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B.C. Air Originals

Step By Step Construction Plans.

24 Pages With Over 60 Full Color Photos showing how to build the

Can be made from most 16oz Beverage Cans.

TOP SECRET

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Welcome to the **B. C. Air *Originals*** Squadron.

This booklet contains complete step by step instructions for building the **B. C. Air *Originals* Helicopter**. Before you start building your first Helo it is suggested that you review the entire set of plan directions. Once you have previewed the construction steps you should start collecting the cans that you want to use to make your first Helo. These plans are designed to be used with any 16 oz. beverage can. Always use clean, unscratched and undented cans for the best looking Helicopters.

Since the building of these planes requires the cutting of cans and the use of sharp tools, **CHILDREN SHOULD NEVER ATTEMPT THE CONSTRUCTION OF THESE PLANES WITHOUT ADULT SUPERVISION AND GUIDANCE. CONSUMER ACCEPTS ALL RESPONSIBILITY FOR ANY INJURY INCURRED IN THE BUILDING OF THESE PLANES.**

It is not necessary to follow all the building steps in the order presented. Such as, if you want to make the Tail Section first, you can do that and then set it aside until you need it. However, until you understand the construction of these planes, it may be easier to follow the steps in the order listed. Your very first step should be to make a copy of all the templates. **All templates are drawn to scale.** Using a sheet of mylar (Clear Plastic) will enable you to re-use your templates again and again. There is no limit to the number of Helos you can build with these plans.

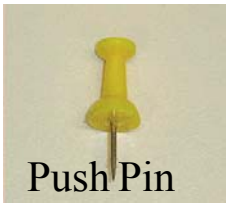
We, at **B. C. Air *Originals***, will make every effort to assist you in answering any questions you may have about the construction of these Helicopters. Please feel free to contact us ANY TIME at command@bcairoriginals.com or P.O.Box 4053, Helena, MT 59604.

Thank you for your interest in the **B. C. Air *Originals*** and have **FUN!**

D. P. (Wayne) Mathis

The following is a list of tools and materials I use to build these planes.
You may find that you do not need all of the tools that I use.
Use whatever works best for you.

Hand Stapler

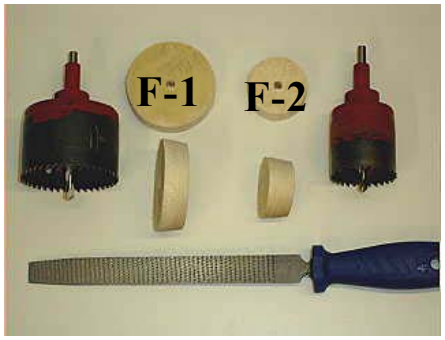

Push Pin

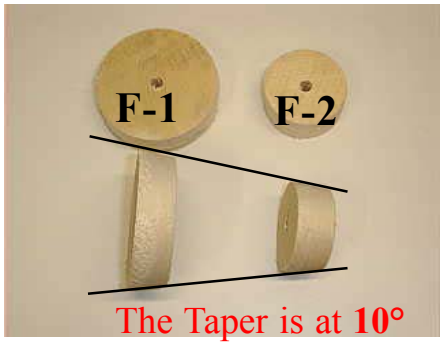
- Small hammer of some kind.
- Pliers.
- Flat head screw driver.
- Hand stapler.
- Snap (carpet) stapler.
- Push Pin.
- Hot glue gun.
- Awl (old screw driver sharpened to a point).
- Wire cutter.
- X-acto knife (hobby knife) (box opener).
- Scissors & Can Opener.
- Ruler (straight edge).
- Felt tip pen (any color).
- Needle nose pliers.
- Open end wrench (to fit whatever size nuts you'll use).
- Hand drill (1/4" works fine).
- Hole saw (2 different sizes - 2 3/4" & 1 7/8").

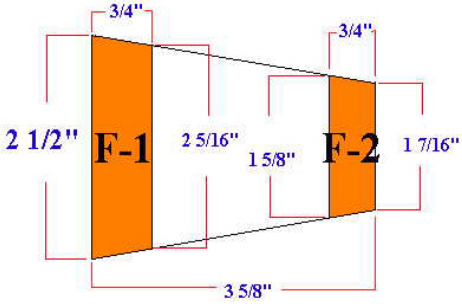
Materials -

- Aluminum Cans (beer, pop, soda, juice, etc) any 12 oz. size will work.
- Bottle caps.
- Corrugated Cardboard.
- Tape (any kind) & Glue (2-Part Epoxy works best).
- Chipboard (thin cardboard, not corrugated).
- Mylar (Clear plastic).
- Copper Coated Welding Rod, Music Wire or any other straight wire .
  (2 sizes - 1/16" & 3/32")
- Hazel Nuts (Acorn Nuts, Cap Nuts, Toothpaste Caps).
- Screws, Nuts and Bolts.
- Wire clip (speed nut).

Using two hole saws (the larger one is 2 3/4” and the smaller one is 1 5/8”) cut two circles from any kind of wood that is 3/4” thick. Soft Pine like that used to make wooden pallets works best. These two wooden circles will now become **F-1** & **F-2.**







Using a wood rasp (or similar tool) taper both **F-1** & **F-2** as shown above. The “Perfect” **F-1** and **F-2** would have the dimensions shown at left. But they don’t have to be perfect as long as **F-1** DOES NOT EXCEED 2 1/2” in diameter. Work **F-1** down to a size (approx. a little less than 2 1/2” in diameter) that will allow it (once wrapped with can **B-2C** Step # 3 & # 7) to fit inside Can B-1 (Step # 8)**.**

NOTE: You can also use a jigsaw or any other method at your disposal to obtain **F-1** & **F-2** as long as you end up with the same dimensions.

WHEN MAKING THE HELICOPTER YOU WILL ONLY NEED F-1

Cutting Cans

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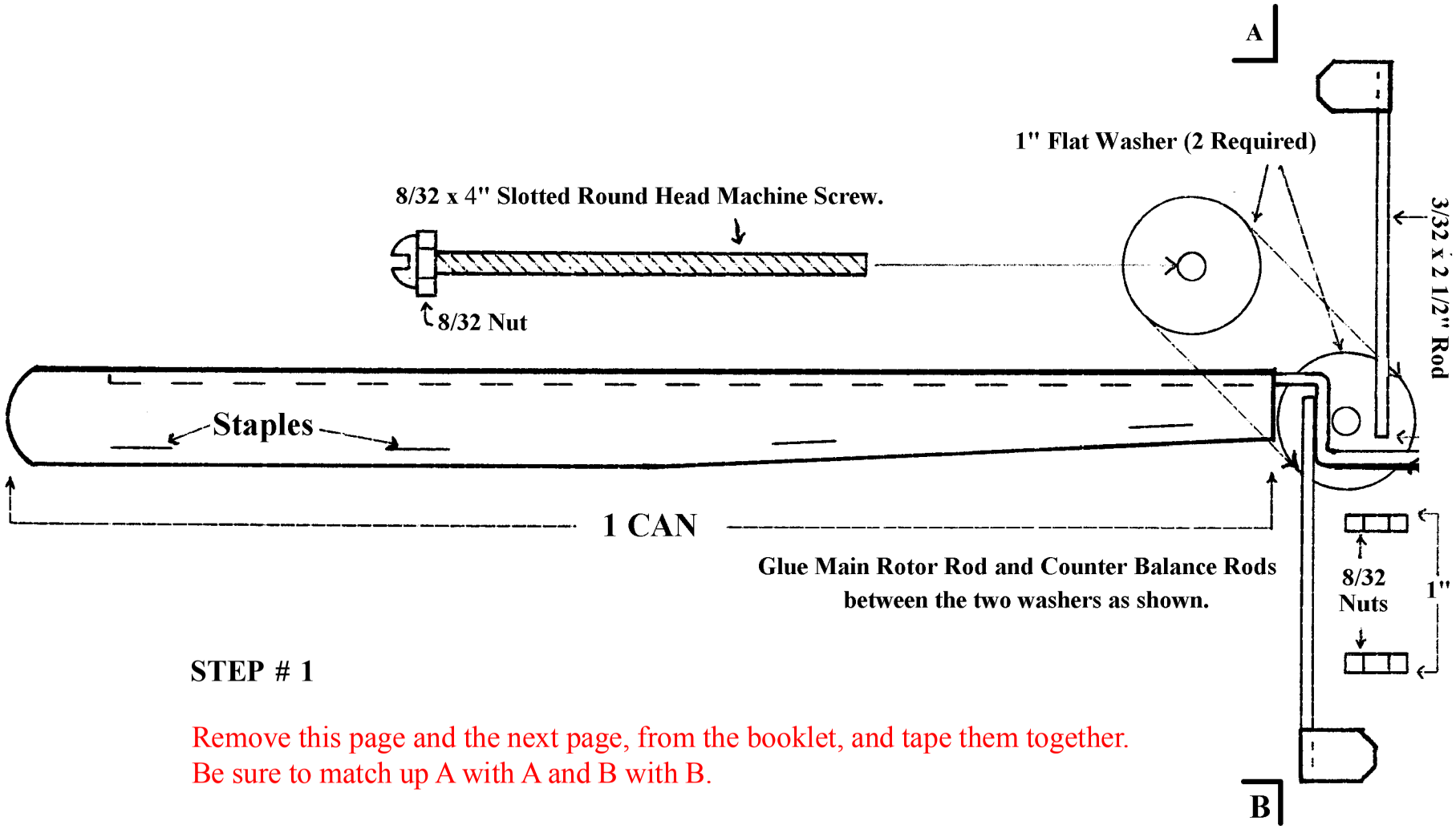
The building of these planes requires that both the Tops and/or Bottoms of beverage cans be cut off. While you can decide for yourself which method you use to accomplish this, most builders use a Dremal® Tool in a fashion similar to that shown above. The Dremal® is secured to a board with the use of a hose clamp. Two guide rails are used to cradle the can. A cutting wheel is used to cut the Bottom of the can off first, and then the Top is cut off. Again, you can use any other method at your disposal to remove the Tops and Bottoms of the cans. Use whatever means you feel most comfortable with.

MAIN ROTOR LEFT SIDE

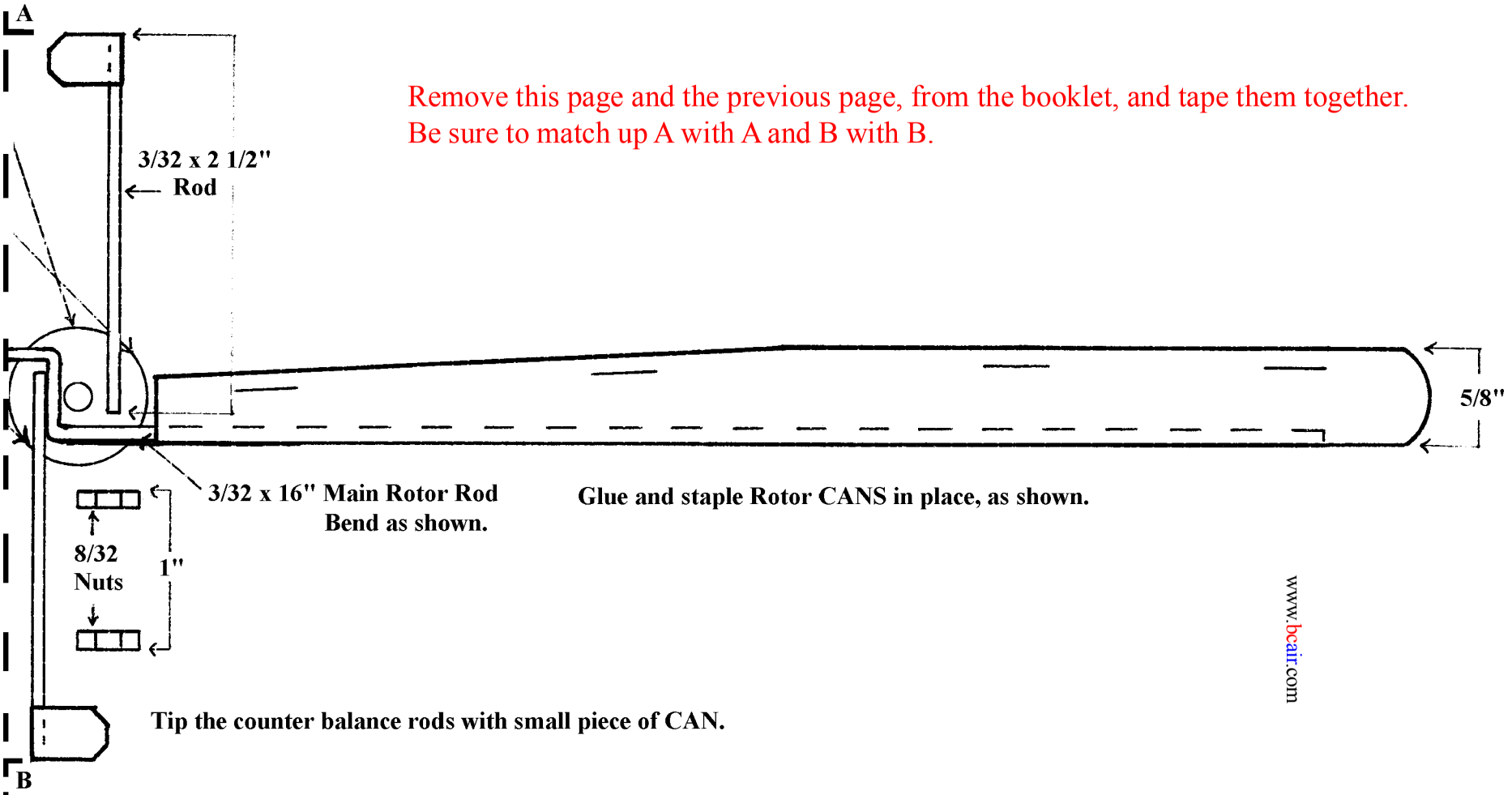


STEP # 1

Remove this page and the next page, from the booklet, and tape them together.
Be sure to match up A with A and B with B.

MAIN ROTOR RIGHT SIDE

Tip the counter balance rods with small piece of CAN.



Remove this page and the previous page, from the booklet, and tape them together.
Be sure to match up A with A and B with B.

Glue and staple Rotor CANS in place, as shown.

Tip the counter balance rods with small piece of CAN.

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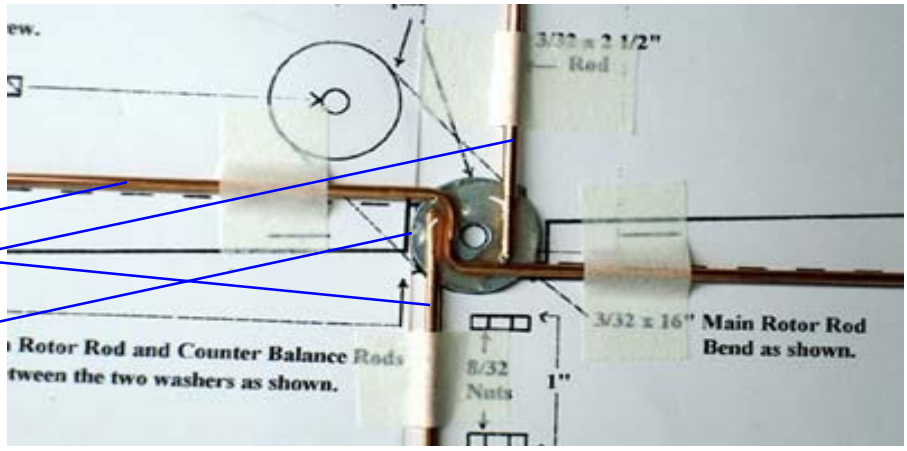
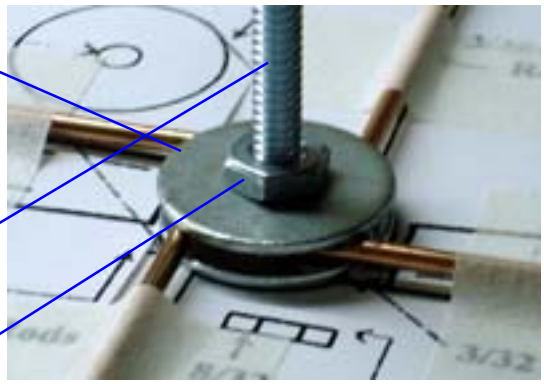
STEP # 2

Take a piece of 3/32” rod 16 1/2” long and bend it as shown for the **M**ain **R**otor **R**od (**MRR**). Epoxy the **MRR** and the **C**ounter **B**alance **R**ods (**CBR**), which are each 3/32” rod 2 1/2” long, to a 1” **F**lat **M**etal **W**asher (**FMW**) as shown.



STEP # 3

Epoxy a second **FMW** on top of the **MRR** and **CBR**. Be sure the holes in the **FMW**’s align. You can insert the 8/32 4” **M**achine **S**crew (**MS**) through the holes in the **FMW**’s and thread an 8/32 nut on as shown, to keep everything tight until the epoxy dries. Then REMOVE the nut & **MS**.



Use cloth pins to hold in place until epoxy is dry.

STEP # 4

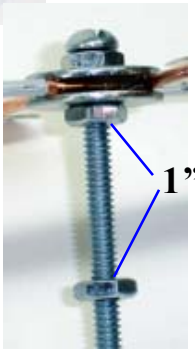
Bend 1 Can (from Step # 8) around each side of the **MRR** and epoxy in place.

STEP # 5

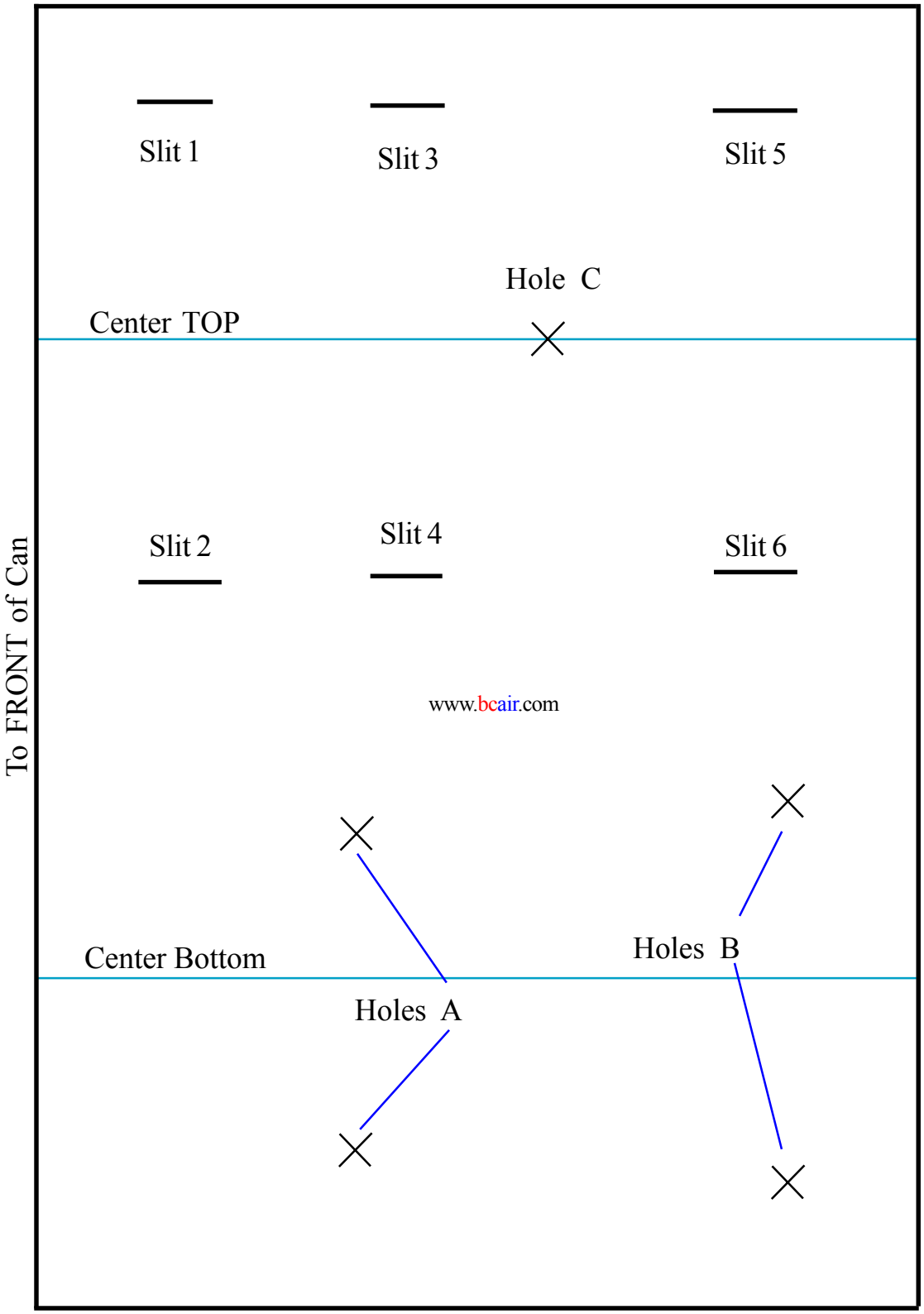
When the Cans are secure to the **MRR** trim as shown and tip the ends of the **CBR**’s with a piece of Can as shown.

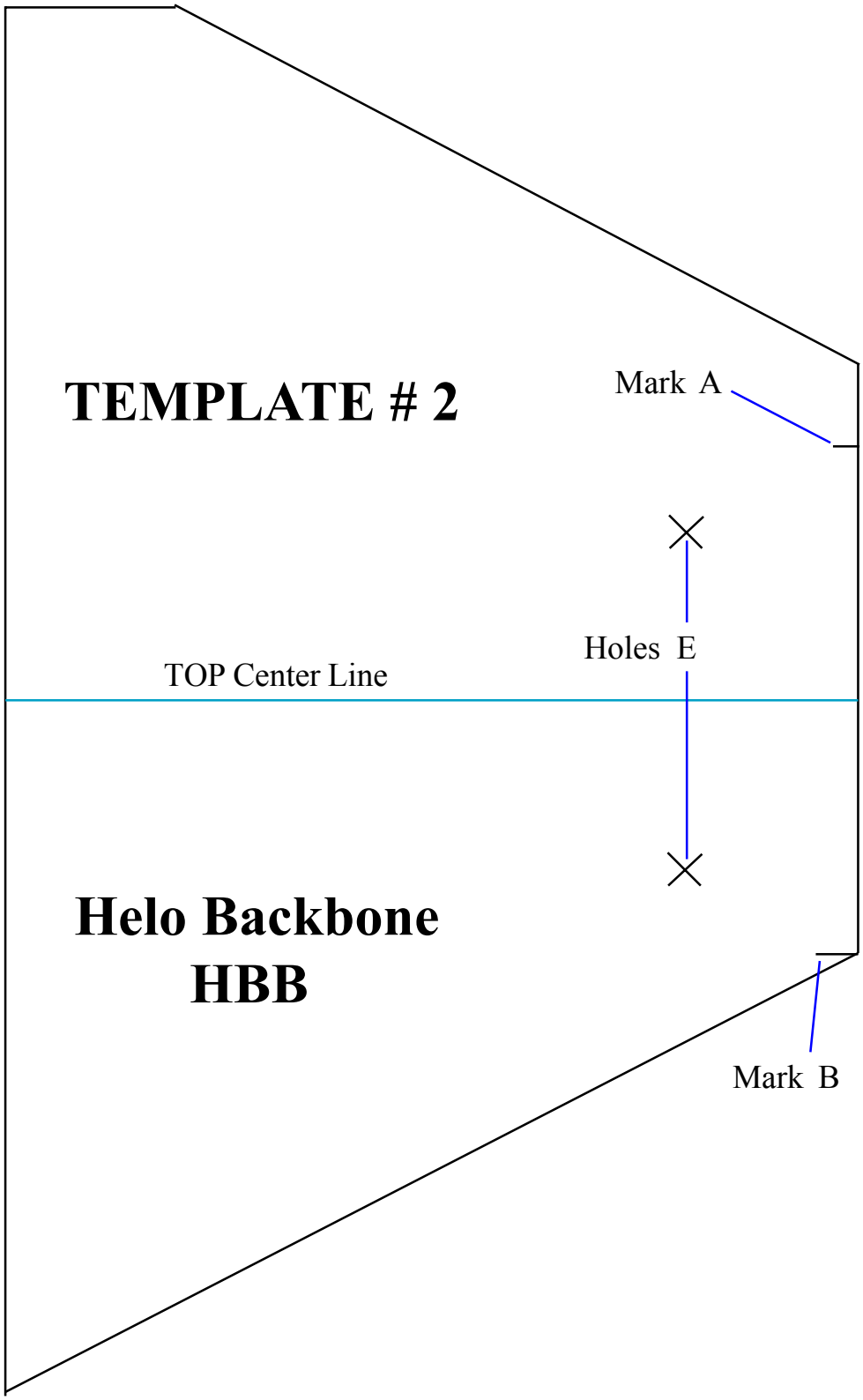
STEP # 6

Thread a 8/32 nut onto the **MS** and Re-insert the **MS** through the **FMW**’s. Thread a second and a third 8/32 nut onto **MS** as shown. Set Main Rotor aside until Step # 29.



TEMPLATE # 1


Slit 1
Slit 3
Slit 5
Hole C
Center TOP
Slit 2
Slit 4
Slit 6
To FRONT of Can
www.bcair.com
Holes B
Center Bottom
Holes A


TEMPLATE # 2
Mark A
Holes E
TOP Center Line
Helo Backbone
HBB
Mark B

STEP # 7

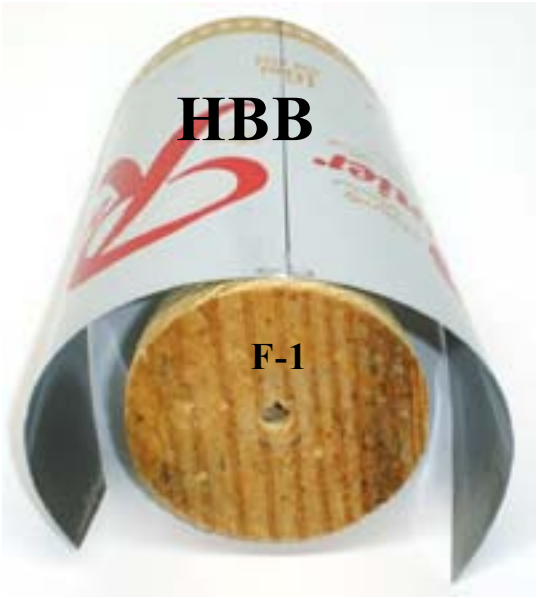
Remove the Pull Tab from one of the Cans you're going to use to make your Helo and cut the bottom off as shown here.

Put a 3/32" hole in the center of the little button, used to hold the pull tab in place, on the top of the Can. This is hole "**D**".

This Can will become **B-1**.

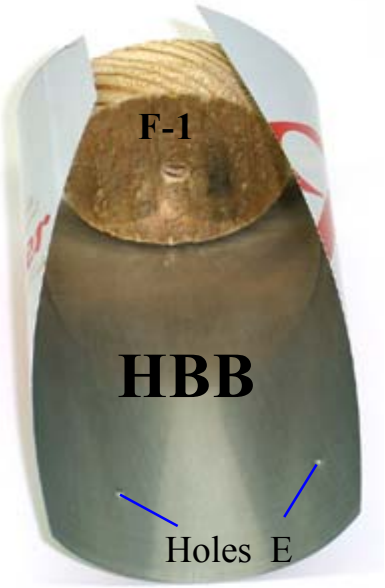
STEP # 8

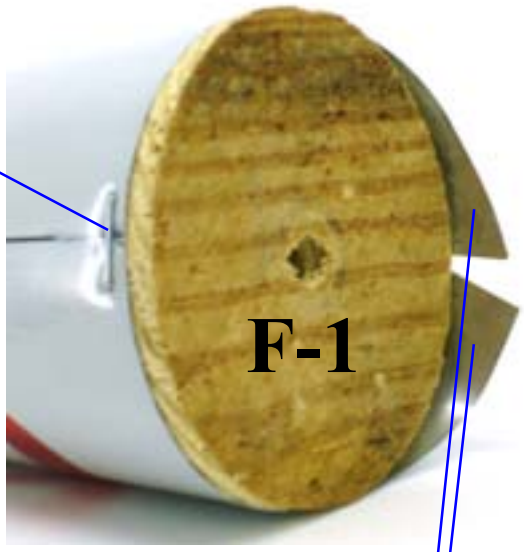
Remove the Pull Tabs and cut the tops and bottoms off 6 additional Cans and open them up as shown here.



STEP # 9

Take one Can from Step # 8 and cut Template # 2 **HBB** from it. Staple **F-1** to **HBB** as shown.





Staple

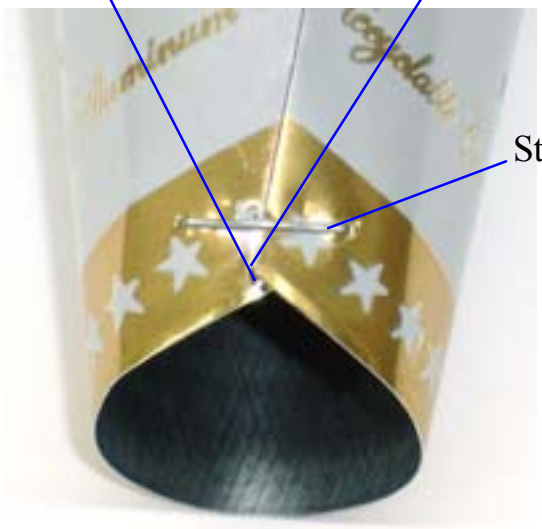
STEP # 10

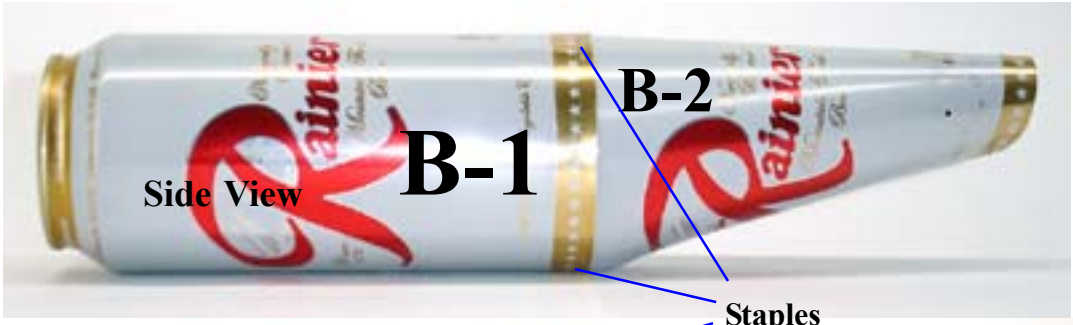
Wrap **HBB** around **F-1** and staple as shown.

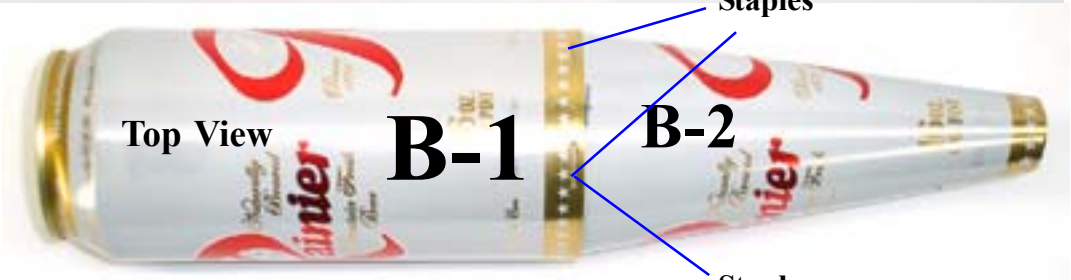
Mark A

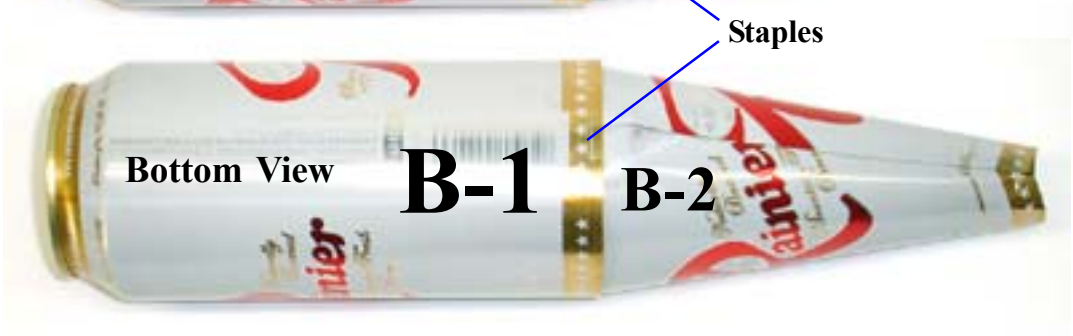
Mark B

This will now become **B-2**.









STEP # 11

Insert **B-2** into **B-1** and secure with three (3) staples as shown.

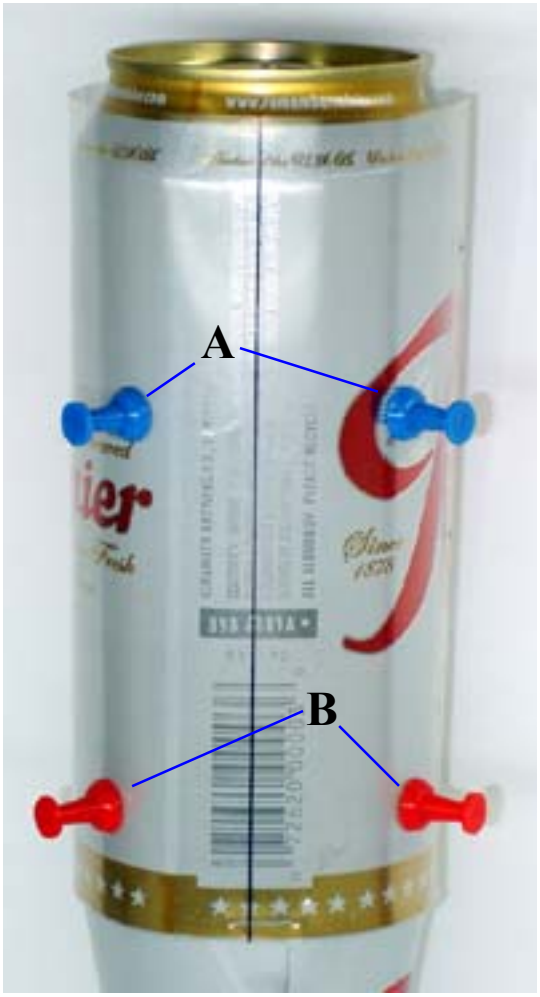
STEP # 12

Insert a 1/8” rod 5-6” long through Holes E in B-2 and slide Template # 1 over B-1. Align the TOP of Template # 1 perpendicular to the 1/8” rod in B-2 as shown. (Remove the Rod when everything is lined up).

The back of Template # 1 is flush with the back of **B-1**.

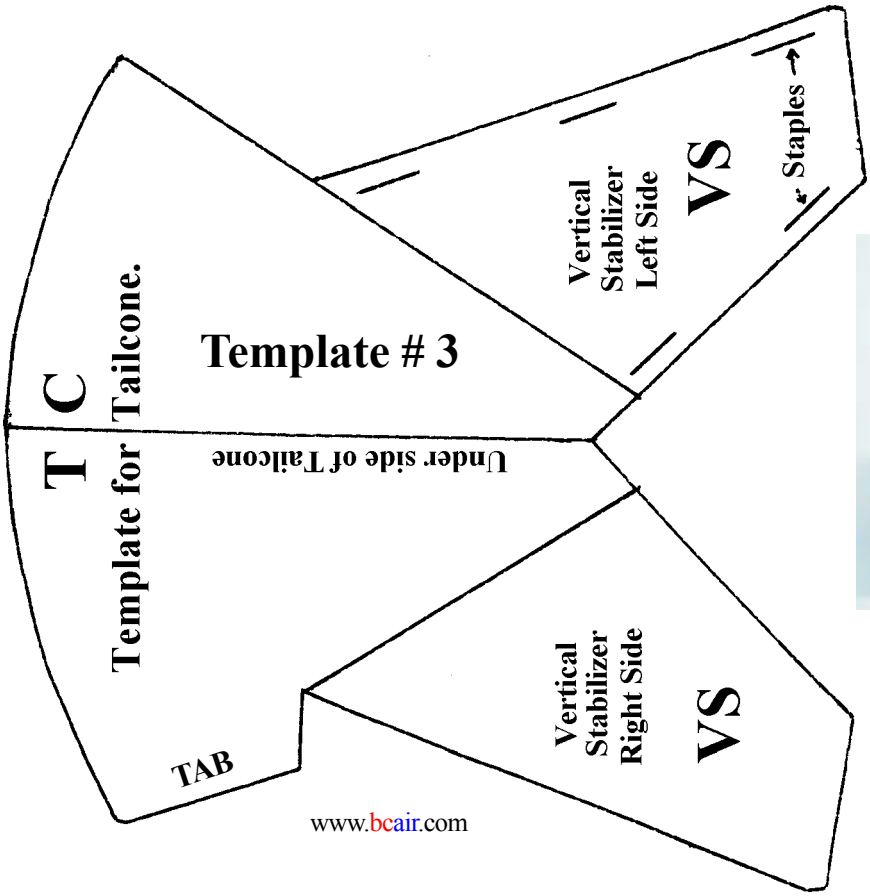
STEP # 13

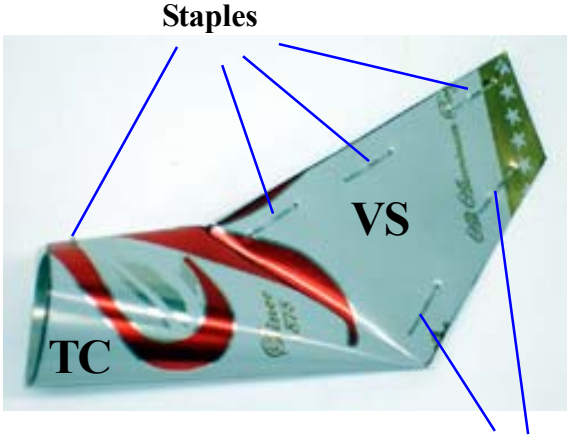
Using your Push Pins, make Holes A & B in **B-1**



STEP # 14

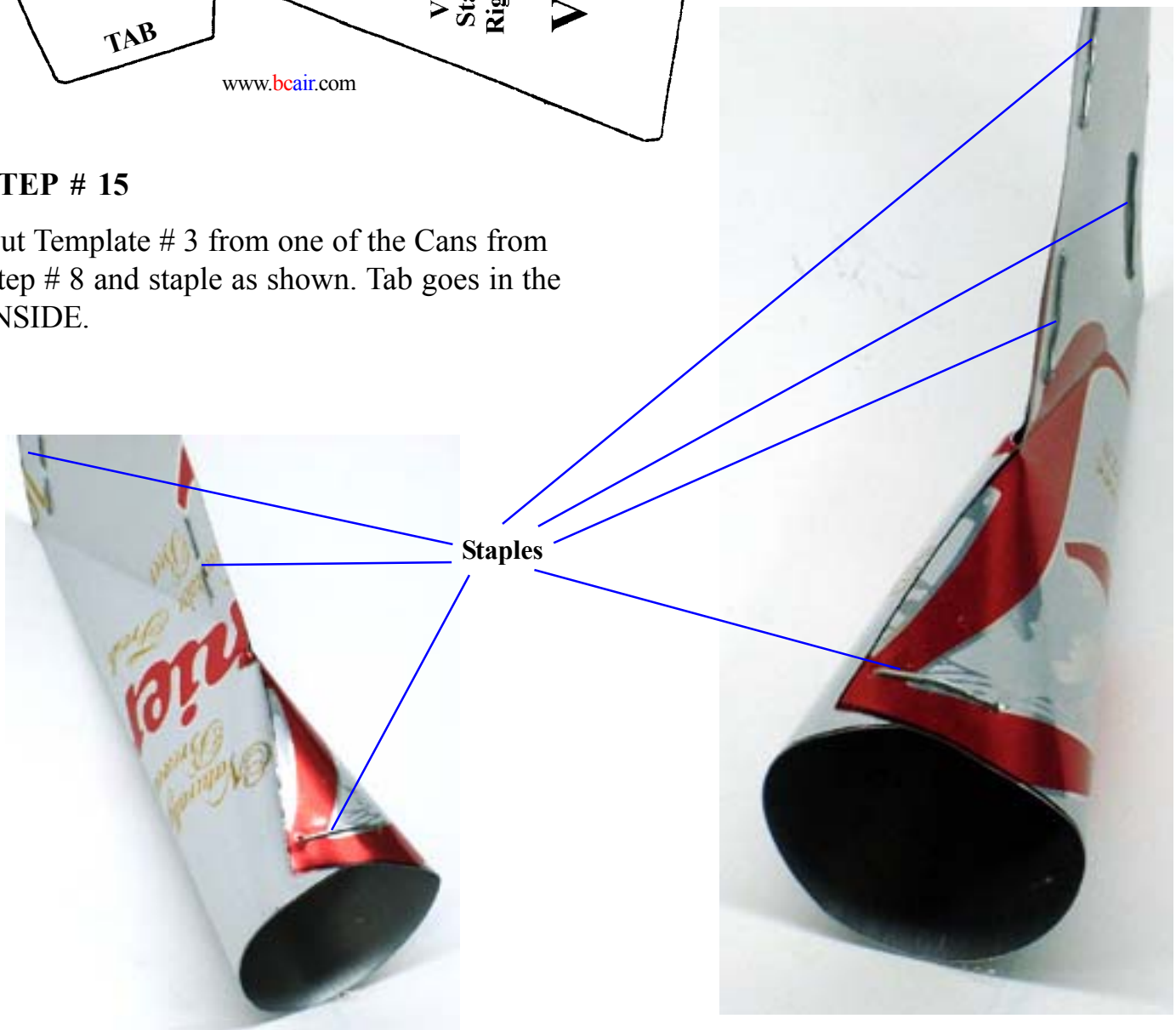
Using your X-Acto Knife, make Slits 1, 2, 3, 4, 5 & 6 and again using your Push Pin, make Hole C

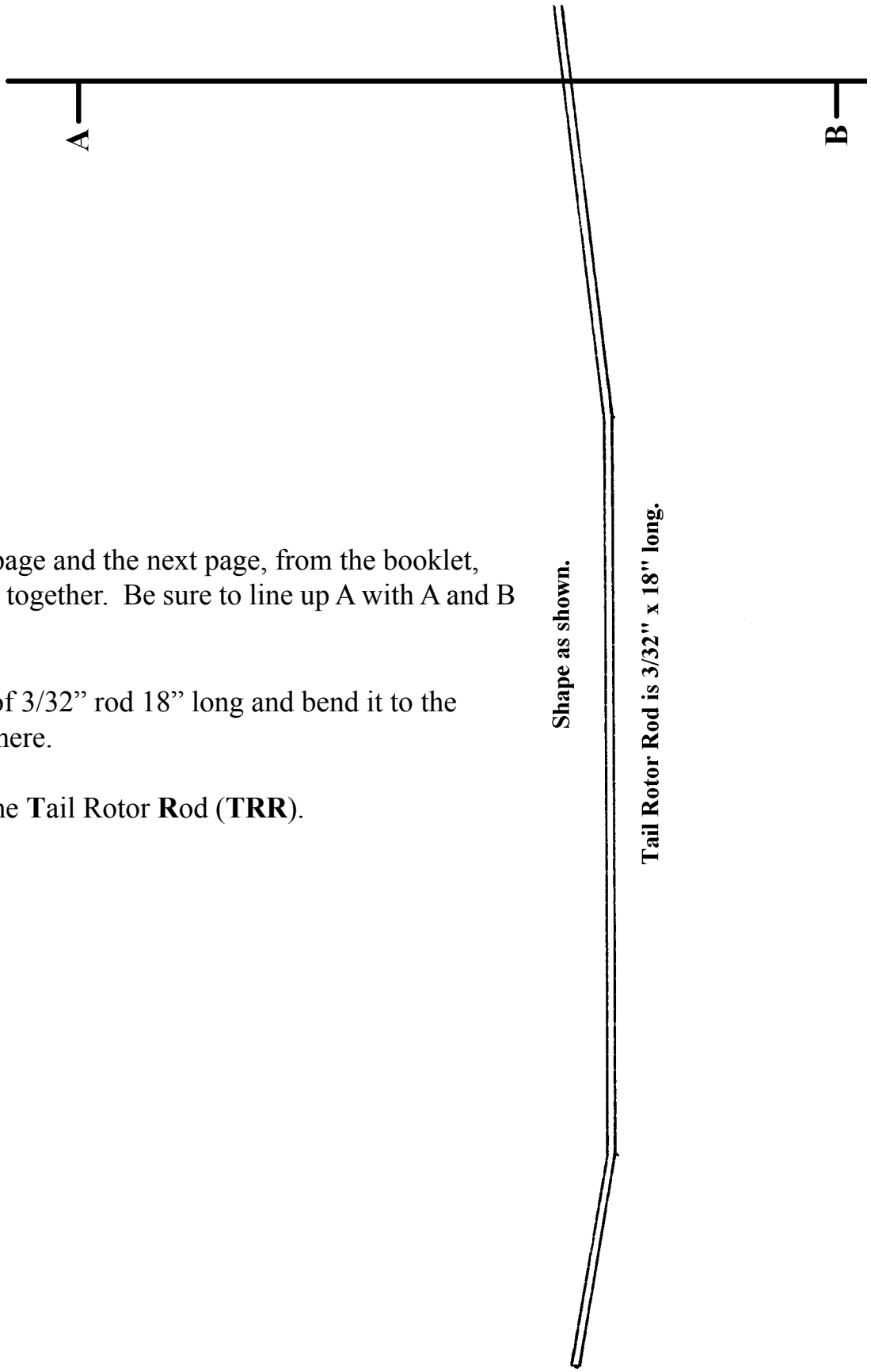




STEP # 15

Cut Template # 3 from one of the Cans from Step # 8 and staple as shown. Tab goes in the INSIDE.



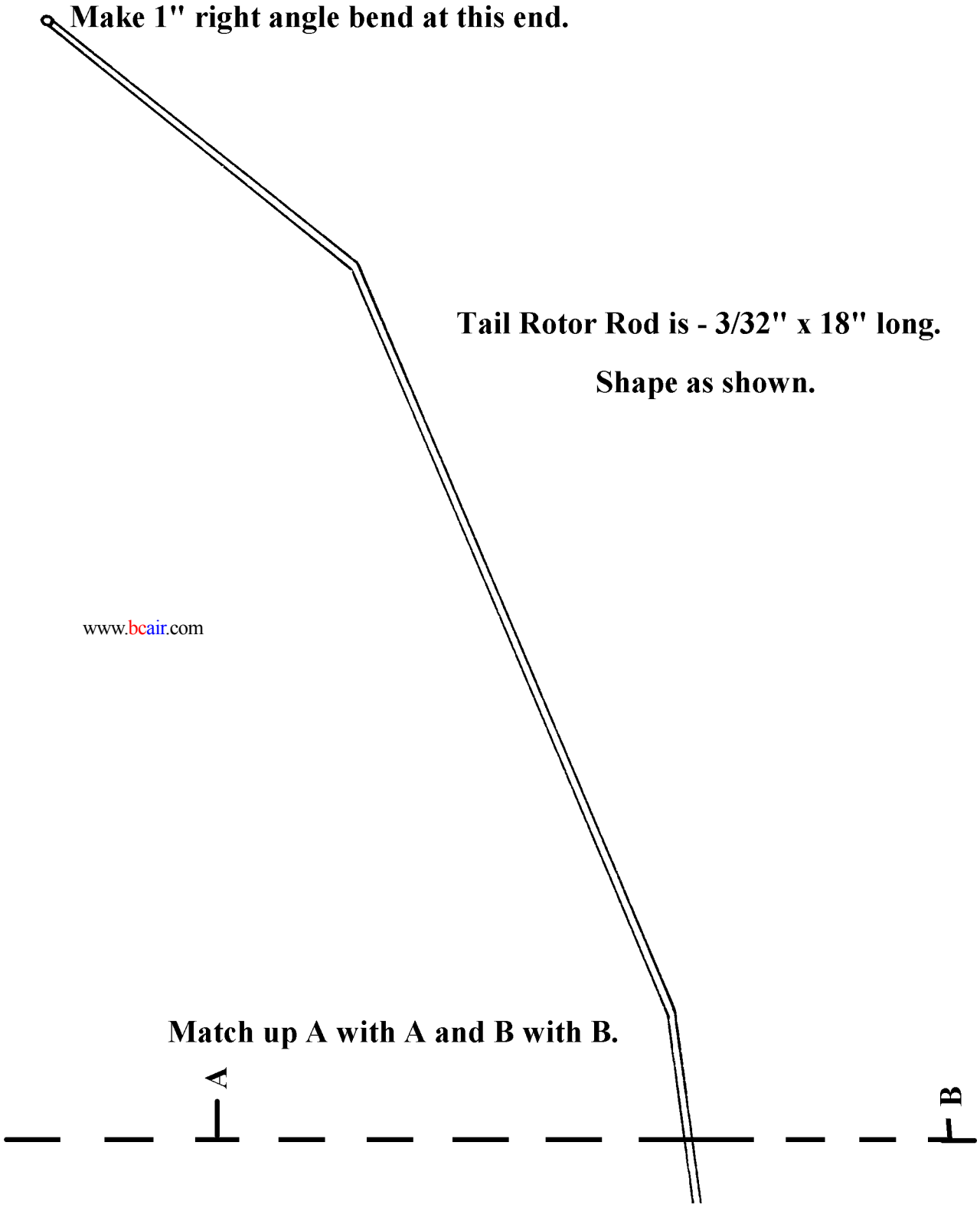


STEP # 16

Remove this page and the next page, from the booklet, and tape them together. Be sure to line up A with A and B with B.

Take a piece of 3/32” rod 18” long and bend it to the shape shown here.

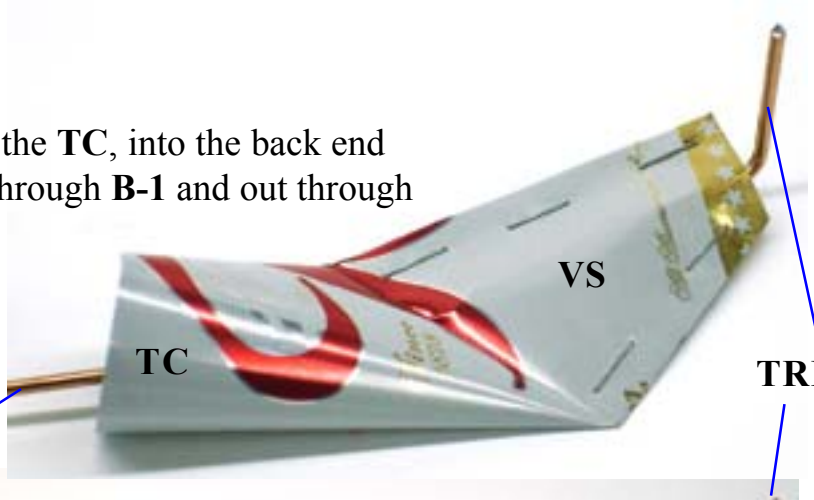
This will be the **T**ail Rotor **R**od (**TRR**).



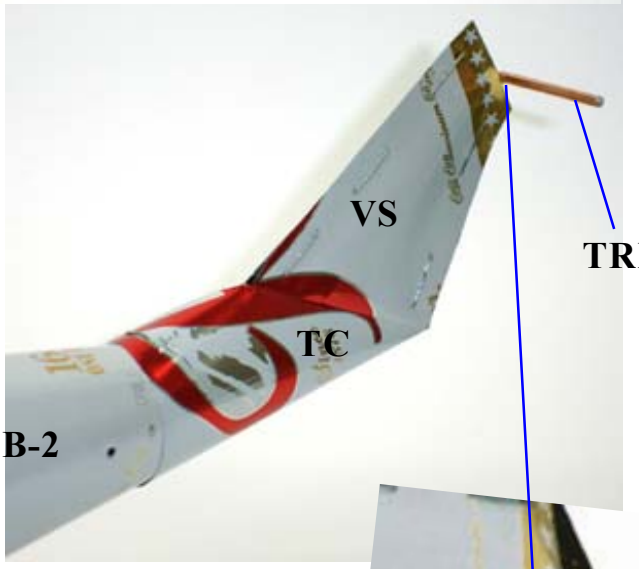
Remove this page and the previous page, from the booklet, and tape them together.
Be sure to line up A with A and B with B.

STEP # 17

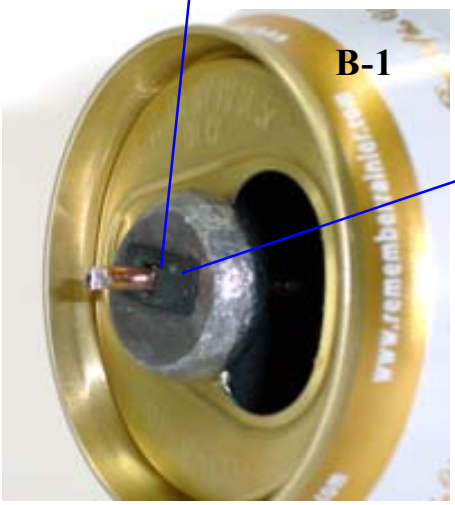
Thread the **TRR** into the **VS**, through the **TC**, into the back end of **B-2**, through the pilot hole in **F-1**, through **B-1** and out through Hole D in the front of **B-1**

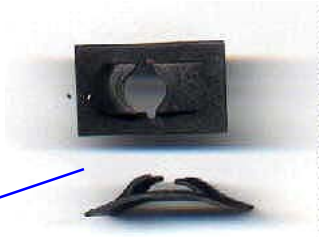


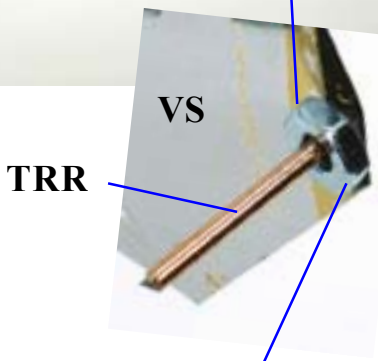
Draw the **TC** OVER the back end of **B-2** and pull the **TRR** snug within the body of the Helicopter.



Add a lead weight to the **TRR** where it comes out of Hole D and hold in place with a wire clip (Speed Nut). Cut off excess **TRR**.





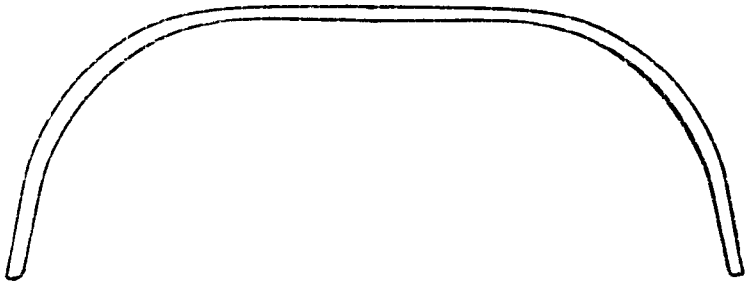


Epoxy an 8/32 nut onto the **TRR** as shown.

Use Copper coated welding rod or Music wire for Landing Gear.

Shape all as shown.

Landing Skid "LS" (2 Req.) 1/8" Rod x 6" long.



Landing Gear "LG" (2 Req.) 3/32" Rod x 5 1/2" long.

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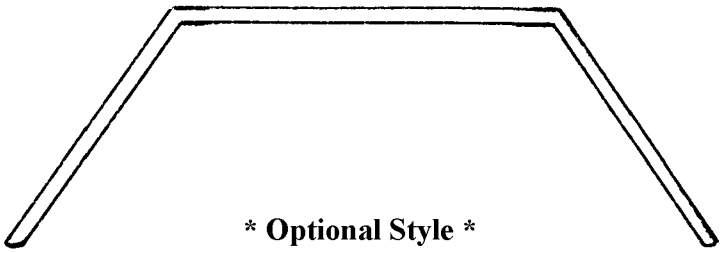
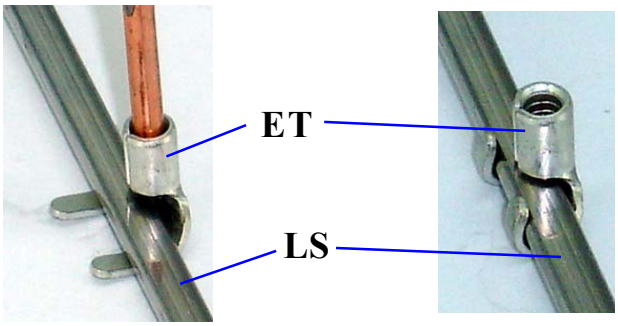


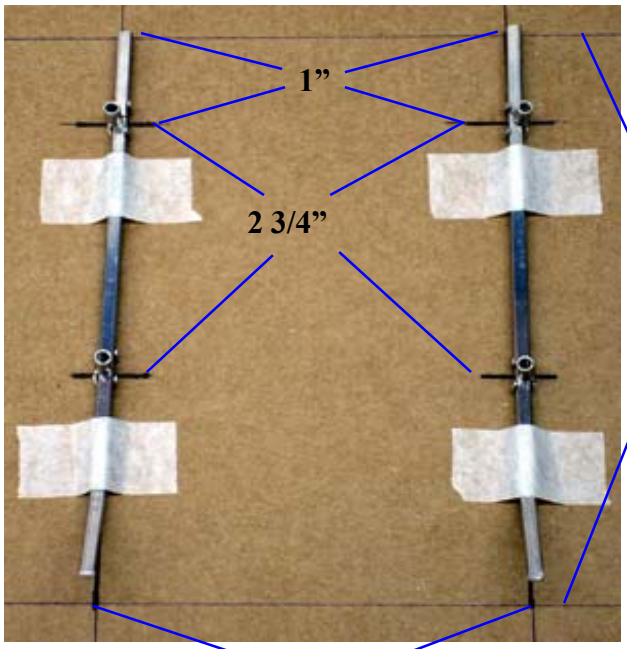
*** Optional Style ***

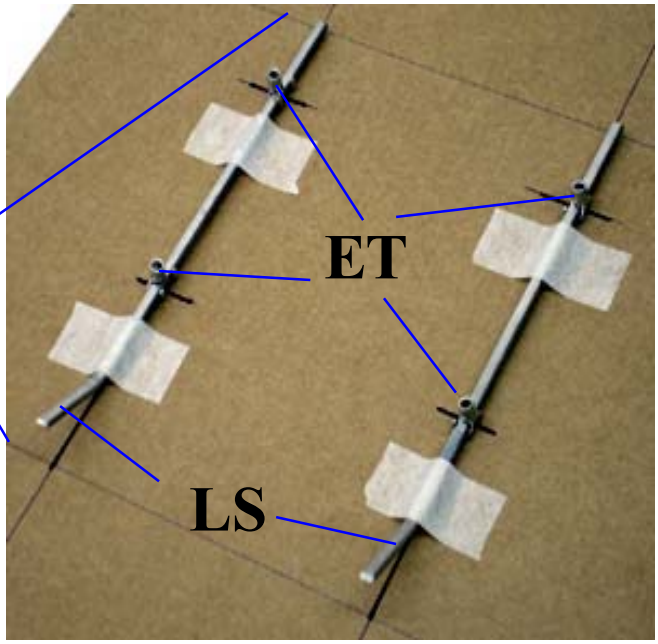
Landing Gear "LG" (2 Req.) 3/32" Rod x 5" long.

STEP # 18

Take four (4) “Spade” Electrical Terminals **(ET)** #8-10 Stud and remove the plastic sheaths. Insert a piece of 3/32 Rod into the **ET**’s and bend them around the **LS** as shown.

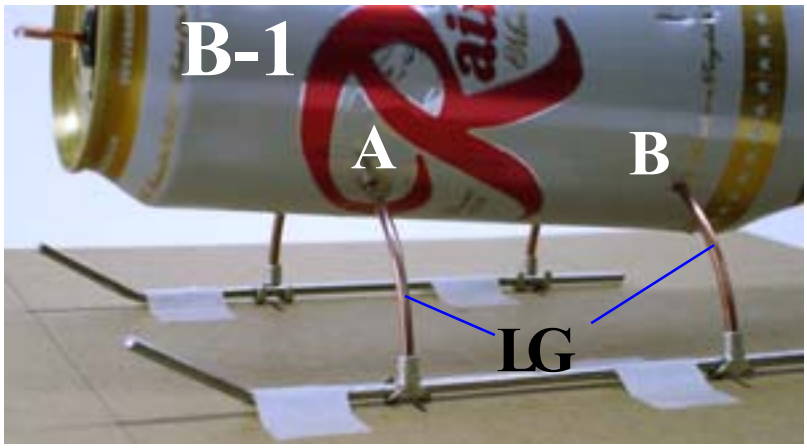






STEP # 19

Take a piece of corrugated cardboard 7” x 8” and on it draw two (2) parallel lines 6” long and 3 3/4” apart. From the Top of your 6” line, make a mark 1” down and from that mark make another mark 2 3/4” down. Tape your Landing Skids (**LS**) on the 6” lines with the **ET**’s on the marks as shown.

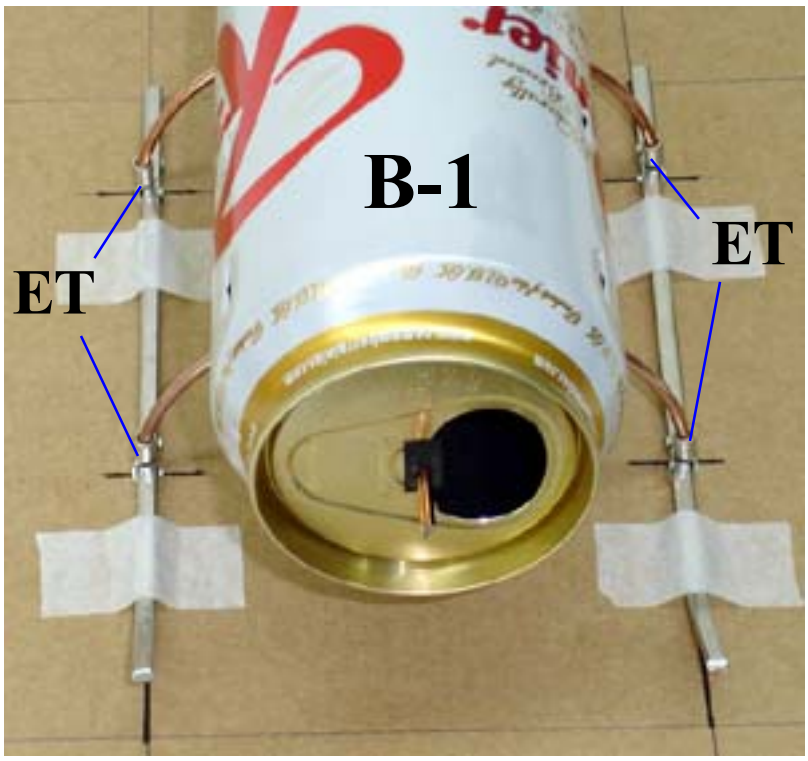


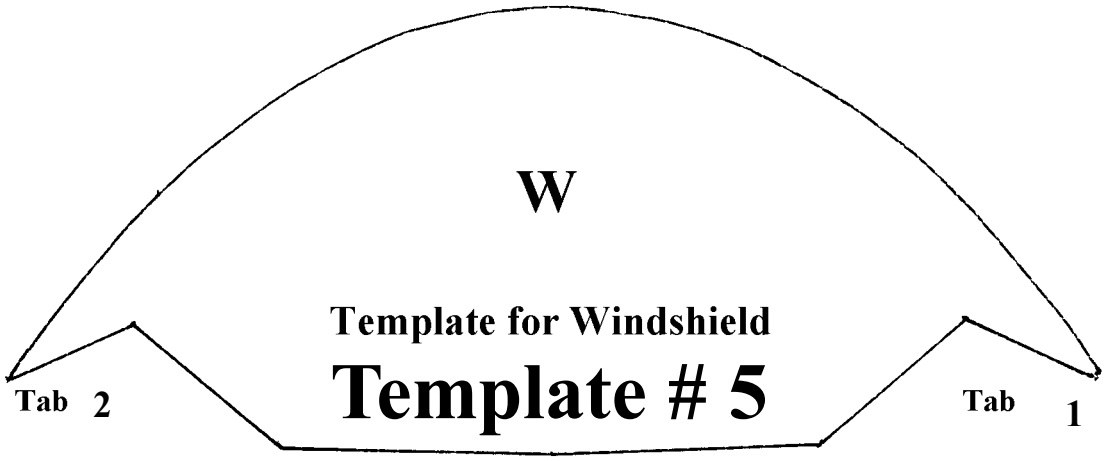
STEP # 20

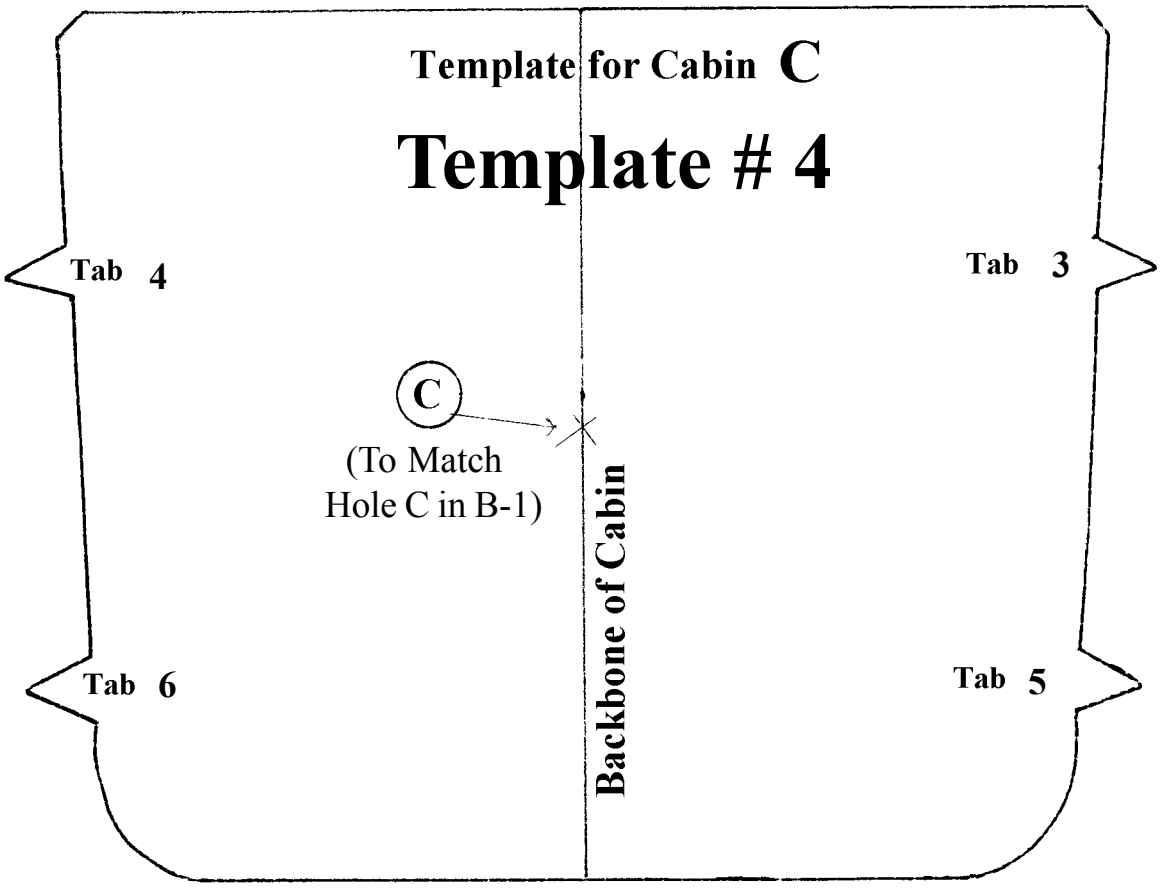
Insert your selected **LG** through Holes A & B in **B-1**.

Apply epoxy to the inside of the **ET**’s and insert the **LG**.

Working through the drink hole in the front of **B-1**, apply epoxy to the **LG** and INSIDE wall of **B-1**.



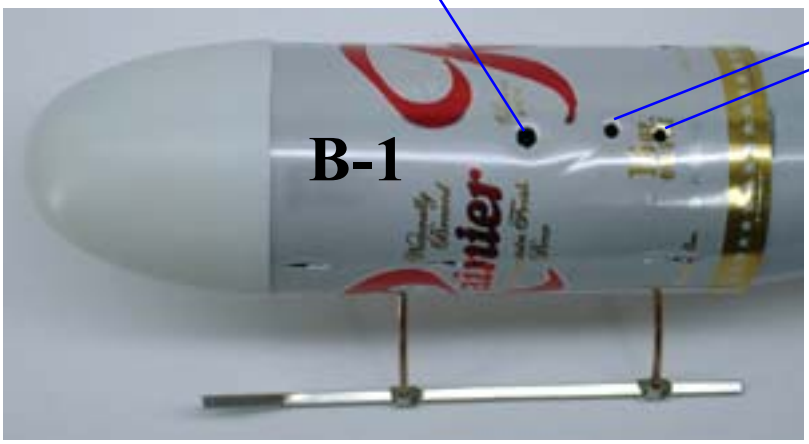

W
Template for Windshield
Template # 5
Tab 2
Tab 1


Template for Cabin C
Template # 4
Tab 4
Tab 3
C
(To Match
Hole C in B-1)
Backbone of Cabin
Tab 6
Tab 5

STEP # 21

Trim Nose Cone, paint if desired, and epoxy to the front of **B-1**.

Hole "**C**"

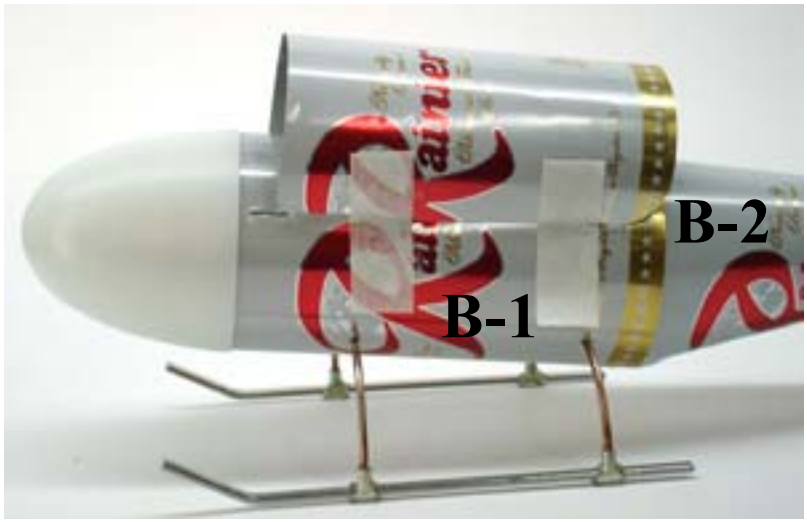


STEP # 22

Make Two (2) 1/4" holes in the approximate location shown at left. Exact position is not critical as they are only for the purpose of anchoring the Engine (Step # 25) to **B-1**.

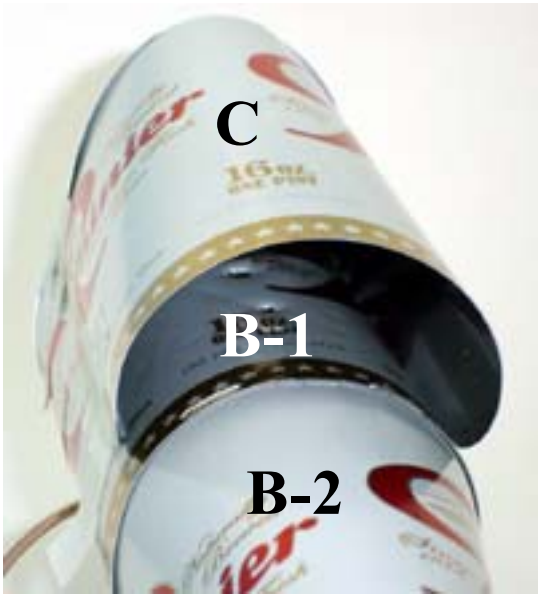
STEP # 23

Cut Template # 4 (**C**) from one of the Cans from Step # 8 and insert Tab 3 into Slit 3, Tab 4 into Slit 4, Tab 5 into Slit 5 and Tab 6 into Slit 6 in **B-1**. Use masking tape to hold **C** in place.



STEP # 24

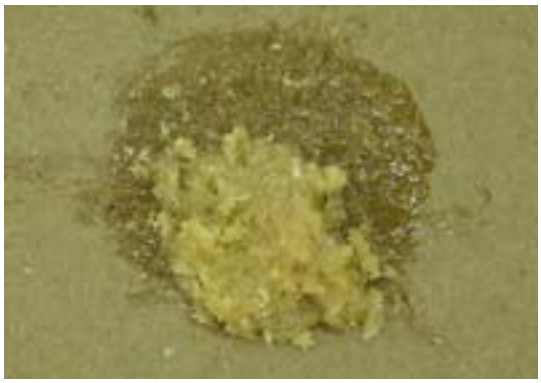
Cut Template # 5 (**W**) from one of the Cans from Step # 8 and insert Tab 1 into Slit 1 and Tab 2 into Slit 2 in **B-1**. Use masking tape to hold **W** in place.



STEP # 25

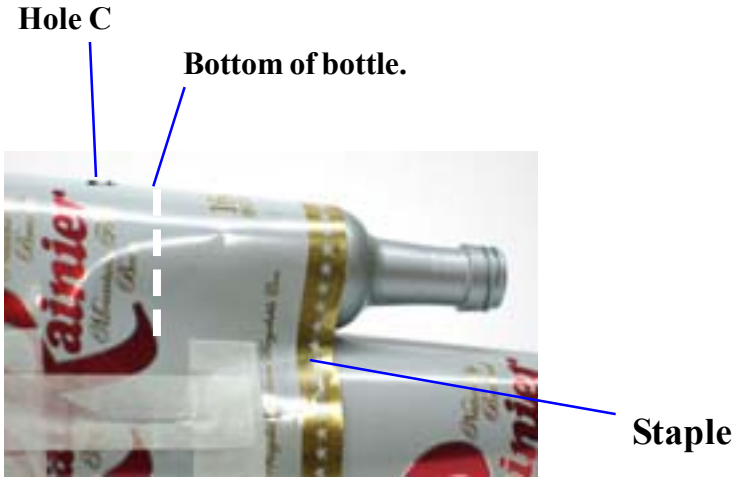
Working through the opening in the back of **C**, apply epoxy to the INSIDE of **C** and **W** where it meets **B-1** and the Nose Cone.

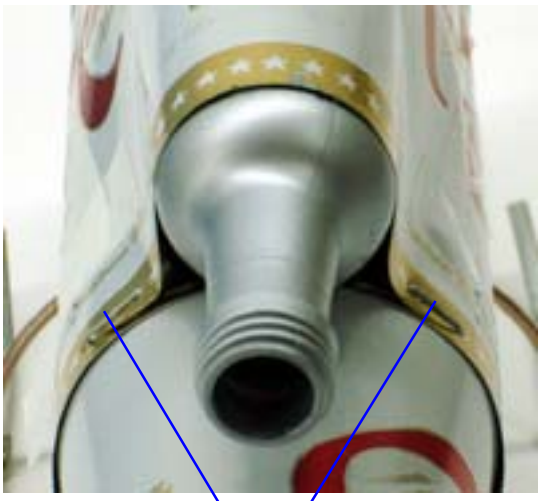
NOTE: Adding a small amount of Saw Dust to the epoxy will give it more body.



STEP # 26

Use a small plastic cocktail bottle as the Engine, and put TWO (2) 1/4" holes in the approximate location shown at Right. Exact position is not critical as they're only for the purpose of anchoring the Engine to **B-1**.





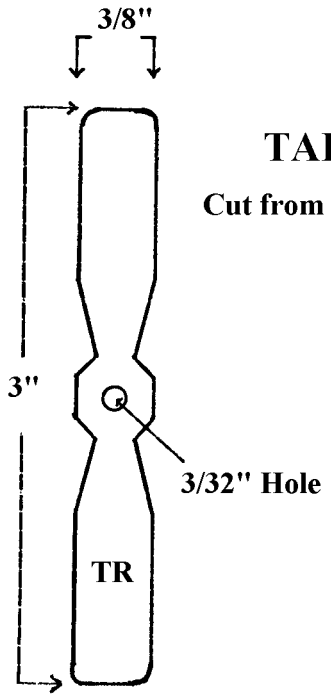
STEP # 26

Apply epoxy to the sides of the plastic bottle and insert it into the back opening of **C**. DO NOT OBSCURE HOLES C IN "**C**" OR "**B-1**". Squeeze the sides of **C** together, against the bottle, and staple where shown.

STEP # 28

Use Duct Tape, or Plastic Tape, to outline the Windshield Frame.

NOTE: Stick your Tape to a piece of glass and use a straight edge to cut it to the desired width.

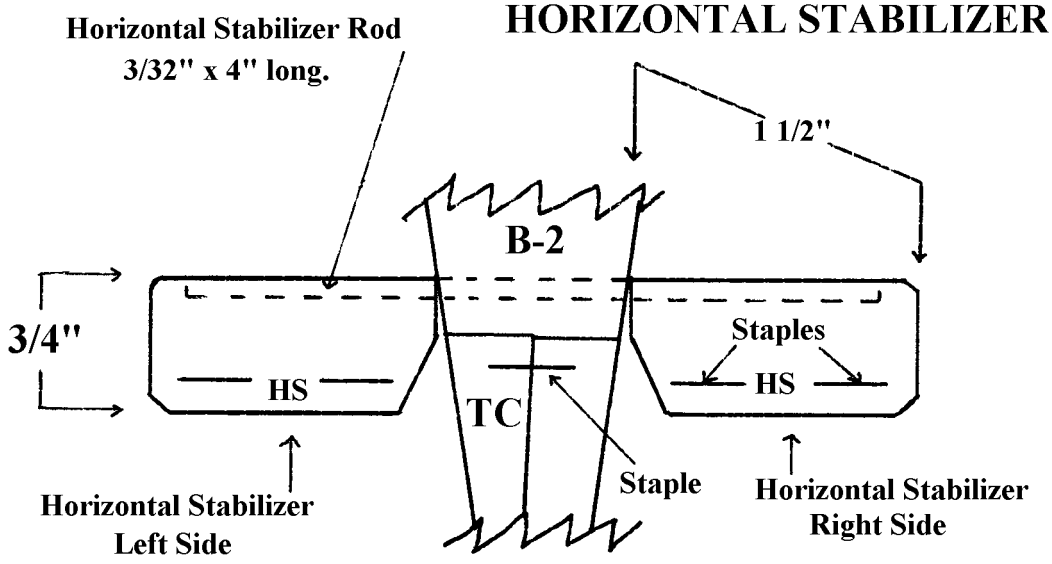


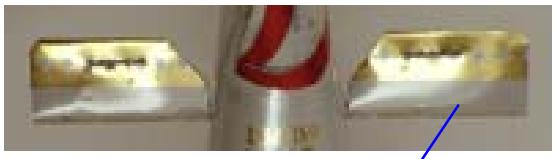
TAIL ROTOR

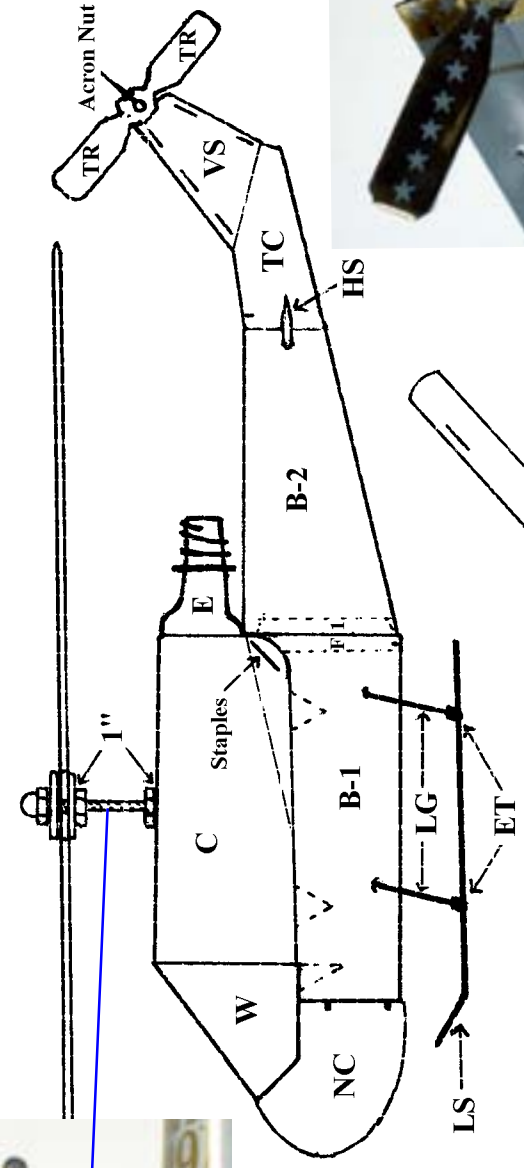
Cut from a piece of CAN (2 thickness').

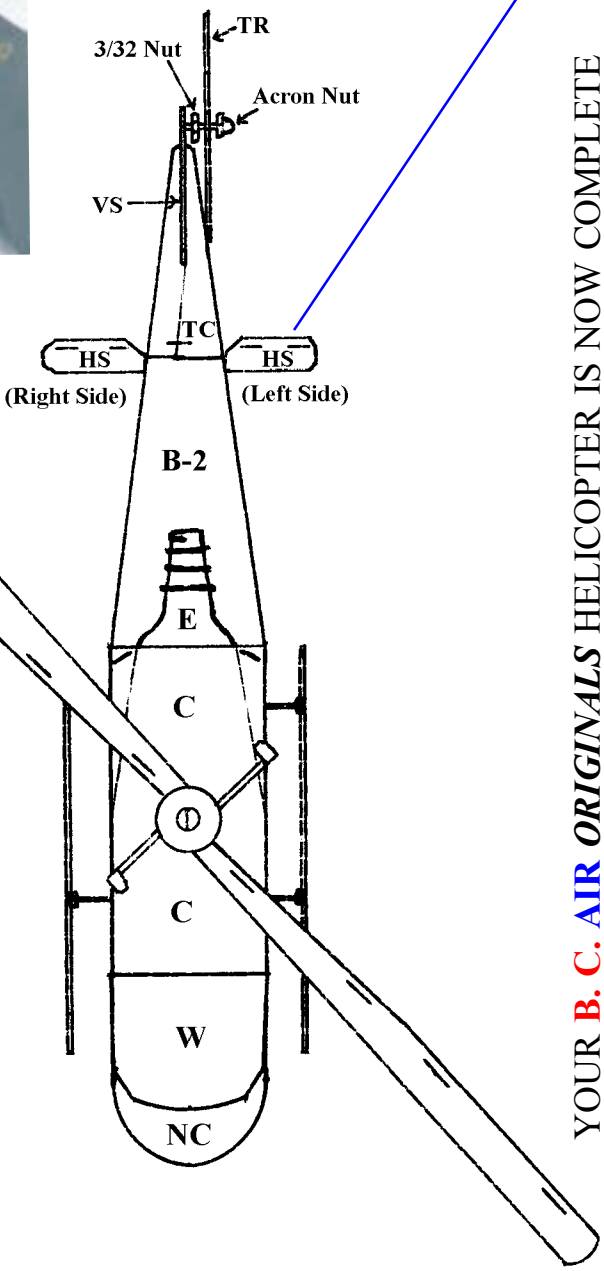
www.bcair.com

HORIZONTAL STABILIZER

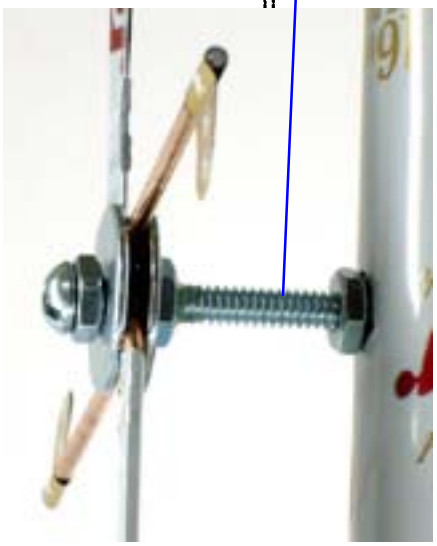








YOUR **B. C. AIR *ORIGINALS*** HELICOPTER IS NOW COMPLETE



STEP # 29

Install the Tail Rotor onto the Rotor Shaft, cut off excess shaft, and hold in place with an Acorn Nut.

Enlarge Holes E to 3/32” and insert the Horizontal Stabilizer Rod Epoxy the Horizontal Stabilizers to the rod..

Apply epoxy to the Main Rotor screw and insert it into Hole C at the TOP of **C and down into Hole C in B-1**.