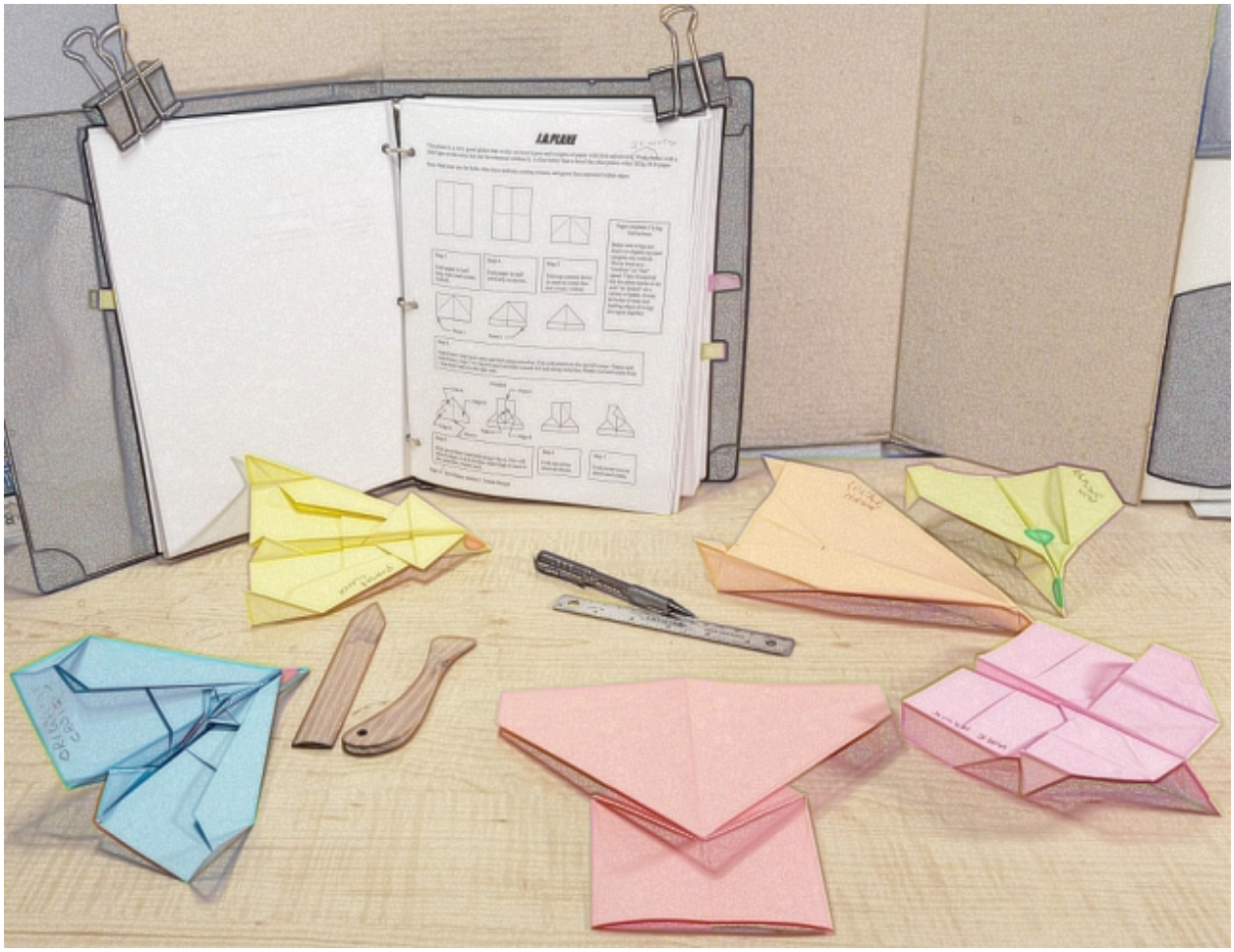
Section 2

Folded Designs

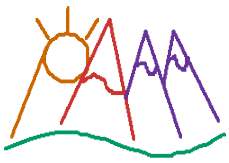
A Combination Of My Designs and Old Classics



Introduction to Section 2

Since at least 1909 paper planes have been folded and flown and become addictive to the true fan. I have been folding paper airplanes for over 50 years and designing them for over a decade. One of the biggest problems for the true fan is lack of documentation. Of the over 70 planes I have folded that seem to glide well, I have chosen only 25 to document. Of those 70, I wonder if any of them are really original to me or if they have been folded by those before me and I have just never come across the documentation and had to "reinvent" the design again.

In selecting what designs to use, the first and most important aspect is does it fly well? But once you have a good flying glider, acrobatic, and dart then you start considering other criteria such as: unique look, easy or fast to build, a challenge to build, a design that leads to experimentation and learning, etc. One last criteria I personally wished to add is at least a few vintage designs to give a sense of development of paper airplane design through the last 115 years. I hope the reader enjoys my selection.



Have Fun
Pat Morgan
patsplanes.com

The cool paper airplane site!

Index of the Planes

Easier to make:

Intermediate to make:

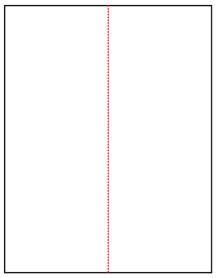
More difficult to make:

Vintage Designs:

Smasher

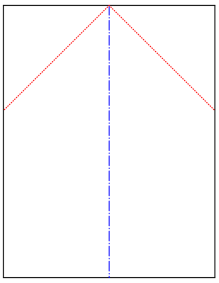
This plane is a very fast and very easy to make glider. This design can be used to make heavier planes to be launched with a rubber band shooter.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



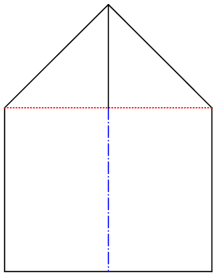
Step 1

Fold paper in half long ways and crease. Unfold.



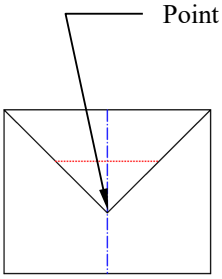
Step 2

Fold top corners down to meet at center. Flatten well.



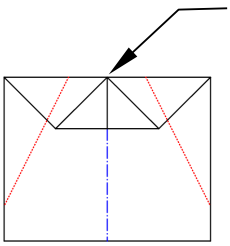
Step 3

Fold top corner down as shown. Flatten well.



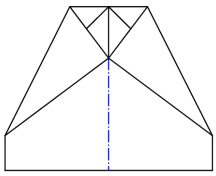
Step 4

Fold Point 1 up to top edge. Flatten well.



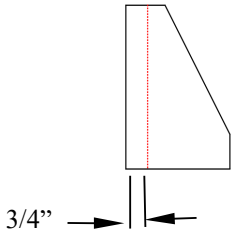
Step 5

Fold top corners down to meet centerline at Point 2.



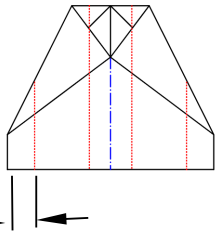
Step 6

Fold in half. Flatten well.



Step 7

Fold wings over at 3/4” from centerline. Flatten well.



Step 8

Fold Fold winglets down 1” from edge.

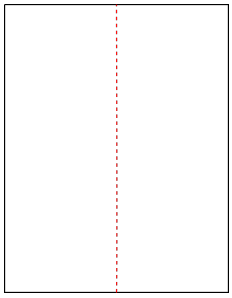
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose is taped together.

The Drone

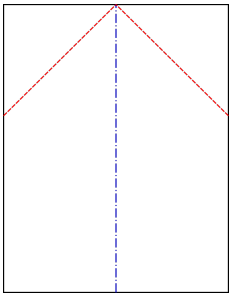
A quick to make glider with a strong nose, perfect for when that young kid insist on a paper plane at that inconvenient time. The nose is strong enough to handle a few crashes.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



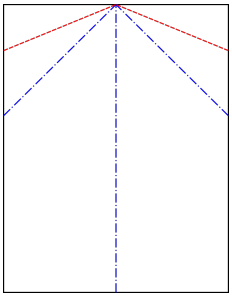
Step 1

Fold paper in half long ways and crease. Unfold.



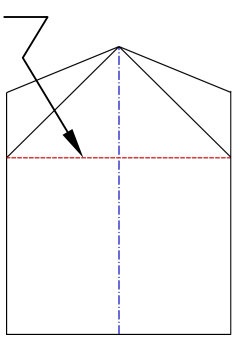
Step 2

Fold top corners down to meet at centerline. Crease and Unfold.



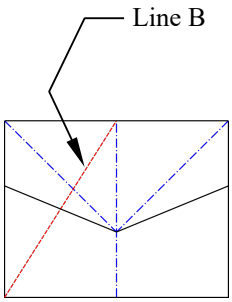
Step 3

Fold top edges down to meet new creases as shown. Flatten well.



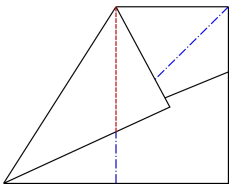
Step 4

Fold top point down along Line A.



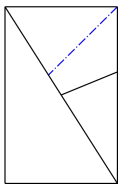
Step 5

Fold top left corner along Line B as shown.



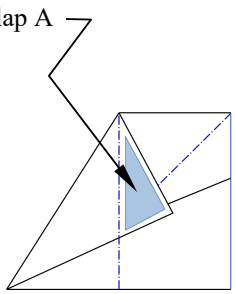
Step 6

Fold along centerline as shown.



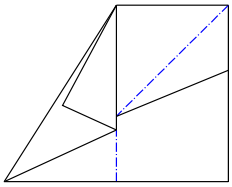
Step 7

Crease well and unfold.



Step 8

Fold Flap A back to left side.

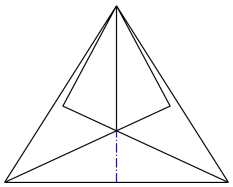


Step 9

Repeat for right side.

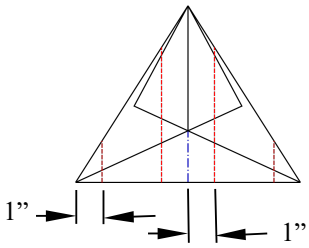
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It might do better if nose and leading edges of wings are taped together.



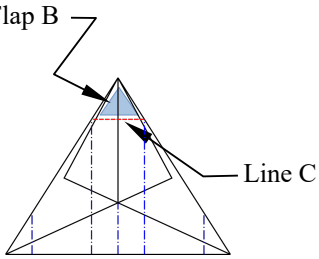
Step 10

Flatten well.



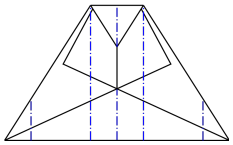
Step 11

Fold both wings and winglets at 1.0” as shown. Crease and unfold.



Step 12

Fold Flap B down along Line C as shown.



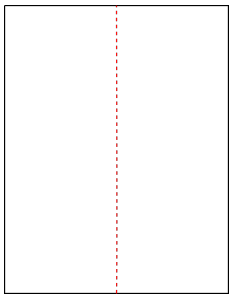
Step 13

Refold wings and winglets on existing creases from Step 11.

XP 22

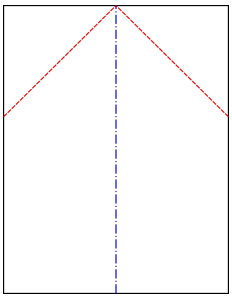
Although fairly simple in design this paper airplane can offer a lot of experimentation. With wing folds designed to give a thicker leading edge it should provide a nice airfoil shape; especially, since the wing folds are going to puff out to make the wing even thicker. A little difficult on thick folds for 24 lb paper but still doable with good results.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



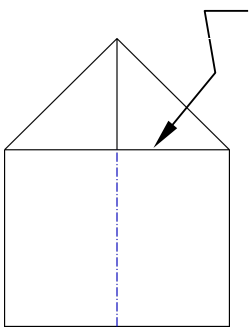
Step 1

Fold paper in half long ways and crease. Unfold.



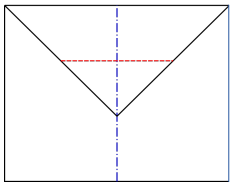
Step 2

Fold top corners down to meet at centerline. Flatten well.



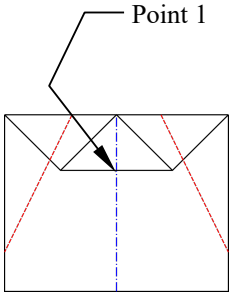
Step 3

Fold top point down along Line A. Flatten well.



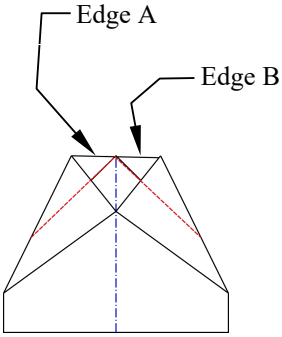
Step 4

Fold top point up to meet center of top edge as shown.



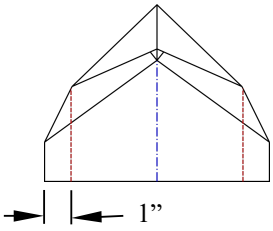
Step 5

Fold top corners down to meet Point 1 as shown.



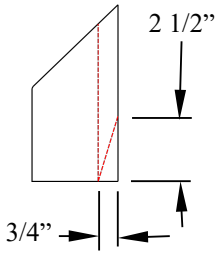
Step 6

Fold Edges A & B to centerline as shown.



Step 7

Fold winglets up at 1” dimension as shown.



Step 8

Fold wings up at 3/4” dimension as shown. Fold tail as shown. Crease, unfold, and reverse fold into fuselage.

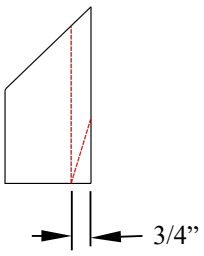
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” to“very fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.

XP 22 (Experimental Mods)

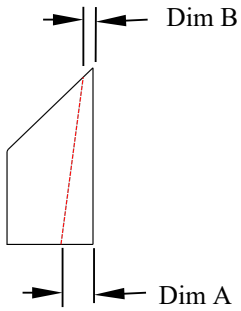
Now what experiments can I do – after all, it is an XP craft?

1. If you read the section on air plane types then you learned there is a definite difference between a glider and a dart. A glider's wings produce more lift at slower speeds then do the wings of a dart (where the wings, along with the fuselage, act as much as fins on a rocket then they do as wings). A glider often requires winglets on the ends of the wing to help maintain that lift, a dart does not since lift is less important. A glider requires a positive angle of attack to generate that lift and often a vertical stabilizer to maintain that angle of attack (see the science of flight section if you want to know why). As shown above this plane is folded as a glider. But it can be turned into an "in-between type", a straight dart, as follows:



Step 8 Old

Fold wings up at 3/4" dimension as shown.



Step 8 New

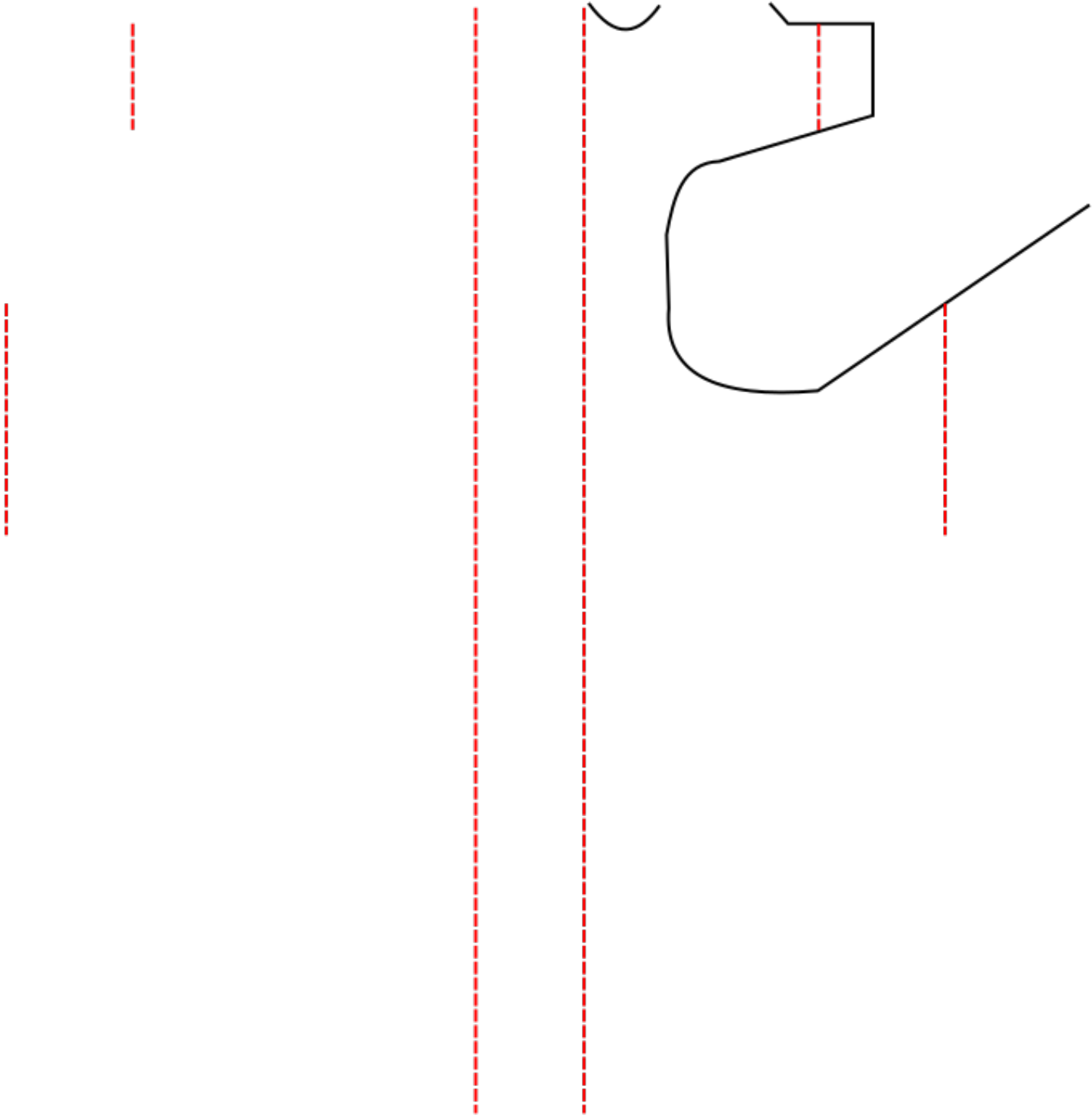
Fold wings up at Dims A & B as shown.

Notes:

If you fold this design using the original Step 8 dimensions for the fuselage, delete Step 7 winglets, and skip the tail; then, you should notice that when you fly it the nose wants to head to floor and the wings either wobble up and down or outright roll. The plane will also slow down fast like there is increased drag. These flight characteristics demonstrate the need a glider has for a tail and winglets. But, as we increase Dim A and decrease Dim B the plane reaches a point that the tail and winglets are no longer required. The body and wings take on more function like fins of a rocket and the trajectory of the plane is more like a dart. Experiment and observe.

2. Try folding the winglets and wings with the plane turned over allowing the fold to the bottom of the plane. The design is for the folds to be on top mainly to keep the plane folds tighter when the nose is taped. Allowing the folds to be on the bottom the wing cross section will be more like that of many real airplane wing airfoils. Just note you may need a glue stick to hold the folds tight to the body. Compare the flights of both designs at different speeds.

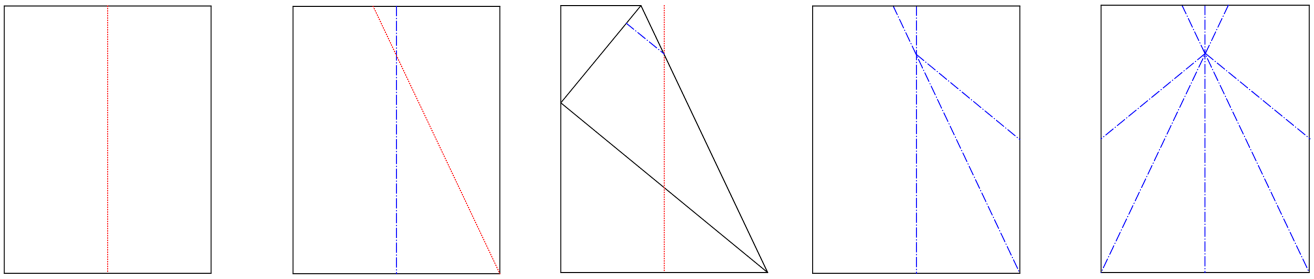
3. This plane is a very good candidate for cutting out unneeded surface area of the wing as was popular in the 1960's. The theory was that this would reduce drag. Make a copy of sheet 3 and fold the printed sheet in half. Cut out along black solid outlines so both halves are symmetric. You may have to look at the original electronic sheet and trace the missing parts of the paths since every printer is different on how close to the borders it will print. Fold as per original instructions except – skip forming winglets and tail from the original directions. Instead use the red dashed lines to fold both winglets and vertical stabilizers down. This plane may have an odd look; but, with a very little fold up on the elevator tabs, I have seen this plane stay with a proper and constant angle of attack and have great lift. Just throw hard.
Judge for yourselves if the designers of the 1960's were correct. Did the popularity of this style of design decline due to lack of flight improvement or just because it was too much work? That is up to the experimenter to answer. Also, try to change what is cut out to improve both looks and function.



Trigon

This plane like Smasher is a quick and easy plane to make. It is also a good choice to make out of 28 lb (or heavier) paper for rubber band launching. Top nose flaps can be taped together but should not be taped to main wing. Bottom nose flaps can be taped to wing at leading edge. This plane flies as a fast glider on all weights of paper.

Note: Red lines are for folds, blue lines indicate existing creases.



Step 1

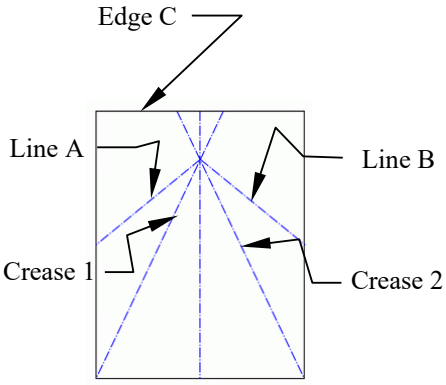
Fold paper in half long ways and crease. Unfold.

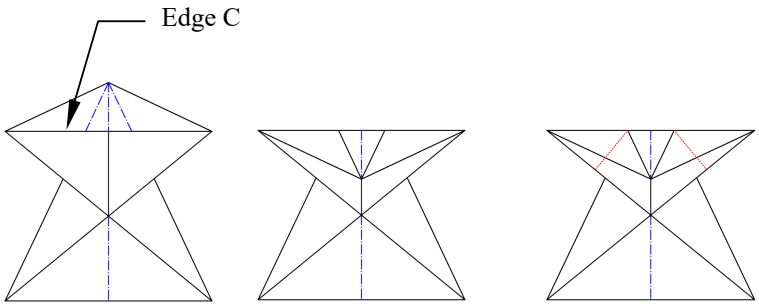
Step 2

Fold upper right corner so that it touches left edge and the crease ends at the lower right corner. Refold at center crease (a ruler or straight edge is a plus here). Unfold both folds.

Step 3 (completed)

Repeat Step 2 instructions for left side.





Step 4

Fold on Creases 1 & 2 bringing Lines A & B to center. This will cause Edge C to puff up. Flatten Edge C down as shown.

Step 5

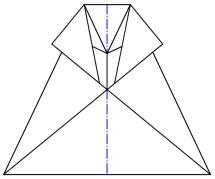
Fold top down along Edge C. Flatten all folds well.

Step 6

Fold left and right upper corners as shown.

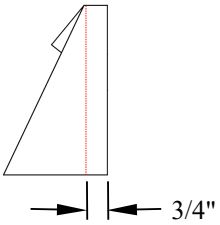
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “slow” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



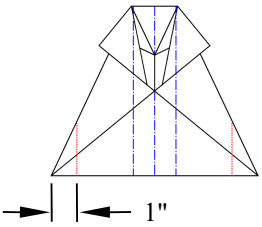
Step 7

Fold plane in half.



Step 8

Fold wings down 3/4" from center edge.



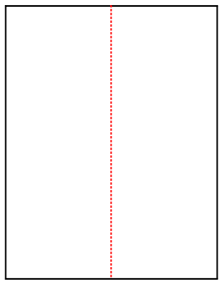
Step 9

Fold winglets up 1" from each corner.

QUASAR CLIPPER

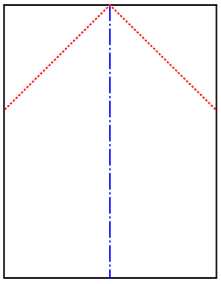
This plane is a fast and easy to make glider. Between it and its sister design, Clipper Too, you should get a good flier on most types and weights of paper. This design can be used to make heavier planes to be launched with a rubber band shooter.

Note: Red lines are for folds, blue lines indicate existing creases.



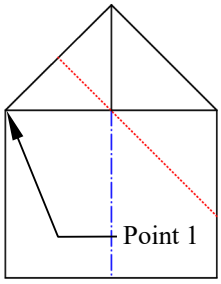
Step 1

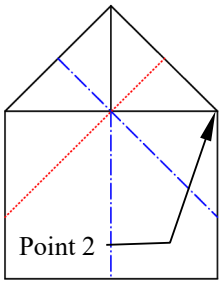
Fold paper in half long ways and crease. Unfold.



Step 2

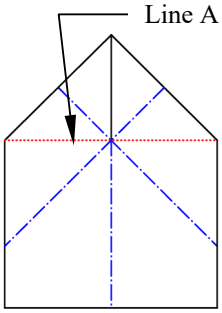
Fold top corners down to meet at center. Unfold.





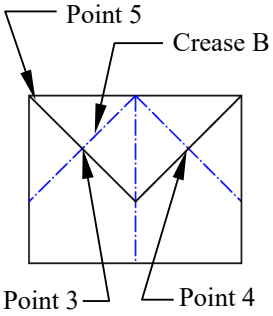
Step 3

Fold top point down to meet Point 1 as shown. Crease and unfold. Fold top point down to meet Point 2 as shown. Crease and unfold.

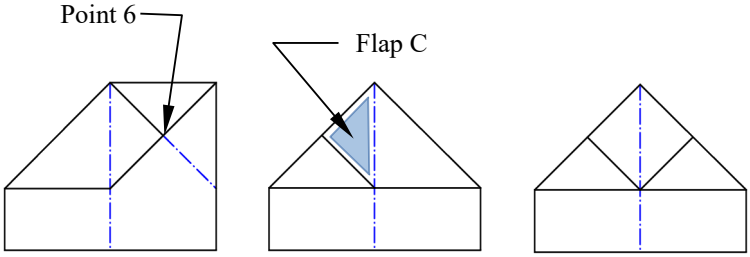


Step 4

Fold top flap down along Line A.

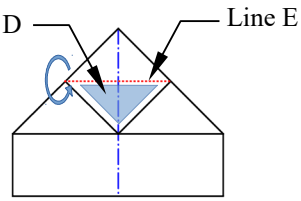


Step 5a
Grab Point 3 and fold to Point 4 on centerline. This will stretch Point 5 to the centerline by folding along Crease B.



Step 5b

Repeat for right side grabbing Point 6 and folding along centerline. Return Flap C back to the right side. Flatten well.

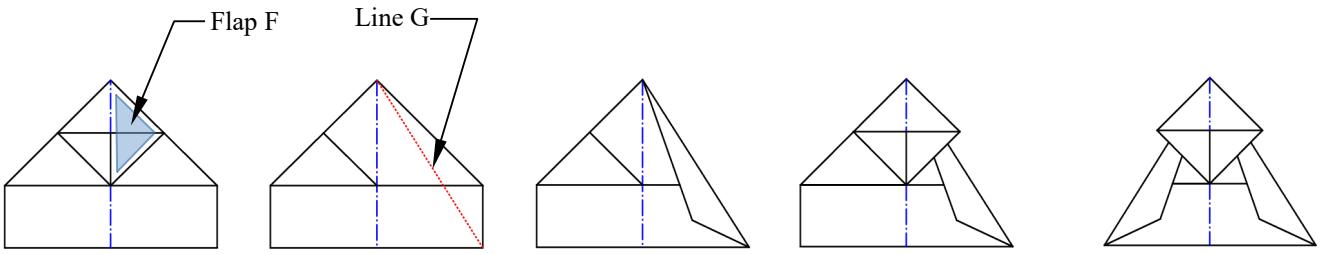


Step 6

Tuck Flap D inside by folding in at Line E. Flatten well.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "fast" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.

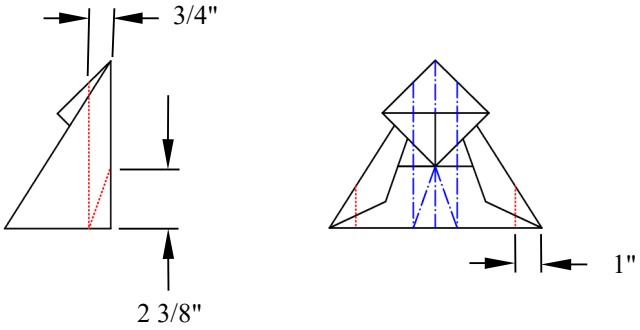


Step 7

Fold Flap F along center to right side. Fold right side along Line G. Return Flap F to right side by folding back on centerline.

Step 8

Repeat step 7 for left side and fold plane in half.



Step 9

Fold wings over 3/4" from centerline. Fold tail 2 3/8" from bottom edge as shown. Crease and unfold. Push tail up into center of body.

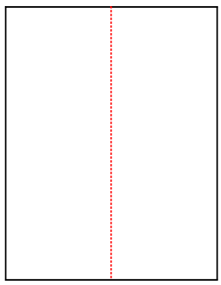
Step 10

Fold winglets down 1" from edge.

CLIPPER TOO

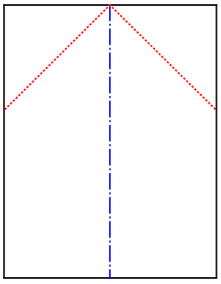
This plane is a fast and easy to make glider. Between it and its sister design, Quasar Clipper, you should get a good flier on most types and weights of paper. These planes are the same through Step 5 but this plane has a few extra folds to adjust the center of gravity for paper that the Quasar Clipper does not work well with.

Note: Red lines are for folds, blue lines indicate existing creases.



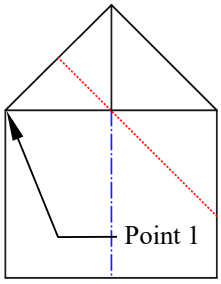
Step 1

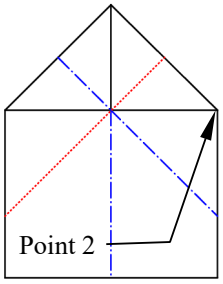
Fold paper in half long ways and crease. Unfold.



Step 2

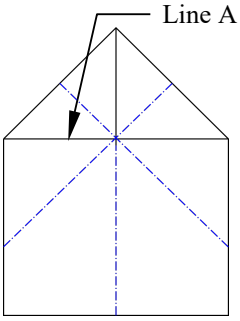
Fold top corners down to meet at center. Unfold.

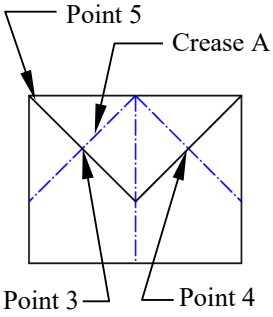


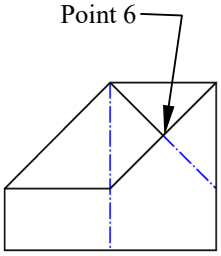


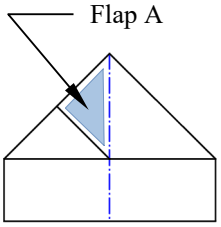
Step 3

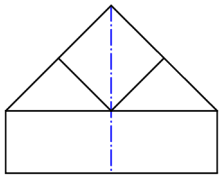
Fold top point down to meet Point 1 as shown. Crease and unfold. Fold top point down to meet Point 2 as shown. Crease and unfold.











Step 4

Fold top flap down along Line A.

Step 5a

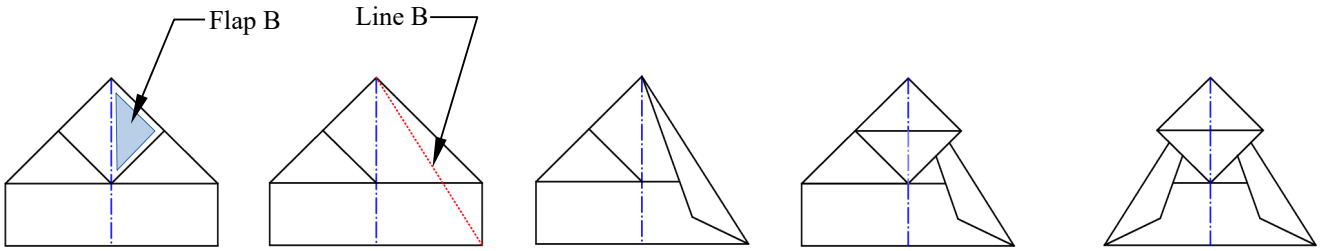
Grab Point 3 and fold to Point 4 along centerline. This will stretch Point 5 to the centerline by folding on Crease A.

Step 5b

Repeat for right side grabbing Point 6 and folding along centerline. Return Flap A back to the right side. Flatten well.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose is taped together.

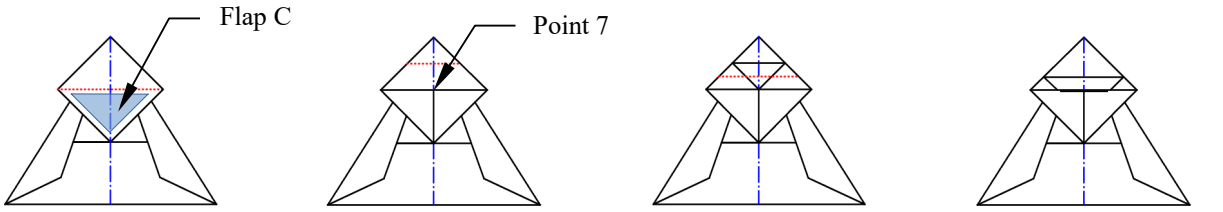


Step 6

Fold Flap B along center to right side. Fold right side along Line B. Return Flap B to right side by folding back on centerline.

Step 7

Repeat Step 7 for left side and fold plane in half.



Step 8

Fold Flap C up as shown.

Step 9

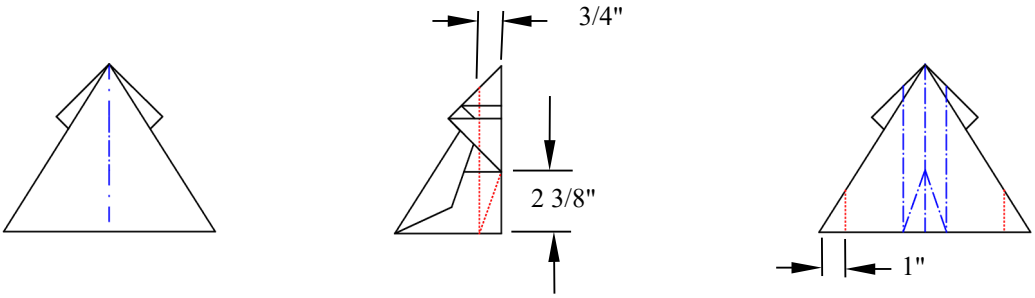
Fold top corner down to Point 7.

Step 10

Fold down again.

Step 11

Plane should look like above. Turn plane over.



Step 12

Fold plane in half.

Step 13

Fold wings over 3/4" from centerline. Fold tail 2 3/8" from bottom edge as shown. Crease and unfold. Push tail up into center of body.

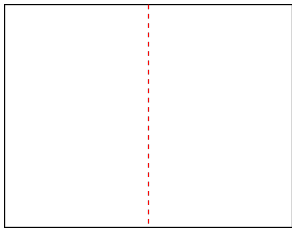
Step 14

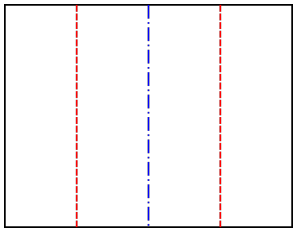
Fold winglets down 1" from edge.

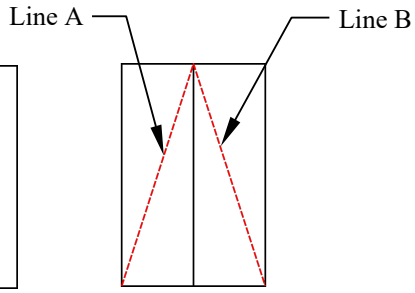
Diamond Head

A mid speed, easy glider.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.







Step 1

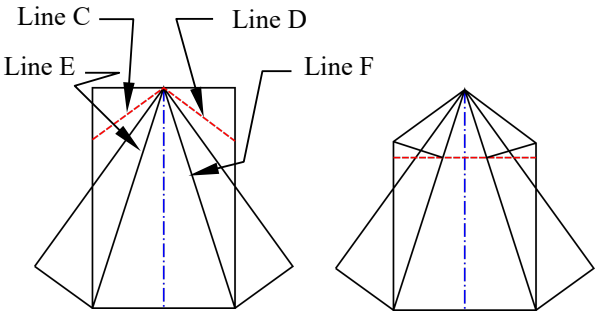
Fold paper in half short ways and crease. Unfold.

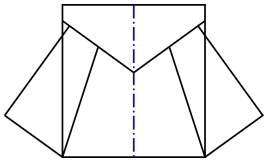
Step 2

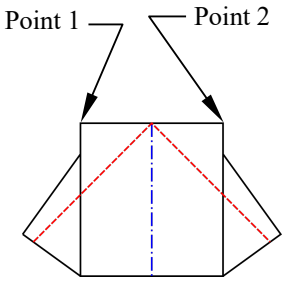
Fold left and right edges to center

Step 3

Fold edges back out along Lines A & B as shown. Flatten well.







Step 4

Fold corners down along Lines C & D to meet Lines E & F as shown. Flatten well.

Step 5

Fold top of plane down as shown.

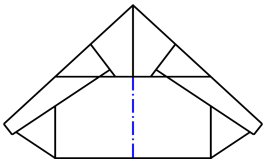
Step 6

Flip plane over left to right as shown.

Step 7
Fold Points to 1 & 2 to Center line as shown. Flatten well.

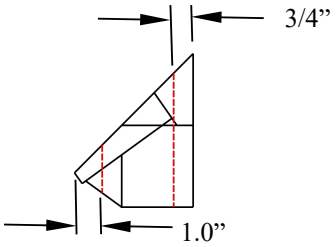
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



Step 8

Fold plane in half to the back as shown. Flatten well.



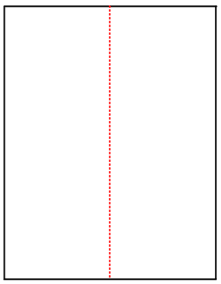
Step 9

Fold wings down at 3/4” and winglets down at 1.0”.

J.A.PLANE

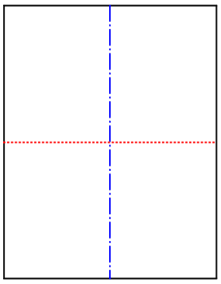
This plane is a very good glider that works on most types and weights of paper with little adjustment. It works better with a little tape on the nose but can be trimmed without it. It flies better than a lot of the other planes when using 20 lb paper.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



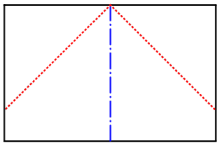
Step 1

Fold paper in half long ways and crease. Unfold.



Step 2

Fold paper in half vertically as shown.

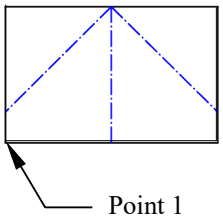


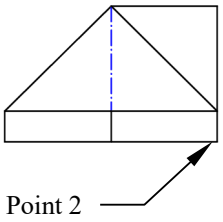
Step 3

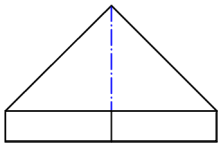
Fold top corners down to meet at center line and crease. Unfold.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "fast" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.

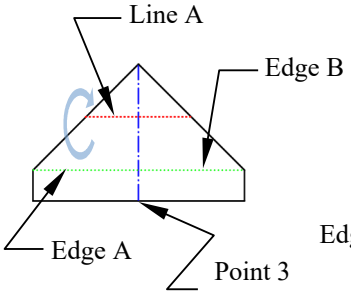


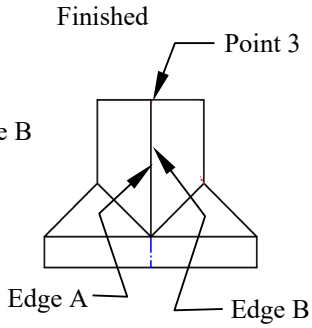




Step 4

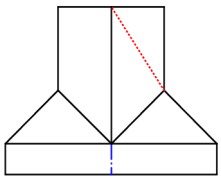
Grab Point 1 (top layer only) and fold along centerline. This will stretch out the top left corner. Flatten well. Grab Point 2 (top 2 of 3 layers) and fold back towards left side along centerline. Flatten well and return Point 1 (top layer only) to the right side.





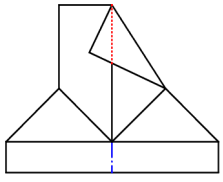
Step 5

Pick up at Point 3 and fold along Line A. This will stretch Edges A & B (hidden under flap) to meet at the centerline. Flatten well.



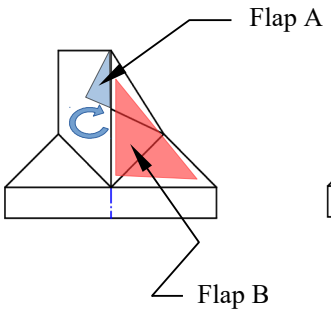
Step 6

Fold top corner down as shown.



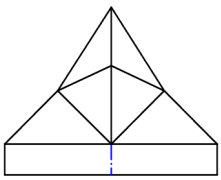
Step 7

Fold corner over as shown and crease.



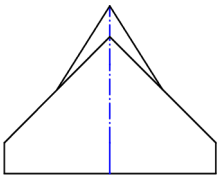
Step 8

Reverse fold Flap A and tuck in behind inner flaps.



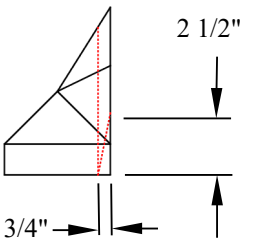
Step 9

Repeat steps 6 thru 8 for other side.



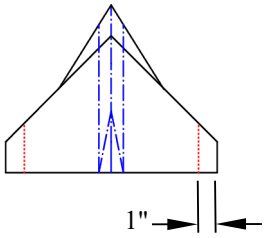
Step 10

Turn plane over and fold plane in half.



Step 11

Fold wings over 3/4" from centerline. Fold tail 2 1/2" from bottom edge as shown. Crease and unfold. Push tail up into center of body.



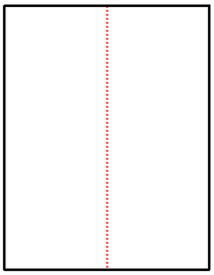
Step 12

Fold winglets up 1" from edge.

HORIZON

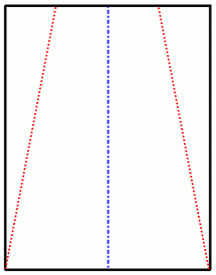
The horizon is a fast straight plane. When 24-lb. paper is used it will fly a very good distance if thrown a little harder than most gliders. It can fly fairly well when made with lighter paper. It is not easy to fold perfectly symmetrical but doesn't require perfection to function well.

Note: Red lines are for folds, blue lines indicate existing creases.



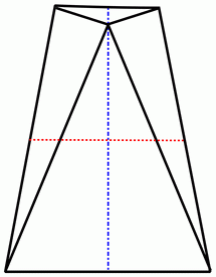
Step 1

Fold paper in half long ways and crease. Unfold.



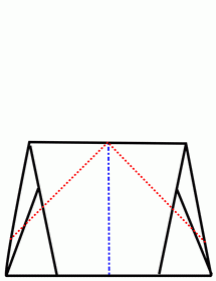
Step 2

Fold top corners in so that corners meet at centerline and creases pass through bottom corners.



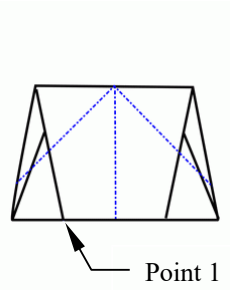
Step 3

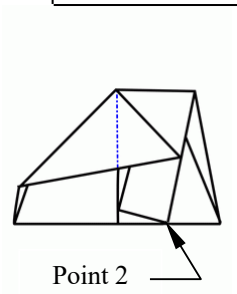
Fold in half from top to bottom.

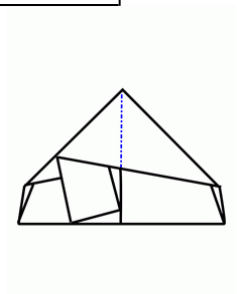


Step 4

Fold top corners down so that edges meet at centerline. Crease well. Now unfold these corners.

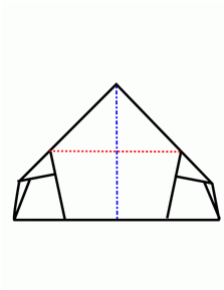






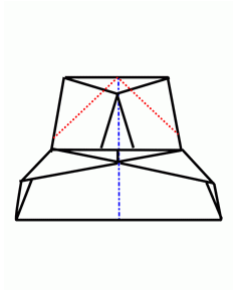
Step 5

Grab Point 1 and fold along centerline. This will stretch out the left crease made in step 4. Flatten well and grab both halves at Point 2 and fold back to left side along centerline. Flatten well and return the top half back to the right.



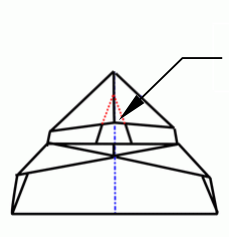
Step 6

Fold nose flap up as far as possible. Flatten all folds well.



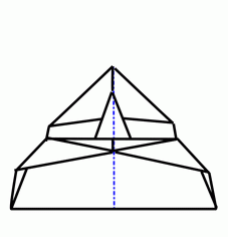
Step 7

Fold corners down to meet at centerline.



Step 8

Fold corners shown and tuck in behind inner flaps.

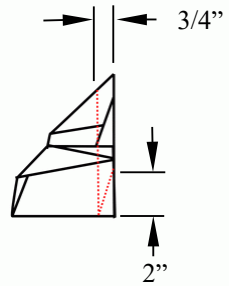


Step 9

Fold in half along centerline with smooth side on inside.

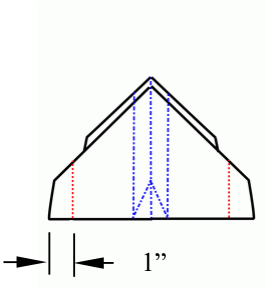
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "hard" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.



Step 10

Fold wings over 3/4” from centerline. Fold tail on diagonal 2” up from bottom edge down to where the wing crease meets the back edge. Crease. Unfold and use index finger to push into center of body.



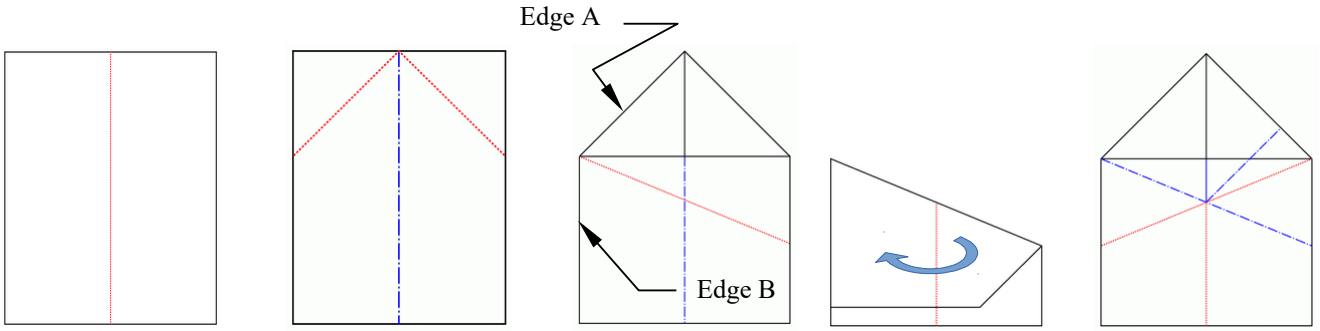
Step 11

Fold winglets up 1” from edges.

FRANCIS JEANE

This plane was designed in Largo, Florida during hurricanes Francis and Jeane. It is a nice mid to high speed glider.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



Step 1

Fold paper in half long ways and crease. Unfold.

Step 2

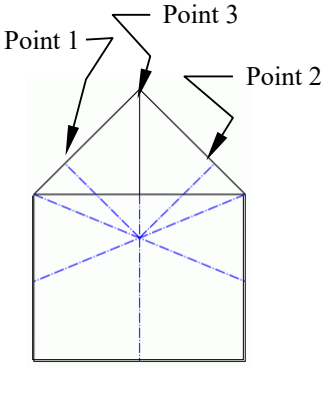
Fold top corners down to meet at center.

Step 3

Fold Edge A down to meet Edge B. Crease well. Fold in half as shown. Crease and unfold both folds.

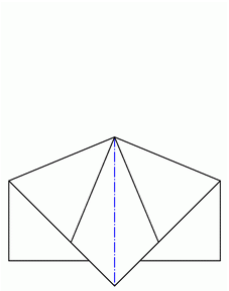
Step 4

Repeat step 3 for opposite edge.



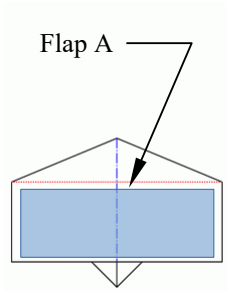
Step 5

Grab Point 1 & 2 and fold them to the centerline. This will cause Point 3 to fold down and puff up. Flatten Point 3 to centerline as shown.



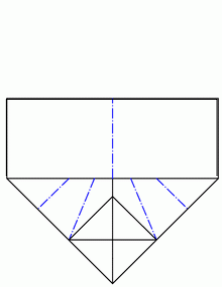
Step 6

Flip plane over from right to left.



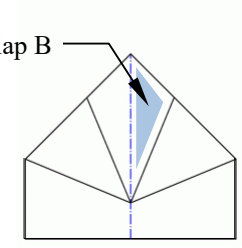
Step 7

Fold Flap A up as shown. Flatten well.



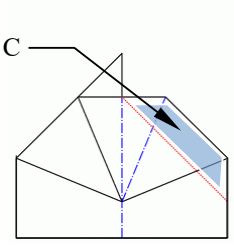
Step 8

Flip plane over top to bottom.



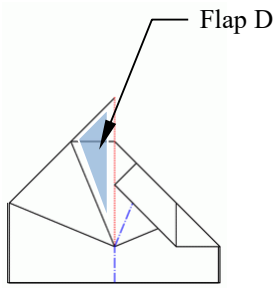
Step 9

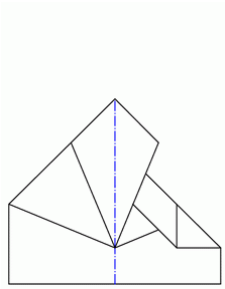
Fold Flap B to left on centerline.

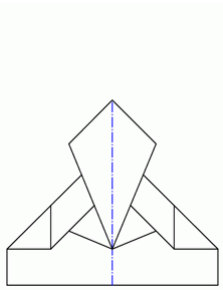


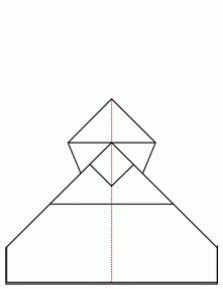
Step 10

Fold Flap C to left as shown.









Step 11

Return Flap D to right side.

Step 12

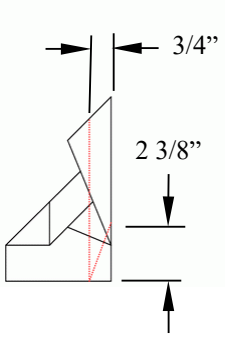
Repeat steps 9-11 for left side.

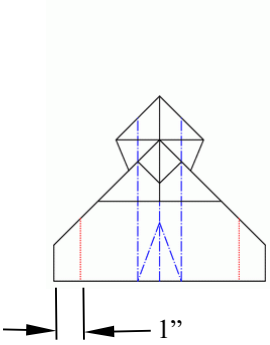
Step 13

Flip plane over left to right.

Step 14

Fold plane in half.





Step 15

Fold wings over 3/4" from centerline. Fold tail 2 3/8" from bottom edge as shown. Crease and unfold. Push tail up into center of body.

Step 16

Fold winglets up 1" from edge.

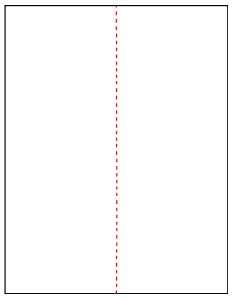
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “high” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.

War Hawk

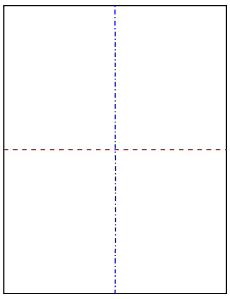
The original version of the War Hawk (War Hawk I) was designed by my son, Jordan Morgan. It is a nice acrobatic plane that works good on most paper. If you don't get good results with a particular paper try the War Hawk II version. War Hawk I is more aerobatic and War Hawk II is more of a straight flier. Try experiment with 20 and 24 lb paper with each.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



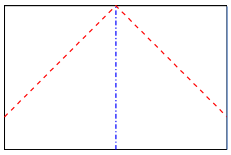
Step 1

Fold paper in half long ways and crease. Unfold.



Step 2

Fold paper in half vertically as shown. Crease and unfold.

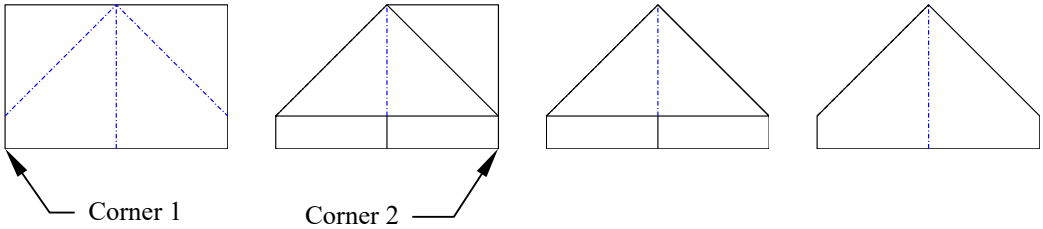


Step 3

Fold top corners down to meet at center. Crease and unfold.

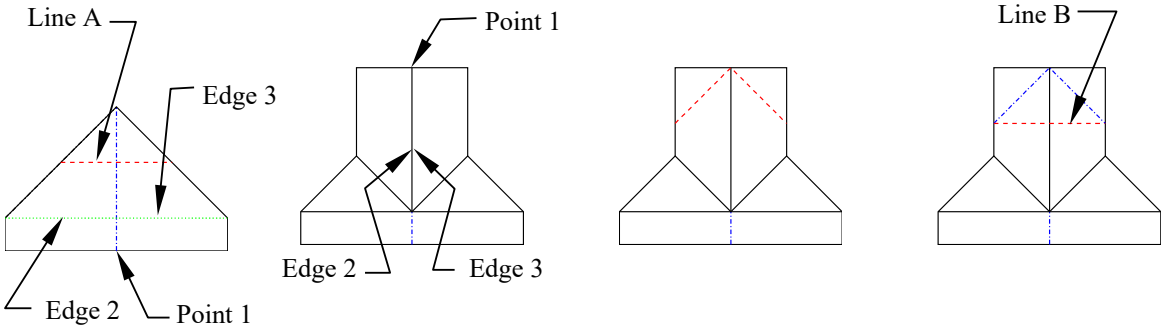
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "fast" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.



Step 4

Grab Corner 1 and fold along centerline. This will stretch out the top left corner. Flatten well and grab both halves at Corner 2. Fold back towards left side along centerline. Flatten well and return upper flap to the right.



Step 5

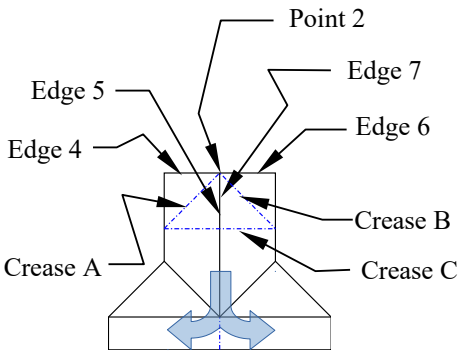
Pick up at Point 1 and fold along Line A. This will stretch Edges 2 & 3 (hidden under flap) to meet at centerline. Flatten well.

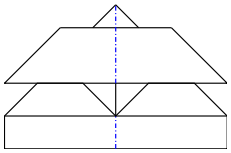
Step 6

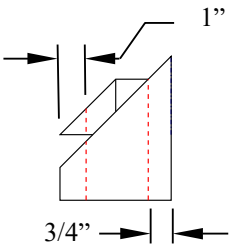
Fold top corners down to center. Crease and unfold.

Step 7

Fold top down along Line B. Crease and unfold.







Step 8

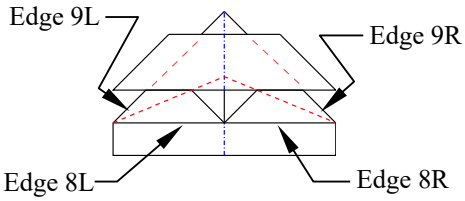
At Point 2 grab the left free corner and squeeze Edges 4 & 5 together along Crease A. Now grab the right free corner at Point 2 and squeeze Edges 6 & 7 together along Crease B. Start pulling these corners down and out continuing to fold the edges together and allowing the whole flap to fold on Crease C. Flatten all creases well. This step looks much more complex then it really is.

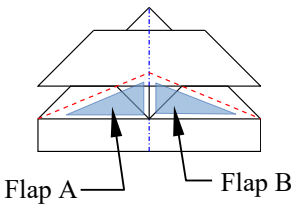
Step 9

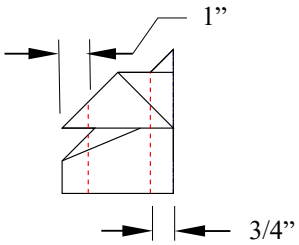
Fold plane in half as shown. Fold winglets down 1” from edge as shown. Fold wings over 3/4" from centerline. This completes the War Hawk I design.

If this plane flies with too much nose up that cannot be trimmed out per normal instructions (or you want a straighter flier) then the following modification may help. Note: This could result due to weight or texture of your paper.

After Step 8 of above instructions is complete:







Step 9

Fold Edge 8L to line up with Edge 9L. Crease and unfold Repeat for Edge 8R to Edge 9R . Flatten all creases well.

Step 9

Fold Flap A inward. Repeat folding Flap B inward. Flatten well.

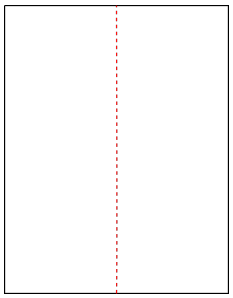
Step 11

Turn plane over. Fold plane in half as shown. Fold winglets down 1” from edge as shown. Fold wings over 3/4" from centerline. This completes the War Hawk II design.

Smooth Fly

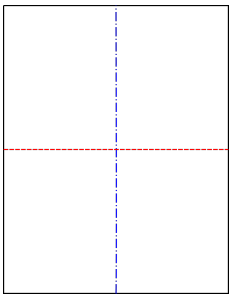
Another design from my son. This one just has a unique look and flies better then I expected when I first saw it.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



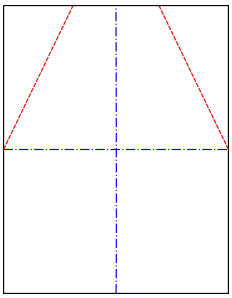
Step 1

Fold paper in half long ways. Crease and unfold.



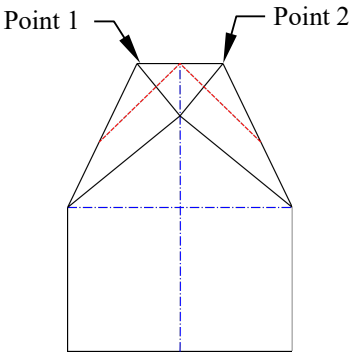
Step 2

Fold paper in half top to bottom. Crease and unfold.



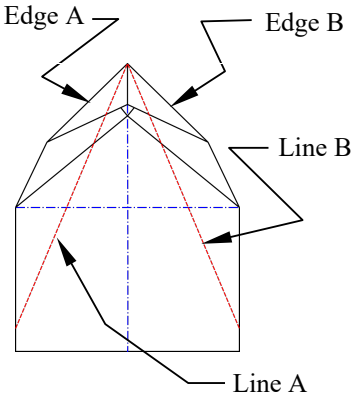
Step 3

Fold top corners down to meet at centerline as shown.



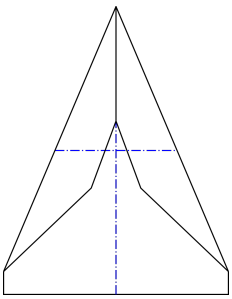
Step 4

Fold Point 1 down to meet Point 2 at centerline as shown.



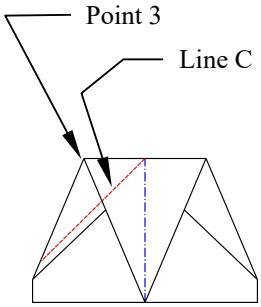
Step 5

Fold Edges A & B along Lines A & B to meet on centerline as shown



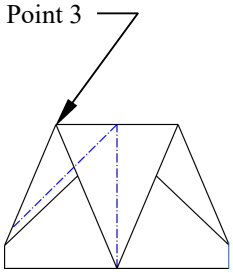
Step 6

Fold top half down using existing centerline as shown.



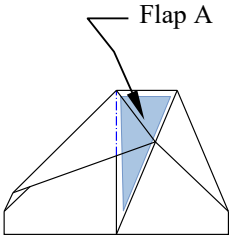
Step 7

Fold Point 3 down along Line C as shown. Crease and unfold.



Step 8

Stretch Point 3 to the left side using crease made at Line C as shown.

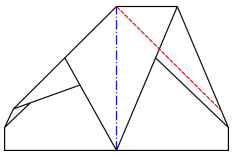


Step 9

Return Flap A to right side using centerline crease.

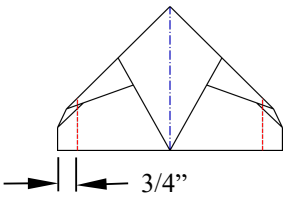
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



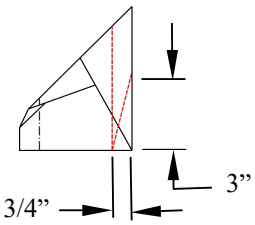
Step 10

Repeat Steps 7 – 9 for right side. Flatten well.



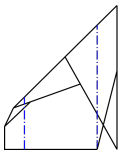
Step 11

Fold winglets up 3/4” from edge.



Step 12

Fold wing over 3/4” from centerline as shown. Crease tail (inner portion only) and push in as shown.

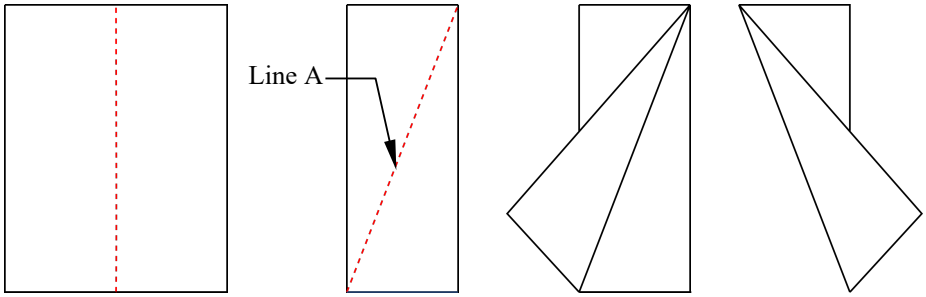


Finished view of tail.

Pentagon II

Between an acrobat and a straight glider. Try trimming for both ways.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



Step 1

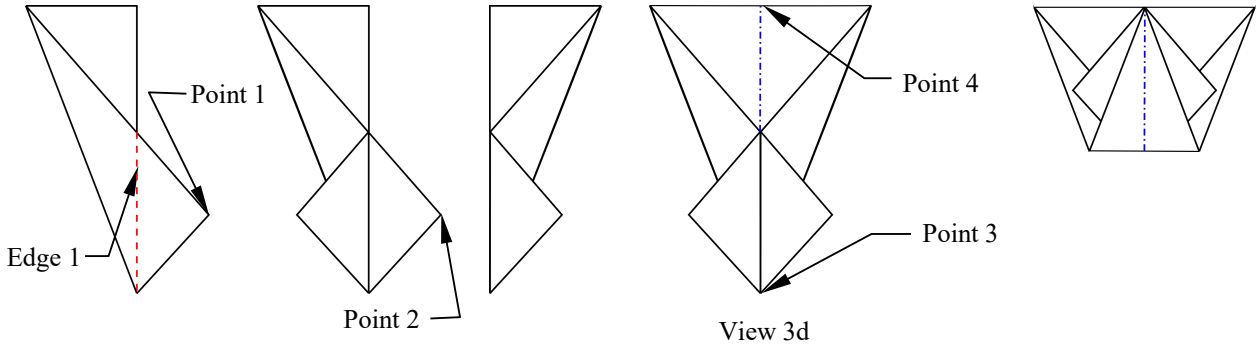
Fold paper in half, left to the right. Leave folded.

Step 2

Fold top half of lower right corner up and left along Line A. Crease well and turn paper over. Fold other side to match. Crease well.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "slow" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.

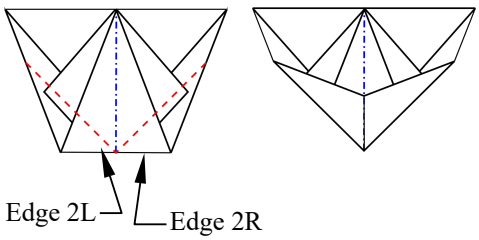


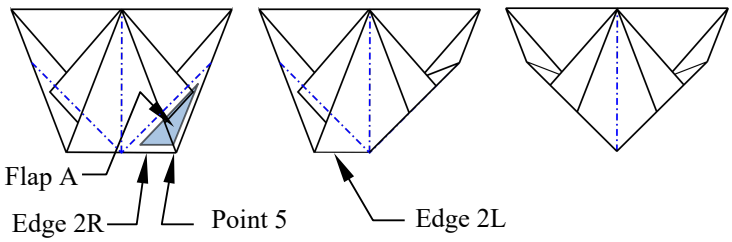
Step 3

Grab Point 1 and fold left to align with Edge 1. Turn plane over and do the same fold for Point 2. Unfold center fold and plane should look like View 3d

Step 4

Grab Point 3 and fold up to Point 4. Flatten well.



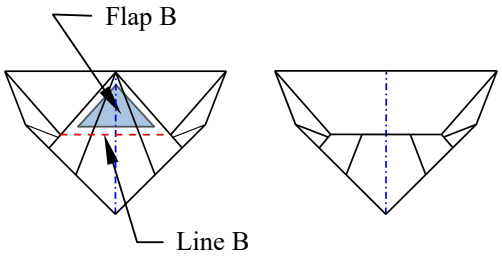


Step 5

Fold Edges 2L & 2R to centerline as shown. Flatten well.

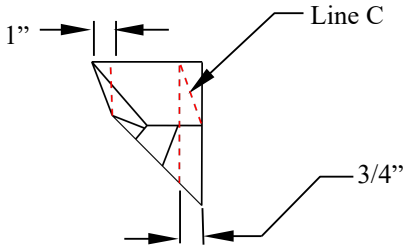
Step 6

Unfold Step 5 folds. Lift Point 5 and bring Edge 2R to centerline. This will allow Flap A to reverse fold inward. Repeat for Edge 2L. Flatten well.



Step 7

Fold Flap B inside by reverse folding on Line B. Flatten all creases well.

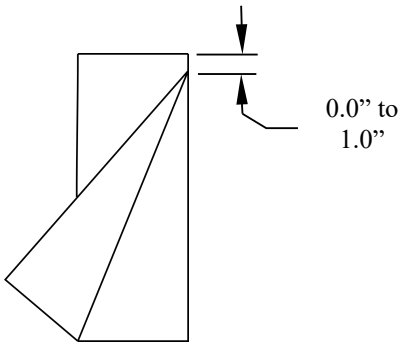


Step 8

Fold winglets up 1" from edge. Fold wings down 3/4” from centerline. Fold tail along Line C as shown. Crease and unfold tail. Push tail up into center of body.

Notes:

This is a very “forgiving” plane when it comes to the Step 2 folding. The actual fold could look as shown below and have very little effect on it flying. The key is keeping both side the same by match folding.

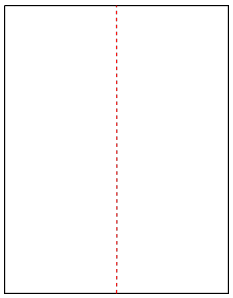


Other planes, especially those with given dimensions requiring a ruler, can be more critical to maintain a stable plane.

Acronaut

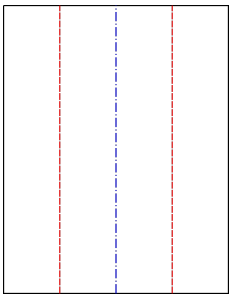
Another versatile plane that can act as acrobat or slower straight glider. Try folding the wing without flipping the plane over in Step 10 and/or flipping direction of winglets along with different paper weights for a lot of variety.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



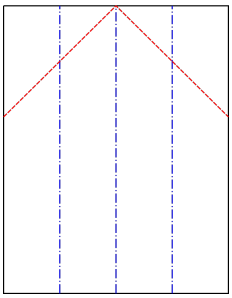
Step 1

Fold paper in half long ways. Crease and unfold.



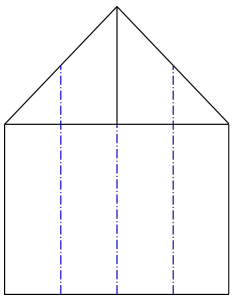
Step 2

Fold left and right edges over to meet centerline. Crease and unfold.



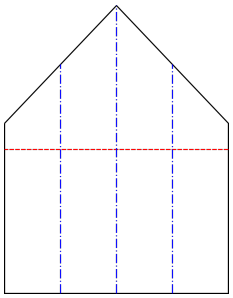
Step 3

Fold top corners down to meet at centerline. Flatten well.



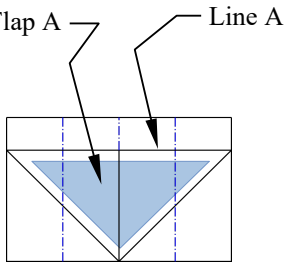
Step 4

Flip plane over left to right.



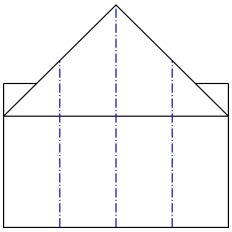
Step 5

Fold top point down to mid point of bottom edge.



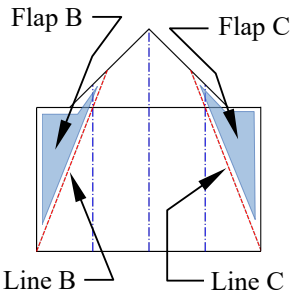
Step 6

Fold Flap A up along Line A. Flatten well.



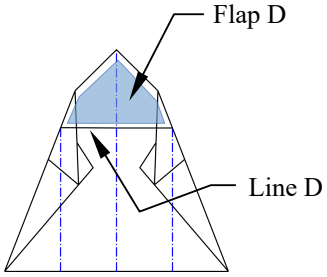
Step 7

Flip plane over.



Step 8

Fold Flaps B and C on Lines B and C as shown. Flatten well.

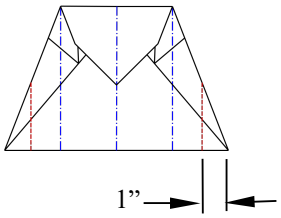


Step 9

Fold Flap D down along Line D. Flatten well.

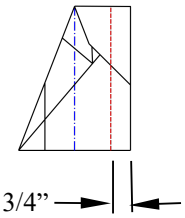
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “slow” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



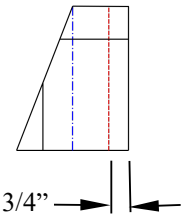
Step 10

Fold winglets at 1” from edge as shown. Flip plane over and fold in half.



Step 11

Fold wings over 3/ 4” from edge as shown.



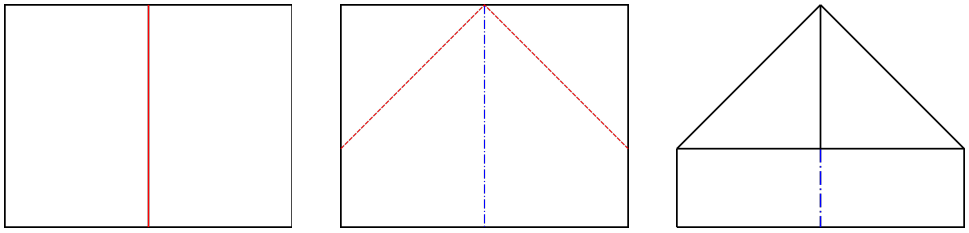
Step 11 Alternate

Do not flip plane over before folding in half in Step 10. Fold wings over 3/ 4” from edge as shown.

Neptune Fighter

An interesting modification to an old classic. May be a little bit of a challenge going from one weight of paper to another but should be consistent once the right dimension is found for each paper weight.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



Step 1

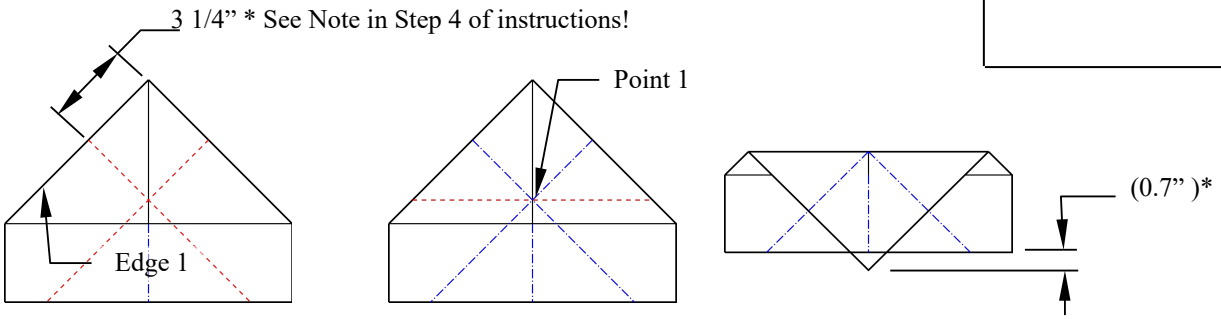
Fold paper in half short ways and crease. Unfold.

Step 2

Fold top corners down to meet at center.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "fast" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.

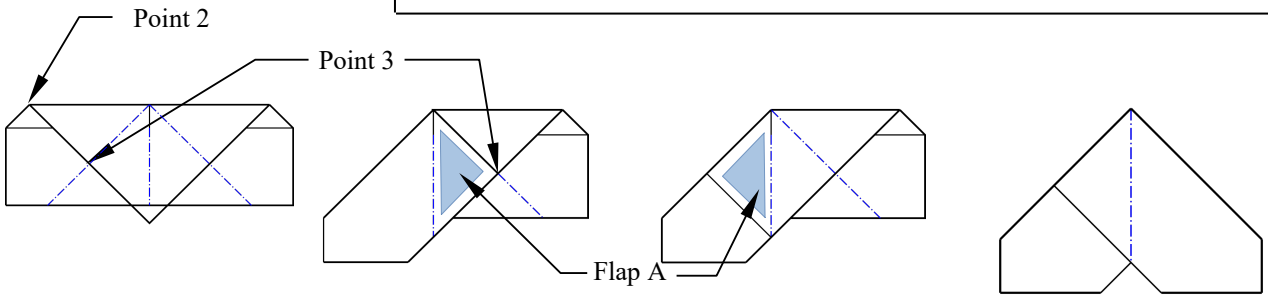


Step 3

Fold top point along Edge 1 at 3 ¼" as shown. Crease and unfold. Repeat for opposite side.

Step 4

Fold top flap down through Point 1. Verify 0.7" dimension is approximately met. **NOTE:** Different types or weights of paper require adjustment of the 3 ¼" dimension in Step 3. Try 3 1/8" fold in Step 3 or try folding Step 4 first with an over hang of .5" instead of .7" and then folding Step 3 folds through the intersection of this line and the centerline. Once the best dimension is found for your paper this plane should be a nice flier.



Step 5

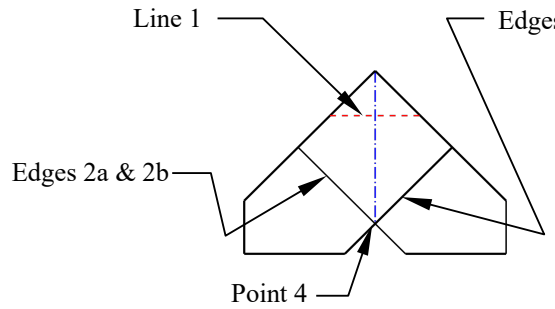
Grab Point 2 and fold to centerline using existing creases and allowing Point 3 to fold across the centerline as shown. Flatten well.

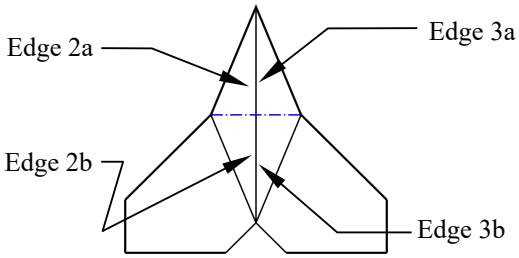
Step 6

Fold Flap A to left side. Flatten well.

Step 7

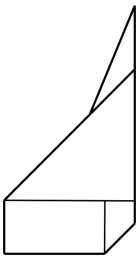
Repeat Steps 5 & 6 for right side. Flatten well.

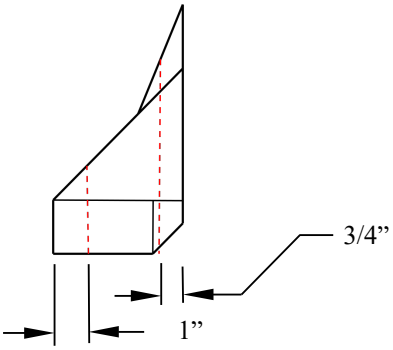




Step 8

Fold Point 4 straight up on Line 1 using an origami petal fold. This will bring Edges 2a, 2b, 3a, and 3b all to the centerline as shown. Flatten all creases well.





Step 9

Fold plane in half as shown.

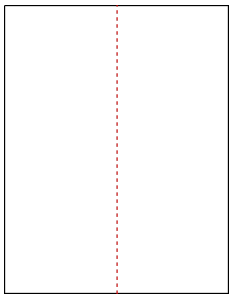
Step 10

Fold winglets down 1” from outer edge.
Fold wing down 3/4” from centerline.
Turn plane over and repeat for other side.
Flatten all folds well.

Street Cruiser

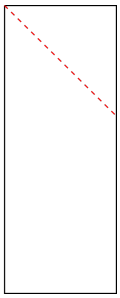
One of my favorite fast gliders.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



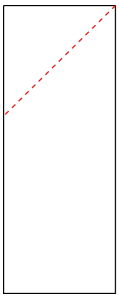
Step 1

Fold paper in half long ways and crease.



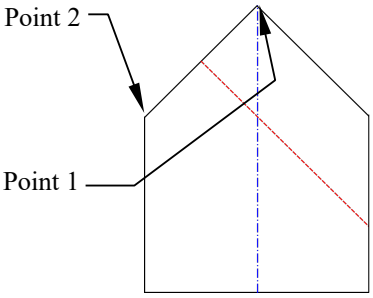
Step 2

Fold top corner down to meet at left edge. Turn paper over left to right.



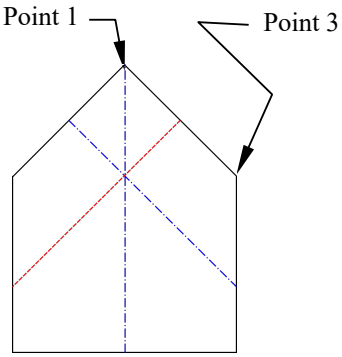
Step 3

Fold top corner down to meet at right edge. Unfold with flaps to the back.



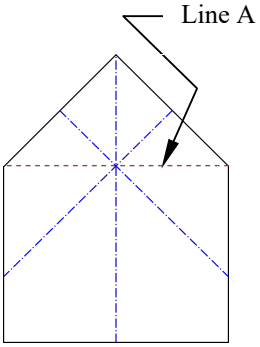
Step 4

Fold Point 1 down to meet Point 2 as shown. Crease and unfold.



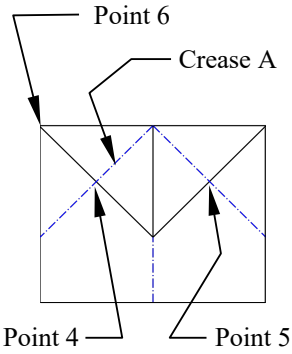
Step 5

Fold Point 1 down to meet Point 3 as shown. Crease and unfold.



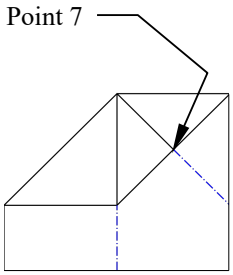
Step 6

Fold top flap down to centerline along Line A as shown.



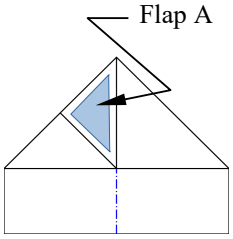
Step 7

Grab Point 4 and fold to Point 5 along centerline. This will stretch Point 6 to centerline along Crease A.



Step 8

Repeat for right side by grabbing Point 7 and folding back to left along centerline.

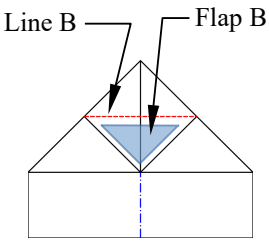


Step 9

Return Flap A to right side.

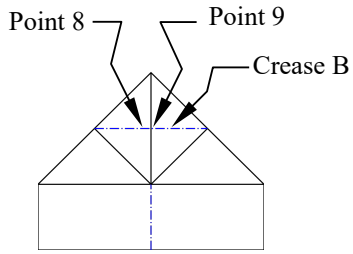
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



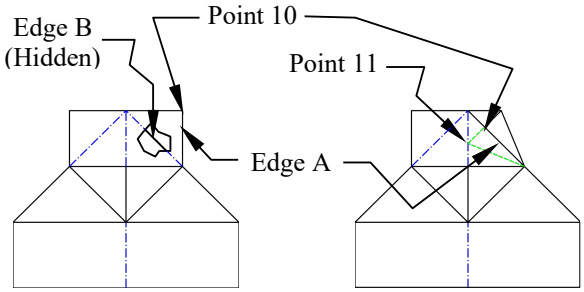
Step 10

Fold Flap B up along Line B. Crease and unfold.



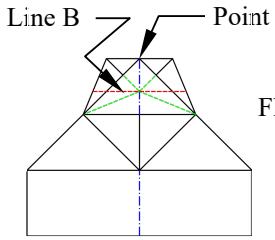
Step 11

Grab Points 8 and 9. Pull up and out fold on Crease B. Flatten well.



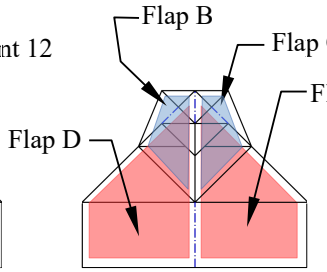
Step 12

Grab Point 10 and fold so that Edge A is in line with Edge B tucking Point 11 inside. Repeat for left side. Flatten well.



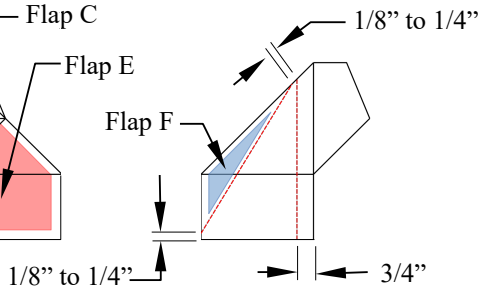
Step 13

Fold Point 12 down along Line B.



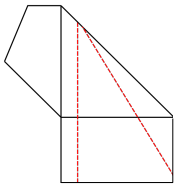
Step 14

Fold Fold Flaps B and C up along centerline. Fold Flaps D and E down along centerline. Flatten well and lay plane on its side as shown.



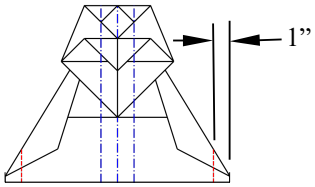
Step 15

Fold wing over 3/4” from centerline as shown. Crease and unfold. Fold Flap F down as shown. Flip plane over.



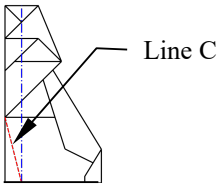
Step 16

Repeat for right side matching left folds. Flatten well. Unfold from centerline and lay down as shown.



Step 17

Fold winglets up 1” from edge.



Step 18

Fold along Line C. Unfold and push tail into body.

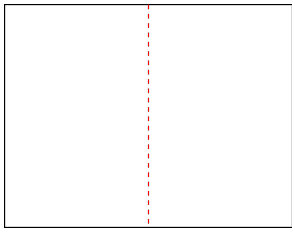
Step 19

Fold wings and fins down on existing creases.

Flying Frog

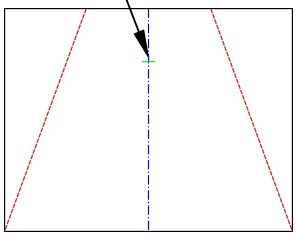
An acrobatic for a change from fast gliders. Folding flaws due to paper thickness give each some natural curved flight.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



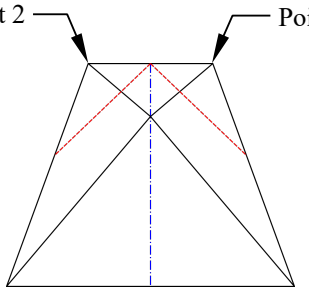
Step 1

Fold paper in half short ways and crease. Unfold.



Step 2

Fold top corners down to meet on centerline at Point 1.

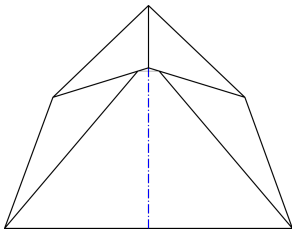


Step 3

Fold Points 2 & 3 to meet on centerline as shown. Flatten well.

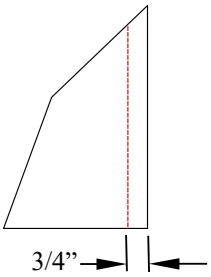
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "slow" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose and leading edges of wings are taped together.



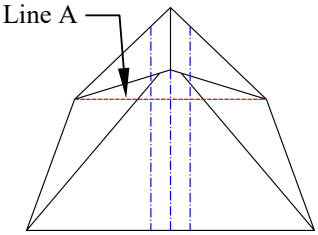
Step 4

Fold plane in half as shown.



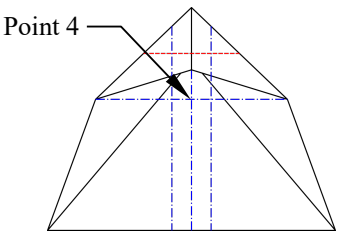
Step 5

Fold wings over 3/4" from edge as shown. Crease and unfold.



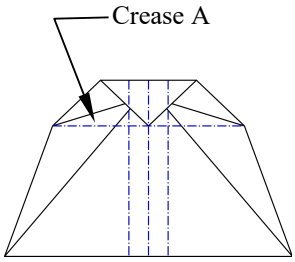
Step 6

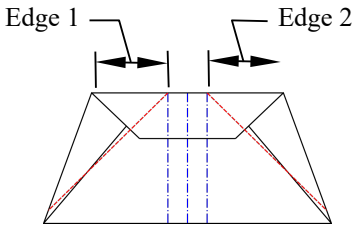
Fold top point of plane down along Line A as shown. Crease and unfold.

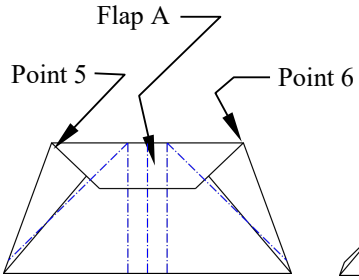


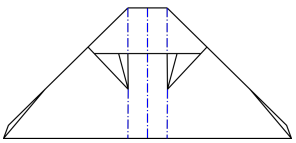
Step 7

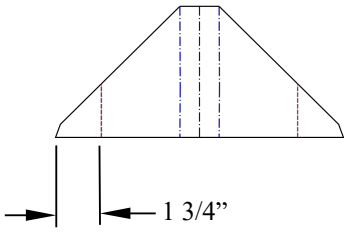
Fold top point down to Point 4 as shown. Flatten well.



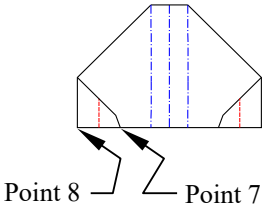








View From Bottom of Plane



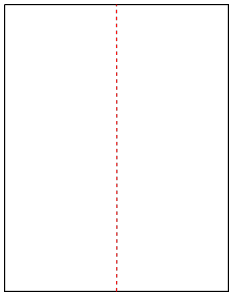
Finished Plane Rear Profile

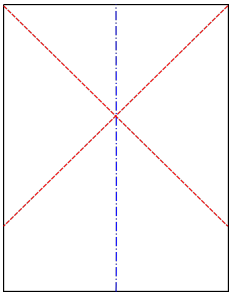
Step 12	Step 13	Step 14
Fold winglets over at 1 3/4”. Flatten well.	Fold Point 7 over to Point 8. Repeat for right side.	Fold wings and fins to profile shown.

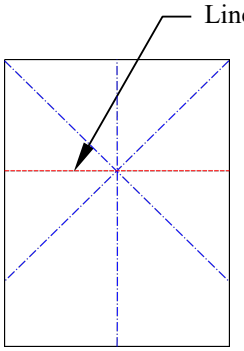
Classic Aero

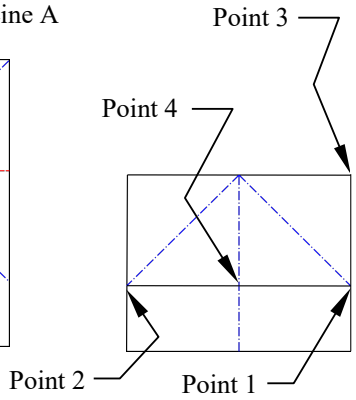
My version of a classic (Steps 1 through 11) that has been around at least since just after WWII. Through the 1950's and 1960's this basic nose has been used in many planes.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.









Step 1

Fold paper in half long ways and crease.

Step 2

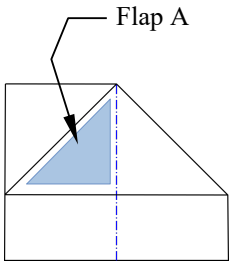
Fold top corners down so that top edge is in line with left edge. Crease and unfold. Repeat for right edge.

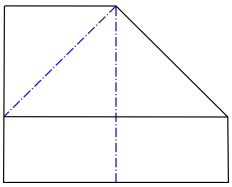
Step 3

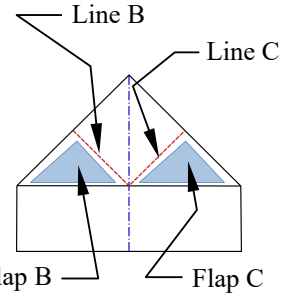
Fold top edge along Line A.

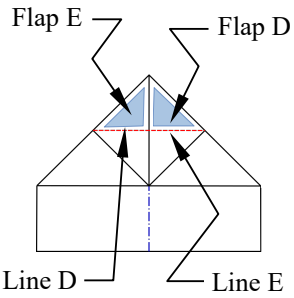
Step 4

Stretch Point 1 over to meet Point 2 stretching Point 3 to meet Point 4. Flatten well.









Step 5

Return Flap A to the right side.

Step 6

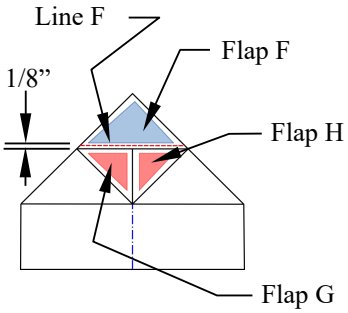
Repeat for left side.

Step 7

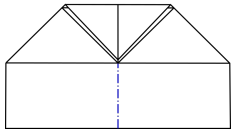
Fold Flaps B and C on Lines B and C as shown.

Step 8

Fold Flaps D and E on Lines D and E as shown. Flatten well.



Finished View

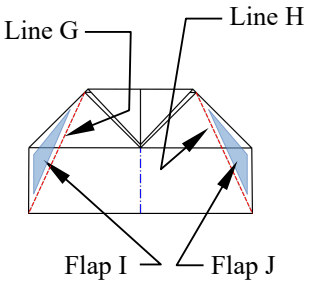


Paper Airplane Flying Instructions

Make sure wings are level (or slightly up). Throw level at a "medium" or "slow" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose is taped together.

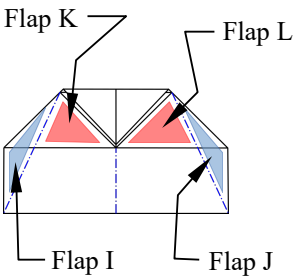
Step 9

Fold Flap F down on Line F while tucking Flaps G and H into pockets on each side of Flap F. Flatten well.



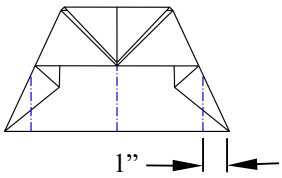
Step 10

Fold Flaps I and J over along Lines G and H. Crease and unfold.



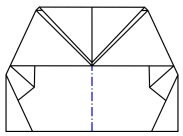
Step 11

Reverse fold Flaps I and J to tuck them in behind Flaps K and L. Flatten well.



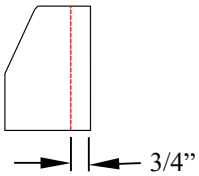
Step 12

Fold winglets over 1” as shown.



Step 13

Fold plane in half left to right.



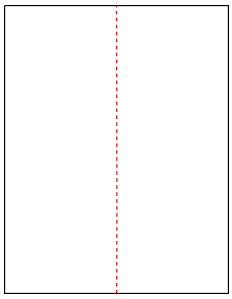
Step 14

Fold wings down 3 /4” from center as shown.

Breeze I

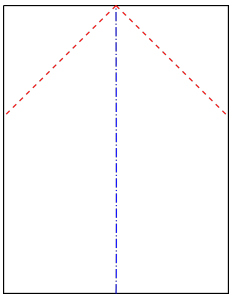
This plane can be anywhere from a fast glider to somewhat of an acrobatic depending on paper weight. Use 24# for a fast glider and 20# to get more of an acrobat.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



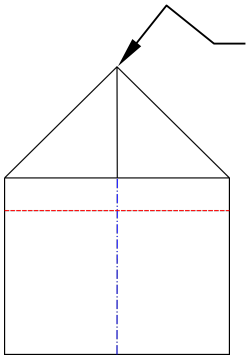
Step 1

Fold paper in half long ways and crease. Unfold.



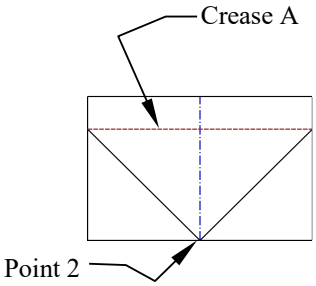
Step 2

Fold top corners down to meet at center. Crease and unfold.



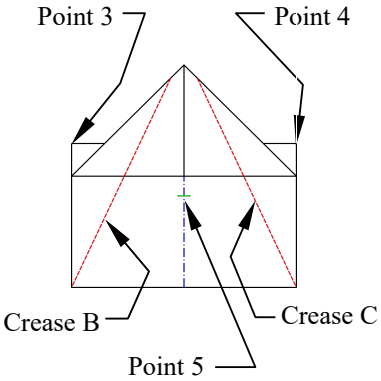
Step 3

Fold Point 1 down as shown on centerline as shown. Flatten well.



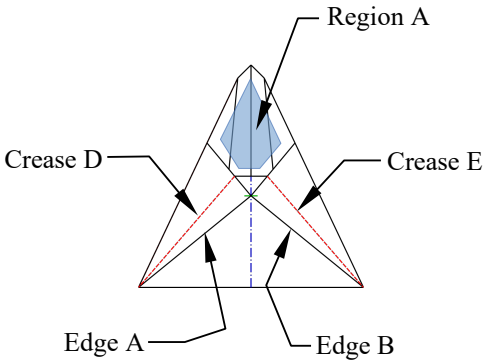
Step 4

Fold Point 2 up Crease A as shown. Flatten well.



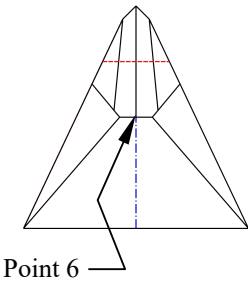
Step 5

Fold Point 3 along Crease B and Point 4 along Crease C to meet centerline at Point 5.



Step 6

Fold Edge A along Crease D and unfold. Fold Edge B along Crease E and unfold. Reverse fold Edges A and B under Region A. Flatten well.

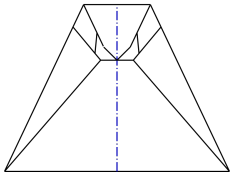


Step 8

Fold top point down to Point 6. Flatten well.

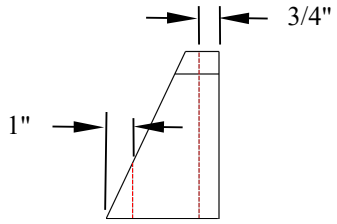
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



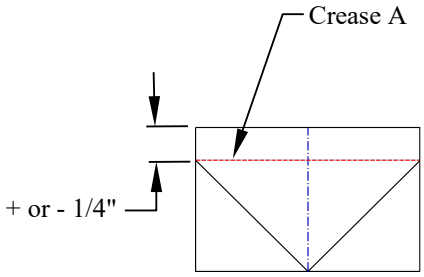
Step 8

Fold plane in half as shown.



Step 9

Fold winglets up 1” as shown.
Fold wings up 3/4”as shown.



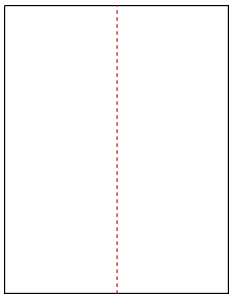
Note:

Step 4 Crease A can be moved up or down as shown depending on paper and desired type of flight.

Zizzer

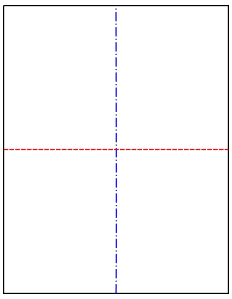
Another one of my favorite fast gliders.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



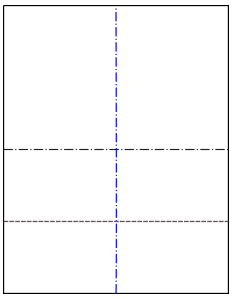
Step 1

Fold paper in half long ways and crease. Unfold.



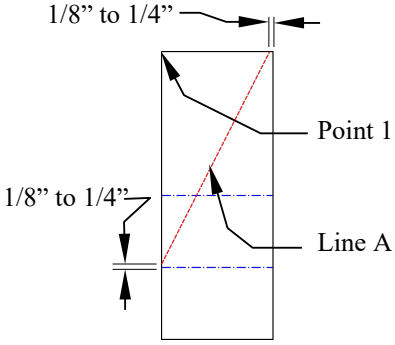
Step 2

Fold top down to meet bottom and crease. Unfold.



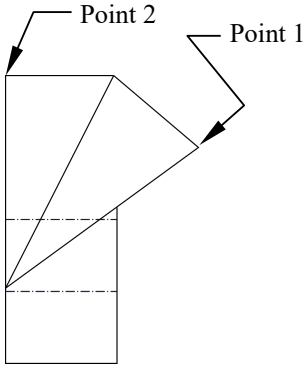
Step 3

Fold bottom edge up to meet centerline. Crease and unfold.



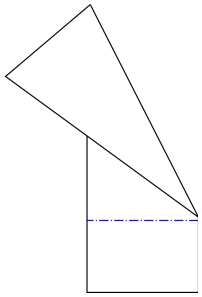
Step 4

Fold paper right to left. Fold Point 1 over along Line A as shown.



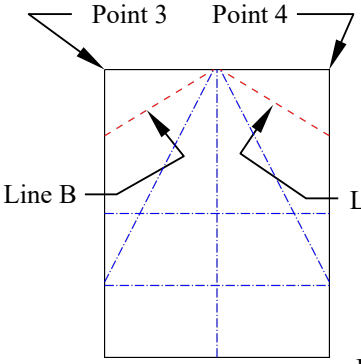
Step 5

Flip plane over and match fold Point 2 down to meet Point 1 as shown.



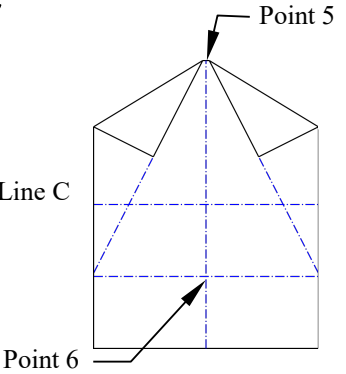
Step 6

Crease all folds well and unfold.



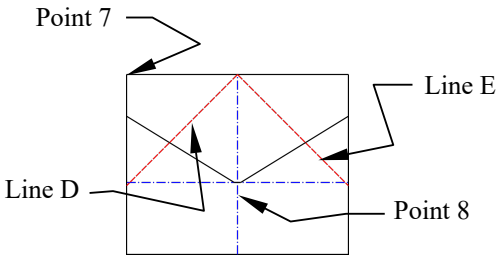
Step 7

Fold Point 3 down Along Line B. Fold Point 4 down Along Line C.



Step 8

Fold Point 5 down to Point 6.

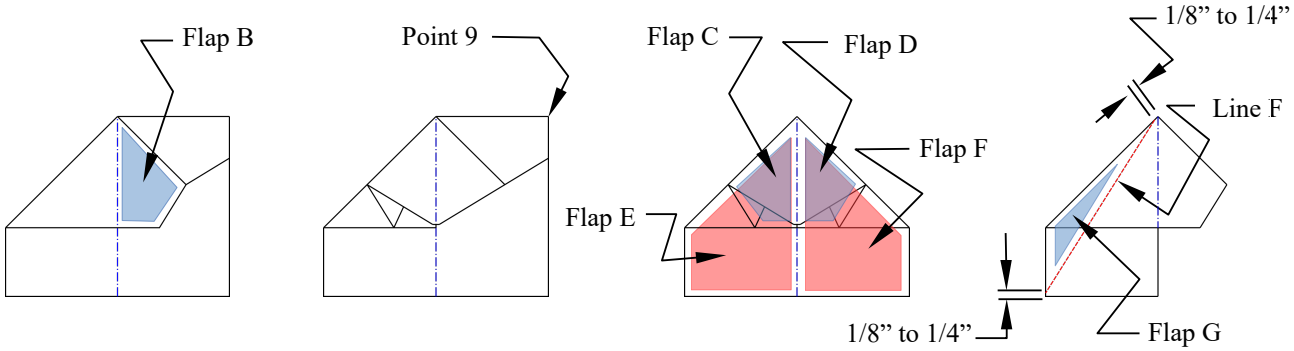


Step 9

Fold top corners down along Lines D and E. Crease and unfold. Stretch Point 7 over and down to Point 8 on centerline.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.



Step 10

Return Flap B to the left side.

Step 11

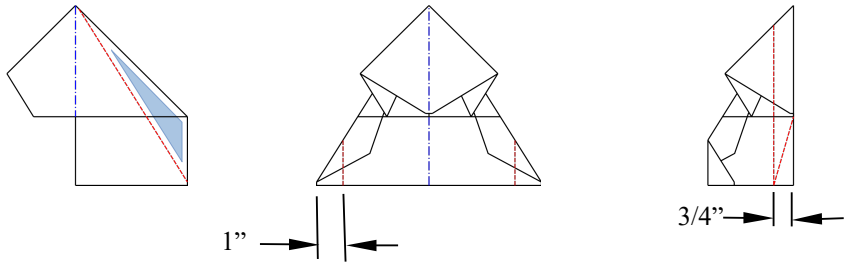
Repeat for Point 9. Flatten well.

Step 12

Grab Flaps C and D and fold up. Grab Flaps E and F and fold down. Lay plane down as shown.

Step 13

Fold Flap G down as shown along Line F.



Step 14

Repeat for right side matching left folds. Flatten well. Unfold from centerline and lay down as shown.

Step 15

Fold winglets over 1” from edges as shown. Flip plane over and fold on centerline as shown.

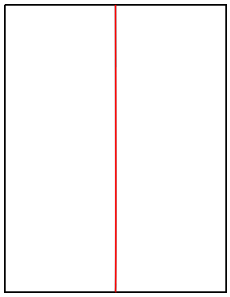
Step 16

Fold wings down at 3/4” from edge as shown. Crease tail fold as shown and reverse fold tail into body.

Origami Cruiser

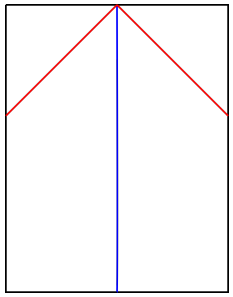
A fast, straight glider with a touch of classic origami folding.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



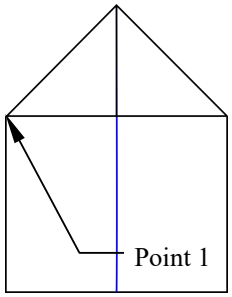
Step 1

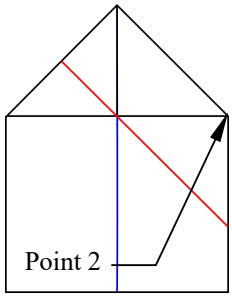
Fold paper in half long ways and crease. Unfold.



Step 2

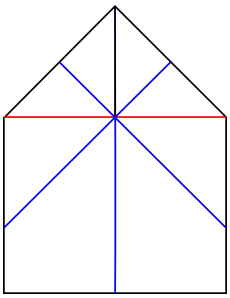
Fold top corners down to meet at center.

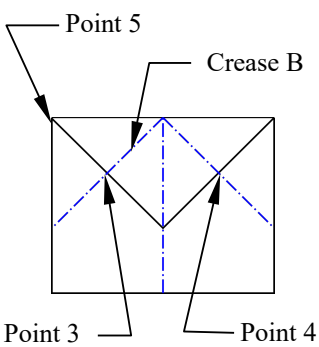




Step 3

Fold top point down to meet Point 1 as shown. Crease and unfold. Fold top point down to meet Point 2 as shown. Crease and unfold.



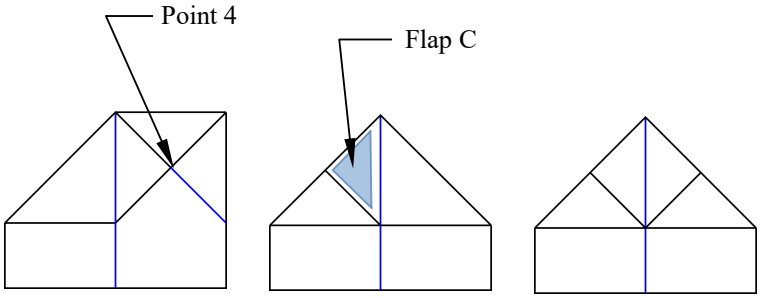


Step 4

Fold top flap down along Edge A.

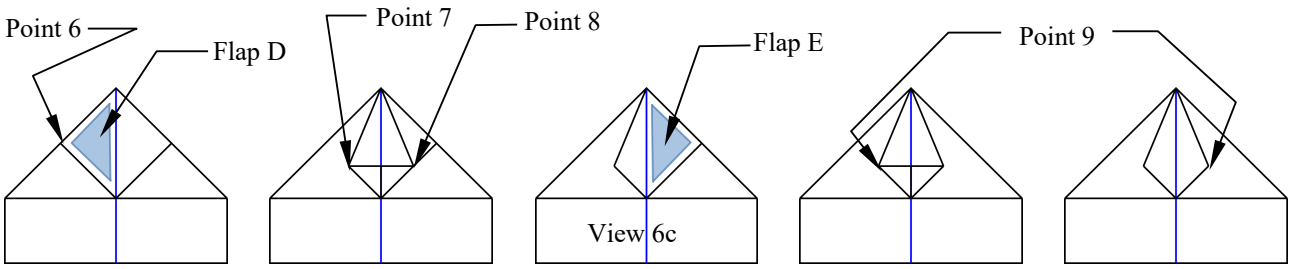
Step 5a

Grab Point 3 and fold on centerline. This will stretch Point 4 to the centerline by folding on Crease B.



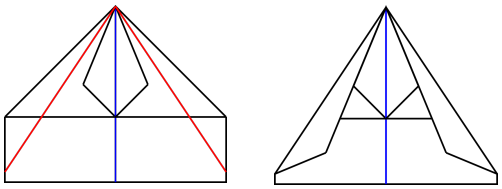
Step 5b

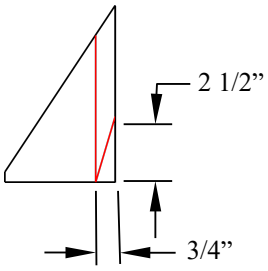
Repeat for right side grabbing Point 4 and folding along centerline. Return Flap C back to the right side. Flatten well.



Step 6

Raise Flap D until Point 6 is above centerline. Squash Point 6 to centerline allowing Flap D to open up and flatten creating Points 7 & 8. Fold Point 8 over to Point 7. Plane should now look like View 6c. Raise and squash Flap E as was done to Flap D. Fold Point 9 back to the right. Flatten all creases well.



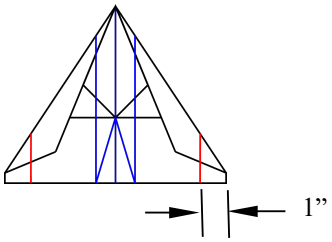


Step 7

Fold outer edges in as shown.

Step 8

Fold wings over 3/4" from centerline. Note: After folding wings 4 small flaps will remain. Carefully fold one of these down with each wing leaving the two middle ones as a cockpit.
Fold tail 2 1/2" from bottom edge as shown. Crease and unfold. Push tail up into center of body.



Step 9

Fold winglets down 1” from edge as shown.

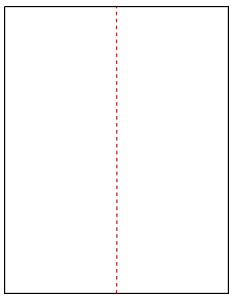
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a “medium” or “fast” speed. Trim if required but the plane seems to do well “as folded” on a variety of paper. It may do better if nose and leading edges of wings are taped together.

Bug Eye

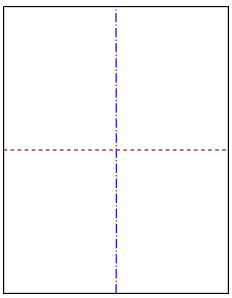
A glider with a different way to trim for desired flight.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



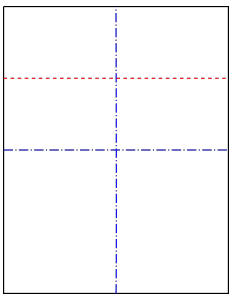
Step 1

Fold paper in half long ways and crease. Unfold.



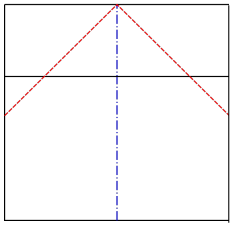
Step 2

Fold paper in half top to bottom and crease. Unfold.



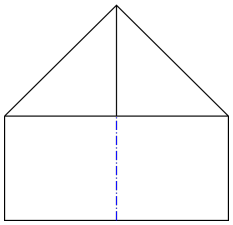
Step 3

Fold top edge down to meet centerline. Flatten well.



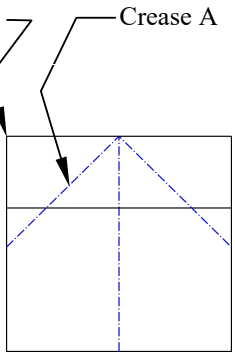
Step 4

Fold top corners down to meet at centerline.



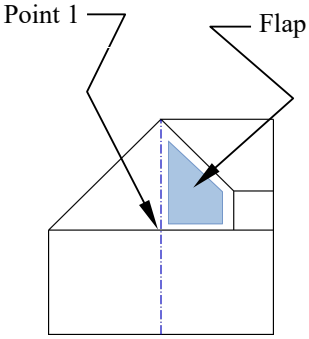
Step 5

Crease and unfold.



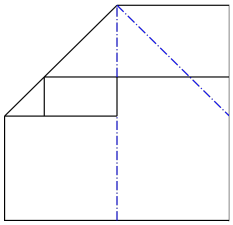
Step 6

Fold Point 1 to centerline along Crease A as shown.



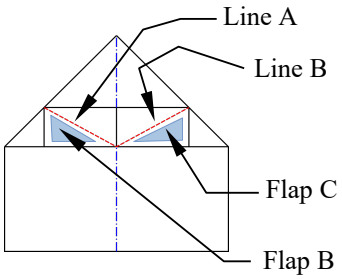
Step 7

Fold Flap A back to left side.



Step 8

Repeat for right side .



Step 9

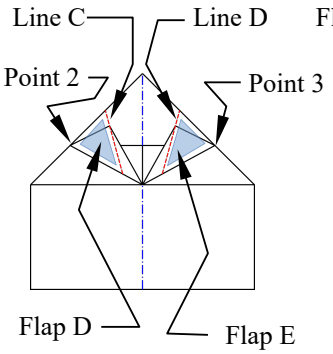
Fold Flap B along Line A and Flap C along Line B as shown.

Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "fast" speed. Start the trimming by putting some curve on the "Bug Eyes" at the nose of the plane as shown:

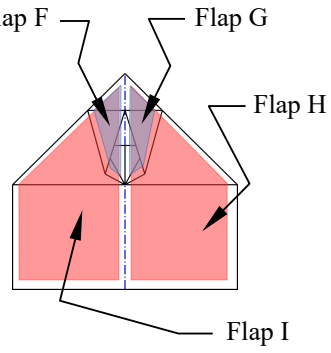
Top View  Side View of "Bug Eye Profile Showing Curve – Cup on bottom for nose up.

Trim if curve does not give desired results. This plane seems to do well on a variety of paper. It may do better if nose and leading edges of wings are taped together.



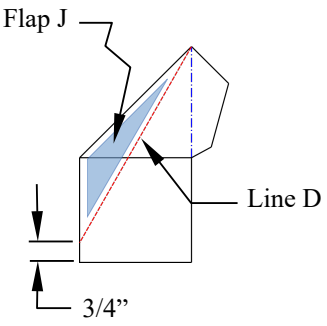
Step 10

Fold Flap D along Line C and Flap E along Line D. Points 2 & 3 should meet at centerline and form a horizontal line as shown.



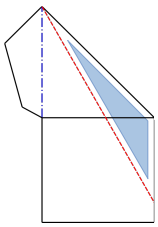
Step 11

Fold Fold Flaps B and C up along centerline. Fold Flaps D and E down along centerline. Flatten well and lay plane on its side as shown.



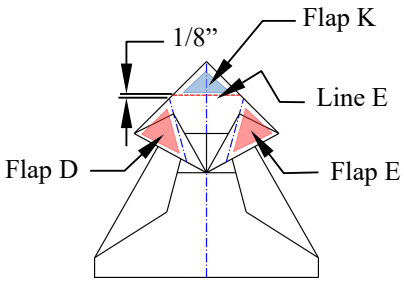
Step 12

Fold Flap J down along Line D as shown.



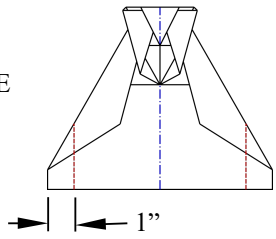
Step 13

Repeat for right side matching left folds. Flatten well. Unfold from centerline and lay down as shown.



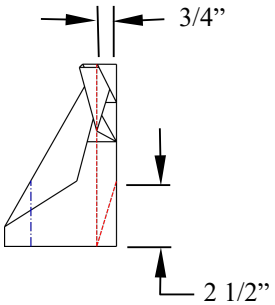
Step 14

Unfold Flaps D & E. Fold Flap K down as shown. Refold Flaps D & E tucking into slots in Flap K. Flatten well.



Step 15

Fold winglets up 1” from edge.



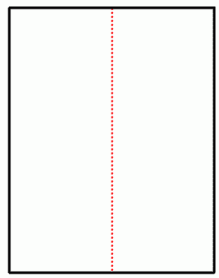
Step 16

Fold wing over 3/4” from centerline as shown.

THE HAMMERHEAD

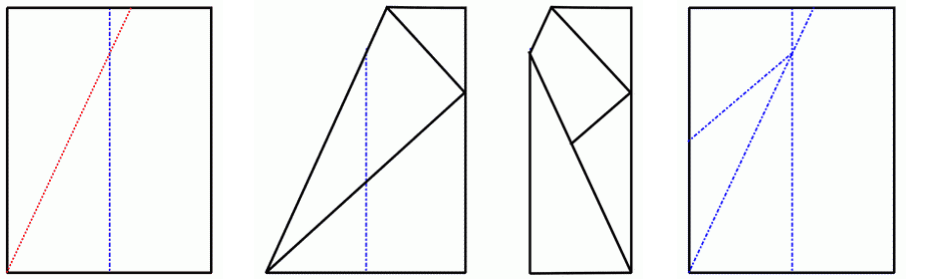
The hammerhead can be made into two totally different planes. A cool typical paper ***glider***, and a ***straight dart***. The hammerhead dart requires heavier (24-lb.) paper to fly well. Even then it can be temperamental. The glider is much more forgiving and makes a good plane on 20-lb. as well as 24-lb. paper.

Note: Red lines are for folds, blue lines indicate existing creases.



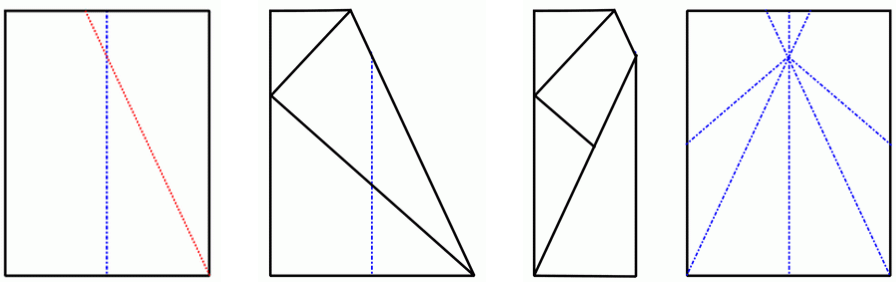
Step 1

Fold paper in half long ways and crease. Unfold.



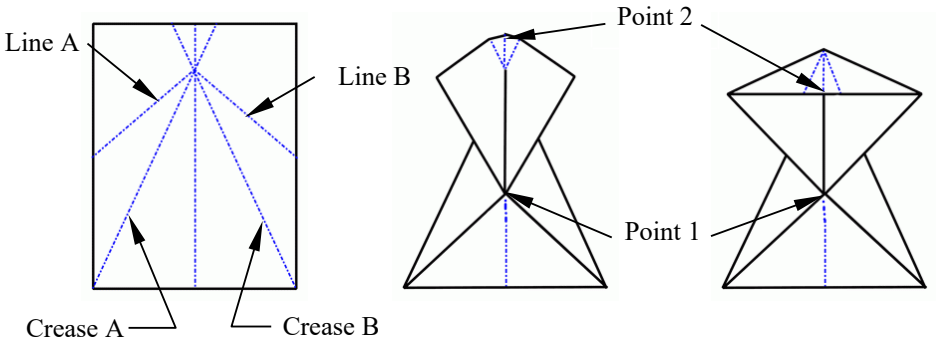
Step 2

Fold upper left corner so that it touches right edge and the crease ends at the lower left corner. Refold at center crease (a ruler or straight edge is a plus here). Unfold both folds.



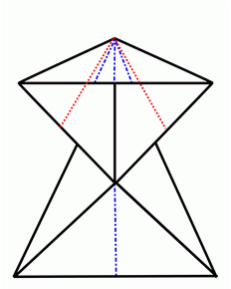
Step 3

Repeat Step 2 instructions for right side.



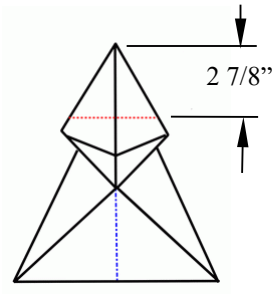
Step 4

Refold along Creases A & B bringing Lines A & B to meet at center. Now hold down at Point 1 with one index finger and use the other index finger to flatten creases from Point 1 towards Point 2.
This should allow the top part of the paper to fold over on itself. Make sure center creases are aligned at Points 1 & 2 and flatten well.



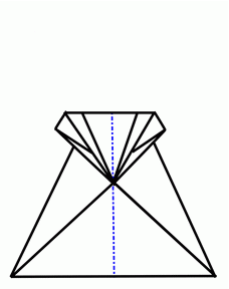
Step 5

Fold top flaps over to centerline. Flatten all folds well.



Step 6

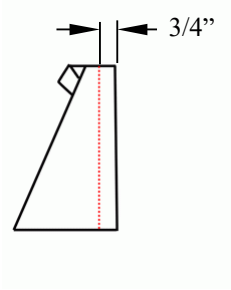
Fold nose down 2 7/8” from top. Flatten all folds well. This dimension is critical for dart.



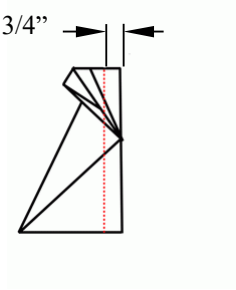
Step 7

Fold in half at center. See next step for which side goes in. Glider goes one way, dart the other way.

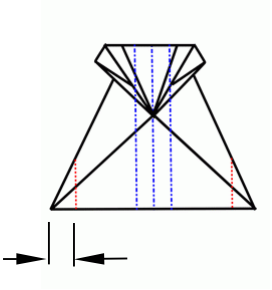
Dart View



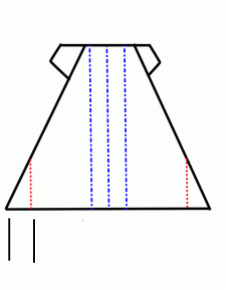
Glider View



Dart View



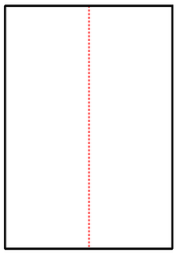
Glider View



NEBULA CRUISER

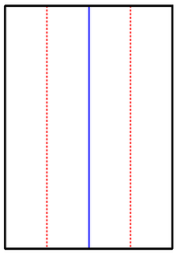
This plane was my first complete design. It came about when I was trying to build a plane I got off of the net but had my paper turned wrong for the first folds. Instead of throwing the paper away I decided to make a plane of my own. It flew so well I was inspired to continue with more designs.

Note: Red lines are for folds, blue lines indicate existing creases.



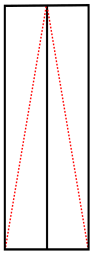
Step 1

Fold paper in half long ways and crease. Unfold.



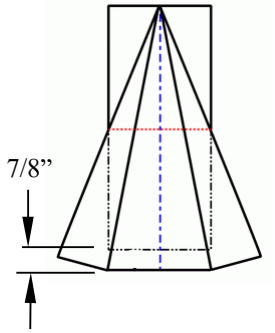
Step 2

Fold both edges to center crease.



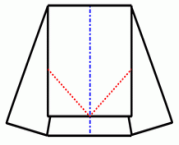
Step 3

Fold flaps out where shown.



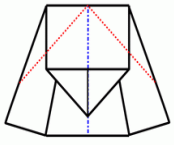
Step 4

Fold top down to 7/8” from bottom edge.



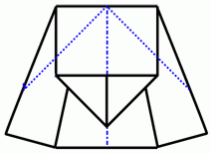
Step 5

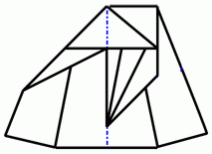
Fold corners up to meet at centerline.

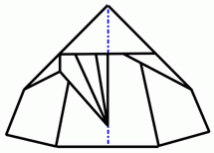


Step 6

Fold top corners to centerline. Crease well. Unfold .

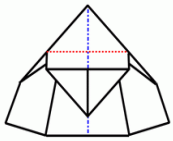






Step 7

Grab Corner 1 and fold along centerline stretching out the left crease made in Step 6. Flatten well. Grab both halves at Corner 2 and fold back to the left along centerline. Flatten well. Return the top half back to the right.

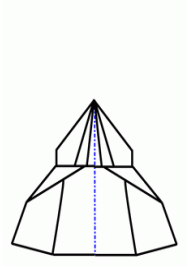


Step 8

Fold nose flap up as far as possible. Flatten all folds well.

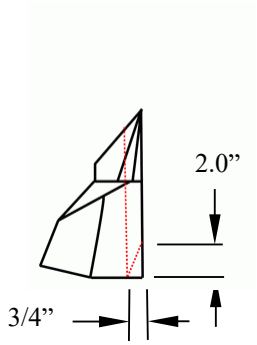
Paper Airplane Flying Instructions

Make sure wings are level and winglets are vertical. Throw level at a “medium” speed. If plane flies nose up and then drops, make a small downward bend on the elevators made in step 12. If plane flies straight but with constant drop bend elevators up slightly. Type and weight of paper can change how planes fly. If plane is still not flying well try bending the winglets from step 11 down. If plane flies but curves to the right move right elevator down slightly and the left on up slightly. If it curves to the left do the opposite. I use 24-lb. smooth paper but have tried this plane on other paper with good results. The 7/8” dimension used in step 4 can be adjusted to change flight characteristics of the plane. Increase or decrease 1/8” to 1/4” and find what dimension works best for your paper. This plane can climb for long flights or fly straight and level. Experiment and have fun.



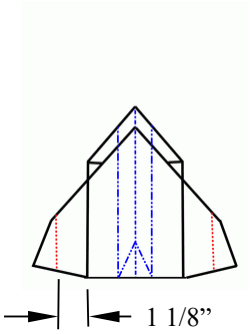
Step 9

View after step 8. Fold plane in half with nose flap on outside.



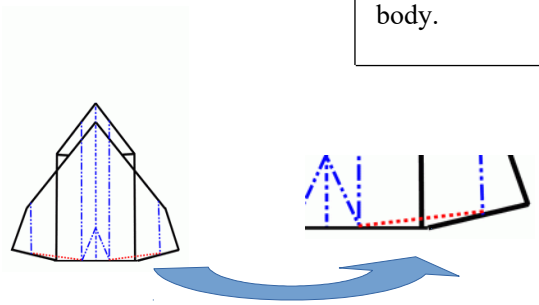
Step 10

Fold wings over 3/4” from centerline. Fold tail 2” from bottom edge as shown. Crease and unfold. Push tail into center of body.



Step 11

Fold winglets up 1 1/8” from reference edge shown. Note: Some paper requires fins folded down.



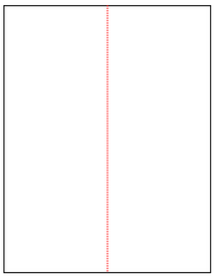
Step 12

Fold rear edges up and crease as shown. Unfold. Fold over to other side and crease. Unfold and smooth back straight. These folds are so small that it is easier to use two rulers to make them. This step is very important because it creates elevators to adjust plane. Also it relieves natural warp that may be there due to folds. This natural warp will act like ailerons causing the plane to curve to one side.

LUNAR HAWK

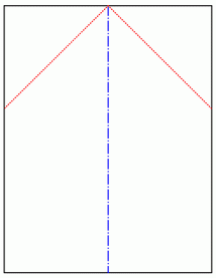
This plane has a unique look. I saw something similar to it on the internet, but that one did not fly well. I spent some time trying different measurements and was finally able to come up with a working plane that kept the unique look.
This plane is one of the more difficult to fold and requires a paper that will stretch without tearing. I have found several types of 24 lb. ink jet paper that do work well. You may waste a few pieces getting this one right. As fast as it likes to fly it may be a good choice for gluing up and shooting with rubber band shooter. Try using 20 lb paper for the first one.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



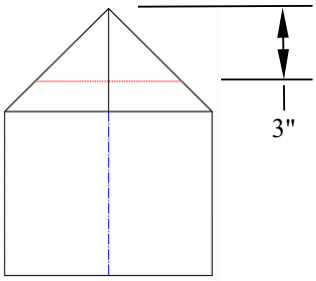
Step 1

Fold paper in half long ways and crease. Unfold.



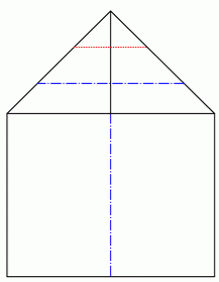
Step 2

Fold top corners down to meet at center.



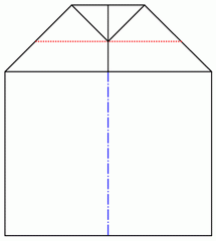
Step 3

Fold top corner down 3.0" as shown. Crease and unfold.



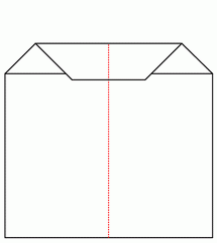
Step 4

Fold top corner down to meet crease just made as shown.



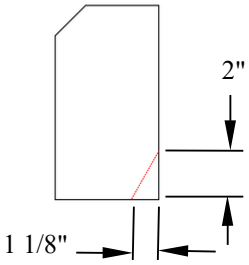
Step 5

Refold top edge along existing crease.



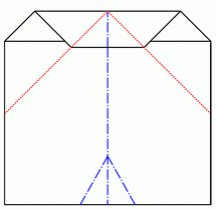
Step 6

Flatten well and fold along centerline.



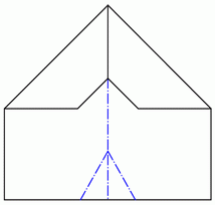
Step 7

Fold tail section at dimensions shown both toward front and back.



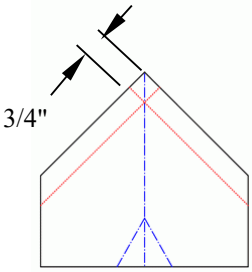
Step 8

Unfold steps 7 and 6. Fold top corners down to meet centerline.



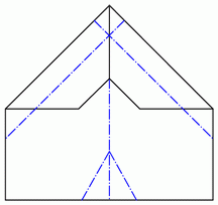
Step 9

View after step 8. Flip plane over from left to right.



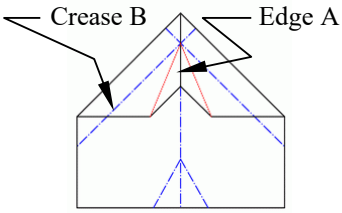
Step 10

Fold both edges over 3/4" as shown. Crease and unfold.



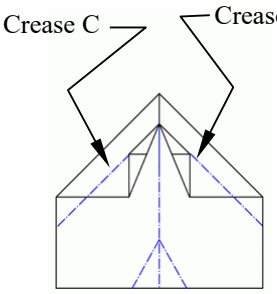
Step 11

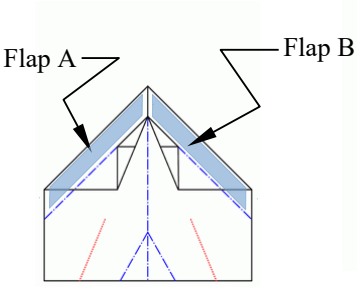
Flip plane back over left to right.

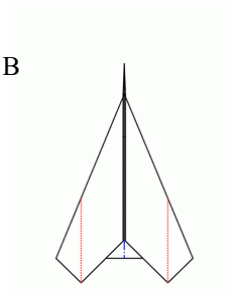


Step 12

Fold Edge A to meet Crease B. Flatten well. Repeat left side.







Step 13

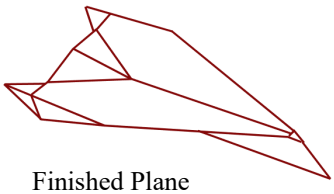
As best as possible fold Crease C to centerline. Only the bottom portion will align to center. Lightly crease lower part of fold as shown with red dotted line. Unfold and repeat with Crease D.

Step 14

Here is the hard part. Grab and raise Flaps A and B to meet each other. Holding both flap together gently push down towards centerline of plane. This should squash the plane into the shape shown to right. Carefully flatten all creases. Tape body flaps together.

Step 15

Fold flaps as shown. Note: plane is shown upside down and flaps will point down on completed plane.



Finished Plane

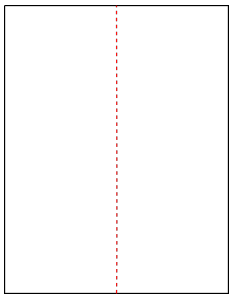
Flight Instructions

Make sure wings are slightly up and fins are straight down. Throw level at a "high" speed. Trim by adjusting how much up angle (dihedral angle) the wings have. This will adjust the tail to give a straight flight. If problems continue, adjust tail size. This plane should be able to make a long straight flight. The plane seems to do well "as folded" on a variety of paper.

Vintage Dart

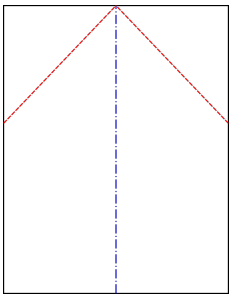
Why show how to fold a dart everybody knows? To mark its importance in paper plane history. I read once that a reference was made to what was believed to be this design as early as 1909 and a documentation of it in 1919. The 1909 document was on English boys school behavior and not trying to document paper airplanes. I have not been able to verify these references. What I do know is that my dad (born 1928) was throwing them in the early 1930's as paper was one of the few affordable items when there was no money for toys. He learned it from older brothers.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



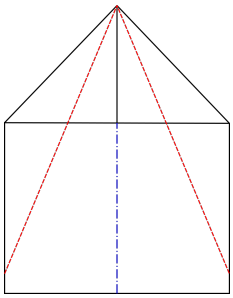
Step 1

Fold paper in half long ways and crease. Unfold.



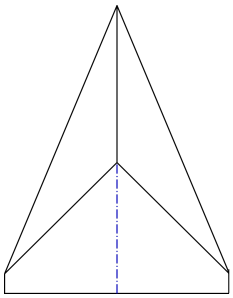
Step 2

Fold top corners down to meet at center.



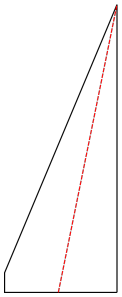
Step 3

Fold top left and top right edges as shown. Flatten well.



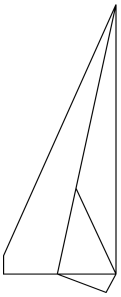
Step 4

Fold plane in half.



Step 5

Fold wing over to meet right edge.

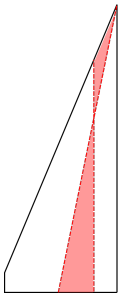


Step 6

Flip plane over and match fold other wing.

Step 7

Finished dart.



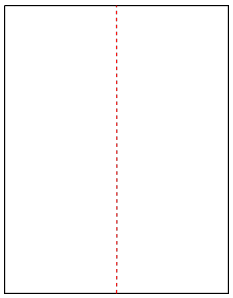
Step 8

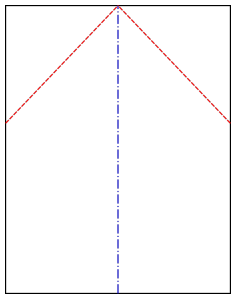
Everyone has their own preference as to wing fold line ranging as shown.

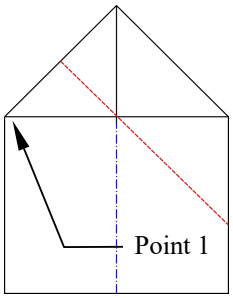
Vintage Acro

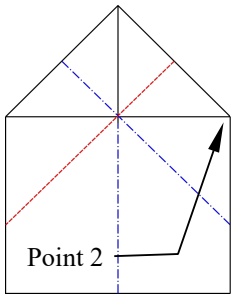
According to my Dad (born 1928), a plane similar to this was being folded by some American kids in the mid 1930's. He doesn't know if it was exactly this design because those who knew how to make it guarded the design. But based on his memory of the look and the easiest fix to get a correct CG this is most likely the design.

Note: Red lines are for folds, blue lines indicate existing creases.









Step 1

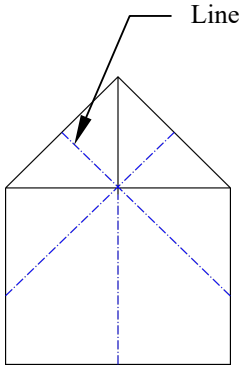
Fold paper in half long ways and crease. Unfold.

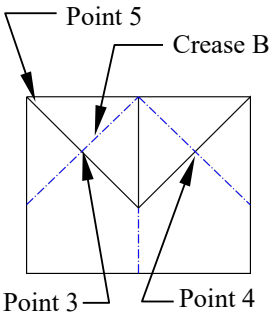
Step 2

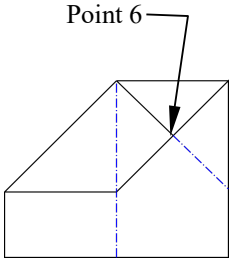
Fold top corners down to meet at center. Unfold.

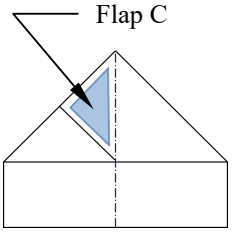
Step 3

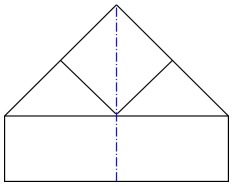
Fold top point down to meet Point 1 as shown. Crease and unfold. Fold top point down to meet Point 2 as shown. Crease and unfold.











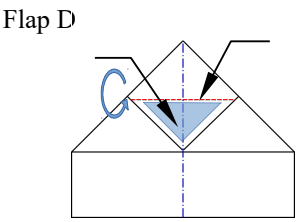
Step 4

Fold top flap down along Line A.

Step 5a
Point 3 and fold on centerline. This will stretch Point 4 to the centerline by folding on Crease B.

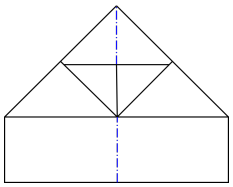
Step 5b

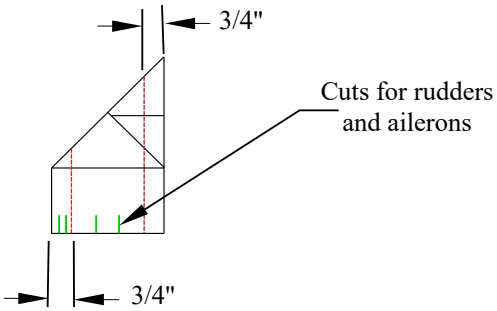
Repeat for right side grabbing Point 5 and folding along centerline. Return Flap C back to the right side. Flatten well.



Step 6

Tuck Flap D inside by folding in at Line E. Flatten well.





Step 7

Fold plane in half.

Step 8

Fold winglets down 3/4" from edge. Fold wings over 3/4" from centerline. Winglets may need to be pointing up to make a stable plane.

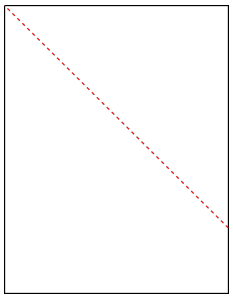
Paper Airplane Flying Instructions

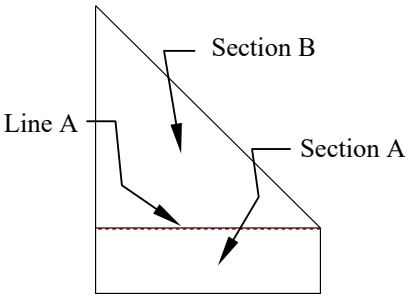
Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "slow" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose is taped together. Stunt trimming can be done by cutting lines to make rudders and ailerons/elevators.

Vintage Swallow

Just prior to WW II this plane was being folded in England. It showed up in USA during WW II (as best I can find). I can track it in Japan at least just at the end of the war based on information from my only Japanese contact who was making them at that time. With its origami folds and bird like appearance where is it's origin? Any information let me know. Americans soon changed the nose to match the nose shown in my Classic Acro (Steps 1-9) which flies just as well but loses the bird look.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.





Step 1

Fold top right corner down as shown.

Step 2

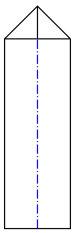
Fold and tear or cut at Line A to separate Sections A and B.

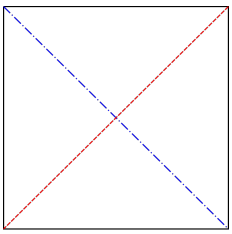
Step 3

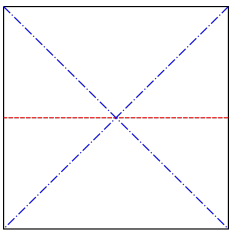
Fold Section A in half as shown. Crease and unfold.

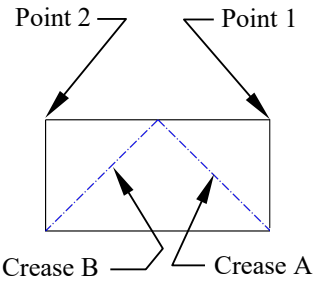
Step 4

Fold top corners to centerline as shown.









Step 5

Set completed Section A aside.

Step 6

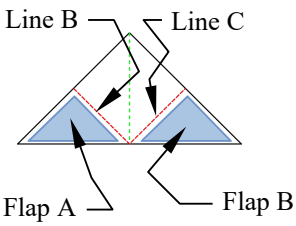
Unfold Section B and fold left top corner down as shown. Crease and unfold.

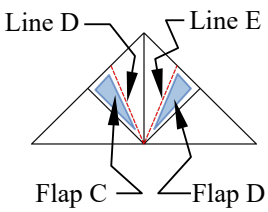
Step 7

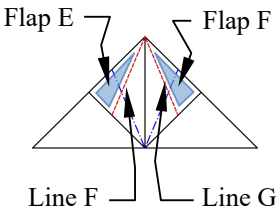
Fold plane in half as shown.

Step 8

Reverse fold Points 1 and 2 inside along Creases A and B.







Paper Airplane Flying Instructions

Throw level at a "medium" or "slow" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. To grab index finger touches the nose and the thumb touches the back of the body (section B)

Step 9

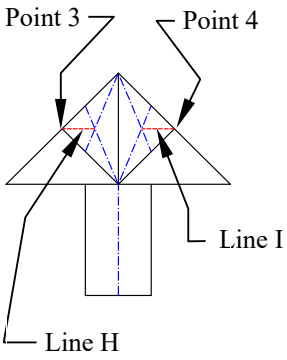
Fold Flaps A and B along Lines B and C as shown. Flatten well.

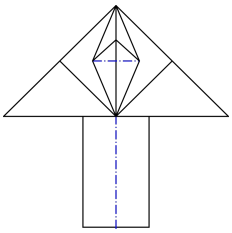
Step 10

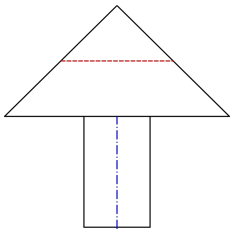
Fold Flaps C and D along Lines D and E as shown. Crease and unfold.

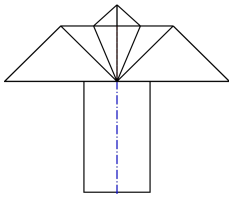
Step 11

Fold Flaps E and F along Lines F and G as shown. Crease and unfold.









Step 12

Pinch Points 3 and 4 along Lines H and I as shown. Fold formed nose up. Flatten well.

Step 13

Flip plane over as shown.

Step 14

Fold top point down as shown.

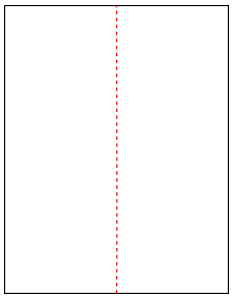
Step 15

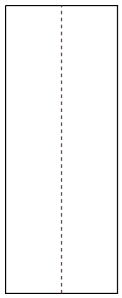
Fold along centerline approximately to this shape:

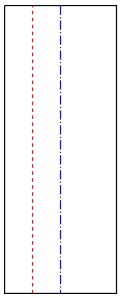
Vintage Flying Wing

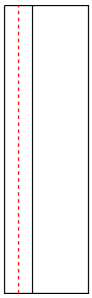
The decade after the end of WW II started the quest for more designs and even a race for new records including this one for improving duration aloft. It was later tweaked and improved to the record holding for duration aloft held by Ken Blackburn in October 1998. (later beaten by Takuo Toda in December 2010 by more of a glider type design)

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.









Step 1

Fold paper in half long ways and crease. Unfold. Tear or Cut in half.

Step 2

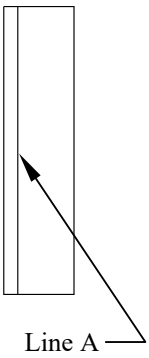
Fold in plane in half. Crease and unfold.

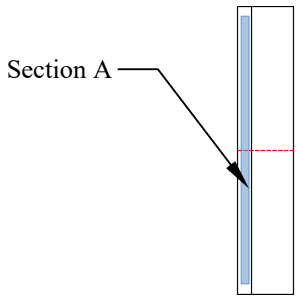
Step 3

Fold edge to centerline as shown. Flatten well.

Step 4

Fold new edge to centerline as shown. Flatten well.





Paper Airplane Flying Instructions

Make sure wings are slightly up. Throw level at a "slow" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if trailing edge of Section A is taped to rest of wing.

Step 5

Fold left edge along Line A. Flatten well.

Step 6

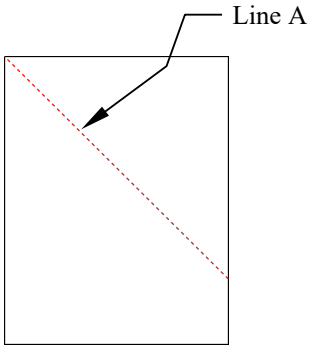
Using a can or similar item curve Section A as shown:

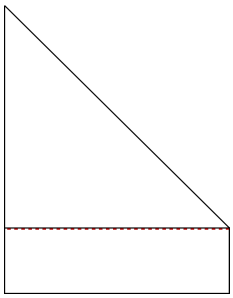
Fold Centerline approximately as shown:

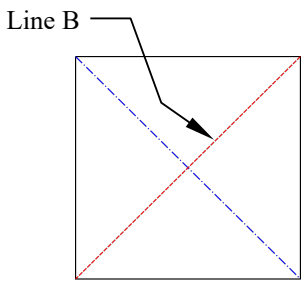
Vintage Bishops Hat

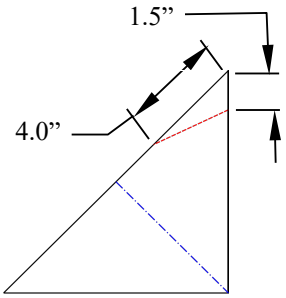
The late 1960's through the early 1970's saw paper airplane designs whose looks were no longer bound by the conventional. Personally, I think this was strongly influenced by the space age – both real and on film. This particular design was a product of that fantasy age. It's primary use was being launched from a height such as a bridge or balcony but can still be of value indoors just to show the skeptical it will fly.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.









Step 1

Fold paper along Line A as shown.

Step 2

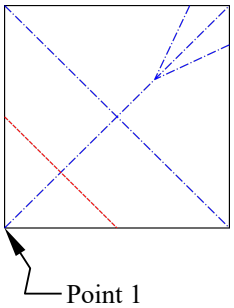
Cut or tear along bottom edge to make a square. Unfold.

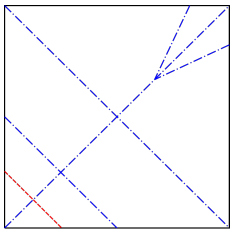
Step 3

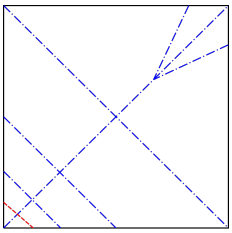
Fold paper along Line B as shown. Flatten well.

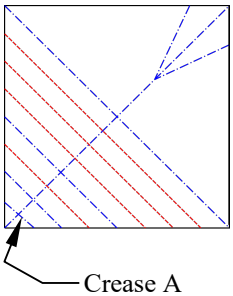
Step 4

Fold tail area to approximate dimensions shown. Reverse fold tail area. Unfold all folds.









Step 5

Fold Point 1 to center point as shown. Crease and unfold.

Step 6

Fold Point 1 to center of new crease as shown. Crease and unfold.

Step 7

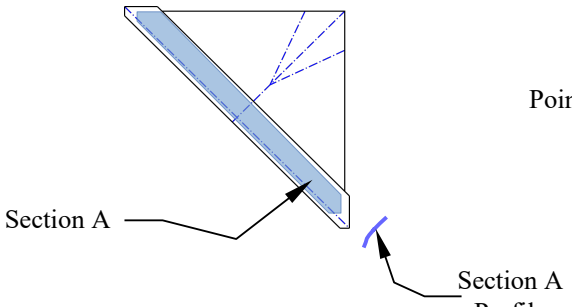
Fold Point 1 to center of new crease as shown. Crease and unfold.

Step 8

Starting with Crease A "roll" Point A up along centerline as tight as possible and keeping as straight to centerline as possible. Due to paper thickness folds will not match existing creases. Continue to roll until just past centerline as shown in Step 10.

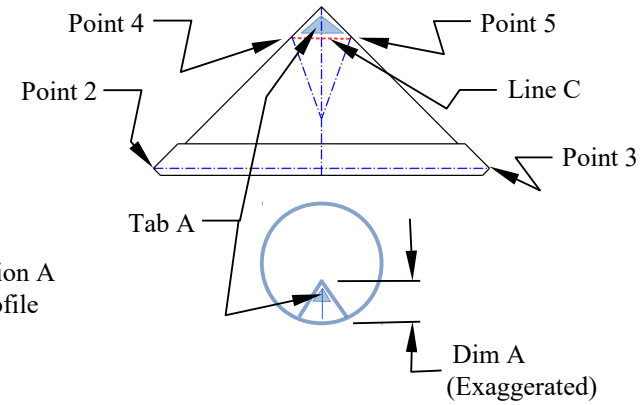
Paper Airplane Flying Instructions

This plane does not trim the same way as most. Use a combination of adjusting Dim A and folding Tab A. Increase Dim A or fold Tab A up to bring nose up. To throw grab between index finger and thumb and toss from "slow" to "medium" speed. Throwing a plane from this "backward" grip can take a little practice. This plane cane be trimmed for both 20 lb and 24 lb paper.



Step 9

Curl Section A to profile shown using fingers or edge of table.



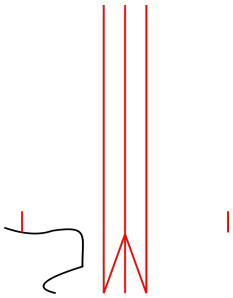
Step 10

Curl Section A along the centerline axis to bring Points 2 & 3 together (with approximately 3/8" overlap). Tape in position. Gently squeeze Points 4 & 5 together to allow tail to rise up in the center of the plane until Dim A is approximately 1/2". Form Tab A by slightly bending up along Line C to complete the air plane.

Vintage Fighter

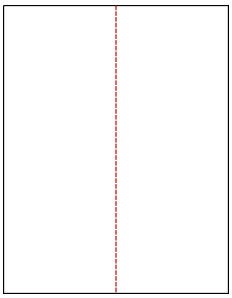
By the late 1950's to early 1960's the trend was toward making gliders which looked more like a normal plane by cutting out part of the paper after folding. The idea was this would reduce surface area of the wing portion that was not producing lift and therefore reduce drag. This is my design using the concepts for designs being entered in the winter of 1966 – 1967 at the First International Paper Airplane Competition sponsored by Scientific American.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



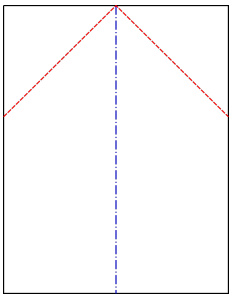
Step 1

Copy Page A (or download .pdf file and print.



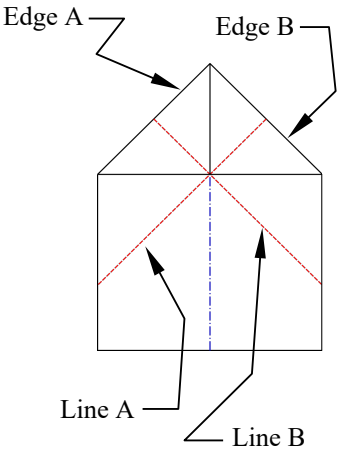
Step 2

Turn paper over left to right and fold in half. Crease and unfold.



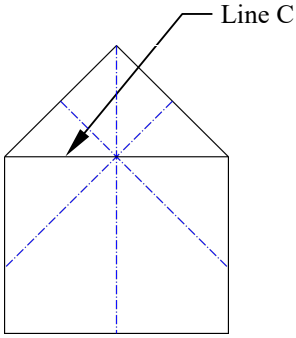
Step 3

Fold top corner to centerline as shown. Flatten well.



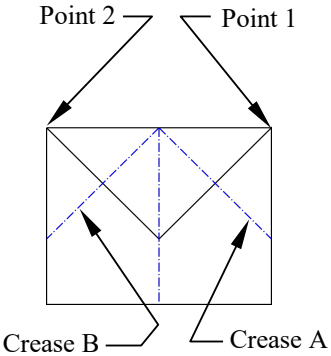
Step 4

Fold Edge A along Line A. Crease and unfold. Fold Edge B along Line B. Crease and unfold.



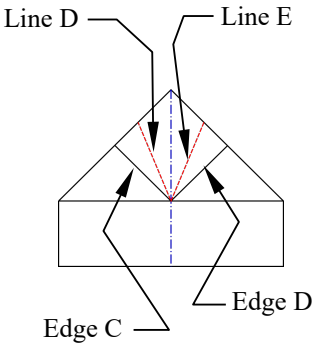
Step 5

Fold top corner down along Line C.



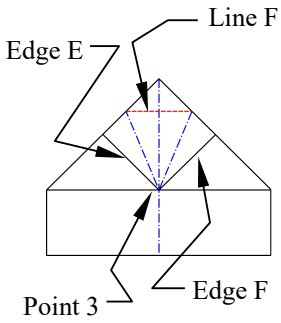
Step 6

Reverse fold Points 1 & 2 inside using Creases A & B. Flatten well.



Step 7

Fold Edges C & D along Lines D & E. Crease and unfold.

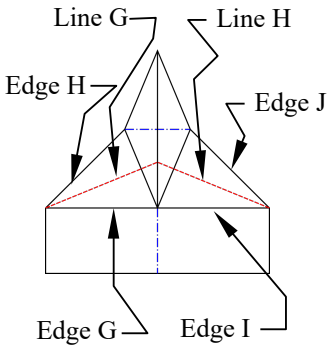


Step 8

Fold Point 3 up along Line F. This will cause Edges E & F to stretch to centerline. This is the same as a origami petal fold. Flatten well.

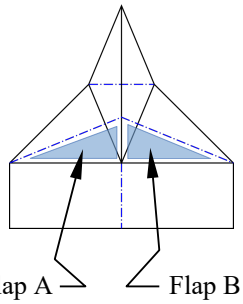
Paper Airplane Flying Instructions

Make sure wings are level (or slightly up) and winglets are vertical. Throw level at a "medium" or "hard" speed. Trim if required but the plane seems to do well "as folded" on a variety of paper. It may do better if nose is taped together.



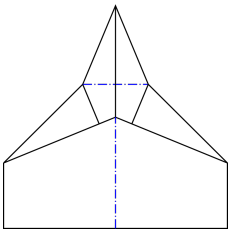
Step 9

Fold Edges G & I to Edges H & J along Lines G & H as shown. Crease and unfold.



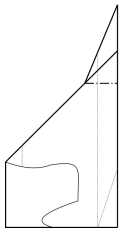
Step 10

Reverse fold Flaps A & B along creases just made as shown. Flatten well.



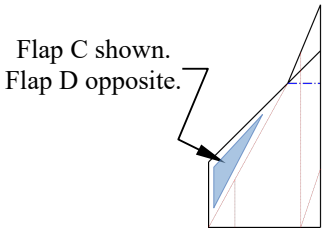
Step 11

Fold plane in half right to left as shown.



Step 12

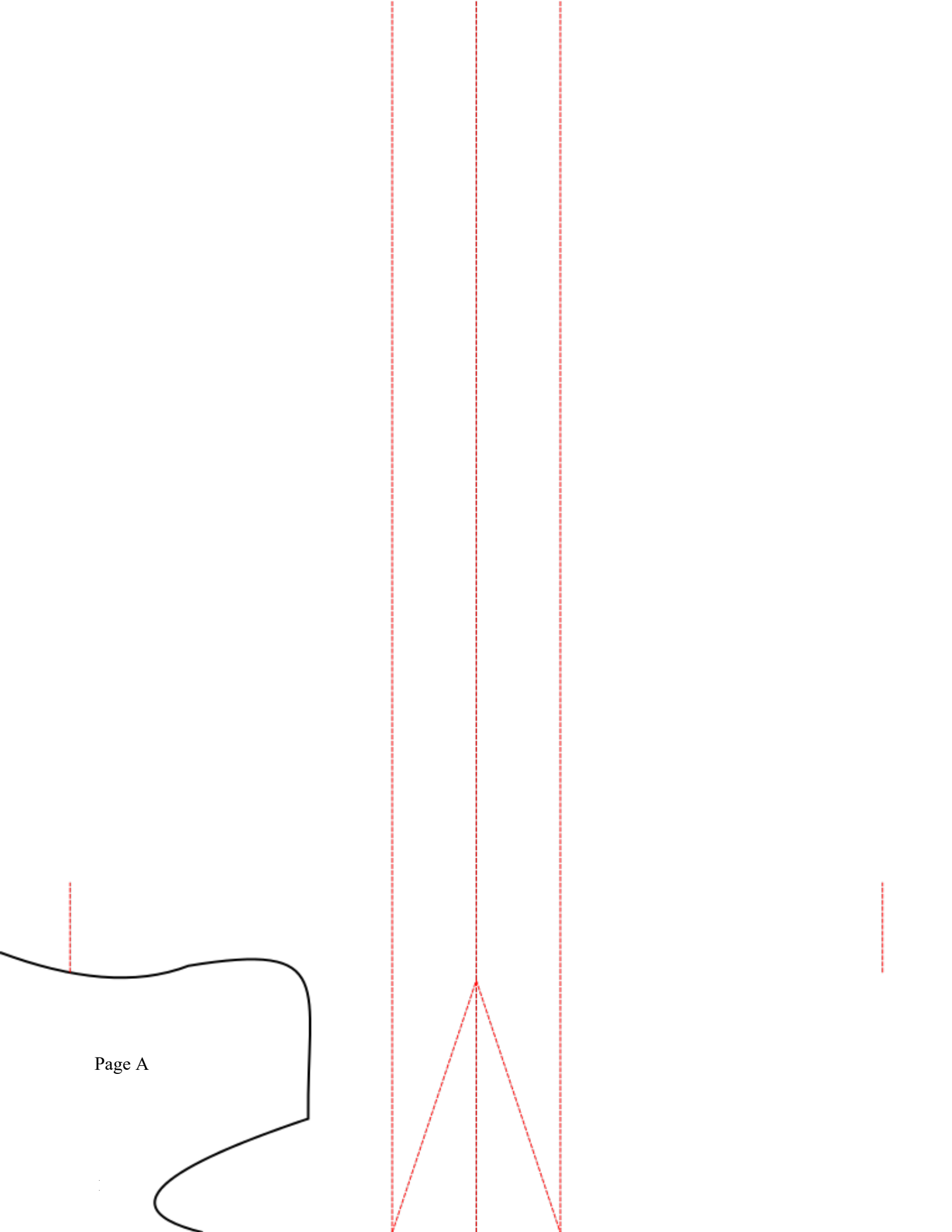
Cut out plane profile as shown. Fold wings down on indicated line. Crease and reverse fold tail into body. Fold winglets on indicated line so that they are up on finished plane.

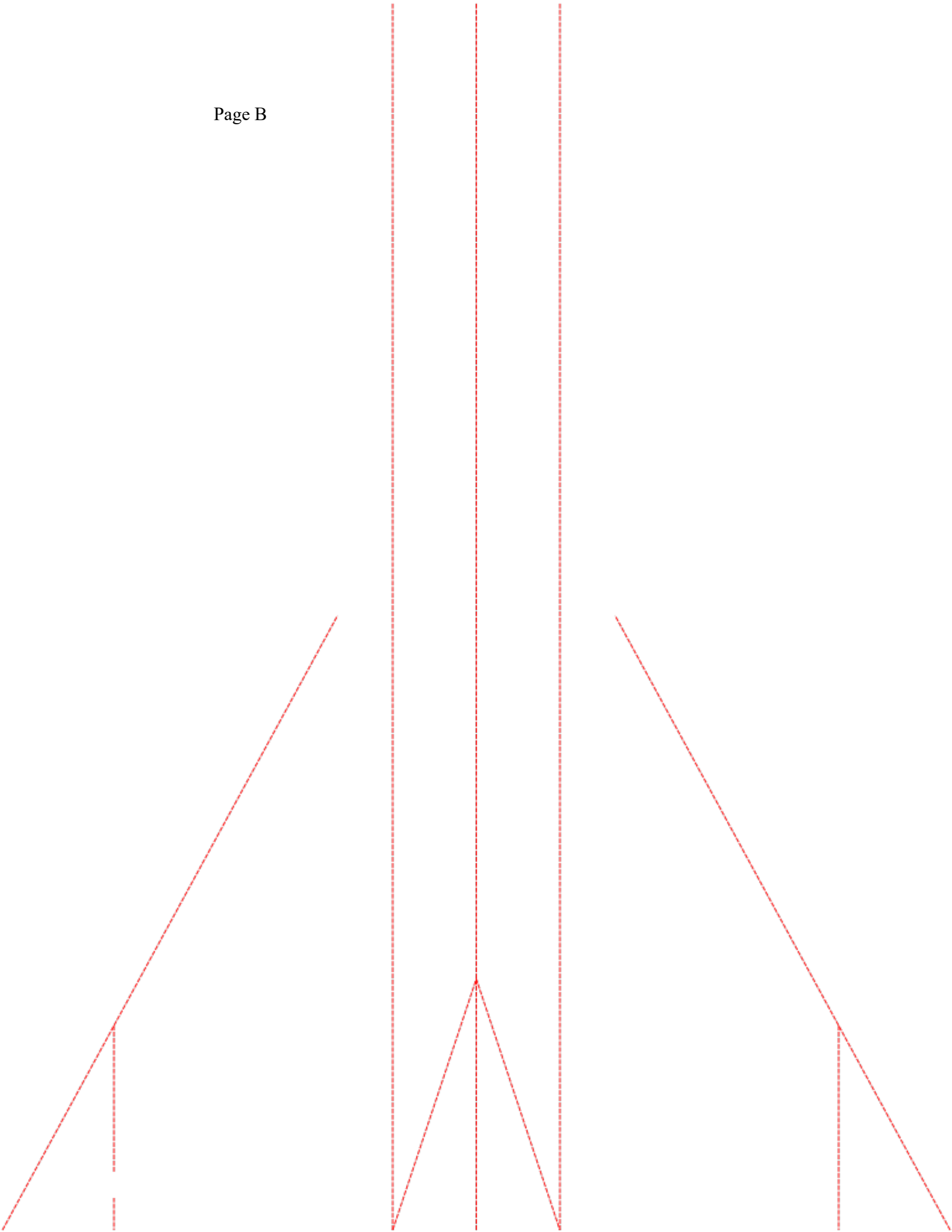


Step 12a

In Step 1 use Page B instead of Page A. Fold Flaps C & D backward on indicated lines. Fold wings down on indicated line. Crease and reverse fold tail into body. Fold winglets on indicated line so that they are down on finished plane.

Note: Designers in the 60's believed cutting out unneeded wing area reduced drag. Here is a more modern style so test and see if they were correct in their assumption! Also they tried to make paper airplanes that looked like normal planes. By the 70's space travel was around both real and on screen allowing planes to look like anything. A plane very similar to this one around by the late 70's.

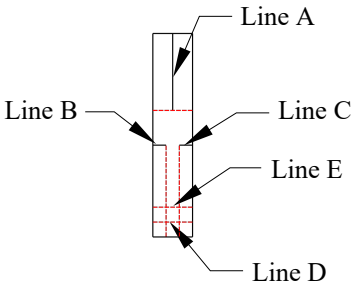

Page A



Vintage Copter

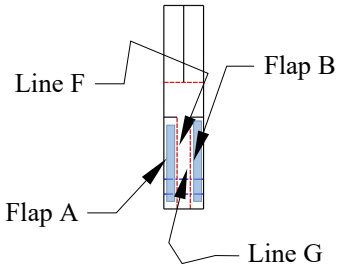
No collection can be complete without a Vintage Copter. This design has been around since somewhere from the start of the Korean war to the winter of ‘66-’67 when it was entered into the First International Paper Airplane Competition sponsored by Scientific American.

Note: Red lines are for folds, blue lines indicate existing creases, and green lines represent hidden edges.



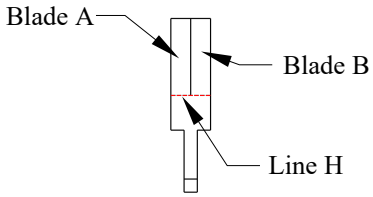
Step 1

Cut out profile. Make cuts on Lines A, B & C. Fold up on Lines D & E. Crease and unfold.



Step 2

Fold Flaps A & B over along Lines F & G. Refold along Lines D & E. Flatten well.



Step 3

Fold Blade A forward on Line H and fold Blade B backward on Line H.

Paper Copter Flying Instructions

Make sure blades are slightly up and even. Drop from as high as possible. The copter seems to do well “as folded” on a variety of paper. Try shrinking the design and putting finished copter in the body of other paper airplanes. If they are tossed to hit the ceiling or the plane goes into a spin the "pilot" drops out for a safe landing!