



DIRECTIONS FOR BUILDING YOUR FLYING MODEL

Good Flying Models depend on (1) careful construction of the various parts, (2) accurate alignment of the model, (3) correct balance and (4) proper adjustment of the wing and tail surfaces. Good-looking models cannot be had unless printed parts on the sheet balsa are cut out accurately or unless you follow carefully the outlines of the drawing when assembling the various parts. This is especially true of the fuselage which will appear lopsided if you are careless. Your airplane will not fly well unless great care is used on the assembly. The wings and stabilizers must be parallel to the line of thrust or you will be in trouble. If your plane is not in balance it will fall to rise or else it will rise too rapidly. Finally, the wing and tail surfaces must be warped slightly for good flights.

PROCEDURE: Tack your plan sheet to a working board. Fasten a sheet of wax paper over it as a protection from the cement. Cut the "spray balsa" apart with a razor blade. This will give you a generous supply of 1/16" squares. The printed parts on the sheet balsa can be cut out later while you are waiting for other parts to dry. In general the procedure will be (1) construct the various parts, (2) to assemble the airplane, (3) to correct the balance, and (4) to adjust the wing and tail surfaces.

FUSELAGE CONSTRUCTION: (1) The fuselage. Place your wood strips on the side view of the fuselage. Use pins to hold the longerons (stringers) in place. Cement the upright and diagonal braces to them. Build the second side on top of the first. When dry separate the two sides with a razor blade except at the tip of the tail. Work from the nose to the tail and put in the top and bottom cross pieces or formers, as shown in the top view. Then cement any remaining stringers to the formers. Bend the tail hook and cement in place. It is very important that it be placed in the exact position shown in the side view of the drawing. Then carve the nose block and cement in place. Cover the fuselage with dark tissue. Leave the bay at the tip of the tail open so that the tail hook is accessible. (Special Instructions for Construction of Fuselage for P-21. Cut out the formers from the sheet balsa. Cement the stringers in place. Do not try to put all the stringers in at once. Start with four, in square or oblong patterns. After you have fastened these to the formers go ahead with the rest of the stringers. Cement

the nose block in place. Bend the tail hook to shape and cement in place and then do the tail skid. Cover the body with dark tissue. Leave the bay at the tip of the fuselage open so that the tail hook is accessible.) (2) The Wings. Place the spars in position on the top view of the wings. The forward spar in this case forms the leading edge, the rear spar the trailing edge. Cement the ribs in place. Put on the wing tips. When bamboo is used for wing tips it can be bent to shape by holding it over a candle flame. Cover the wings with light-colored tissue. (Special Instructions for P-2. Do not cover the wing fillet section until after the wings have been fastened to the fuselage and the struts fitted in. See instructions under Airplane Assembly for directions how to put on fillets.) (3) Tail Surfaces. Build the tail surfaces directly on the plan, the stabilizers on the top view and the rudder on the side view. Do not cover with tissue until they have been fastened to the fuselage. (4) The Propeller. The sawed balsa propeller is made ready quickly by smoothing with sandpaper. Pierce a hole for the propeller shaft. Insert propeller shaft and cement in place. (Special Instructions for P-14, P-20, P-22, P-23. Make the wheel pants as follows: Cut the fillets and sides from the balsa sheet, cement together and sand to shape.)

AIRPLANE ASSEMBLY: Before assembling your model, study the plan carefully and note the exact position of the various parts in relation to each other. (1) Wing Assembly for P-13, P-14, P-15, P-16, P-17, P-18, P-20. Attach the wings to the body after carefully noting that the bottom of the wings is parallel to the line of thrust. You can find the line of thrust by drawing a line on the side view of your drawing from the center of the propeller hook to the center of the tail hook. Then check your assembly with the front view of the plan to see if you have the proper dihedral in the wings. Attach the wing struts. (Special Instructions for P-19, P-21, P-22, P-23, P-24. Cement the lower wings on first. Make sure that the wings are parallel with the line of thrust. Locate the line of thrust on your plan by drawing a line from the center of the propeller hook to the center of the tail hook. Check also with the front view to see if the wings have the proper angle with the body. Then cement the interplane struts to the wings and let dry in the right position. Cement the top wing in place. Finally put in the cabane struts.) (Special Instructions for P-10. Cement the top wings in place. Fasten wing struts to bottom of top wings. Cement lower wing to struts. Then put in cabane struts.) (2) Put on the stabilizers. Make sure that they are parallel with the line of

thrust. Then fasten the rudder in place. Cover the stabilizers with light-colored tissue; the rudder with dark tissue. Color one side only of the tail surfaces. (3) The Landing Gear is next. Then do the tail skid or wheel. (4) Hook up the propeller by catching the rubber motor over the propeller hook, drawing the other end through the body by means of a long wire hook or string, and then hooking it on to the tail hook. (5) Shrink tissue tight by spraying the model lightly with water except for the tail surfaces. Water is used instead of dope on light models as dope makes the models too heavy.

AIRPLANE BALANCE: The point of balance of your model is about one-third back from the leading edge of the wing. If the plane is nose heavy, correct by adding weight to the tail or by reducing the nose weight; if the model is tail heavy, correct by adding weight to the nose. BB shot makes good nose weights. Airplanes that are tail heavy will stall quickly; those that are nose heavy will lose altitude rapidly when hand-launched.

FLIGHT TESTING: This type of model flies best in light air or a calm. Be sure that you have plenty of room, free of trees and other objects. Remember that your airplane will not be likely to fly well unless it makes good glides. Hence, the first thing to do is to glide your model. If it noses down too sharply as you glide it, correct by raising the trailing edge of the stabilizers slightly. Make these adjustments by breathing heavily on the stabilizers as you bend them. If it stalls correct by lowering the trailing edge of the stabilizers. If the plane turns to the left, correct by giving it opposite rudder; if it turns to the right, correct with a little left rudder. If the airplane makes a circular dive to left, correct by "washing-in" the tip of the left wing. Do this by gently warping the trailing edge of the wing tip downwards. A circular line to the right would be corrected by "washing-in" the tip of the right wing. Now for the first flight. Hold your model by the nose block, as you wind the propeller. Wind the propeller clockwise until you have a row and a half of knots on the rubber motor (about 50 times). Launch it carefully from the hand by thrusting it forward gently as you release the propeller. The model should be pointing down slightly and the wings parallel with the ground when you release it. As it goes forward note whether it flies up or down, left or right, forward, etc. Make whatever adjustments are necessary before flying it again by warping the wings or tail surfaces or by correcting the balance. Fly again. Once the model is properly adjusted, wind the motor fully and fly again.