

Building Paper Airplanes Technical Manual

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This manual contains detailed instructions on how to build and operate a paper airplane.

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Figure 1

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Materials Needed

1. One sheet of paper.
 - a. The paper used must be rectangular in shape with straight, smooth edges and square (90°) corners. The size of the paper can range from about 4x6 inches to about 11x14 inches.

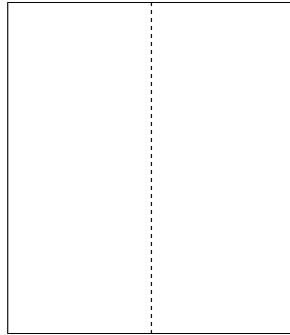
2. A smooth, flat work surface.
 - a. The work surface should be at least as large as the sheet of paper and offer a firm, stable surface to support the paper while it is being folded.

3. OPTIONAL:
 - a. One pair of scissors.
 - b. Tape (preferably scotch tape)

Procedures

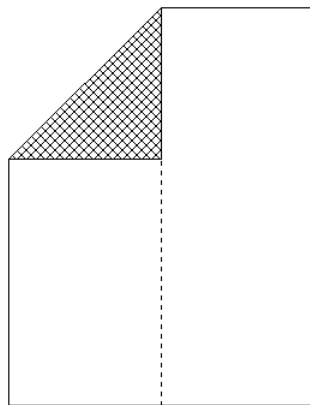
Step 1:

Fold the paper in half lengthwise. Crease this fold well, then open up the folded page and fold it along the same line in the opposite direction (in other words, turn it inside out) and crease again. This fold is the foundation of all that follows and it is important that it is done properly.



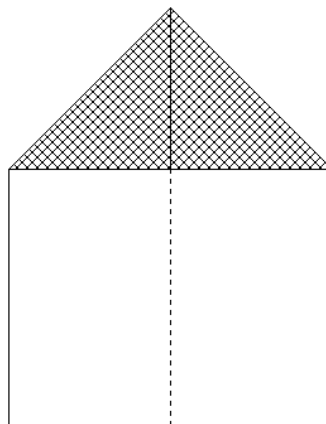
Step 2:

Fold down the top left corner until the top edge of the left half of the page is aligned with the first fold.



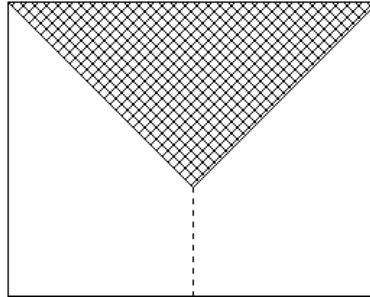
Step 3:

Fold down the top right corner until the top edge of the right half of the paper is aligned with the first fold.

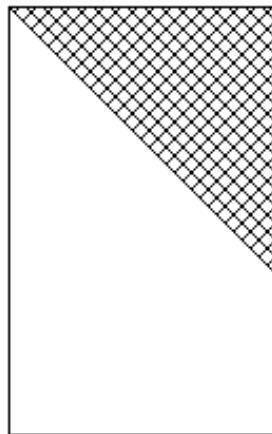


Step 4:

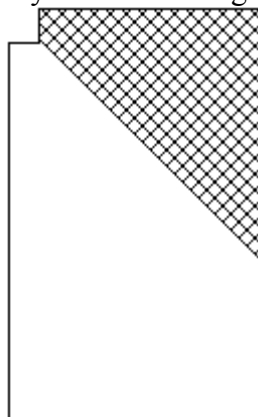
Fold the point down towards you so that the flaps formed in steps two and three are on the inside of the fold. Make the fold as high up on the page as possible without folding or crushing the flaps which are on the inside of this fold.

**Step 5:**

Fold in half lengthways (along the original fold from step 1) towards the back so that the folded-down point is on the outside of the fold.

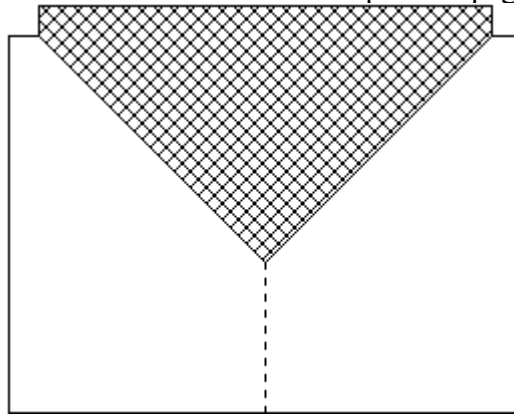
**Step 6:**

Tear or cut a notch in the upper corners. If you have scissors available they will provide an easier and more attractive way to make the notches. Remove a square (about ½ inch) from the outer corners. Make sure you do not cut your notch along the center fold.



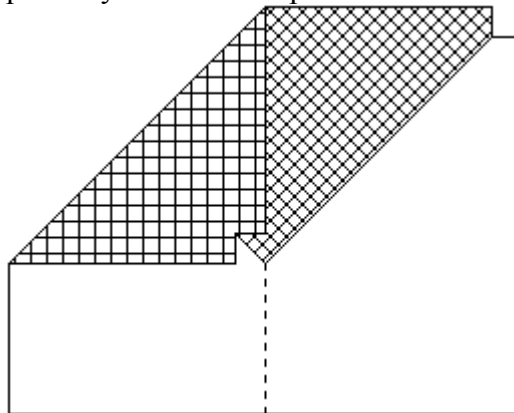
Step 7:

Open the fold from step five so that the point is again on top and pointed toward the bottom of the page. The notched corners will be at the top of the page.



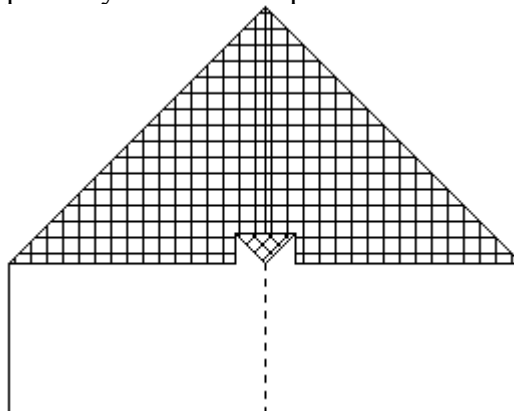
Step 8:

Fold down the top left corner so that the top edge of the left half of the page is aligned with the center fold. This step is very similar to step two.



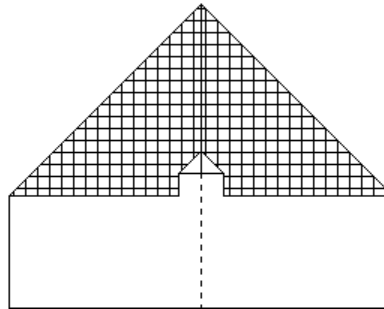
Step 9:

Fold down the top right corner so that the top edge of the right half of the page is aligned with the center fold. This step is very similar to step three.



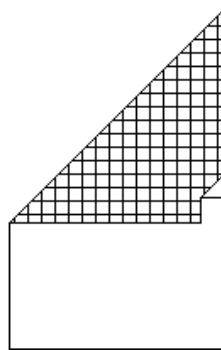
Step 10:

Fold up the tip of the point to hold the flaps in place. Fold the exposed tip of the point up so that it covers the edges of the two flaps. This will hold those flaps in the proper position during flight.



Step 11:

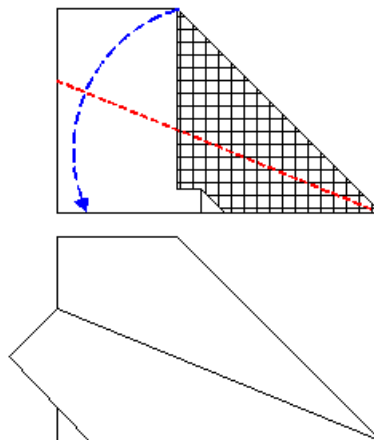
Fold the right side of the page back along the center fold so the flaps and point are exposed on the outside. This creates two panels folded back-to-back along the center fold, with the notches and upturned point on the outside of the fold and the inside faces of the panels being smooth.



Step 12:

Rotate the page clockwise 90° so that the angled portion is to the right and the square end is to the left.

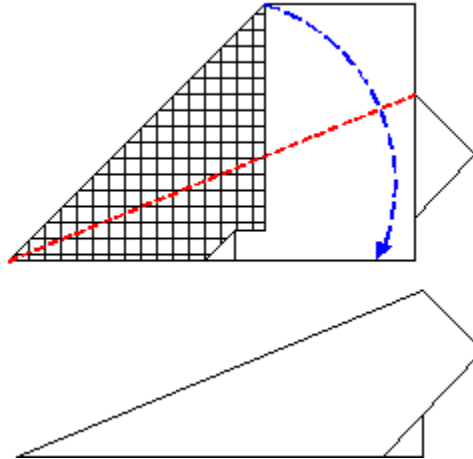
Fold down the right wing. This fold lifts just the top panel created in step 11 and folds it "in half" so that the angled upper edge of the panel is parallel to and even with the original center fold (now at the bottom of the page).



Step 13:

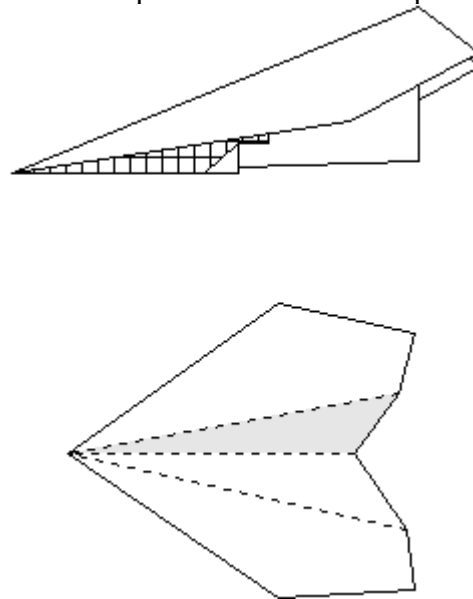
Flip the page over, left to right so that the fold created in step 12 is down against the work surface and the angled edge is at the top and left and the square end is to the right.

Fold down the left wing. This fold is a mirror image of the one just completed in step 12. The angled edge is folded down so that it is parallel to and even with the original center fold.



Finished Plane:

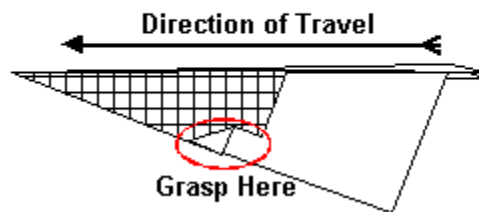
The plane is now finished and ready to fly! Here is a side view and a top view of the plane after step 13 is completed and the plane is allowed to "open up" naturally.



Operating Instructions:

As mentioned above, the finished plane tends to "open up" a bit when it is released. In order to launch the plane you must get the plane back to its fully folded position as it was at the completion of step 13. Then, allowing the two wings to open upward until their two smooth top surfaces are parallel to each other, grasp the base of the plane between your thumb and forefinger at about the center point along the length of the first center fold. This grip will hold the center of the plane together so that the plane will have a "T" shape when viewed head-on from the tip, the wings will be flat and level with the ground and the central base of the plane will extend downward perpendicular to the wings.

To launch the plane select an area with few obstructions, either indoors or outdoors, unless it is very windy. The plane should be launched, point-first at a medium speed and at a level or slightly upward trajectory.



Bibliography

Figure 1: "The Arrow." Learn how to make 10 great paper airplane designs with free, easy to follow animated instructions! 11 Feb. 2009 <<http://www.10paperairplanes.com/>>.