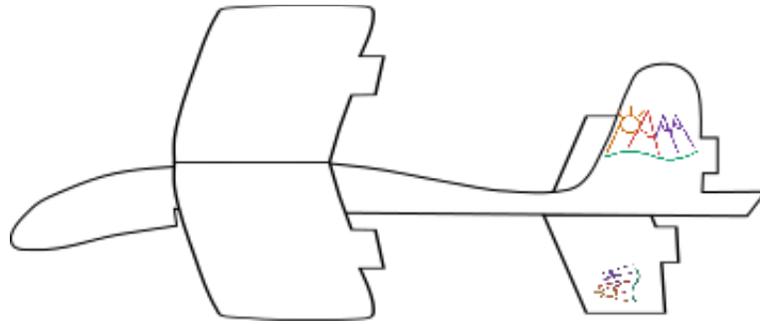


Pat's Planes

Card Stock Designs



Introduction

As a kid in the late 60's through early 70's I was very interested in balsa wood kits. I was totally unaware of making paper airplanes from heavy paper such as index cards, poster board, or even cereal box cardboard. But now that affordable balsa kits are very hard to find, perhaps there is a place for these planes again.

The "Hand Toss" series presented here is influenced by the "White Wings" but is a little smaller, lighter, and adapted to being tossed inside. They can be still be used outdoors with a chained rubber band shooter as long as it is not too powerful. They are not strong or stable enough to be high speed launched using extra heavy duty, 12 inch diameter, office grade rubber bands. Hand Toss 5 is a tribute to the Delta Wing model sold in the Atlanta Airport around 1990. Loop 1 and Loop 2 are a tribute to the looping airplane sold in the mall's of the 70's. And the Delta X Glide is a close copy (hopefully not too close) to a model I found on the back of a cereal box (Rice Crispies I think). Couldn't help it, that graphic art crew did a great job. I do hope in the near future to design some of the heavier designs for "outdoor only" use with stronger rubber bands.

I use Inkscape software to produce the designs. It has wonderful curve producing routine that you can produce your shapes with. You can even scan a hand drawn design, import it as a *.jpeg, then trace curves over the drawing, finally deleting the jpeg when done. Features like copying and pasting a body section and adding (or subtracting) node points allows you to make a perfect fitting next layer body section (or nose section). You can even start by scanning and tracing one of mine and then use the edit nodes function to modify the shape to your liking.

To me these planes seem to fly better on plain white 110# card stock then they do on colored 65# stock. By scanning in a copy of the .pdf file and importing into any one of several graphic software packages to add some color or graphic design. This can be done with The GIMP or Krita for complex design or LazPaint, mypaint, or iPhotoDraw for simpler designs and text (these are also simpler to learn) and best, all of them are free.



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Index of the Planes

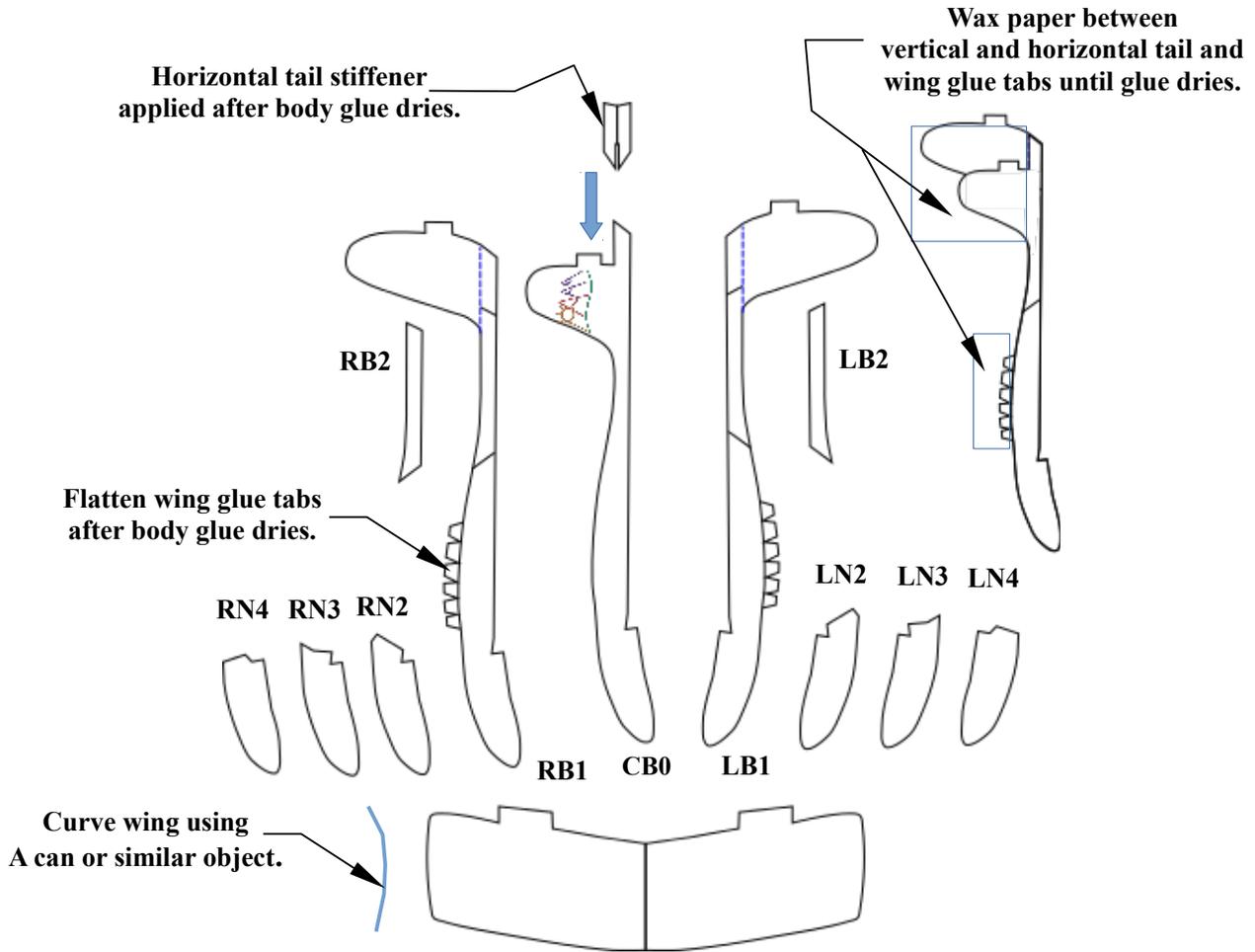
Hand Toss series:

1. Hand Toss 1
2. Hand Toss 2
3. Hand Toss 3
4. Hand Toss 4
5. Hand Toss 5
6. Hand Toss 6
7. Hand Toss 7
8. Hand Toss 8
9. Hand Toss 9
10. Hand Toss 10
11. Hand Toss 11
12. Hand Toss 12

Other planes:

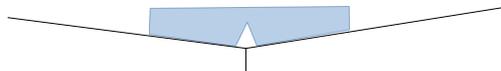
13. Loop 1
14. Loop 2
15. Delta X Glide
16. PW Jet

Hand Toss 1

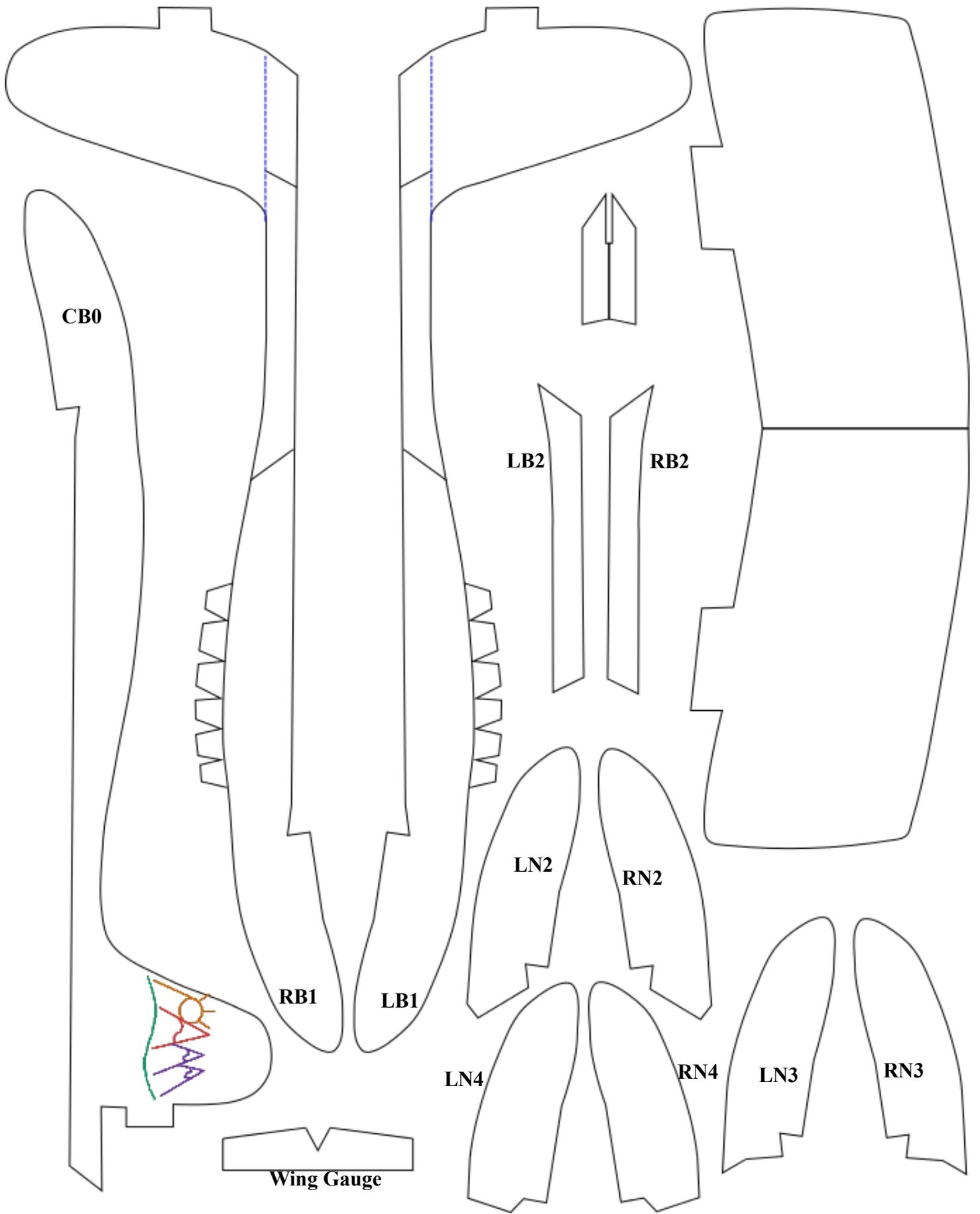


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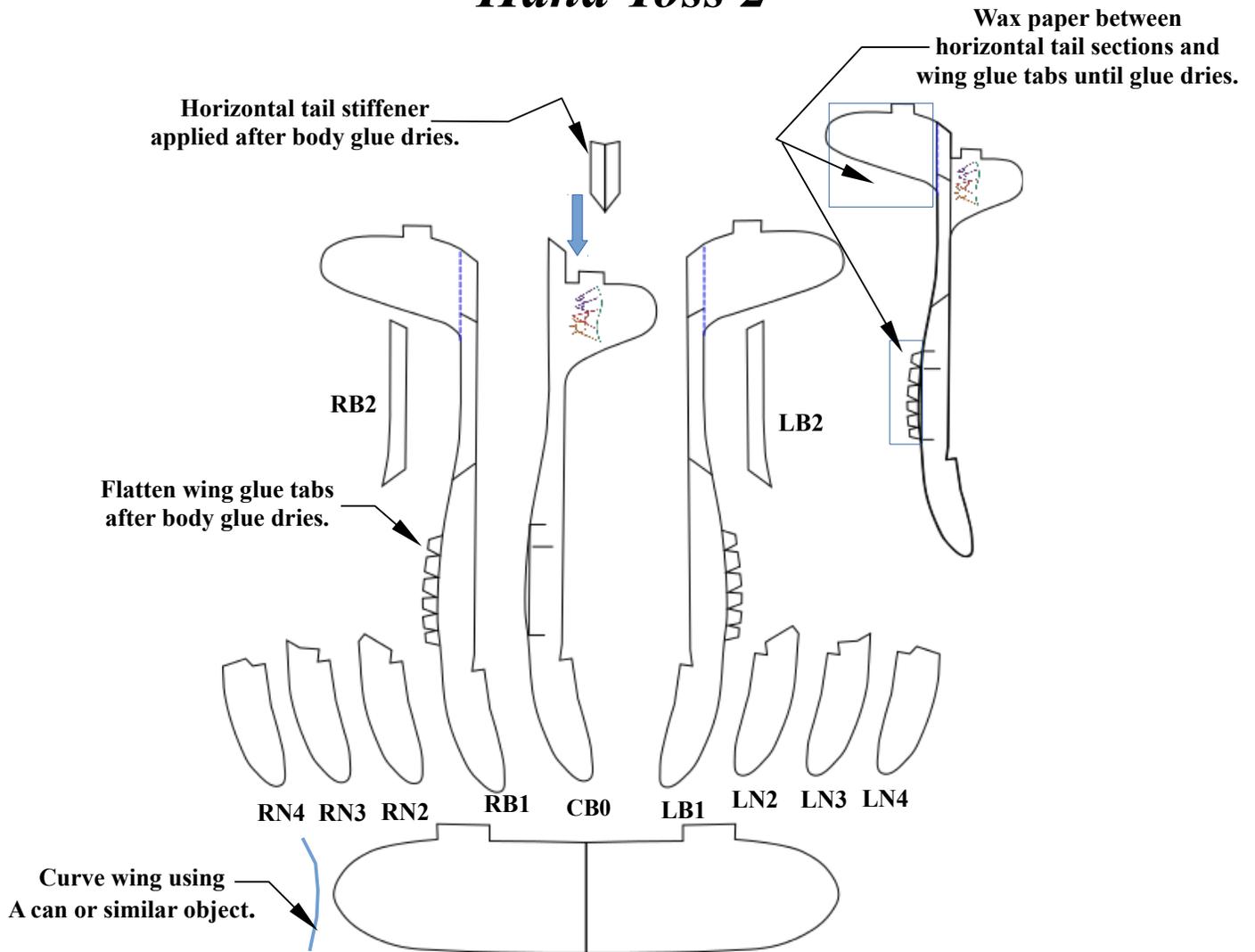
1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2-4, RN2-4). Glue tail stiffener on to keep horizontal tail halves level and square.
3. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can. Flatten wing tabs with pencil or similar item and glue wing in place.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions here.

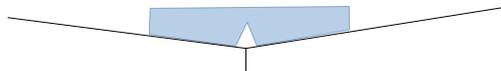


Hand Toss 2

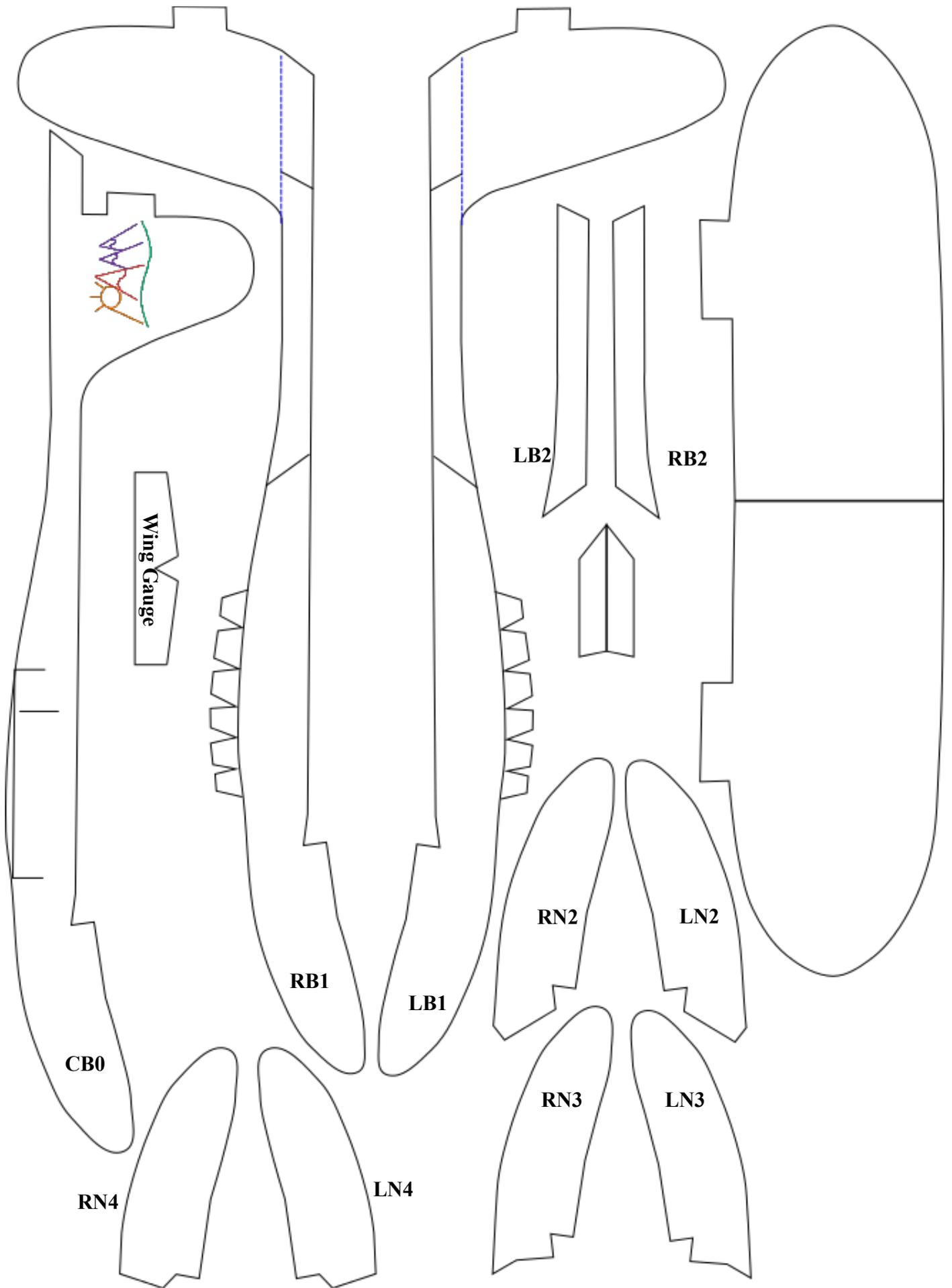


Instructions:

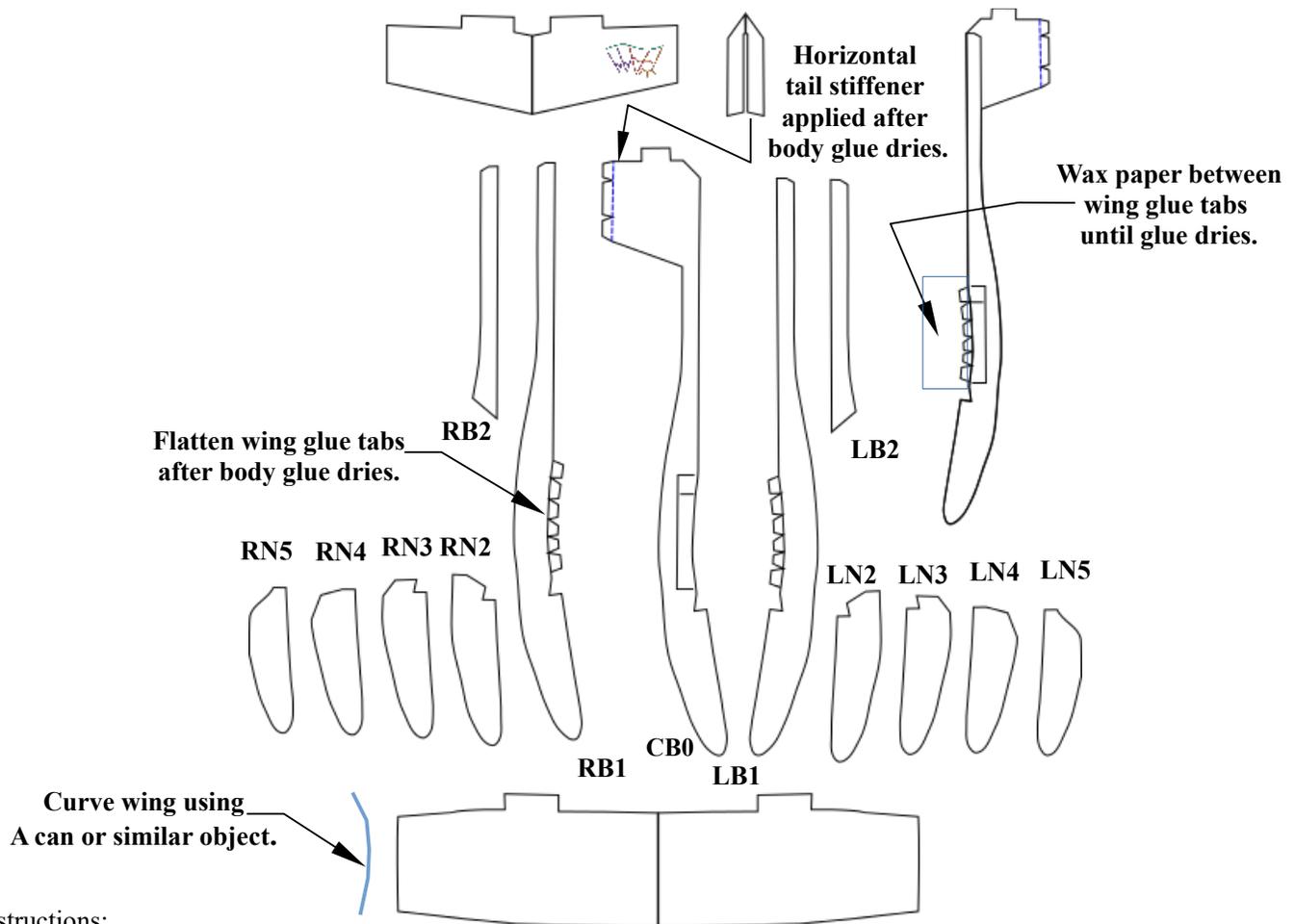
1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2-4, RN2-4). Glue tail stiffener on to keep horizontal tail halves level and square.
3. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can. Flatten wing tabs with pencil or similar item and glue wing in place.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions here.

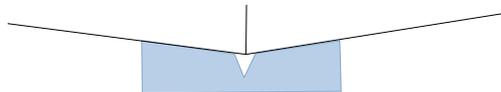


Hand Toss 3

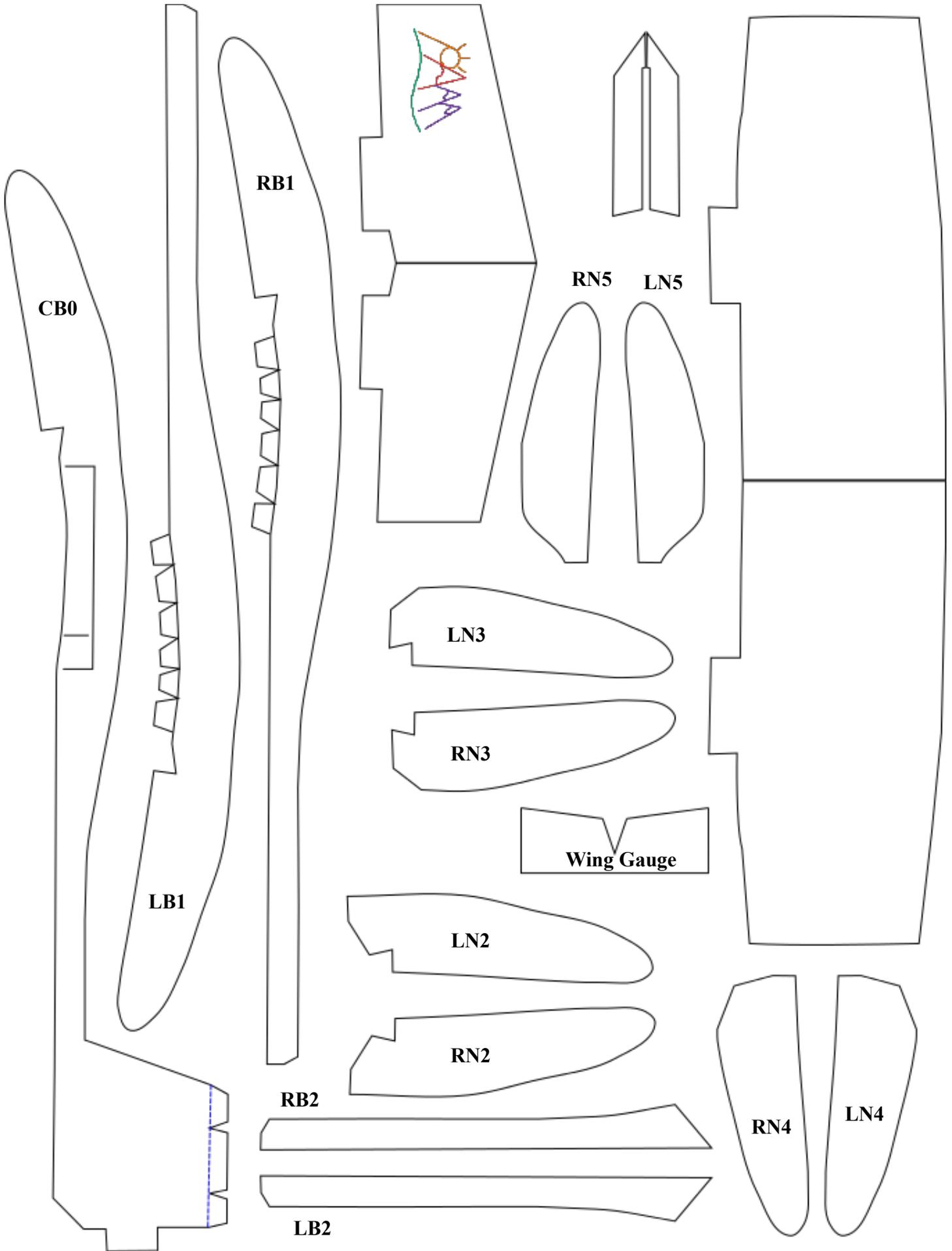


Instructions:

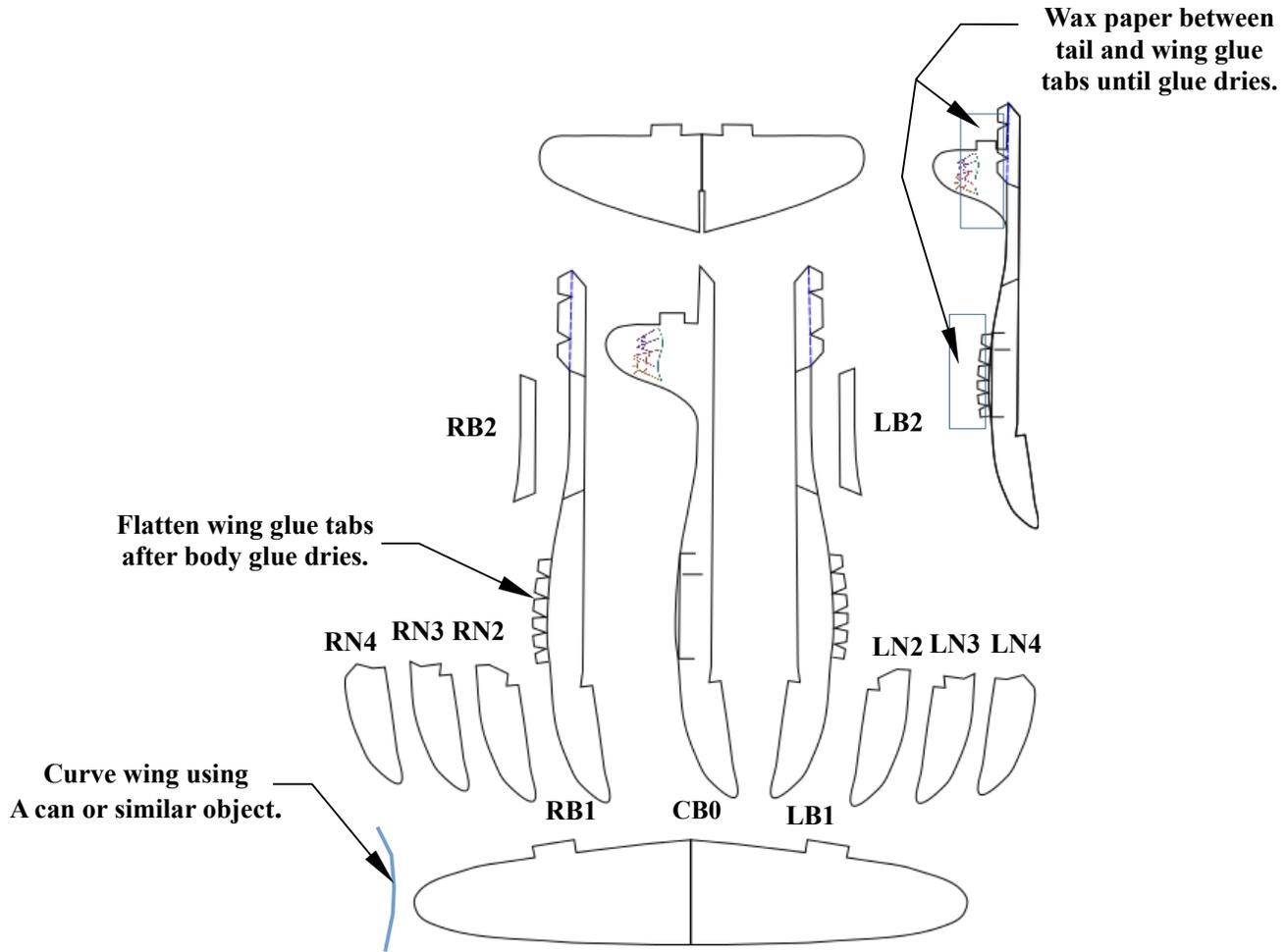
1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2-5, RN2-5).
3. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can. Flatten wing tabs with pencil or similar item and glue wing in place. Glue tail in place.
4. Glue tail stiffener on to keep horizontal tail level and square.
5. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions here.

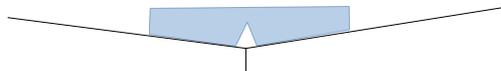


Hand Toss 4

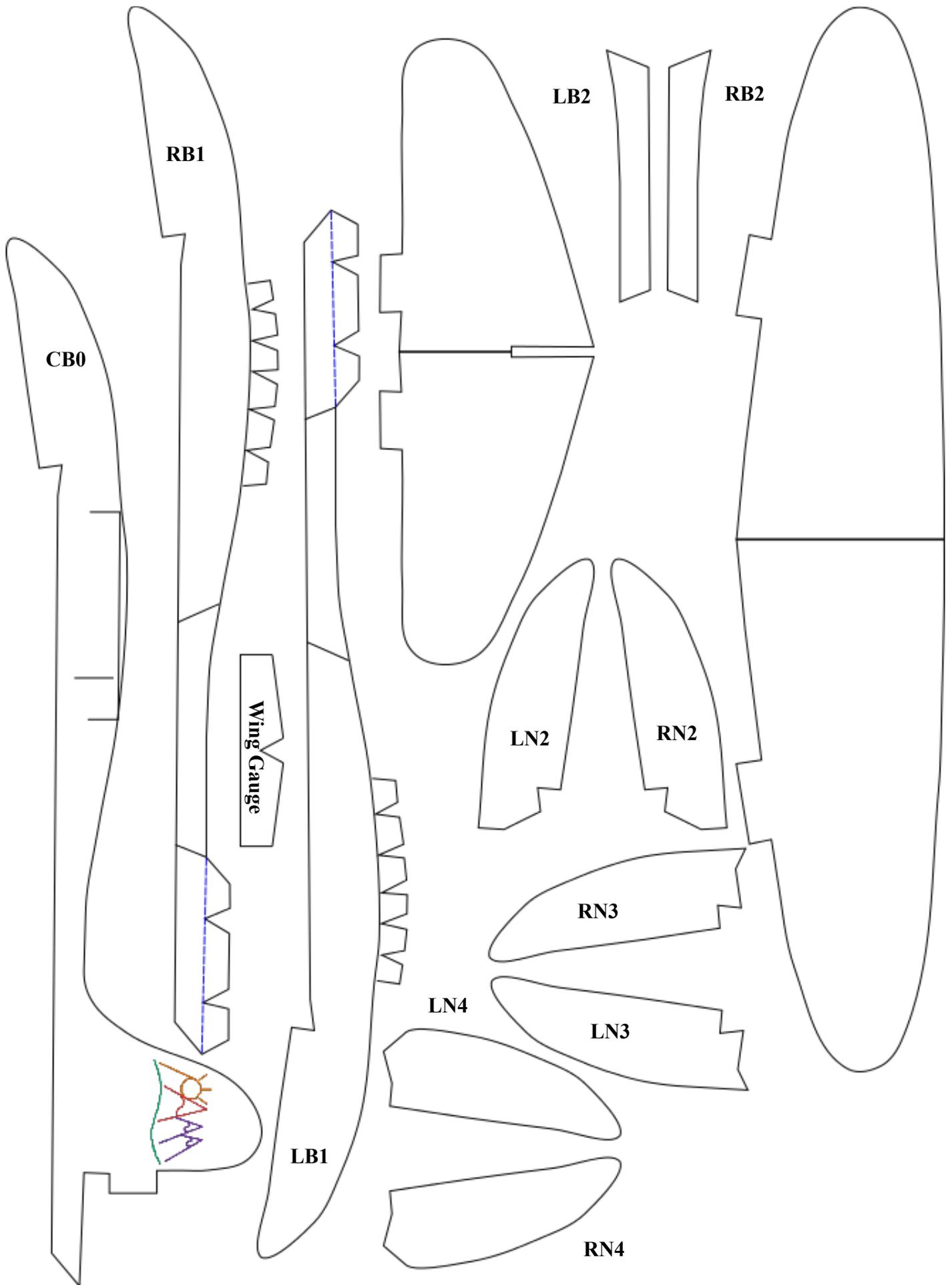


Instructions:

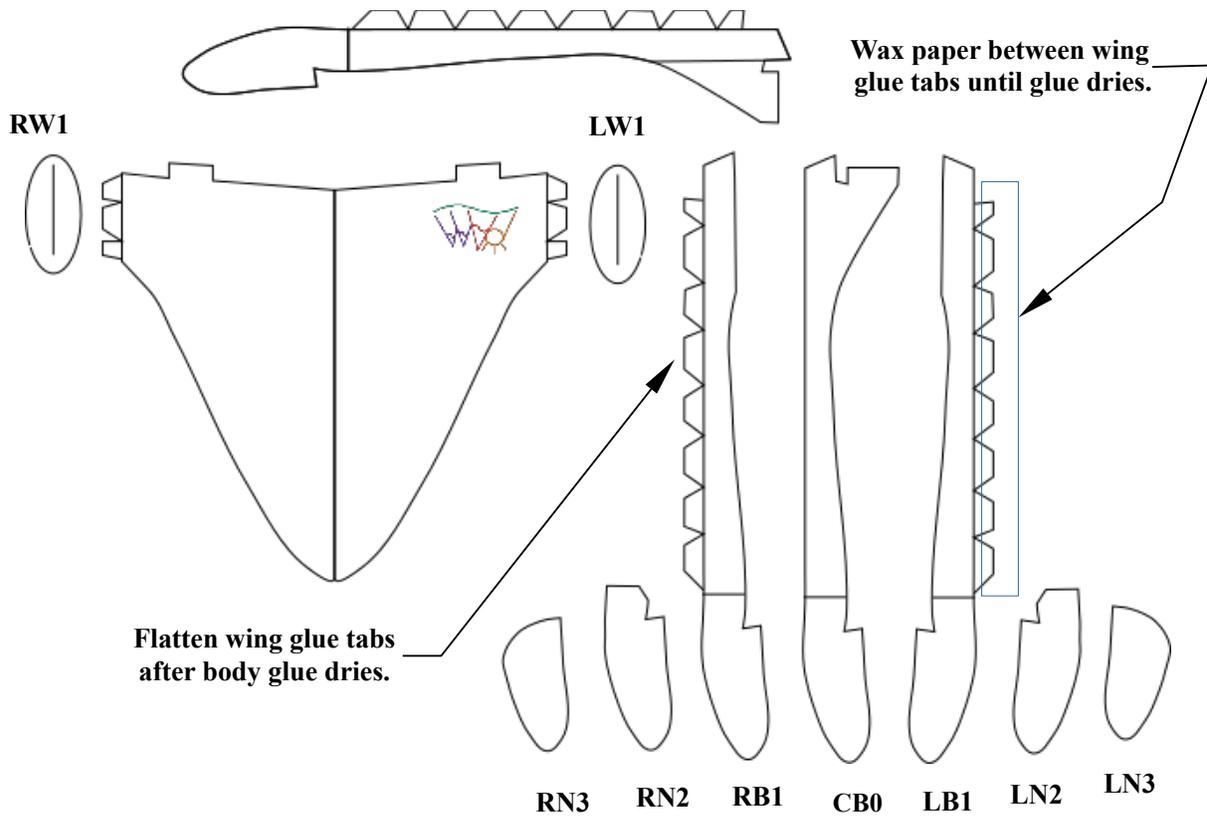
1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2-4, RN2-4). Glue horizontal tail section in place.
3. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can. Flatten wing tabs with pencil or similar item and glue wing in place.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions [here](#).



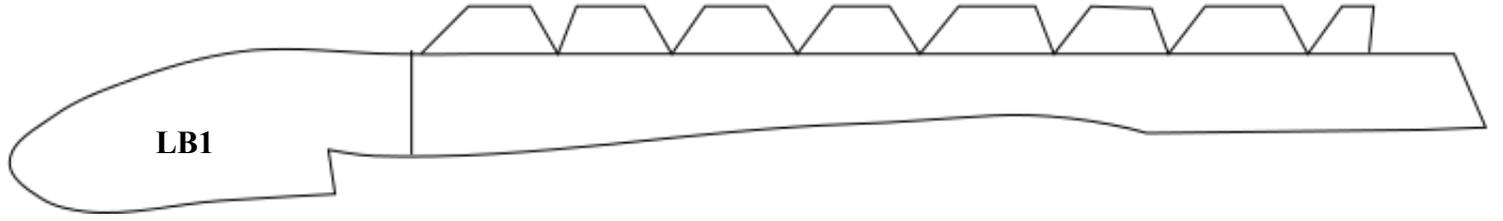
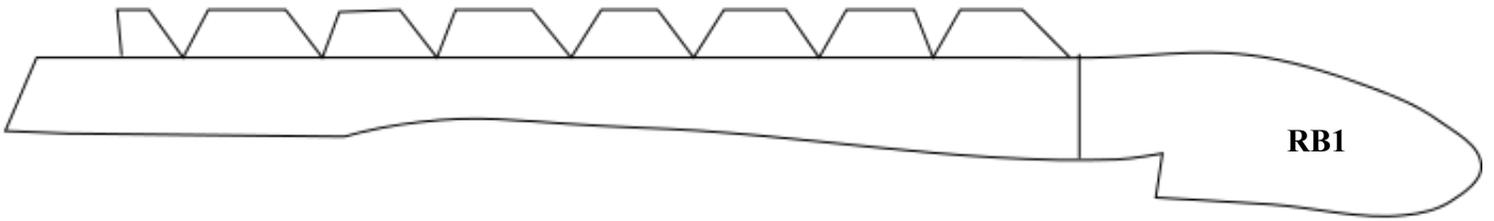
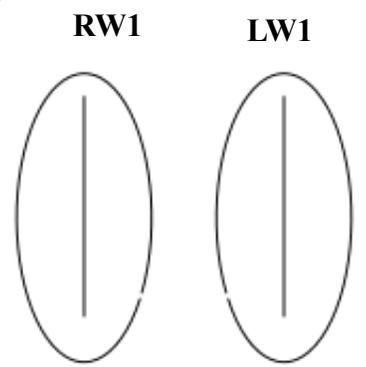
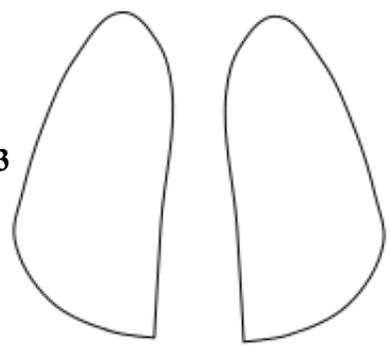
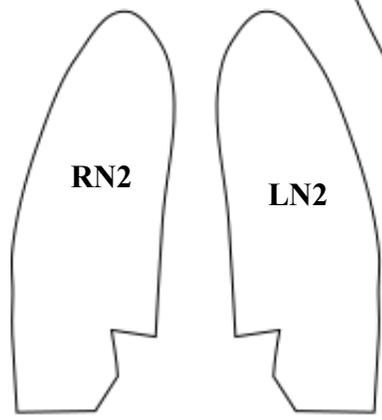
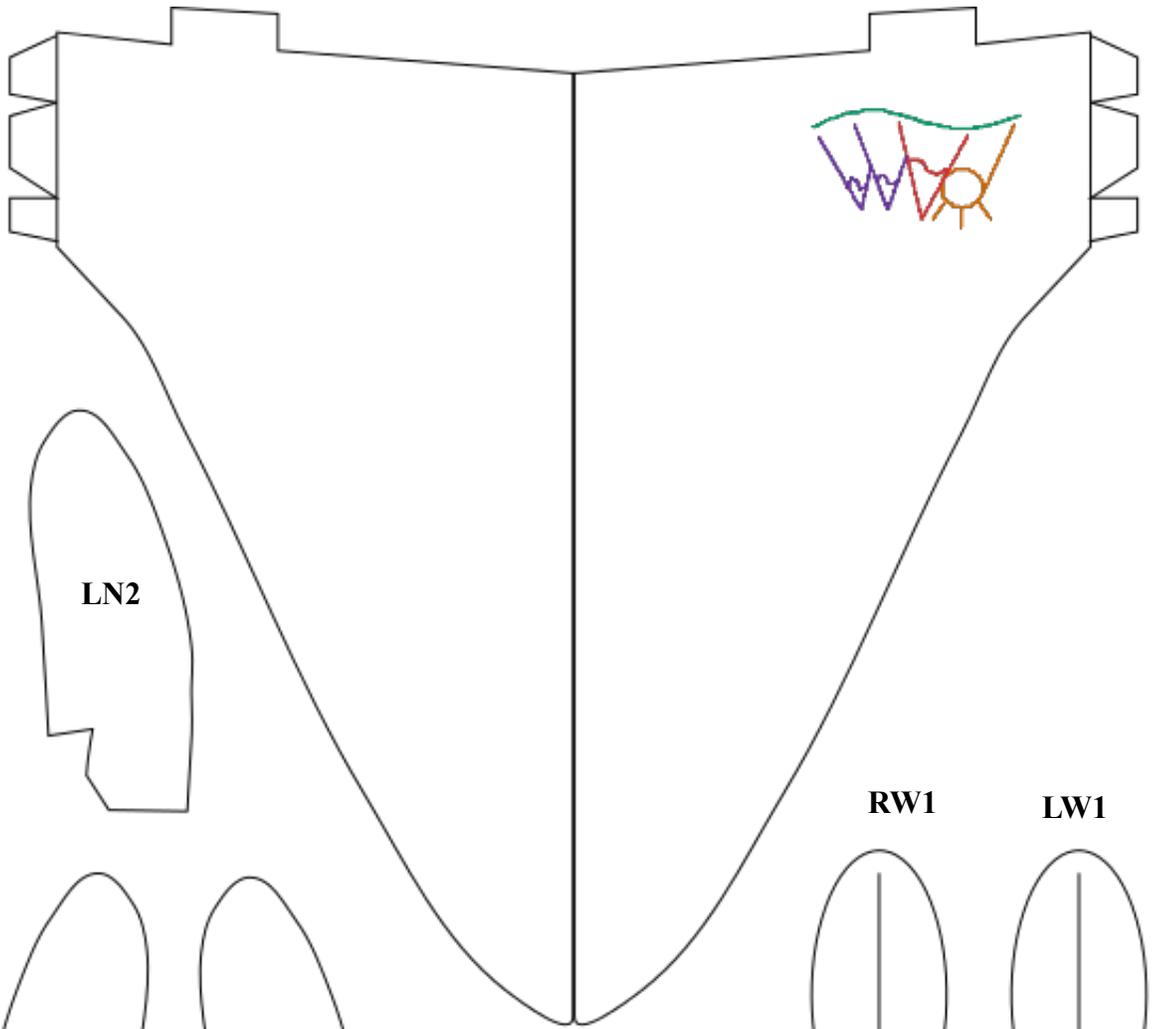
Hand Toss 5



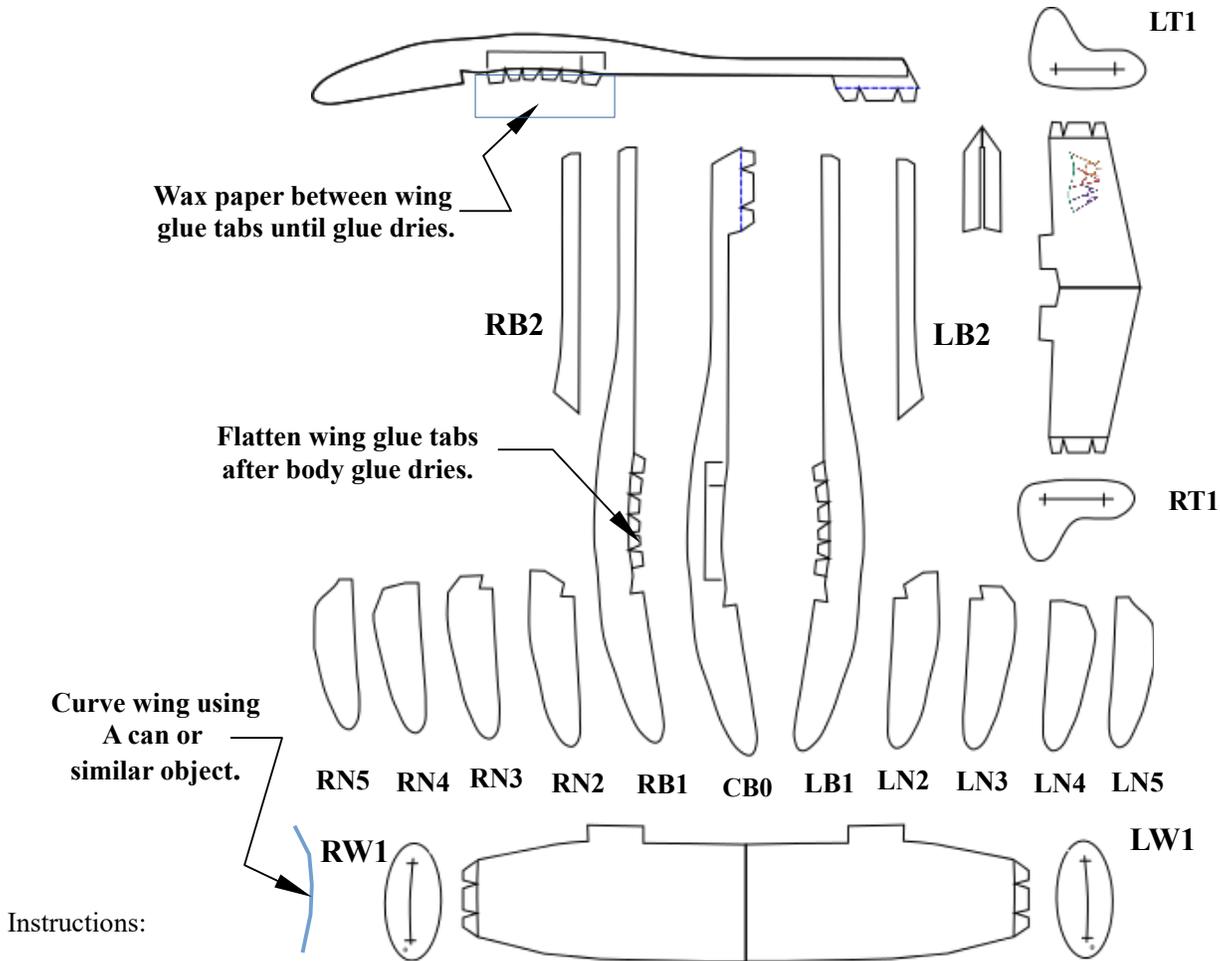
Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1 and RB1).
2. After Body dries glue nose pieces on (LN2&3, RN2&3). Glue winglets to wing level and square.
3. Glue wing assembly in place. This type of airplane is referred to as a delta wing airplane.

Note: Quick instructions only see full instructions here.

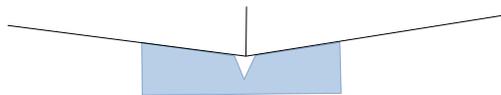


Hand Toss 6

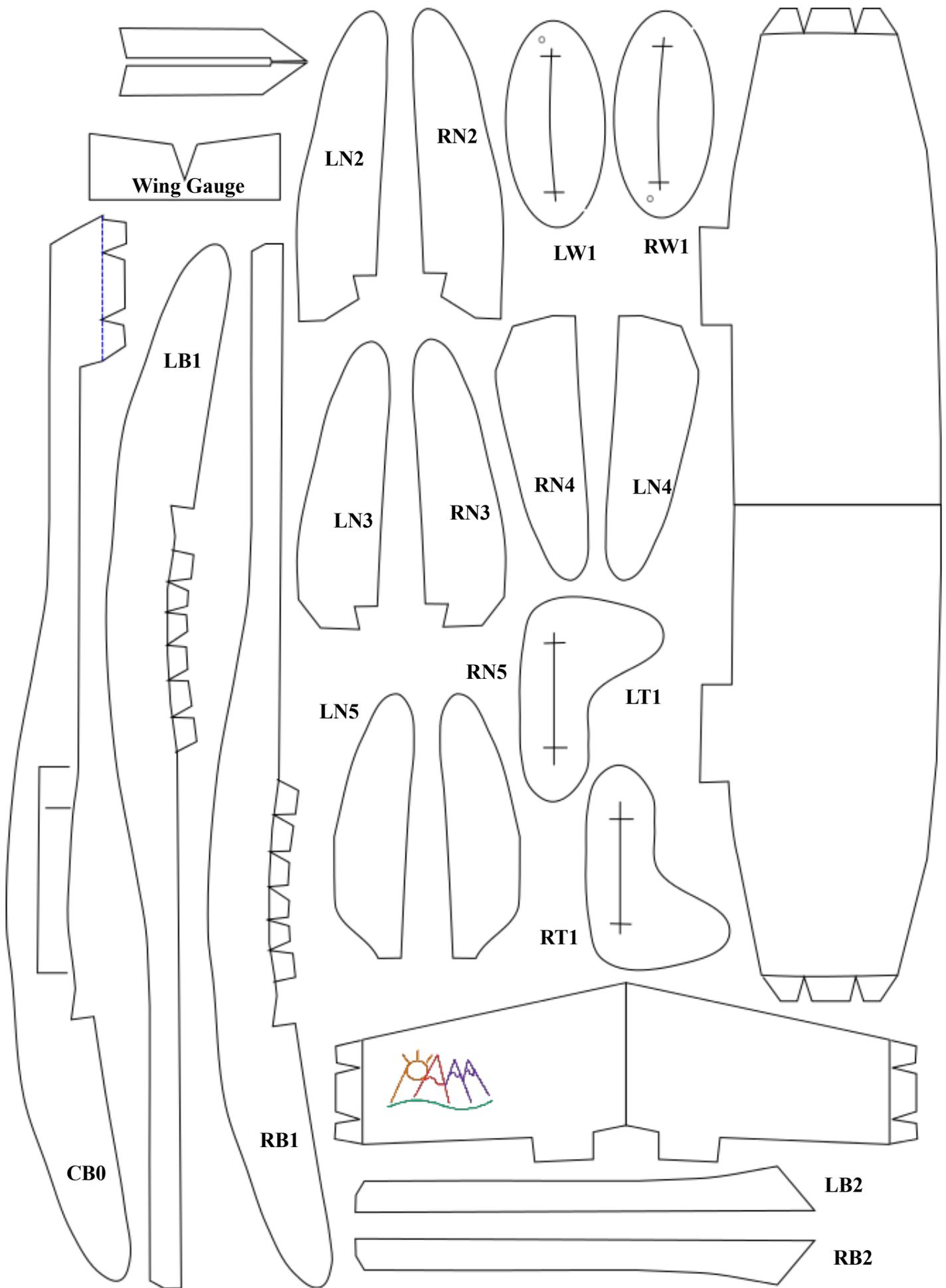


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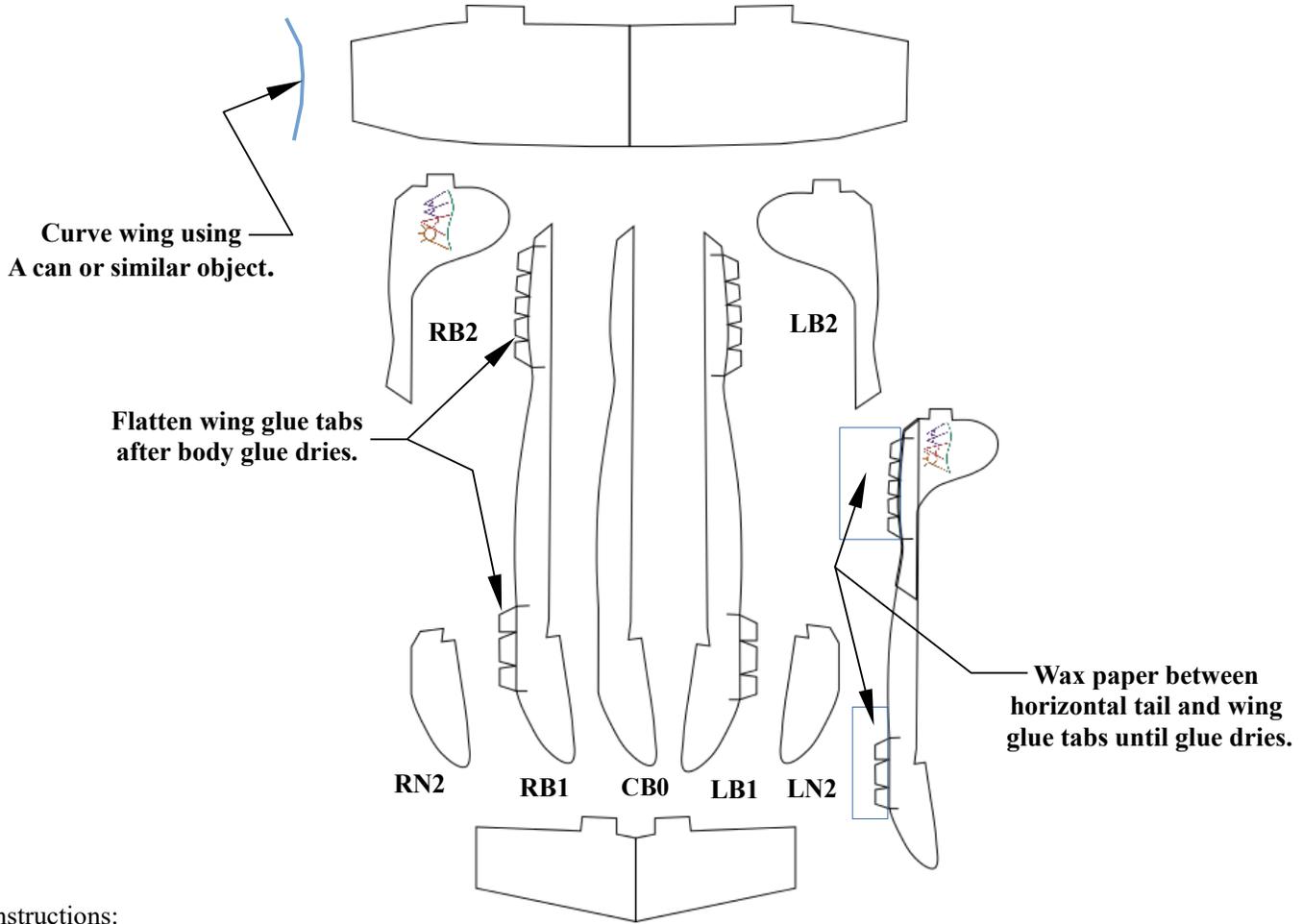
1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2 and RB1&2).
2. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can.
3. After Body dries glue nose pieces on (LN2-5, RN2-5). Glue winglets to wing and vertical stabilizer to tail level and square.
4. Flatten wing tabs with pencil or similar item and glue wing in place. Glue wing and tail assemblies in place. This type of airplane is referred to as a low wing airplane.
5. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions here.

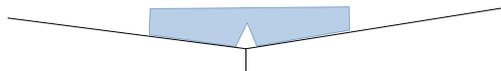


Hand Toss 7



Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2, RN2).
3. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can. Flatten wing (plane rear) and tail (plane front) tabs with pencil or similar item and glue wing and tail in place. This type of airplane is referred to as a canard airplane.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions [here](#).



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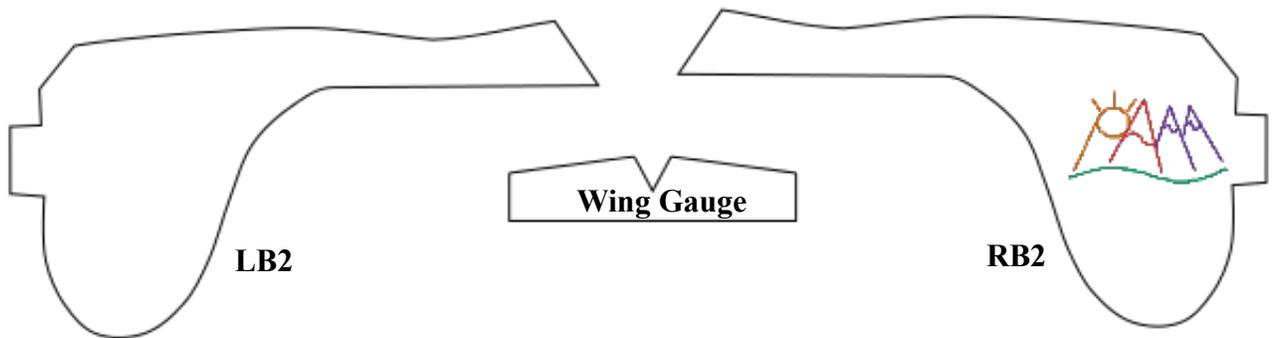
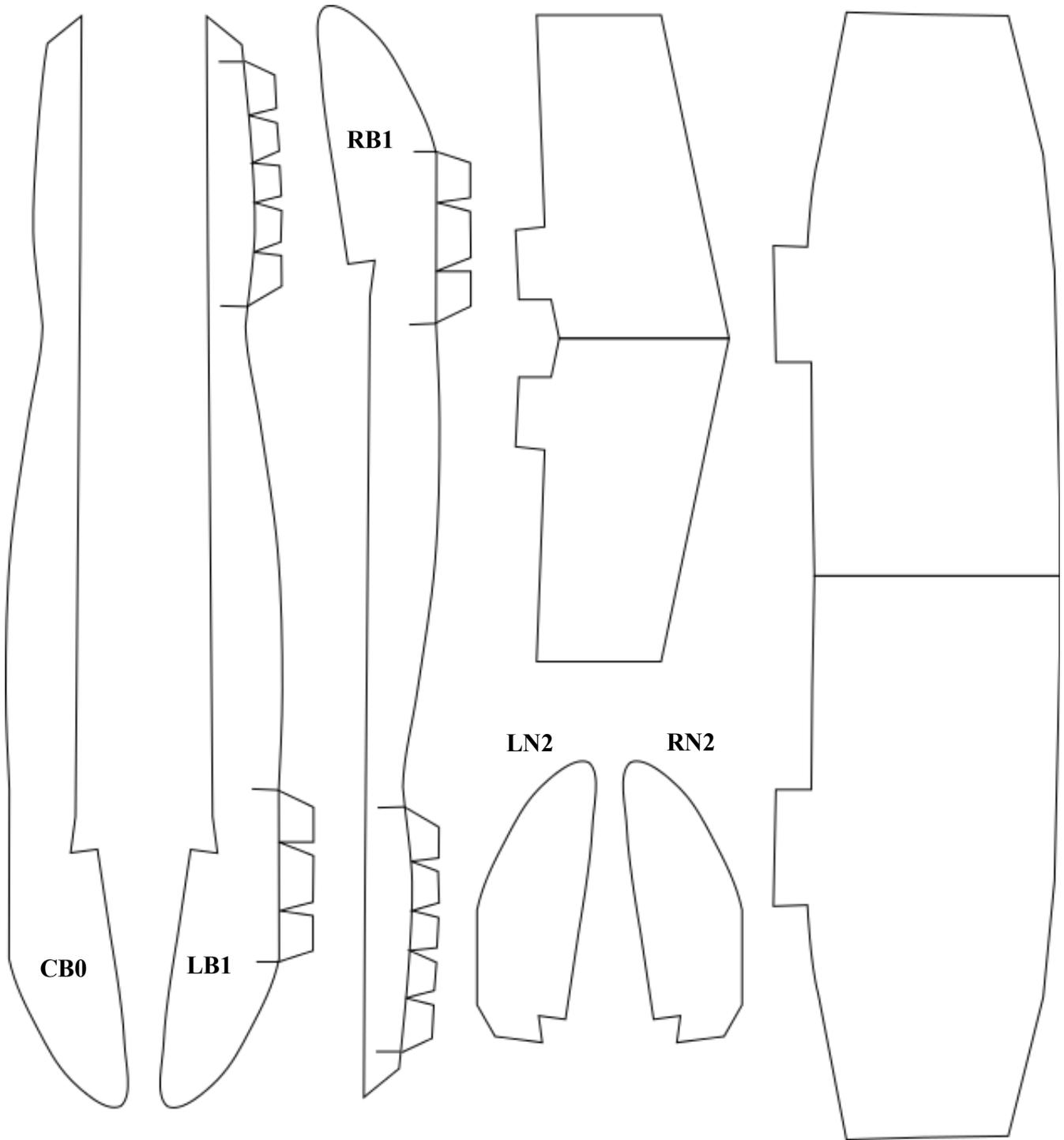
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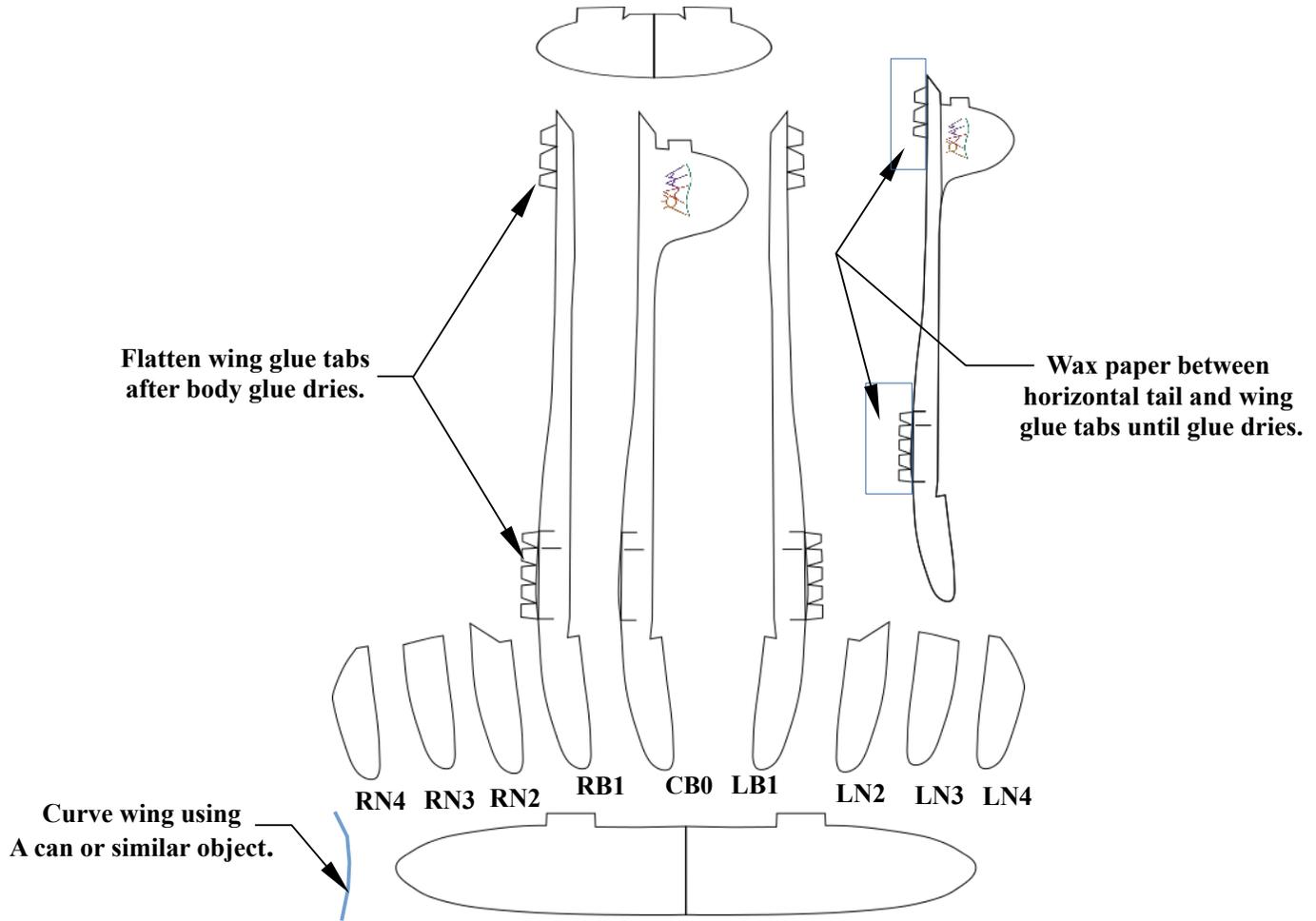
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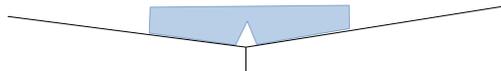


Hand Toss 8



Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1, RB1).
2. After Body dries glue nose pieces on (LN2-4, RN2-4).
3. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat wing along the curve of the can. Flatten wing and tail tabs with pencil or similar item and glue wing and tail in place.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



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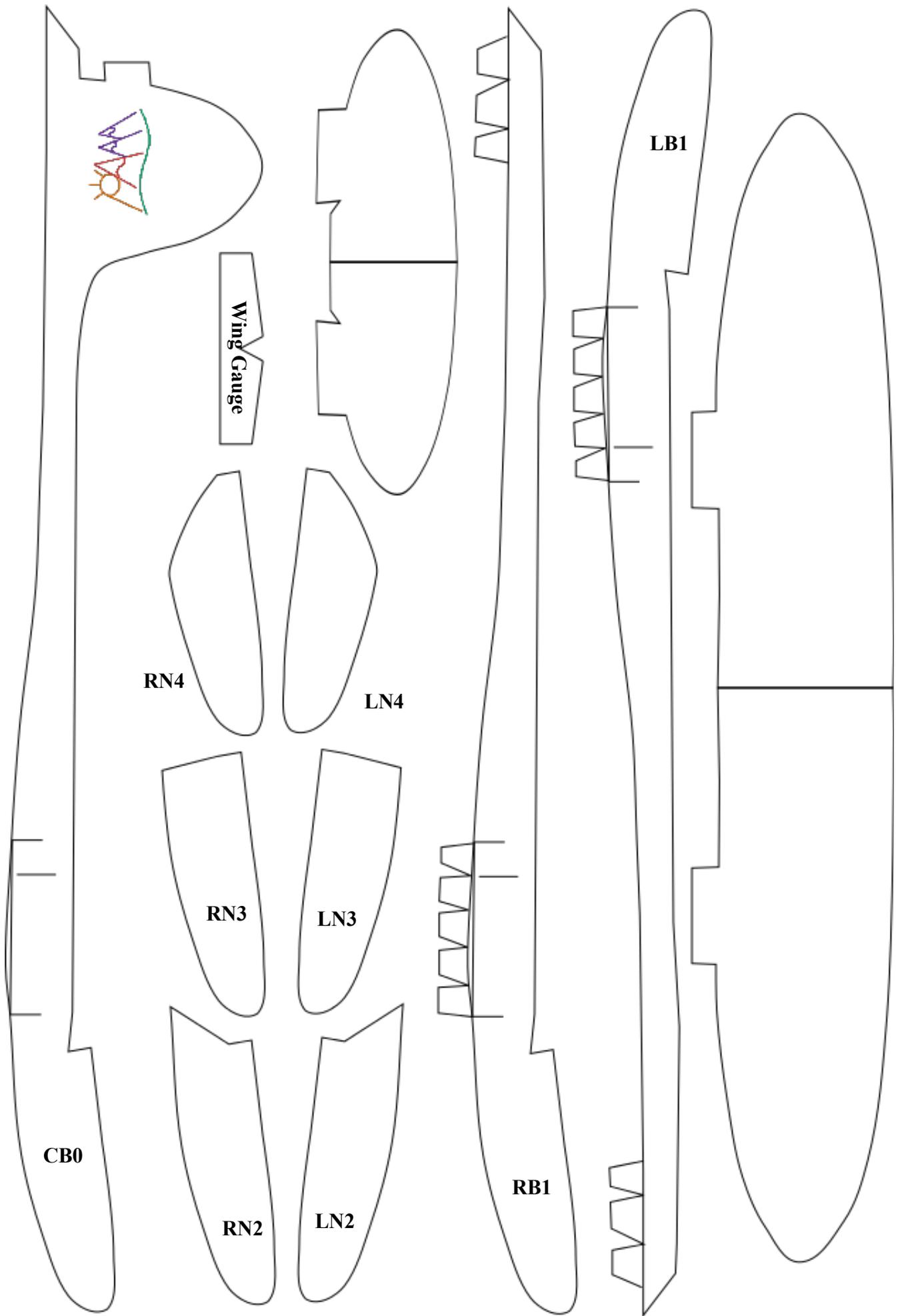
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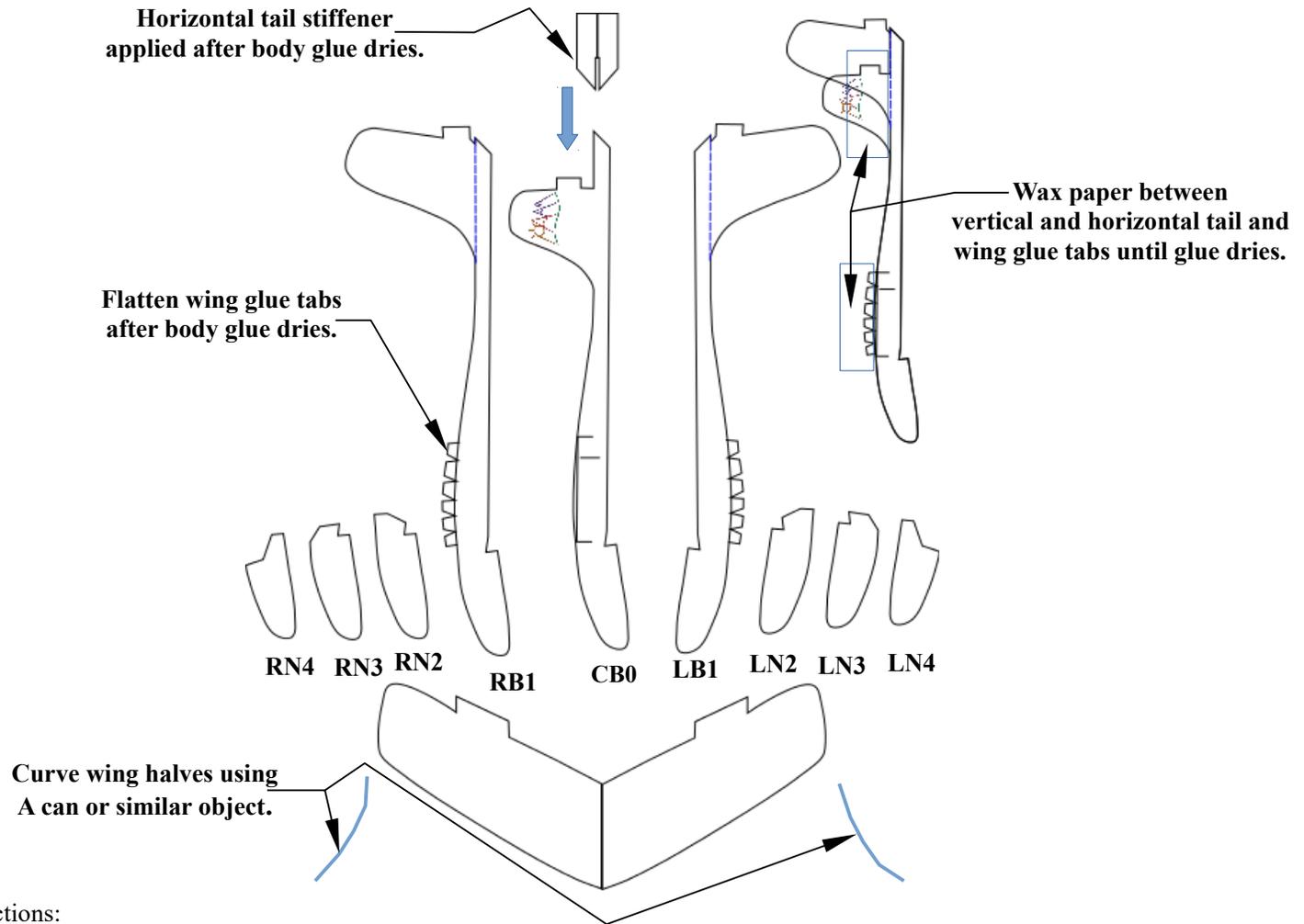
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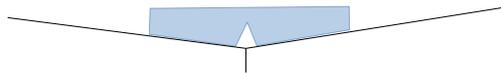


Hand Toss 9



Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2, RN2). Glue tail stiffener on to keep horizontal tail halves level and square.
3. Using a can or other cylindrical item add some initial curve to the wing halves by rubbing flat wing along the curve of the can. Flatten wing tabs with pencil or similar item and glue wing in place. This type of airplane is referred to as a swept wing airplane.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions [here](#).



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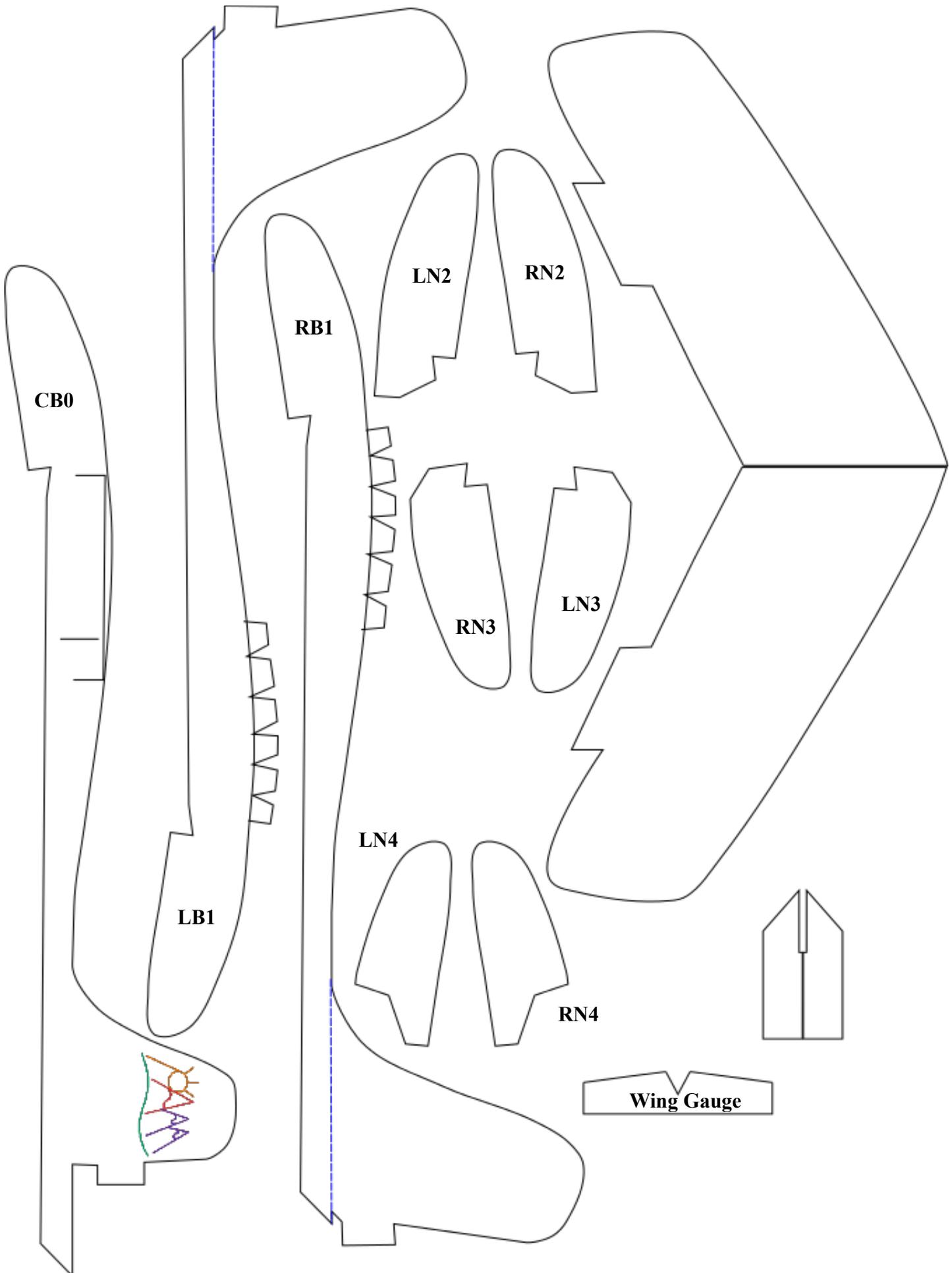
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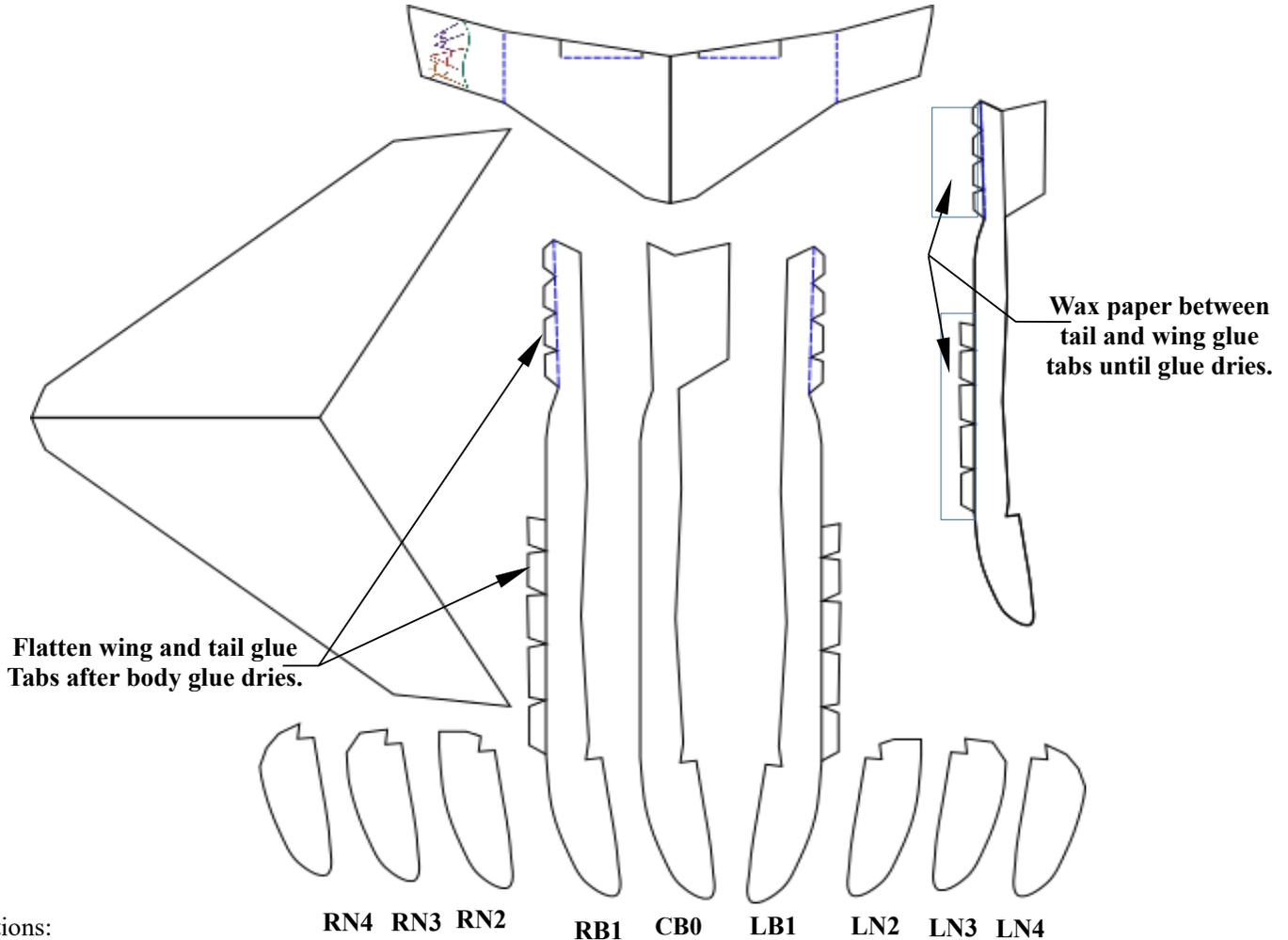
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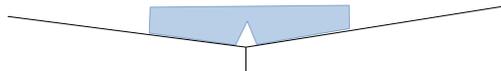


Hand Toss 10

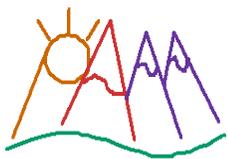


Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1, RB1).
2. After Body dries glue nose pieces on (LN2-4, RN2-4).
3. Leave wing flat. Flatten wing and tail tabs with pencil or similar item and glue wing and tail in place. Bend left and right vertical stabilizers of tail up 90°.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



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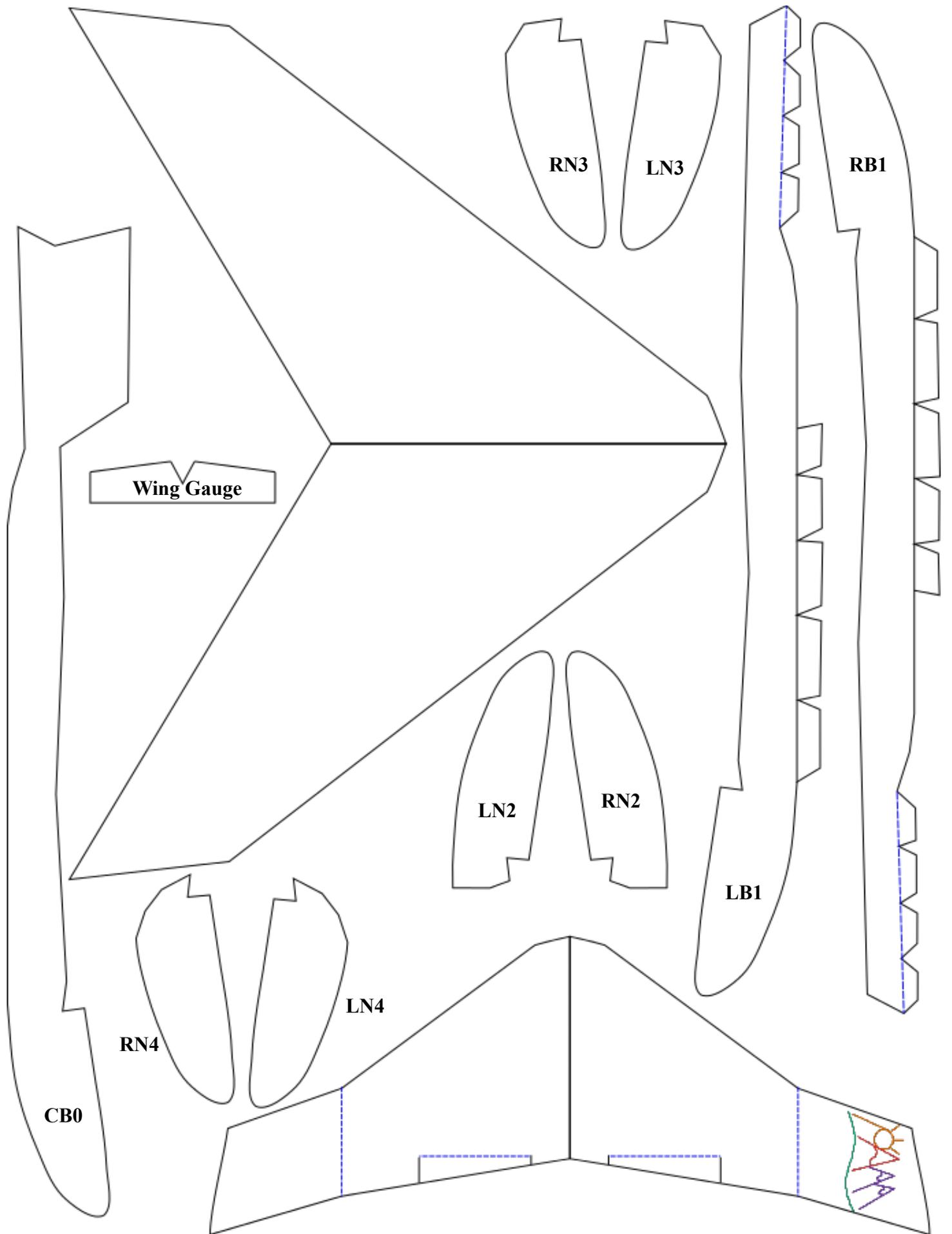
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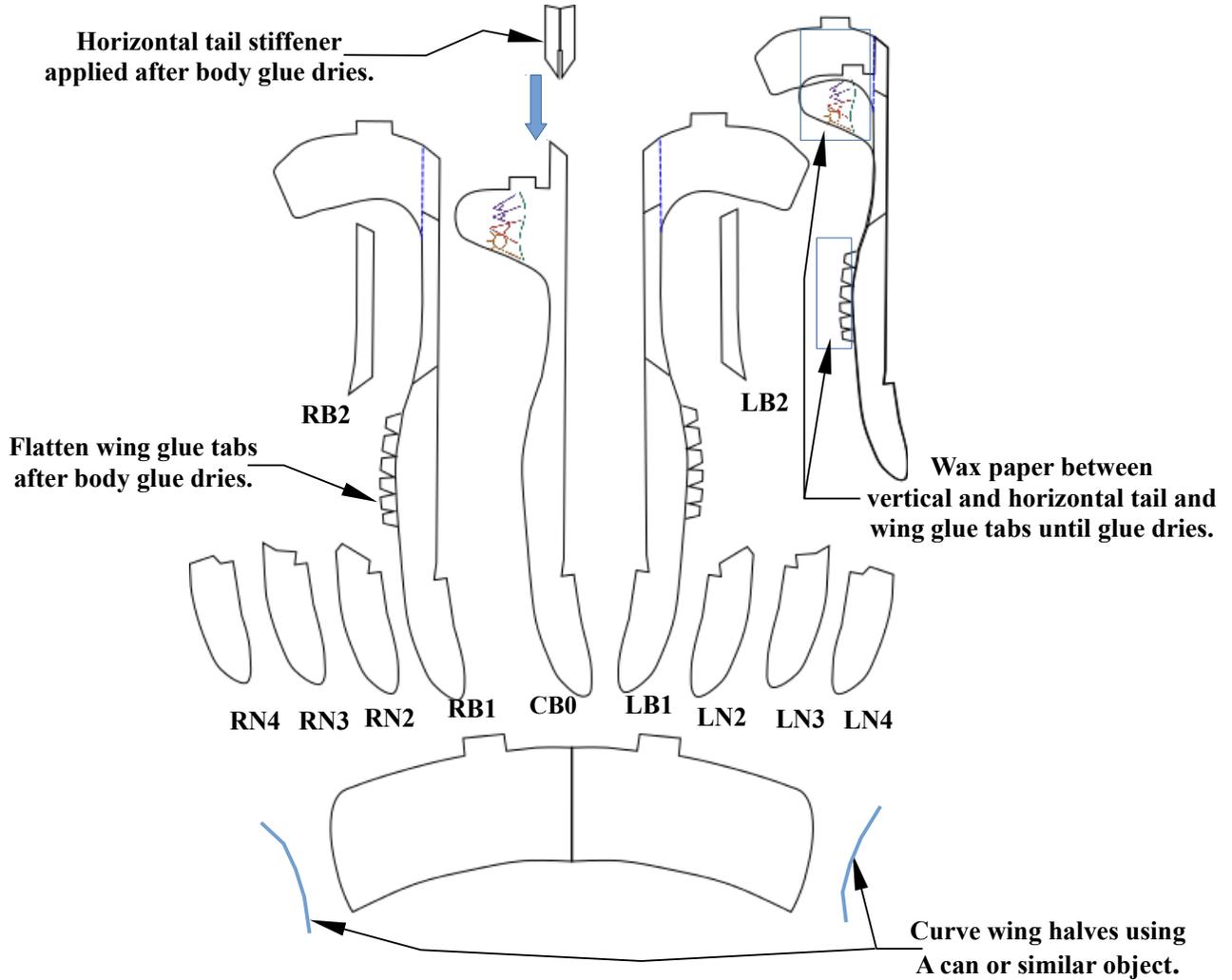
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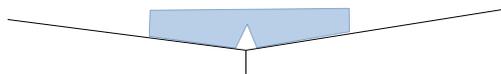


Hand Toss 11

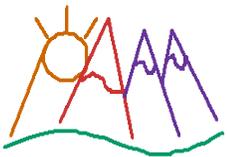


Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2-4, RN2-4). Glue tail stiffener on to keep horizontal tail halves level and square.
3. Using a can or other cylindrical item add some initial curve to the wing halves by rubbing flat wing along the curve of the can. Flatten wing tabs with pencil or similar item and glue wing in place. This style is referred to as a forward swept wing.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions here.



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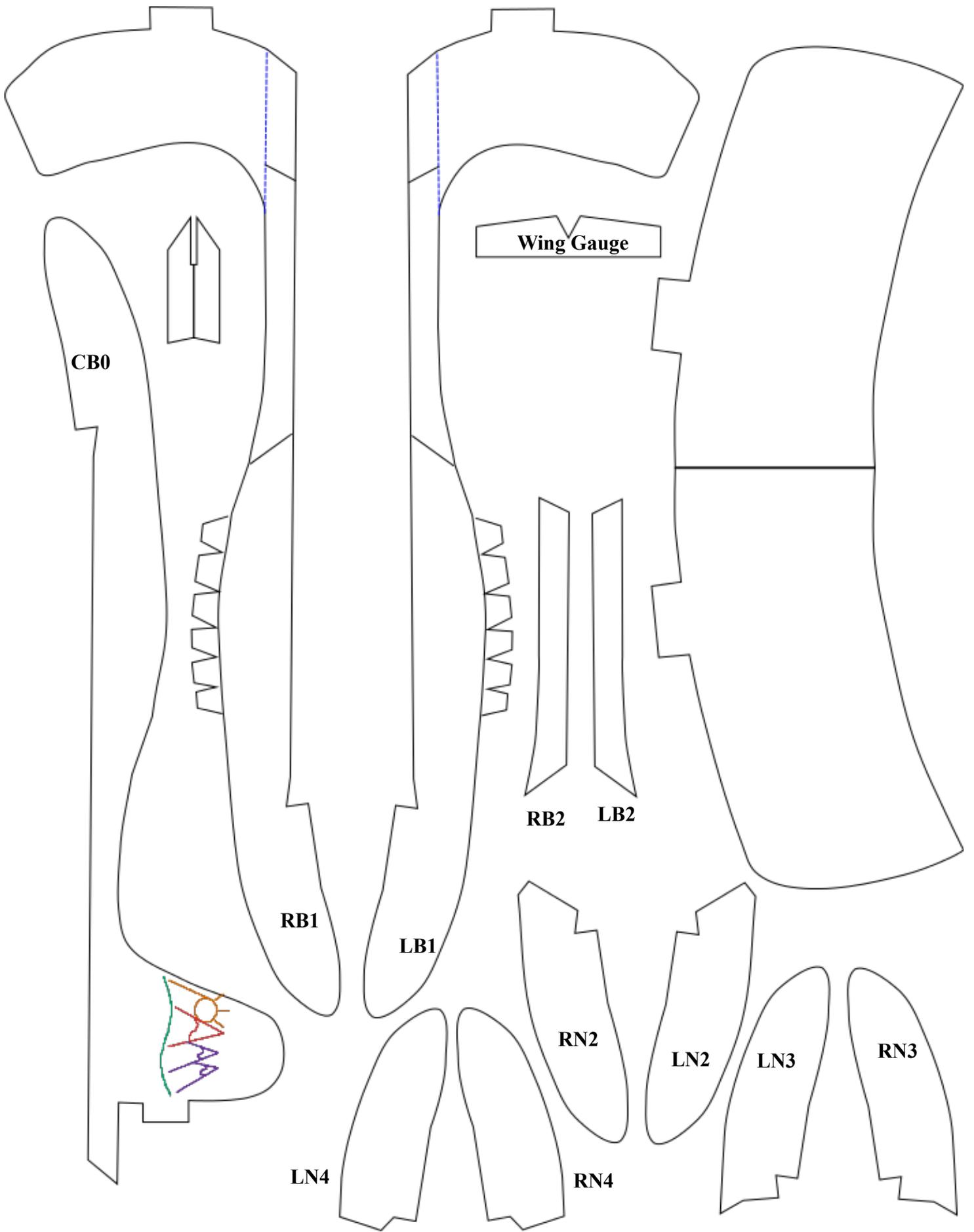
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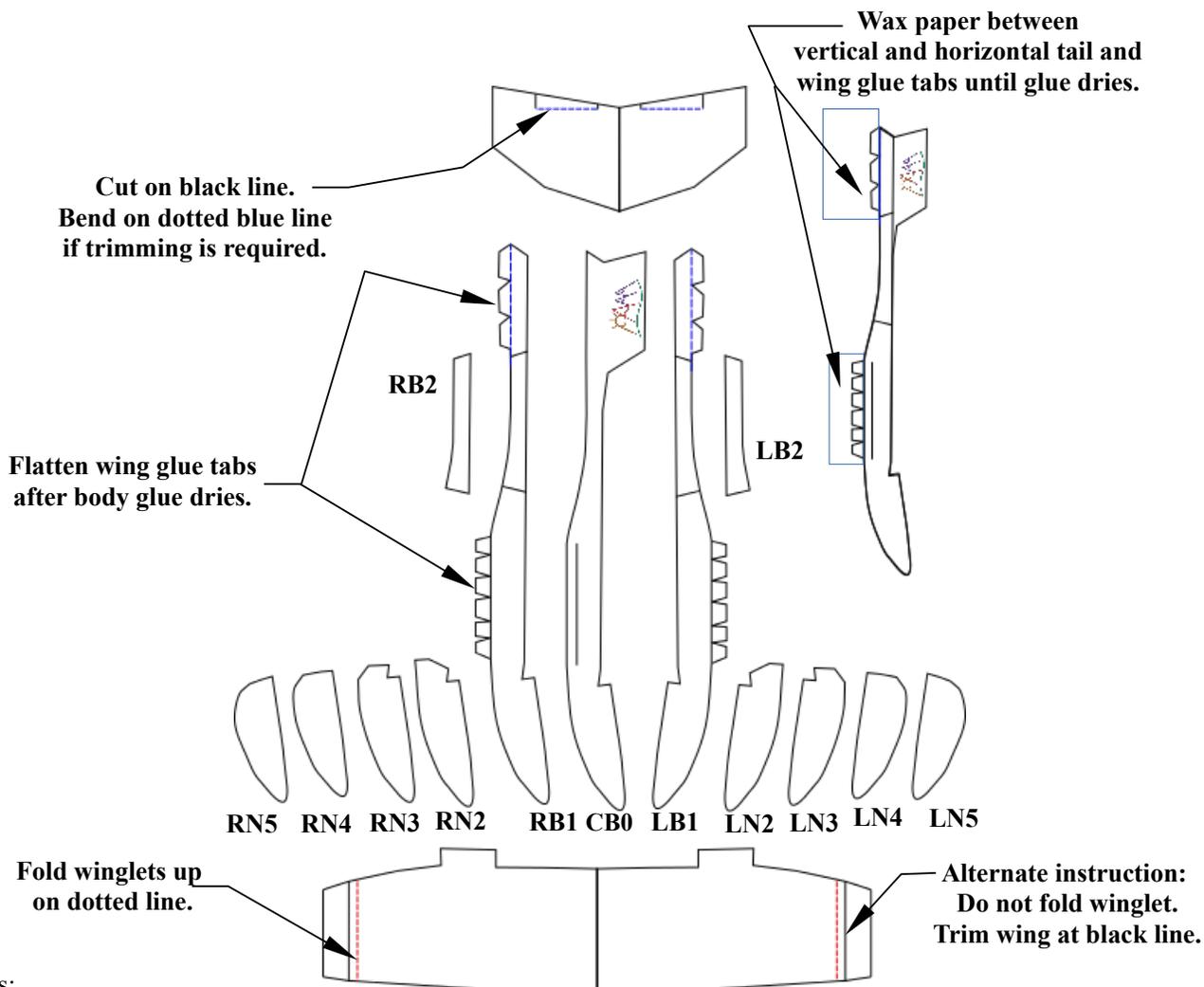
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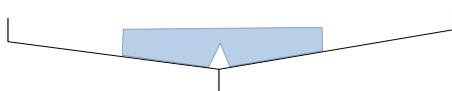


Hand Toss 12



Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN2-4, RN2-4). Glue tail stiffener on to keep horizontal tail halves level and square.
3. Leave wing without any curve. Bend winglets up. Flatten wing and tail tabs with pencil or similar item and glue wing and tail in place.
4. Before Body/Wing assembly completely dries use gauge to set dihedral angle for wings as shown:



Note: Quick instructions only see full instructions here.



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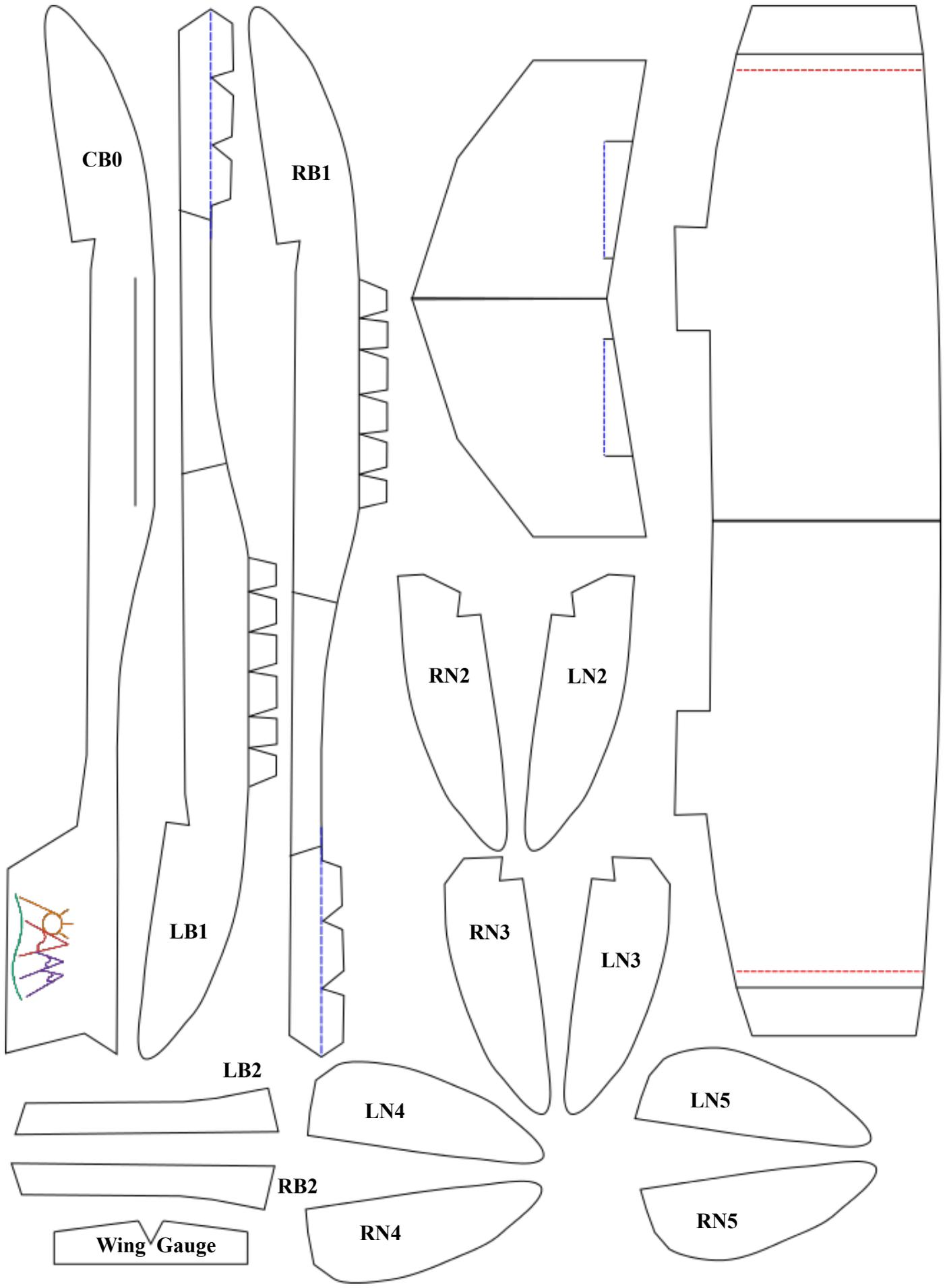
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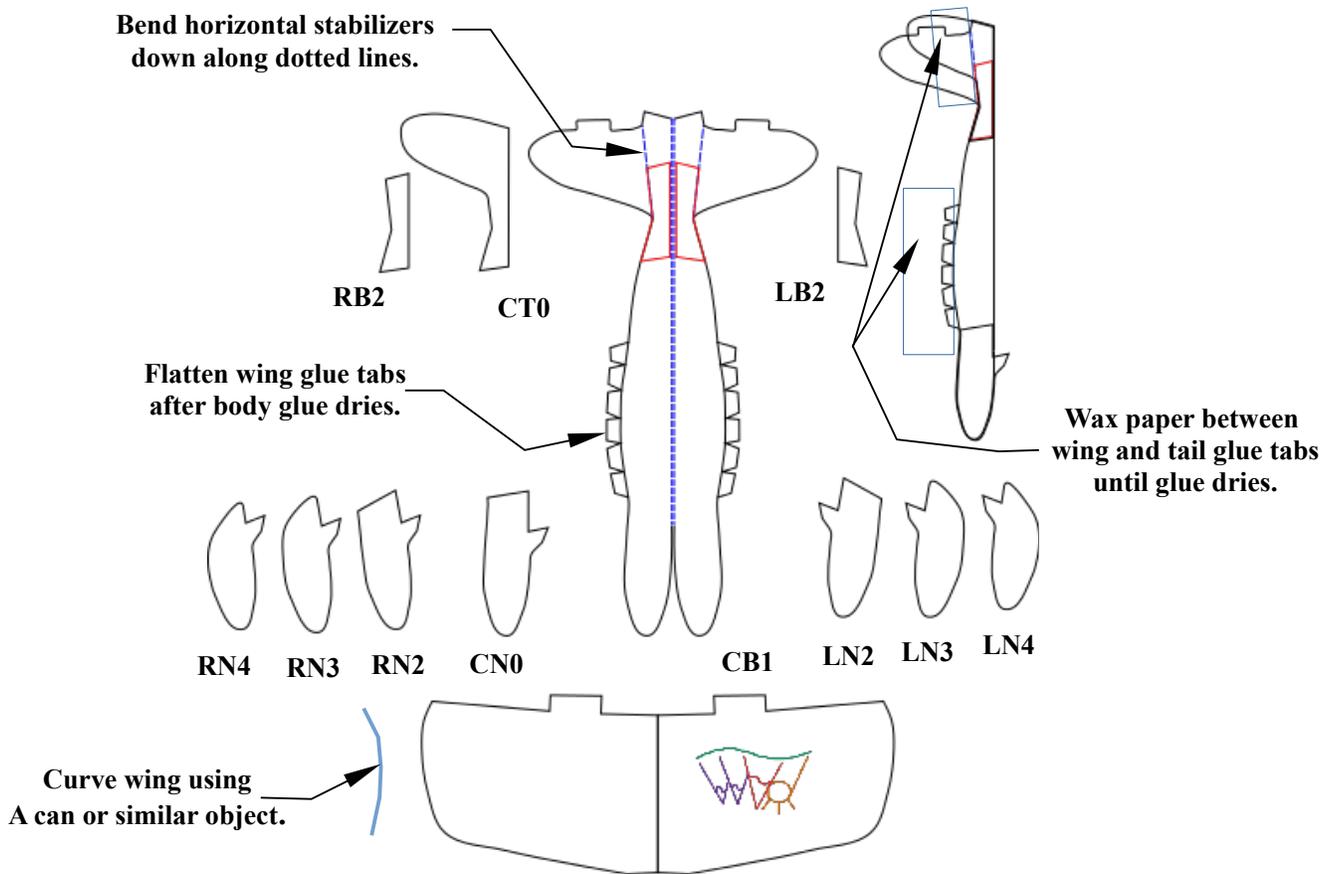
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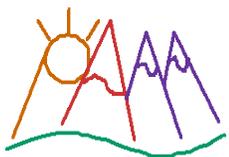
Loop 1



Instructions:

1. Cut out and lay pieces as shown. Fold outer body piece (CB1) on dotted lines.
2. Use a glue stick to glue inner body pieces (CN0 & CT0) to folded outer body piece on both sides.
3. After Body dries glue nose pieces on (LN2-4, RN2-4) and body pieces (LB2 & RB2).
4. Flatten wing and tail tabs with pencil or similar item.
5. Using a can or other cylindrical item add some initial curve to the wing by rubbing flat pieces along the curve of the can.
6. Bend horizontal stabilizers down. Stabilizers bend with a negative angle of attack to allow tail to produce negative lift for looping flight.
7. Glue wing to body.

Note: Quick instructions only see full instructions here.



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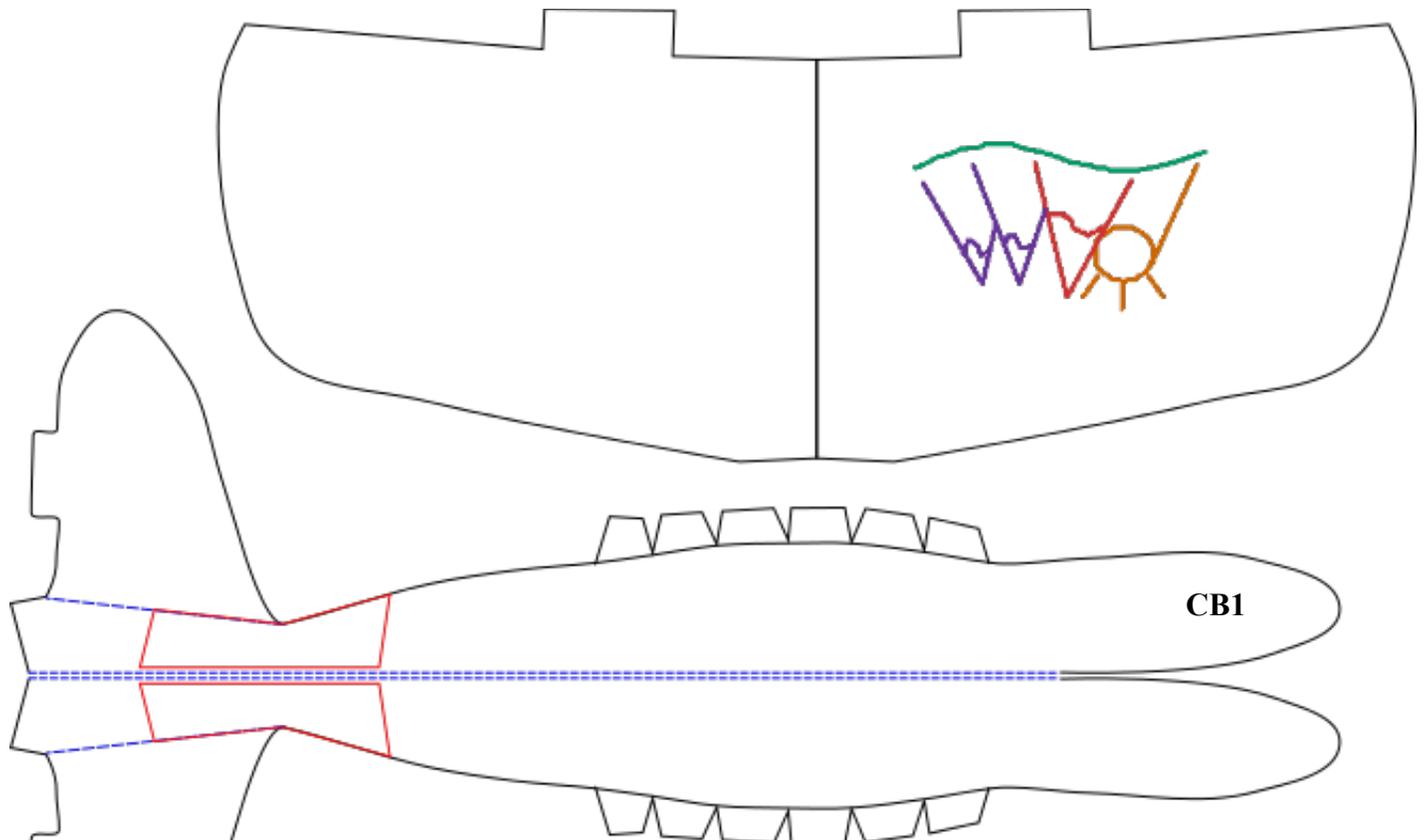
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CB1

CT0

CN0

LB2

RB2

RN4

LN4

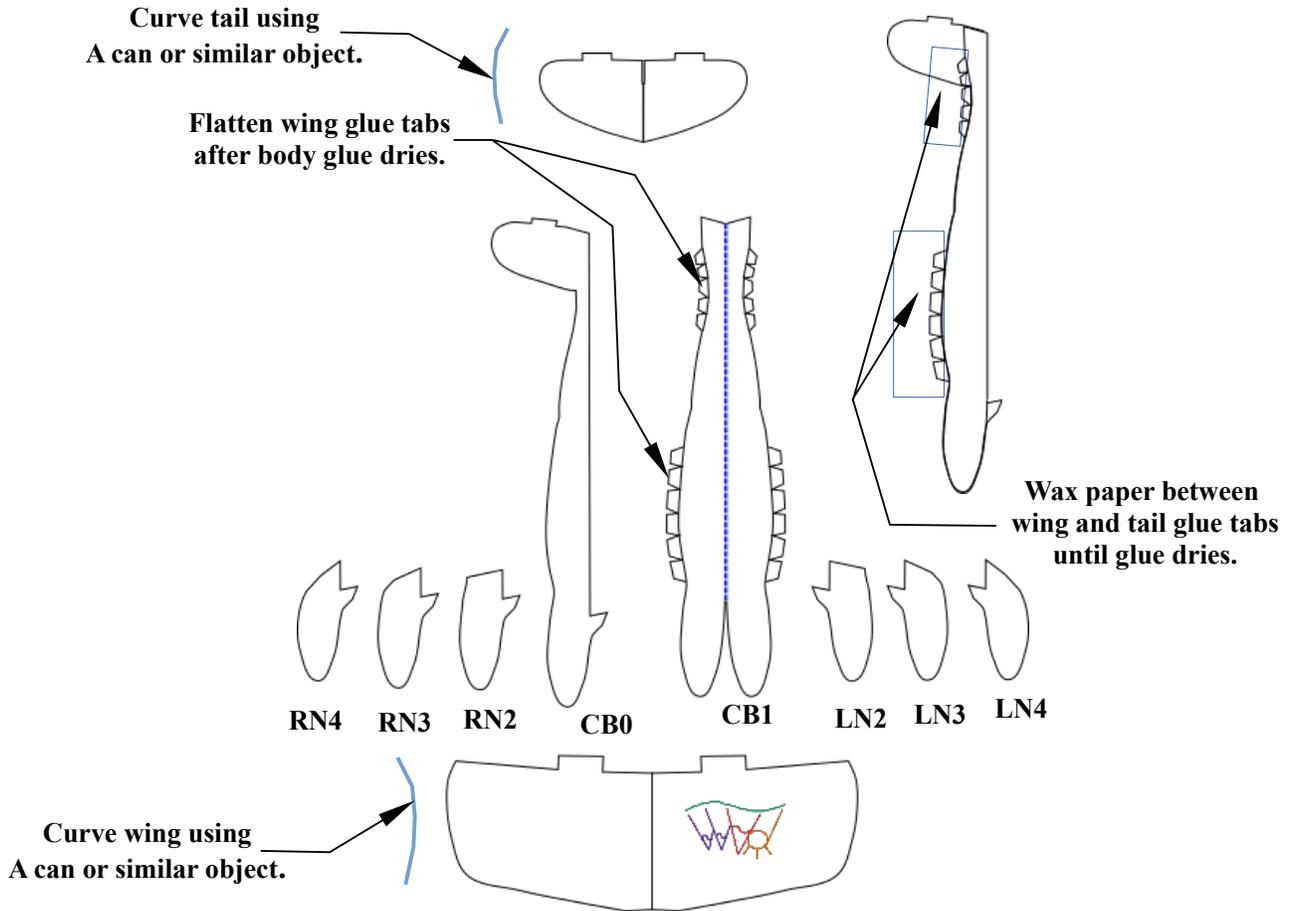
RN3

LN3

RN2

LN2

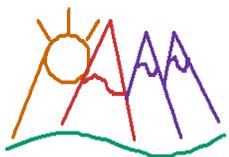
Loop 2



Instructions:

1. Cut out and lay pieces as shown. Fold outer body piece (CB1) on dotted lines.
2. Use a glue stick to glue inner body piece (CB0) to folded outer body piece on both sides.
3. After Body dries glue nose pieces on (LN2-4, RN2-4).
4. Flatten wing and tail tabs with pencil or similar item.
5. Using a can or other cylindrical item add some initial curve to the wing and tail by rubbing flat pieces along the curve of the can. Tail curves on top side to allow tail to produce negative lift for looping flight.
6. Glue wing and tail to body.

Note: Quick instructions only see full instructions [here](#).



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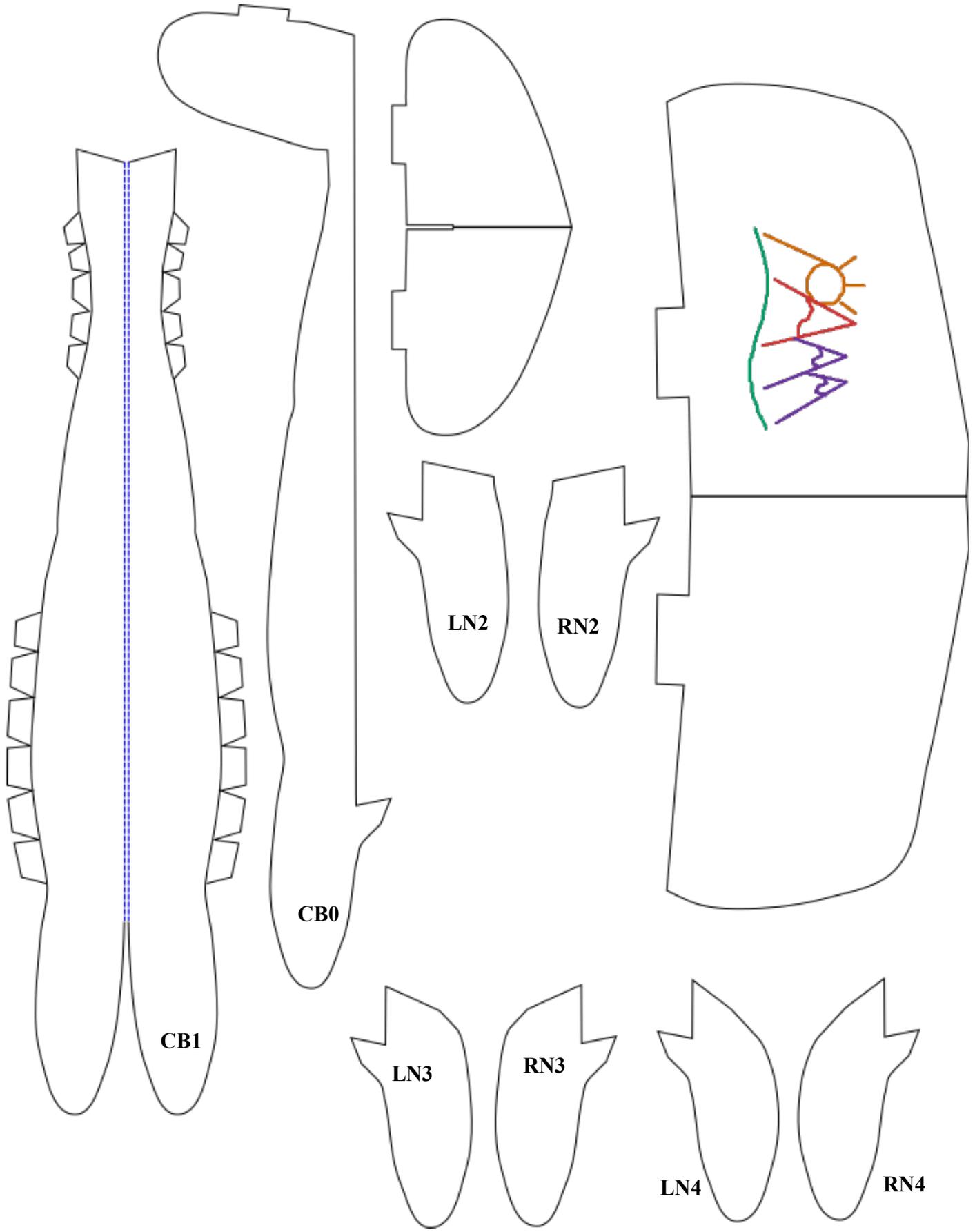
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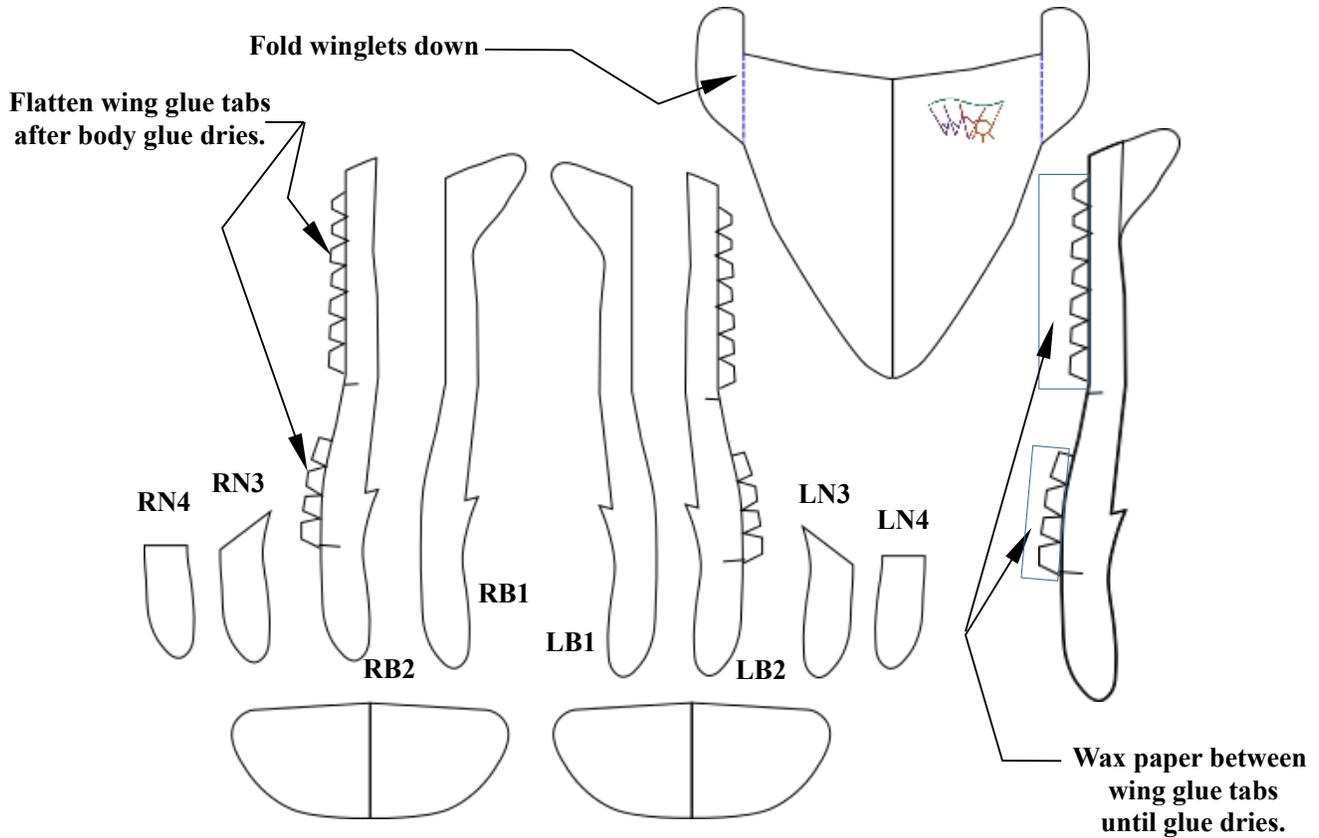
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Delta X Glide



Instructions:

1. Cut out and lay pieces as shown. Starting with center (LB1 & RB1) use a glue stick to glue body section together (LB2, RB2).
2. After Body dries glue nose pieces on (LN3&4, RN3&4).
3. Flatten wing and tail tabs with pencil or similar item. Fold winglets down on dotted lines.
4. Glue wing to body. Glue both halves of horizontal stabilizer together let dry and glue onto plane (goes on plane in front of wing).

Note: Quick instructions only see full instructions [here](#).



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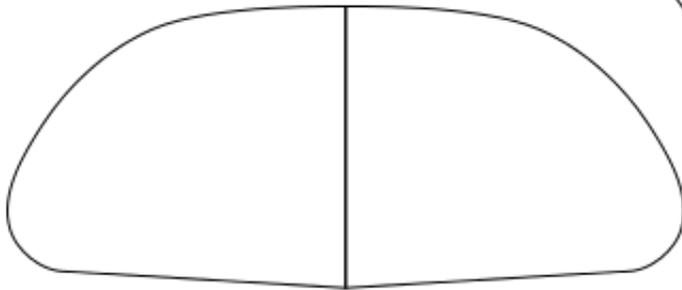
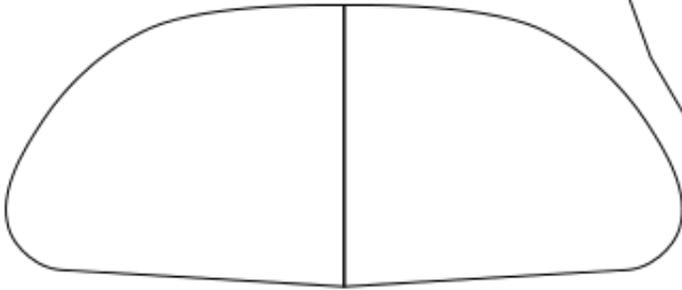
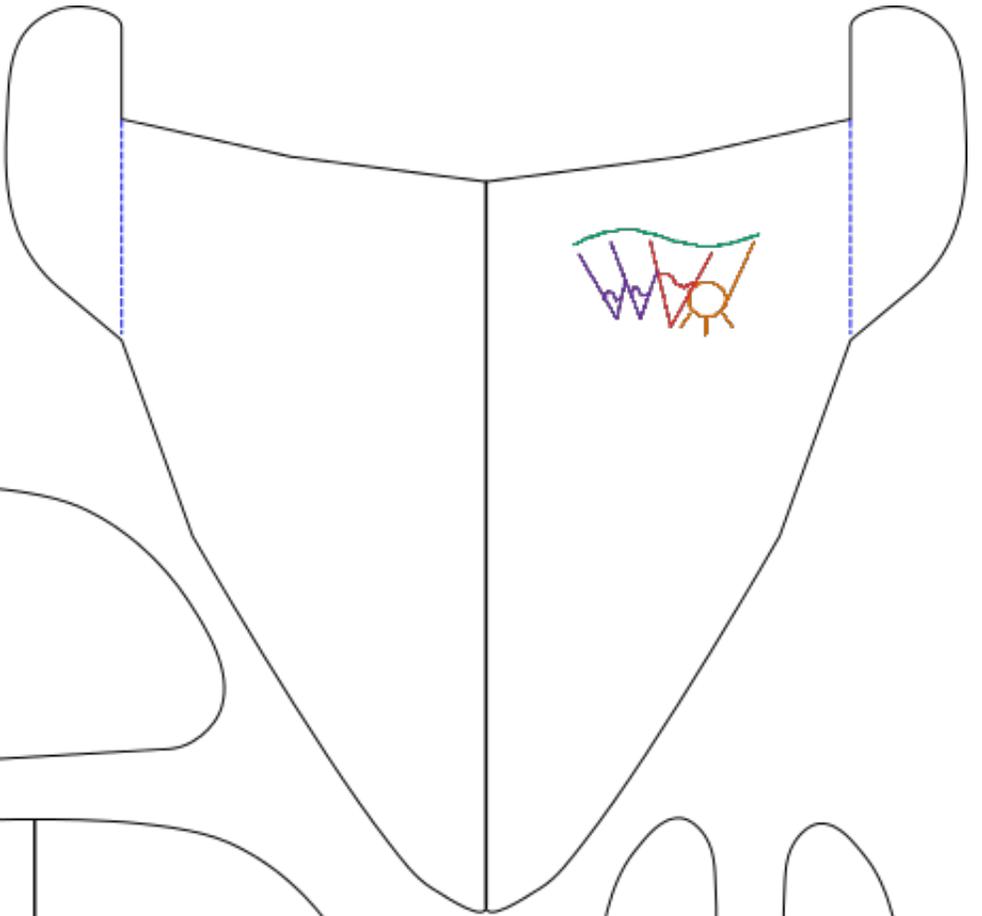
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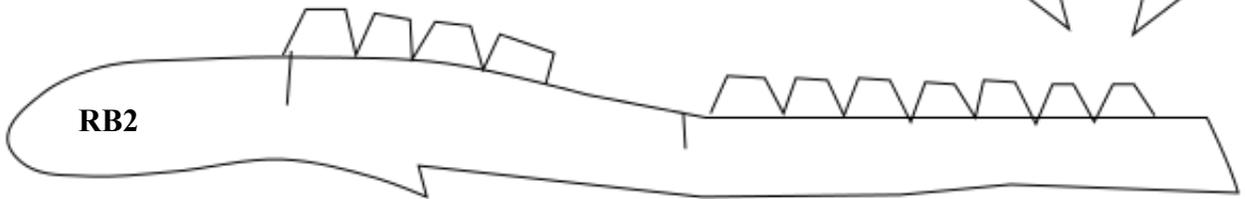
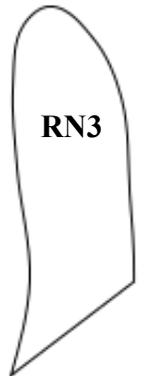
LN4

RN4

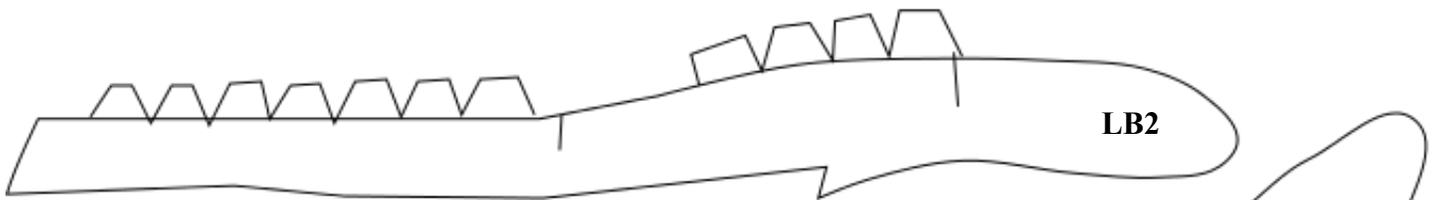


LN3

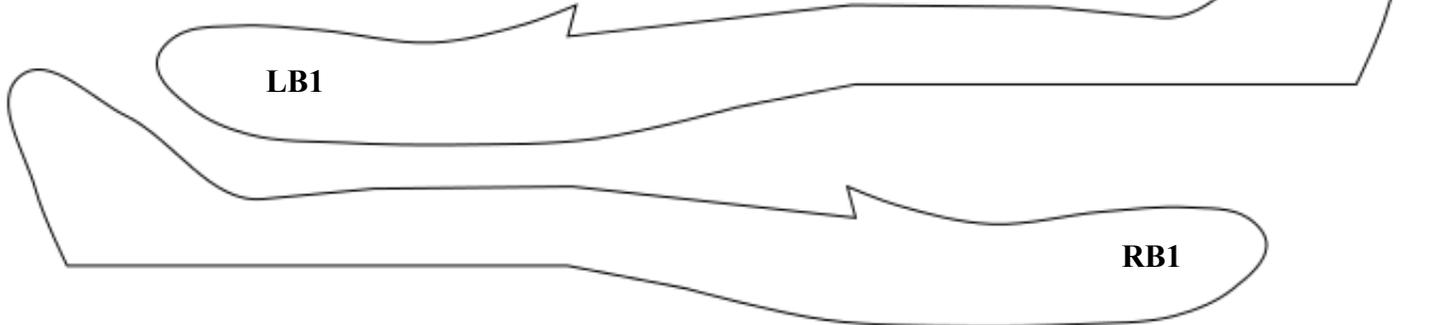
RN3



RB2



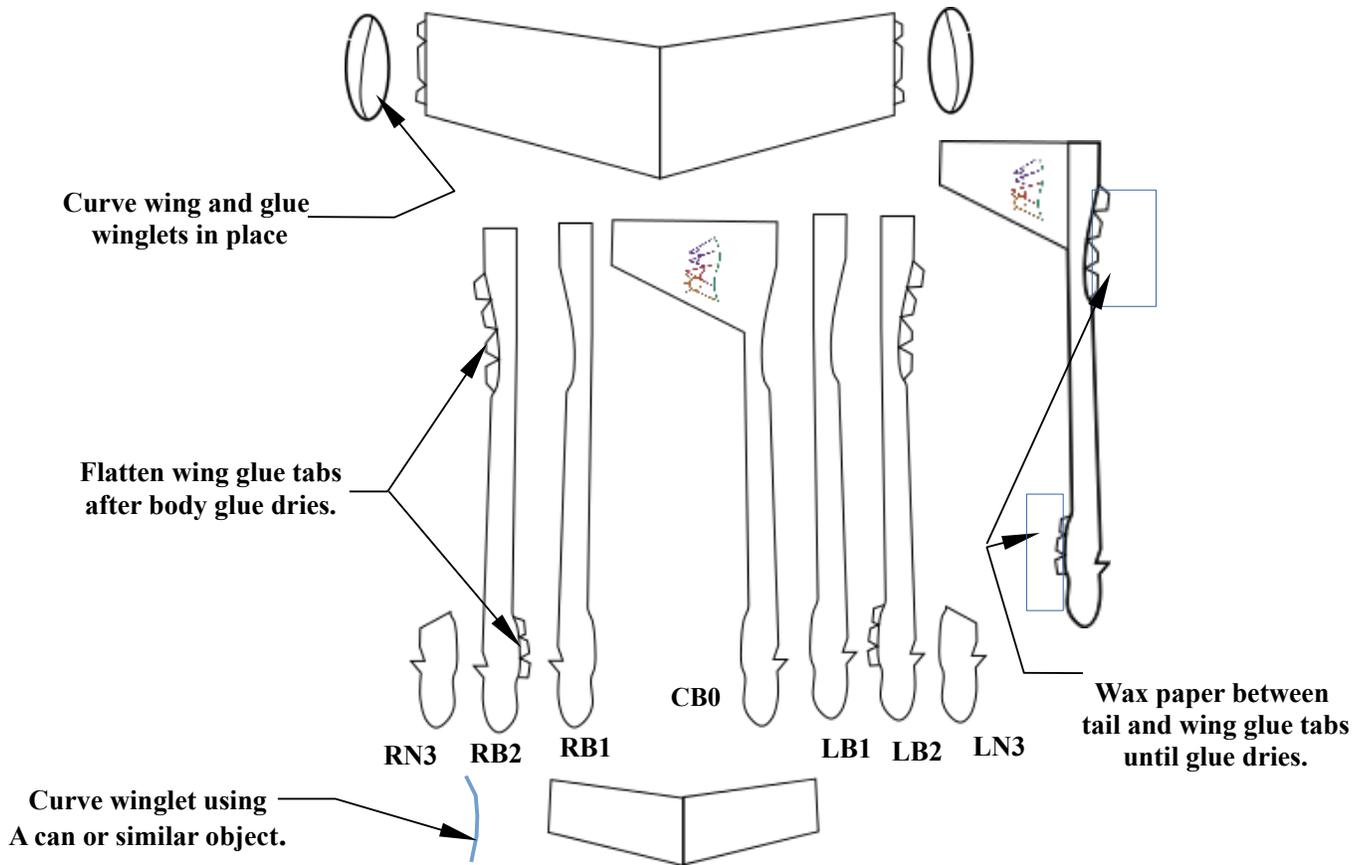
LB2



LB1

RB1

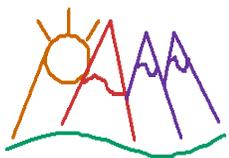
PW Jet



Instructions:

1. Cut out and lay pieces as shown. Starting with center (CB0) use a glue stick to glue body section together (LB1&2, RB1&2).
2. After Body dries glue nose pieces on (LN3, RN3).
3. Using a can or other cylindrical item add some initial curve to the wing and tail by rubbing flat wing along the curve of the can.
4. Flatten wing and tail tabs with pencil or similar item. Glue winglets to curved wing.
5. Glue wing assembly and tail to body.
6. This plane is a low wing (wing below body) canard (wing to back of plane).

Note: Quick instructions only see full instructions [here](#).



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