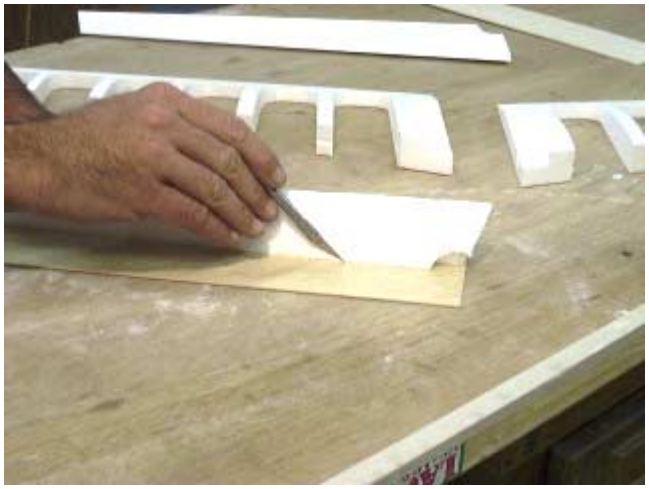
Wing Assembly

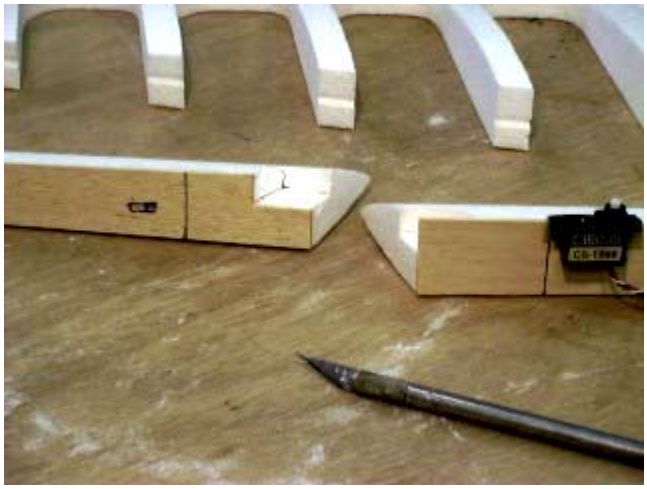
1. If you want to build the "clipped" wing version of the pop fly, use a new razor to cut the tips off at next to the last wing tip bay.

2. Take the 1/16 balsa spars from the box and use a sanding bar to make sure the edges are straight. Then apply a heavy coat of spray adhesive to the contact side of the spars.

3. Remove the foam leading edges from the box and use the sanding bar to scuff the backside if the leading edge. Then bond the backside of the leading edge to the balsa using the straight edge of the balsa as a guide. (Align the bottom of the leading edge with the straight edge). **Note:** The top of the leading edge is notched.

4. Use a razor to trim the excess balsa from the top of leading edge, as well as at the tips. Remove the balsa from the notched space too.



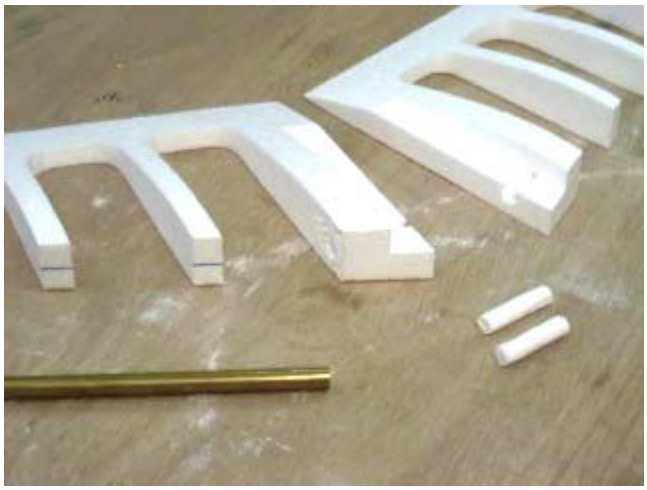


5. Use your servos as a pattern and mark their locations on the wing.

6. Transfer the depth of your servos to the Exacto knife with a marker, and then cut the holes for the servos. Remove the foam from the holes then cut a hole in the balsa spar at the bottom for the servo connectors and wires to pass through. **Note:** The holes for the servos should be slightly under size to hold it in place.

7. Use a straight edge to mark the forward end of the ribs span wise and about half way from top to bottom, (only one wing is required for this step). Use a razor to cut a notch where the marks were made, (this is where the receiver antenna will pass through the wing).

8. Use an Exacto knife to sharpen the inside edge of a ½ " brass tube. Then use the tube to "drill" a hole for the servo wires to pass through Use epoxy to bond the leading edge to the ribs. Masking tape is used to hold the assembly together until the glue cures. The scrap foam between the ribs (plugs) should be used as spacers to keep the ribs aligned.



9. Remove the tape from the wings then place the wings in their beds. With the “plugs in place sand the bottom of the wing to remove any irregularities in the surface. This will improve the appearance of the wing as well as the bond. Then turn the wing over and do the tops.

10. Sand a flat spot in the leading edges until it is ¼ inch wide then blend it into the rest of the wing to form a round leading edge.

Covering the Wing

11. Use compressed air to blow the foam dust from the wing and the “plugs”.

12. Remove the shrink-wrap from the box and spread it out on the table. Trim the shrink-wrap to make two sheets. Then place the wing panels on one of the sheets. Cut the sheet to make two panels with roughly 2” or more of excess around the wing panels. Then set aside every thing but one trimmed sheet.

13. Use masking tape to hold the corners of the sheet to the table surface. Remove the large wrinkles by pulling the tape. Tape down the edges of entire sheet.

14. Use a heat gun set on high to carefully shrink out the remaining wrinkles. Avoid heating the masking tape by aiming the Heat Gun at an angle away from the tape, the adhesive will soften and release its hold on the table. Be careful to only get the wrinkles out DO NOT completely shrink the covering at this time you only want a nice wrinkle free surface to adhere the wing cores to, you will then shrink the covering tight.

15. Next, wash your hands. It is almost impossible to keep from touching the sticky side of the wing during the next step. Your fingerprints will transfer to the wing spoiling the finish if you don’t.

16. Spray the bottom of the wing with spray adhesive; allow it to dry for 5 to 10 min. Then place the wing panel on the wrinkle free sheet that is taped to the table. Apply pressure to the panel where it touches the sheet. Then use a razor to cut the panel free from the table around the trailing edge and up to the spar. Cut near the masking tape to keep the extra sheeting. Then, with a rolling motion rotate the wing panel so the leading edge foam

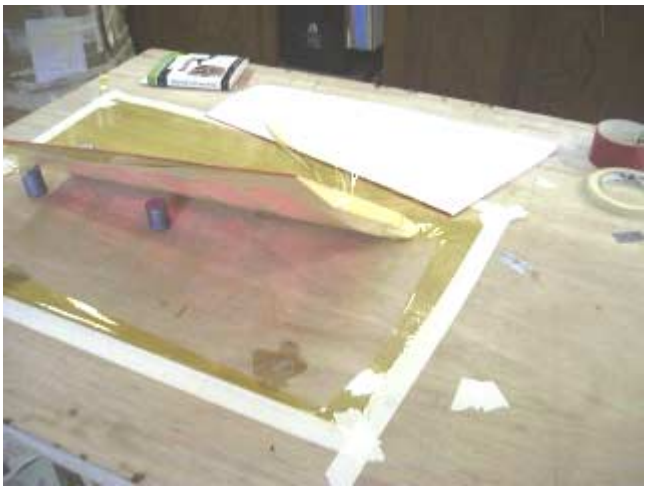
will contact the sheet. Now cut the panel free from the table. **Note**: use your thumb in a wiping motion to remove small wrinkles where the sheet contacts the foam. Any wrinkles in the open bay area will be taken out in a future step.

17. Take a sheet of newspaper and cover the wing panel with the exception of the sheeting that protrudes from the trailing edge. Spray the exposed sheet with adhesive then remove the newspaper. Trim the sheet ½ inch from the trailing edge then wrap the sheet around the trailing edge.

18. Repeat the last step on the leading edge. Then trim the sheet flush at the wing root. Then apply spray adhesive with a Q- tip to the wing tip and fold the sheet over to cover the tip. And trim.

19. Repeat Steps 15 through 18 on the other panel.

20. To cover the top of the panels you must mask the open bay areas with the “plugs” before you apply the spray adhesive. Then remove and discard the plugs. Blow out any “foam dust” from the bays before you apply the panel to the sheet. When you bond the panel to the sheet you must start at the trailing edge and roll it forward, cutting it free a little at a time. When the panel has been cut free from the table, finish the edges as you did the bottom sheet. **Note:** The sheet at the tips will require relief cuts before it is bonded to the wing tip.



Joining the Wing Panels

21. Lay the panels flat on the table to check the fit. They should contact completely at the root, adjust if needed, with a sanding block. Apply epoxy to the joint with the exception of the area that the receiver will go. (See the marked area in the photo.) Then hold the panels together with tape. Wipe off any excess epoxy then return the wing to the table. Once the epoxy has cured, remove the tape from the outboard toward the inboard, (this will keep you from pealing the covering off).

22. Place the wing flat on the table and apply light pressure with weights to the edges. Then use the blow drier to remove the wrinkles if any from the open bay areas. Turn the wing over and place it in the wing panel beds apply the weights and do the bottom.

Servo Installation

23. Cut the covering to form a “flap” at the servo holes and push it into the wing so it will stick to the balsa spar. Feed the servo leads into the servo holes and through the holes in the spar. Use tweezers to grip the servo wires and pull the wires and connectors through the holes in the center section. Push the servos into their holes then pull the slack out of the wires. Temporally plug the center section holes with foam rubber to prevent foam bits from entering the wing during the next step.

24. Plug the servo leads into the receiver then lay the receiver on its side in the center section. Mark the area around the receiver. Cut the foam away as you did the servos to form a hole for the receiver. Also, cut slots for the servo wires.

25. Cut a slot for the antenna wire to reach the wing panel that you cut notches in during step 5. Feed a fine wire through the notches and into the wing center section, and then attach a string to the wire with tape. Pull the string through the wing and out the tip. Next, tie the string to the antenna wire and pull the wire into the wing. Anchor the string to the tip with a small piece of tape.

26. Plug the speed controller into the receiver and then cut a hole for it behind the receiver, also cut a slit for the wires

27. Plug a charged battery to your radio system and check your servos for proper movement.(see your radio’s instructions for mixing elevons)

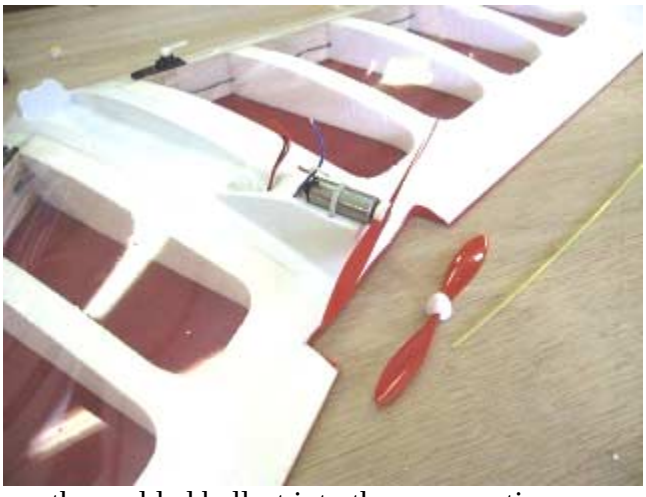
28. Trim the center section cover along the trim lines molded into the plastic. Place the cover into the center section. Use the balsa spar to align the cover to the center section. (There are marks molded into the cover.)

Once the cover is aligned, mark the aft edge of the wing using the cover as a guide. Cut a “flat spot” at the trailing edge to fit the cover. The flat spot extends 2” out from the wing panel joint to clear the prop.

Motor Installation

29. To prepare a motor for installation with a pinion gear the gear must be removed first. If you do not have a pinnion gear press. An alternate method is to hold the pinion gear with pliers and grind the gear away until you see the steel shaft. The gear will pull right off. **Note: The use of safety glasses is highly recommended during this step.**

30. Drill holes in the center section cover on both sides of the motor mount “pocket”. Also drill holes for the wires to exit the cover ½” forward of the “pocket”. Cut a slot large enough for the battery connector part of the speed controller to exit the cover at the base of the connector mount.



31. Apply double back tape to the motor mount “pocket” and install the motor. Feed the zip tie through the holes on the sides of the motor and fasten. Note: the large portion of the zip must be inside the center section cover.

32. Apply double sided tape to the center section recess. Then feed the wires through their holes. In addition, install the center section cover to the center section. Use double-sided tape or CA to attach the battery connector to the connector mount then solder the wires to the motor. In both cases, push the excess wire into the center section cover. Lift the nose of the cover and slip the molded ballast into the nose section.

33. Use the 2 short supplied pieces of Mylar tape along the edges of the center section cover to complete the installation.

34. Install Velcro on top of the motor, in the recess on the nose, and in the battery compartment. Trim the battery cover along the molded lines and cut out the air scoop area. Apply the Velcro to the cover then test the fit. **Note**: the aft portion of the cover is longer than the center section cover and will require trimming

Elevons

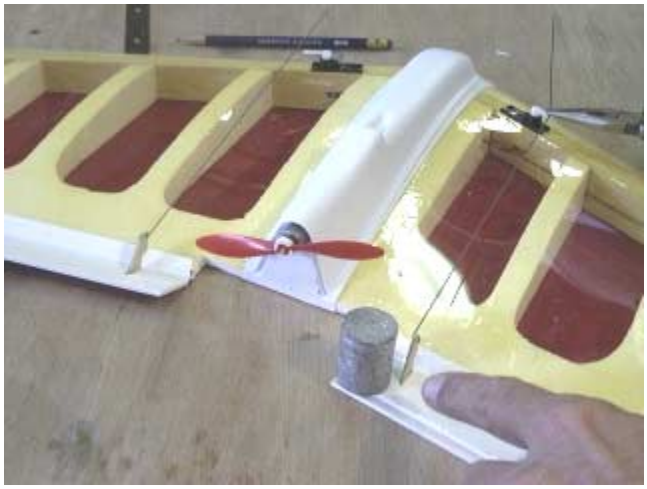
35. Take the 3/32-inch balsa elevons these are laser cut and should be very close to perfect but may need a little sanding. The wider end if the elevons go out board. Sand a 45-degree angle along the leading edge then place the elevon along the trailing edge of the wing. Mark the ends of the elevons using the wing as a guide. **Note:** cut the outboard ends a little undersize to clear the winglets.

36. Attach the control rods with "Z" bends to the servos, then mark the locations for the ply wood elevon control horns. Cut a notch in the elevons to accept the control horns. Do not install them yet.

37. Spray the elevons with any spray enamel of the appropriate color. Spray a light coat of paint and then immediately wipe it with a cloth before it soaks in and dries. Let the paint dry and repeat the procedure one more time. Let the paint dry completely before attaching them with the supplied mylar hinge tape. Make sure the paint is dry. A strong tape bond can be achieved by spraying a light coat of 3M77 adhesive on the elevon before applying the hinge tape. Mask off the elevon leaving ¼" – ½ " exposed. Spray the exposed area with a light coat of adhesive. Remove the masking tape. Let the adhesive dry. Position the elevon on the trailing edge of the wing with a small piece of masking tape on the bottom side
38. With the 45-degree angle of the elevon against the trailing edge of the wing, and even with the prop clearance cutout, attach the elevon with the supplied mylar tape.

39. Fold the elevons over until the top surfaces touch. Apply some this clear cellophane box tape to the bottom of the wing and then work the tape over to the trailing edge of the wing then to the 45-degree angle then finally to the bottom of the elevon. Trim off the excess tape.

40. Cut the tape away from the control horn slots, topside only. Fill the slot with CA then install the control horn. After the CA sets install the control rod in the control horns at the top hole, using the "Z" bend you made earlier. Then turn the radio on; set the controls to neutral. With the wing flat on the table, shim the elevon 3/32" from the tabletop. Place the control rod over the servo arm and make the "Z" bends reach the outer most hole in the servo arm. Install the arm on the "Z" bend then back on the servo. Test the movement of the elevons for proper direction and throw. High rate = ½" elevators & ailerons. Low rate = ¼" elevators & ailerons, in both directions.



41. Attach the supplied foam winglets to the wing tips with double side tape.

Flying

42. For the test flight, pick a day with light wind (below 5 mph.) Find a field with tall soft grass to catch the plane in case something goes wrong. Check the control surfaces for proper movement and set the duel rates on low, if your radio has that feature. Give the elevator trim 3 or 4 clicks of "up". Check the C.G. (5" from the tip of the nose. Then have a friend lightly toss the plane into the wind. Do not apply power to the motor until the wing has left his/ her hand. Allow the plane to climb to about 20 feet then pull the power back to around half. Then try some turns. Get the feel for the controls, then go to full power and have fun. Before the battery runs out try a little "dead stick" flight. The Pop Fly is a gentle glider. Landing, Fly the plane to the down wind end of the field. From about 10 ft., turn the motor off and glide it to the grass.