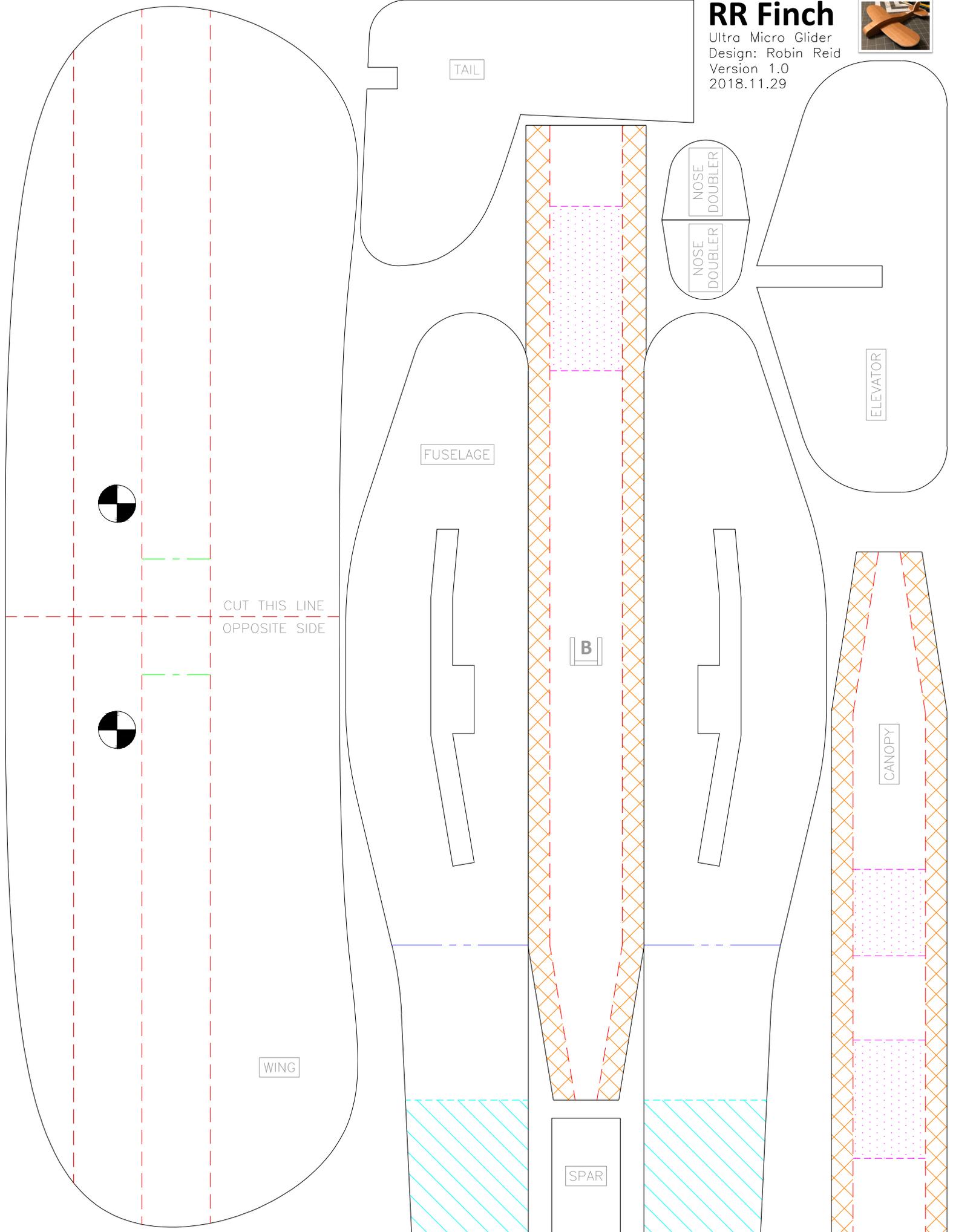


# RR Finch

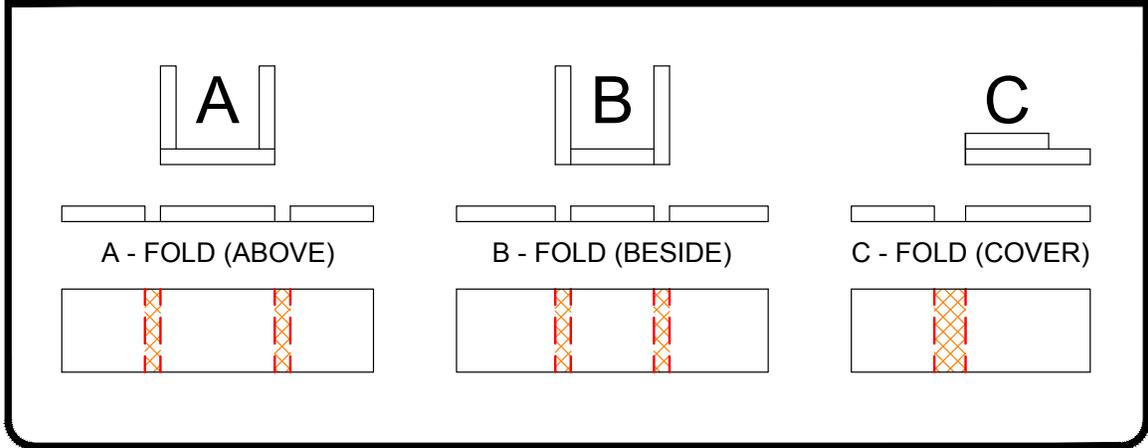
Ultra Micro Glider  
Design: Robin Reid  
Version 1.0  
2018.11.29



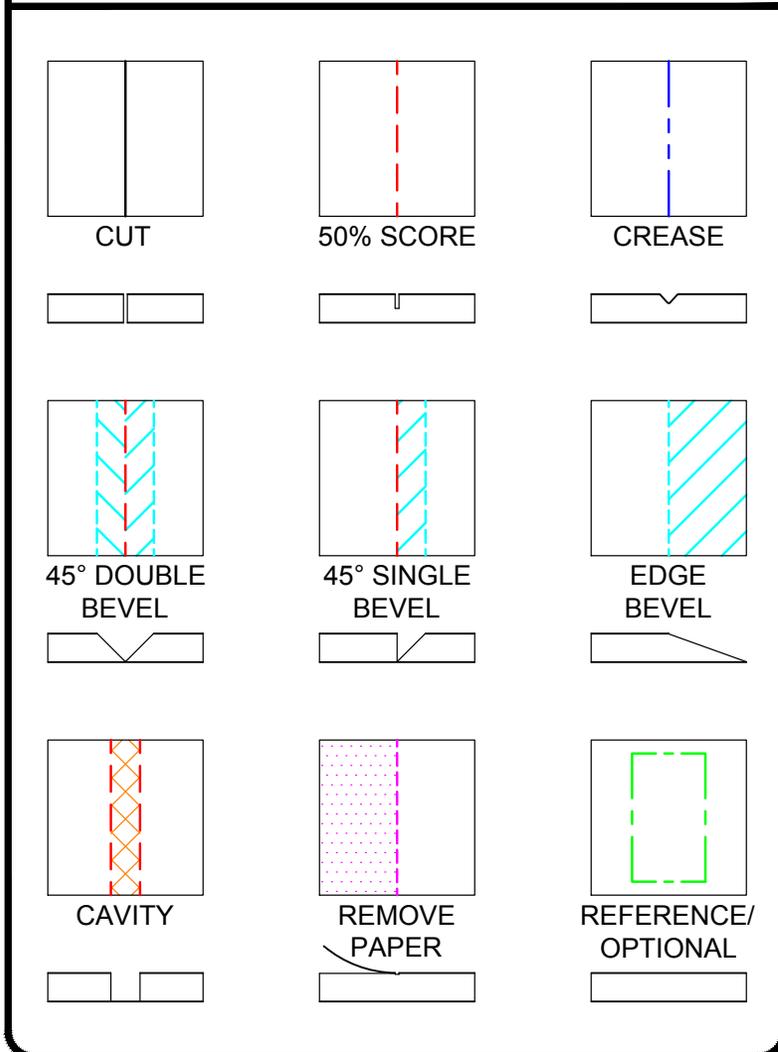
CUT THIS LINE  
OPPOSITE SIDE

# DRAWING KEY

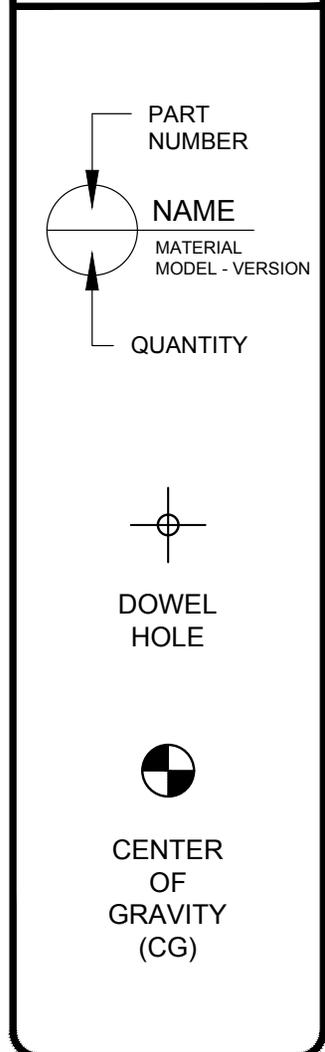
## FOLD TYPES



## LINE TYPE/COLOR



## SYMBOLS



# RR Finch – Build Instructions

Ultra Micro Glider

Designed by Robin Reid

Version 1.0

November 29, 2018



*Typical FliteTest standards and techniques are used in the construction of this plane, refer to the various FliteTest videos on various plane builds for detailed instructions if desired. I recommend the use of the FliteTest water-resistant foam board for this build, for durability and ease of use.*

1. Print parts sheet (ensure no scaling) and spray the back of the sheet with repositionable adhesive (Krylon Easy-Tack or similar). Allow to dry to the touch before applying to the foam board.
2. Apply the parts sheet onto the foam board. Carefully cut out each part and prepare according to Drawing Key legend. Once each piece is prepared, remove the parts sheet from the foam board surface.
3. **Wing:**
  - a. Score along each lateral score line (along the full width of the wing), being careful not to cut through the bottom layer of paper. Be sure to mark the center of gravity locations (use a toothpick to poke a small hole) before removing the parts sheet.
  - b. Flip the wing over and lightly score along the longitudinal score line (front-to-back along the centerline). This will enable the addition of dihedral, later.
  - c. Flip the wing back over (showing the 3 lateral score lines again), and hot-glue the mini-spar into the location as referenced near the center of the wing.
  - d. Fold the wing back, widening and exposing the three lateral score lines, and quickly fill each with a bead of hot-glue. As the glue is cooling, curl the wing over the mini-spar, and place spar-down on the table to assist in curling. Hold firmly in place, ensuring an even camber is achieved over the width of the wing surface and each score line. Be very careful not to split the wing along the dihedral score line. Hold for 2 minutes to ensure complete glue adhesion.
  - e. Flip the wing over (convex side up) with the dihedral score line up. Very carefully flex the wing downwards at the tips to open the dihedral score line, and fill with a bead of hot-glue. Now flex the wing upwards to close it along the score line, and adjust for as much dihedral as desired. With one side of the wing flat on the table, approximately 1" of lift on the tip of the other wing is a good starting point. Hold for 2 minutes while the glue cools.
  - f. Your wing is now done! Set it aside for now.



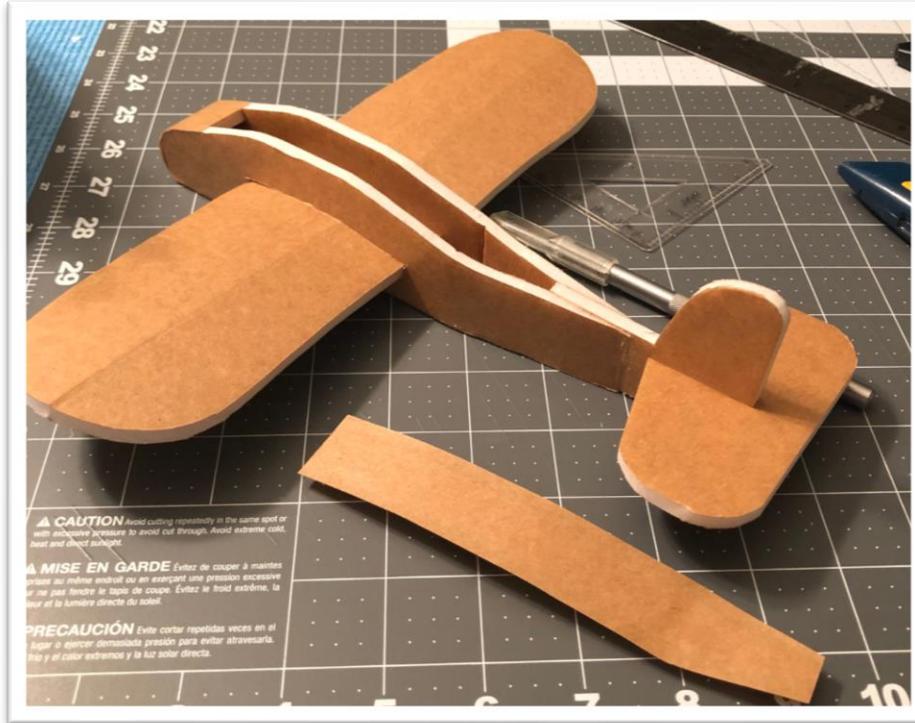
#### 4. Fuselage:

- a. Take the fuselage piece and ensure all cavities, creases and paper removal is completed, according to the plans. The rear of the fuselage will be tapered to the tail portion, so fully bevel the foam from the reference line down to the paper (zero-thickness) at the rear.
- b. Glue a Nose Doubler piece to the inside of each side of the nose of the fuselage, leaving enough clearance for the thickness of the nose to wrap around flush.
- c. Using the B-Fold technique (side pieces Beside the bottom piece), glue each of the sides of the fuselage to the bottom section. Be sure to slightly bend the rear portion of the fuselage at the crease line so it follows the taper of the bottom section as you're gluing. Be sure to use a square when gluing the sides in place to ensure perfect alignment.
- d. Once the sides are glued in place, apply a slight upward curve to the nose section where the paper is removed to facilitate a smooth curl around the nose of the fuselage. Once the fit is perfect, glue in place. Once the glue is cool, trim the excess paper around this edge to ensure a clean appearance (extra paper is intentionally left on both edges to enable this step).
- e. Your fuselage is now ready for a wing and tail!

#### 5. Tail:

- a. Carefully insert the tail piece into the rear slot of the fuselage, between the beveled tapers. Insert fully so that it makes contact with the rear of the fuselage section. Ensure that the fit is perfect, and flush on the top and bottom. Remove the tail piece and apply glue to the inside of the bevel surfaces. Insert the tail and hold in place as the glue cools.
- b. Now carefully slide the wing in from the side of the fuselage, being careful not to overstress the slotted openings in the fuselage. Position the wing with the dihedral seam perfectly in the center of the fuselage, ensuring alignment. Do not glue in place yet.

- c. Slide the elevator piece onto the rear of the tail, snugly into the slot in the rear. Initial suggested angle for the elevator a very slight 'up' elevator. Look down the length of the plane from the rear, along the elevator surface, and align the top plane of the elevator surface with the top plane of the wing at its rearmost edge. Do not glue in place yet.



## 6. Alignment and Balance:

- a. Take a 7g weight (available from your local hobby store) and slide it into the pocket between the nose doublers, inside the nose of the fuselage.
- b. Take the canopy section and apply a very slight curve to each portion where the paper has been removed, and test-fit it along the top of the fuselage. Work the piece until it fits perfectly (trimming shouldn't generally be needed). Do not glue in place yet.
- c. With all the pieces dry-fitted and in place, balance the plane on your fingers at the two Center of Gravity markings. The plane should balance and be level front-to-back, with a very slight nose-down attitude. If not, adjust the location or size of the nose weight until this is perfect.
- d. Once the static balance is correct, and before gluing everything in place, it's time to take your first test flight! Strive for a firm but calm and level release, aiming for the horizon (not up or down). The plane should glide nicely and remain level. Give this a few tries to make sure you're registering the plane's flight characteristics and not inconsistency in release.
- e. Once the flight characteristics are clear, slightly adjust the wing alignment (left/right yaw) to counteract left/right roll tendencies, and adjust the elevator angle to counteract nose up/down tendencies.

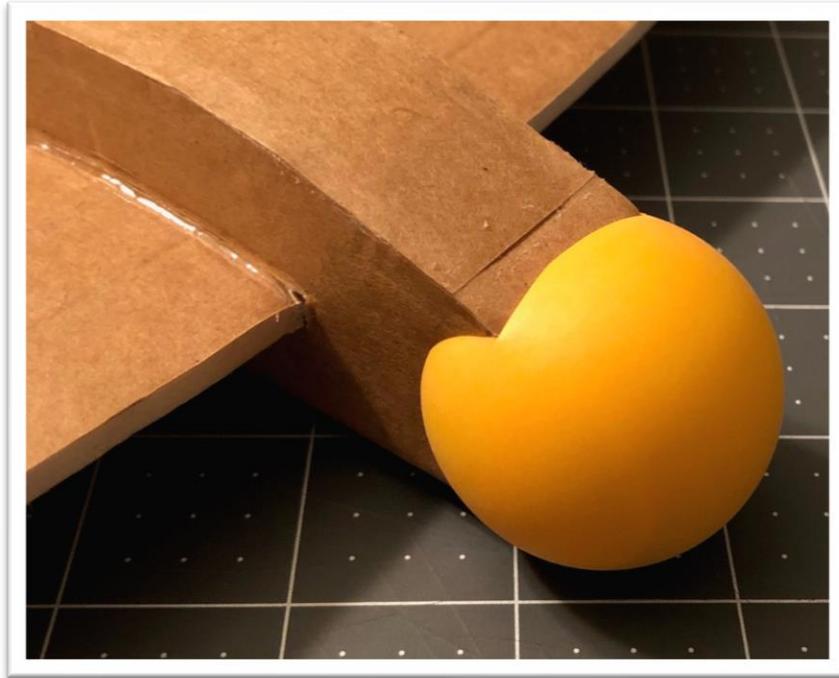
- f. Once you are happy with how the plane is gliding, first glue the elevator in place. This is done most easily by applying a light bead of glue along the top and bottom edge of where the elevator meets the tail, pushing the glue into the edges as you go. Do this carefully so as not to change the position of the elevator.
- g. Once the tail is glued in place, carefully remove the canopy section.
- h. Using the same technique as for the elevator, apply hot-glue to both the inside and outside seams of where the wing meets the fuselage. Careful attention to apply glue neatly to all edges will provide the necessary strength without adding excessive weight.
- i. Lastly, apply hot-glue to the edges of the canopy section (including the front and rear seams) and slide into place.



**7. Great job! Your plane is ready to go! A few final (optional) ideas:**

- a. For added durability, consider finishing the raw foam edges of the plane. There are two methods I like:
  - i. Apply a bead of hot-glue along the exposed foam edge, and while still hot, scrape the excess away. Leave it to cool and simply rub away any buildup along the edge to leave a tough glue finish.
  - ii. Conversely, an iron or a hot sealer can be used to heat and 'roll' the exposed edges of the foam board into each other, to make a smooth, radiused edge with no exposed foam. A slight application of hot-glue along this final seam can add robustness as well.

- b. For extreme durability, a ping-pong ball can be carefully notched out and added to the nose of the fuselage, such that the nose is inserted completely and reaches the front of the ping pong ball. Careful cutting will ensure that the ball meets nicely with all edges of the fuselage and nose. The ball is light enough and smooth enough to not impact the flight characteristics greatly, while providing resistance for higher velocity nose impacts.



- c. If you plan to paint your plane, a light coat of Minwax Polyurethane (oil-based, not water-based) will further seal the foam board and allow application of paint without having to prep the water-resistant foam board by scuffing the surface. Paint adhesion and durability is best with this combination.



- d. If you'd like to get creative with control surfaces and be able to adjust the flight characteristics on the 'fly' (ha!), feel free to cut in a functional hinge for rudder, elevator, or even ailerons. The choice is yours!
  - i. **Challenge:** see if you can set the plane up to be thrown and have it bank around and return to you. Good luck!

Thanks for giving this plane a try! If you have any suggestions for improvements, or if you just like the plans and want to share your creation with me, I'd love to hear from you!

Hope you enjoy! 😊

Robinder