hinge as shown and install any commercial horn of the size shown. Be sure to offset the rudder about 1/2" to turn the plane away from the center of the circle. This is very important.

Decide whether or not you intend to perforin stunts and then build your wings. Notice that the stunt wing requires two 3/32” square hard balsa spars and a heavy trailing edge. All struts are made of hardwood (pine or spruce). Use hard balsa throughout for the wings.

The control liner can take about four coats of clear dope and three of colored. Wood filler can be used on the fuselage. The model may be colored all yellow or green fuselage and yellow wings and tail. Use rubber tired wheels. Mount the control line guide on the outboard inter plane strut on the inside of the circle. Fuel proof the entire ship before flying and never fly with the model tail heavy.

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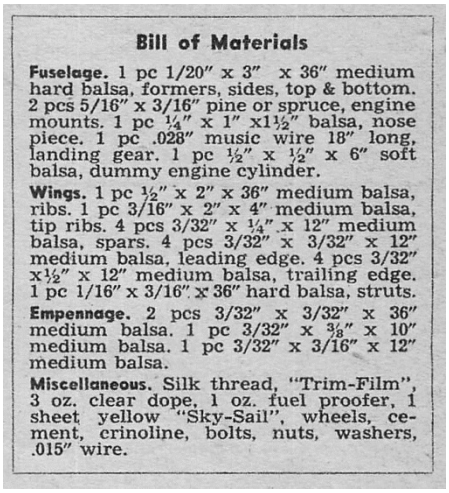
De Havilland DH6 Trainer

Cut the engine hatch with a sharp razor blade and install the engine with about two degrees of down thrust and one degree of right thrust. Our fuel tank is 3/4" square and is made from very thin shim brass. This item can now be installed by working through the cockpit and engine hatch. Use 3/32" square strips to hold the tank in place.

We employed no engine shut off device, the tank proved to be the correct size for enjoyable flying when allowance was made for an engine warm-up of about ten to fifteen seconds. The entire model including the cowl interior and bulkhead should receive a thin coat of fuel proofer (Comet is what we used).

The prototype DH-6 model did not sport a paint job, for reasons of saving on weight. We used yellow tissue on the frame surfaces and, with the addition of the insignia, the model presented a pleasing appearance. Only the struts received one coat of reddish brown colored dope to simulate mahogany. An infinitesimal amount of weight was required in the tail to balance the model correctly. Hand glide the model over tall grass until a good glide is obtained. The first few flights should be carefully observed to note any erratic flight tendencies then get ready for some real scale model flying.



Bill of Materials

Fuselage. 1 pc 1/20" x 3" x 36" medium hard balsa, formers, sides, top & bottom. 2 pcs 5/16" x 3/16" pine or spruce, engine mounts. 1 pc ¼" x 1" x1½" balsa, nose piece. 1 pc .028" music wire 18" long, landing gear. 1 pc ½" x ½" x 6" soft balsa, dummy engine cylinder.

Wings. 1 pc ½" x 2" x 36" medium balsa, ribs. 1 pc 3/16" x 2" x 4" medium balsa, tip ribs. 4 pcs 3/32" x ¼" x 12" medium balsa, spars. 4 pcs 3/32" x 3/32" x 12" medium balsa, leading edge. 4 pcs 3/32" x½" x 12" medium balsa, trailing edge. 1 pc 1/16" x 3/16" x 36" hard balsa, struts.

Empennage. 2 pcs 3/32" x 3/32" x 36" medium balsa. 1 pc 3/32" x ⅜" x 10" medium balsa. 1 pc 3/32" x 3/16" x 12" medium balsa.

Miscellaneous. Silk thread, "Trim-Film", 3 oz. clear dope, 1 oz. fuel proofer, 1 sheet yellow "Sky-Sail", wheels, cement, crinoline, bolts, nuts, washers, .015" wire.