F-24 Panther

Instructions for Building and Flying the F-24 Panther

Parts List

1.....Body Tube (1) BT55 17"
2.....Nose Cone BNC55AC(1)
3.....Steel Eyelet (1)
4.....Launch Lug 1/8"x 1-1/4"(1)
5.....Centering Rings (2) CR2055F
6.....Engine Thrust Ring (1) CR520P
7.....Engine Hook (1)
8.....Parachute Kit (1 18")
9.....Intake Tube 8.5"BT55(1)
10...Balsa for Canopy (3 sheets) 3/16" x 2 x 5
11...Kevlar and Elastic shock cords (1 kit)
12...Balsa Fin Stock (Printed with actual fin profiles only to show reference)1/8"x4x17
13...Fin Template Sheets (2) (Not Shown)
14...Fin Wrap Marking Guide (1) (Not Shown)
15...Tube Cutting template (1) (Not Shown)
16...Instruction Pack (1) (Not Shown)
17...Engine Clip Retaining Collar (1) Not shown Piece of BT20 about 1" long/split
18.....Decal Sheets (2)

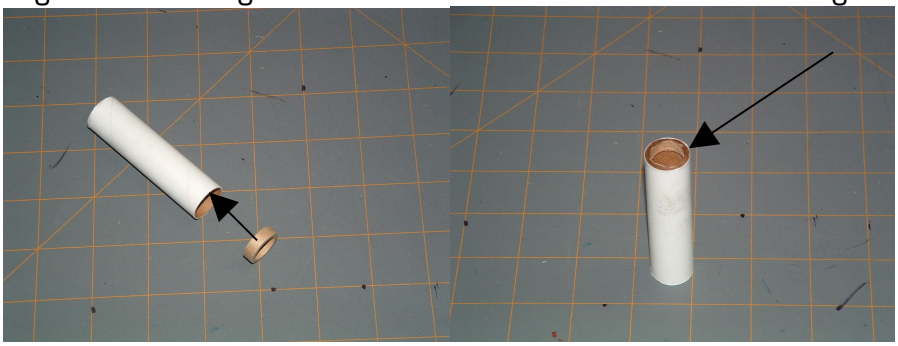
Thrustline Aerospace
WWW.THRUSTAERO.COM

Thank you for choosing a Thrustline model rocket kit! Please read through the entire instruction pack prior to starting. If you have any questions, please feel free to contact me. John Rowan-Stern

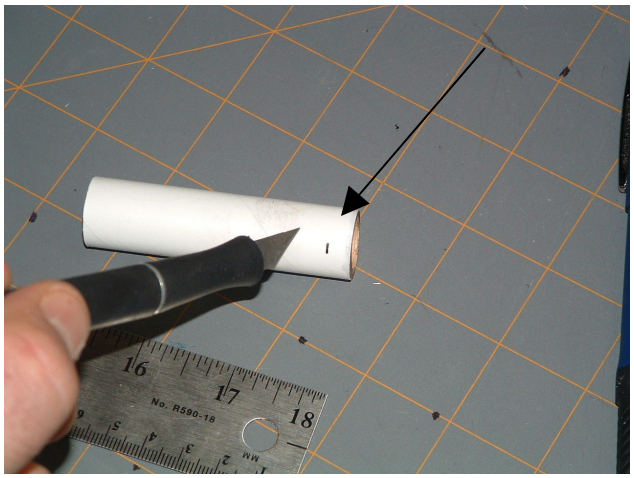
rocketman1959@netzero.com

Engine Mount Assembly

1- Glue engine block ring so that it is flush with the end of engine tube.

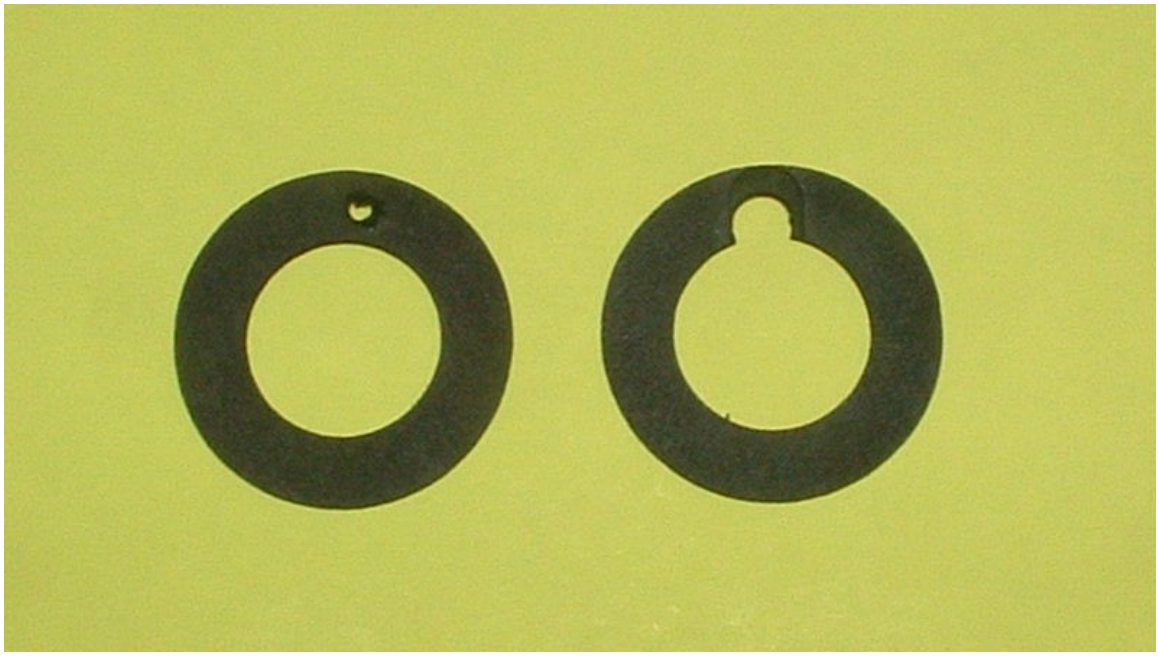


2- At the same end as the engine block installed in the previous step, make a mark ¼" from that end of the engine tube, 1/8" long with a pen or pencil. Make a slit with a sharp Xacto knife on this mark. See illustration below.

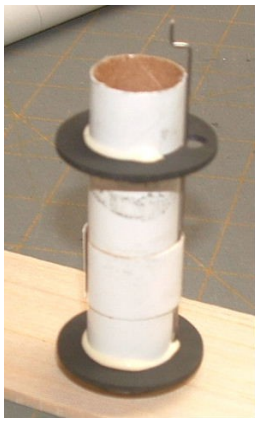


3- Insert the engine as shown in the next photo. Slide hook retaining collar over the hook and glue into place (make sure that slit on collar is positioned on the opposite side from the hook.). It may be necessary to hold the collar in place with masking tape as it dries. See next two photos for clarification.

4. Make a 1/16th inch hole in one of the two centering rings as shown. This will eventually be the forward ring. Cut a notch in the other centering ring to allow movement of the engine hook. If you have a paper punch, this makes a real clean notch as shown in the next photo.



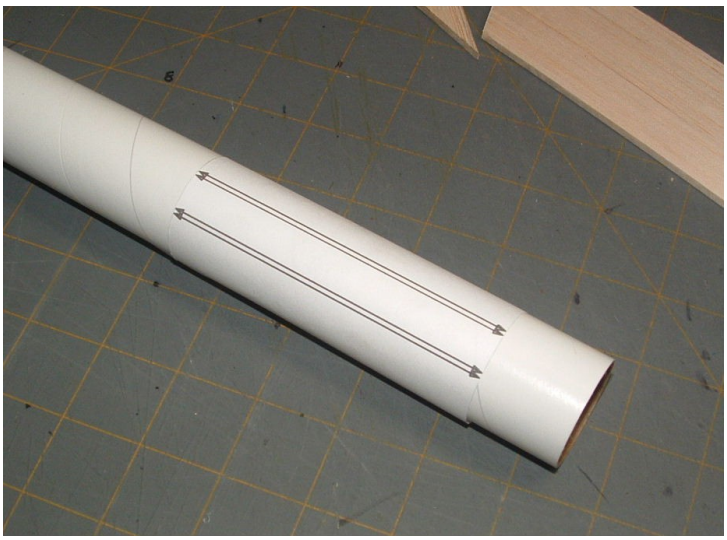
5. When the engine hook retaining collar has dried, glue the centering ring with 1/16th inch hole to the forward end of the motor tube so that it abuts the engine hook insertion point. The other ring, the one with the notch, is glued 3/8th's of inch back from the rear of the motor tube. See following photo for clarification.



Once the motor mount has a chance to dry, give all of the joints on it one last coat of glue for extra strength.

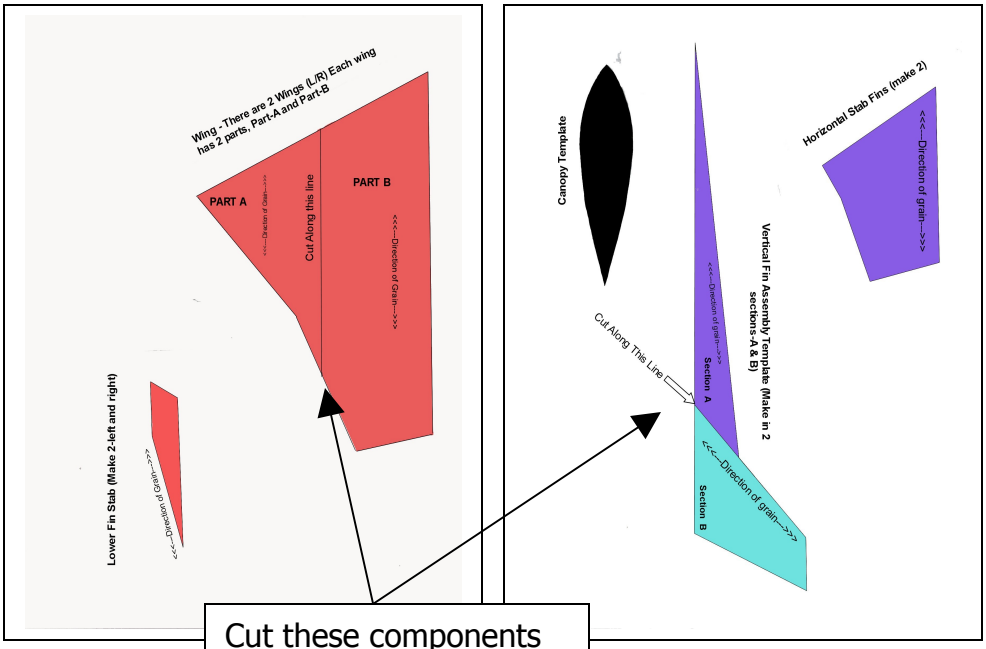
6. Once the engine mount has thoroughly dried, take the Kevlar cord and tie it around the motor mount leaving one end of the Kevlar long. Thread the long end through the hole you drilled earlier. Coat the area where the Kevlar is wrapped around the engine tube and also place a dab of glue where the thread goes through the hole. Coat all of the threads around the motor mount as it will form the anchor point for the rest of the recovery system including the parachute. Set aside to dry.

7. While the motor mount is drying, cut out the fin wrap-around-guide and wrap the body tube with it, taping it into place. Before marking the fin lines, take not of each position and visualize where each fin will go. There are 6 different lines. The wings lines are shared by the horizontal fins. Make the marks on the body tube and using a straight edge or piece of angle stock extend all of the lines. The Wing and stab, and launch lug lines should extend all the way from front to back. This will help align the wings to the rear stab fins during installation. For ease of orientation, mark each line with the name of the component being installed on it.



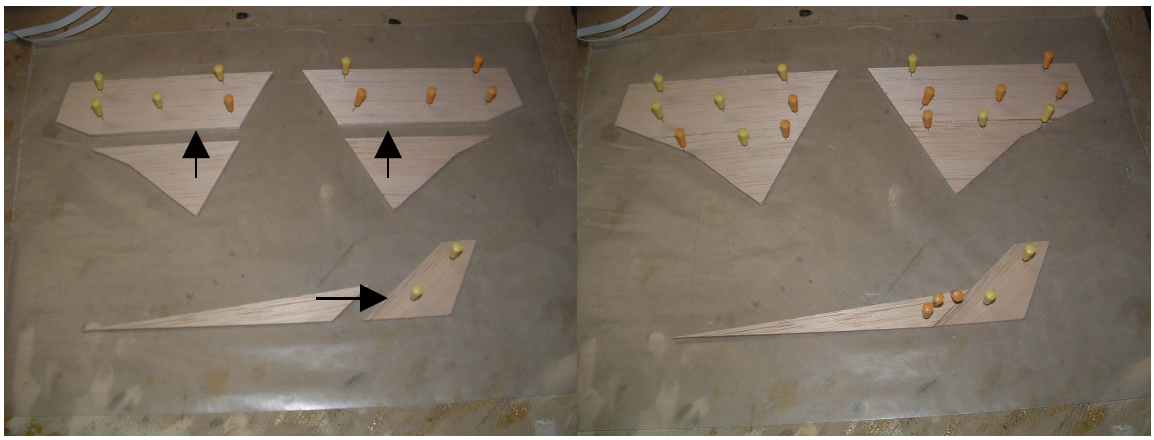
Fin Installation

1. Cut out all of the fin templates. Notice the vertical stabilizer and the wings are actually built in 2 sections. Cut along the indicated line on each of these component templates. Note the grain reference on each template. See the photo on the following page for clarification.



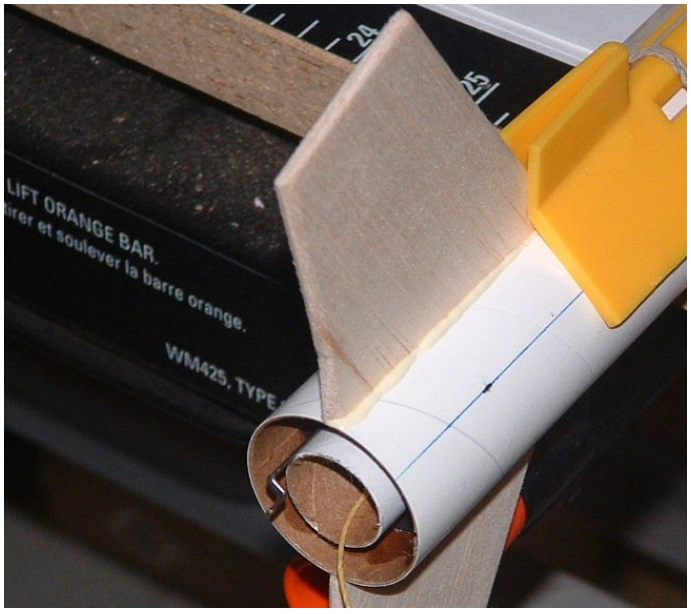
Cut these components along indicated lines. Take note of the grain.

2. Trace out all of the fin pieces and sand each so that they are uniform. Layout the wing and vertical fin pieces on a piece of wax paper or saran wrap on a flat surface. I use a piece of homasote underneath so that I can stick pins through the work to hold it in place. Glue the wing sections and the vertical fin sections and pin them down until they are dry. Make sure that the pieces lay flat while drying. Don't worry about the pin holes; they can be filled later.



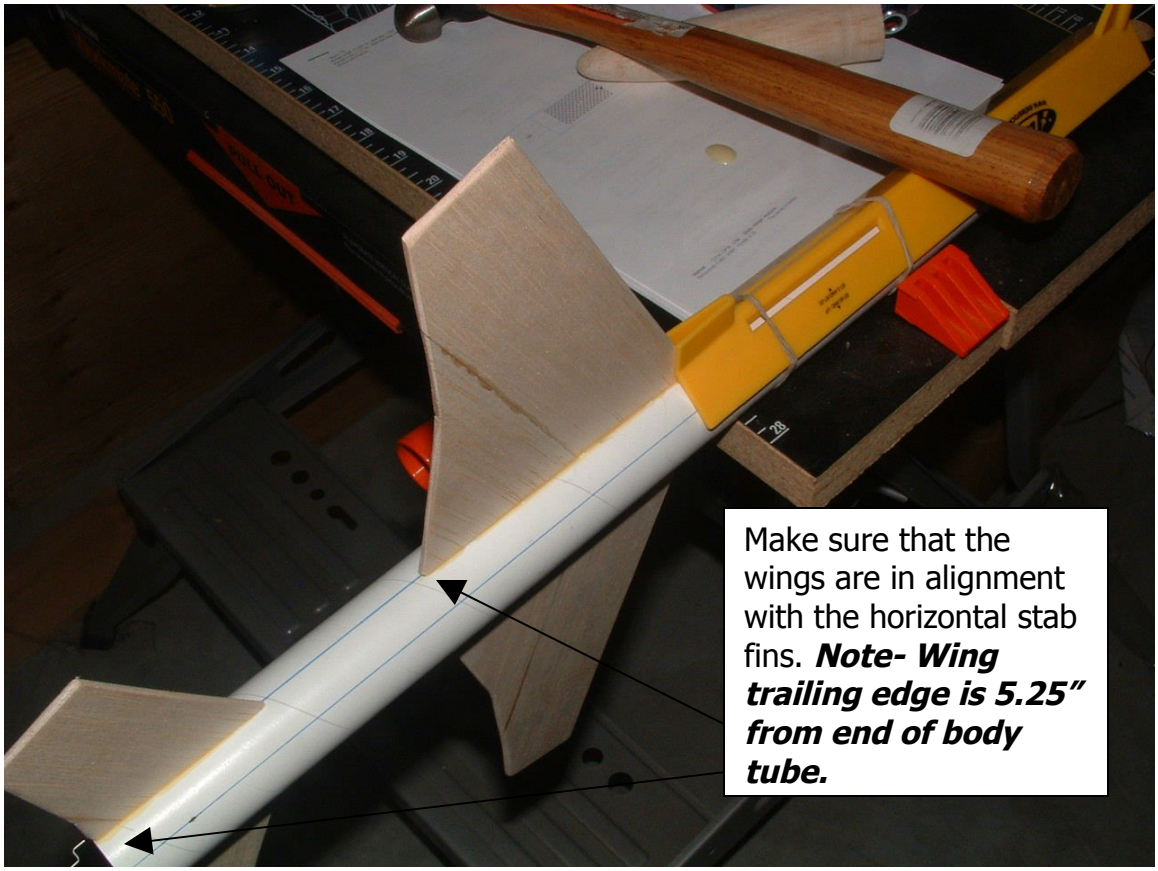
2. While the Wings and vertical stab are drying we can glue the motor mount in place. After applying a bead of glue the inside of the aft end of the motor tube, slide the motor mount assembly into place. I like to tuck the Kevlar thread back through the engine tube so that it doesn't get glued to the side of the body tube during this step. When this dried, you may proceed to the next step.

3. Beginning with the aft horizontal fins glue them so the trailing edges are flush with the end of the Body tube, See the next photo. Notice the lower fin stab lines. Those will be glued on last. Once the opposite side fin is glued and dried, we can proceed to the wing sections.

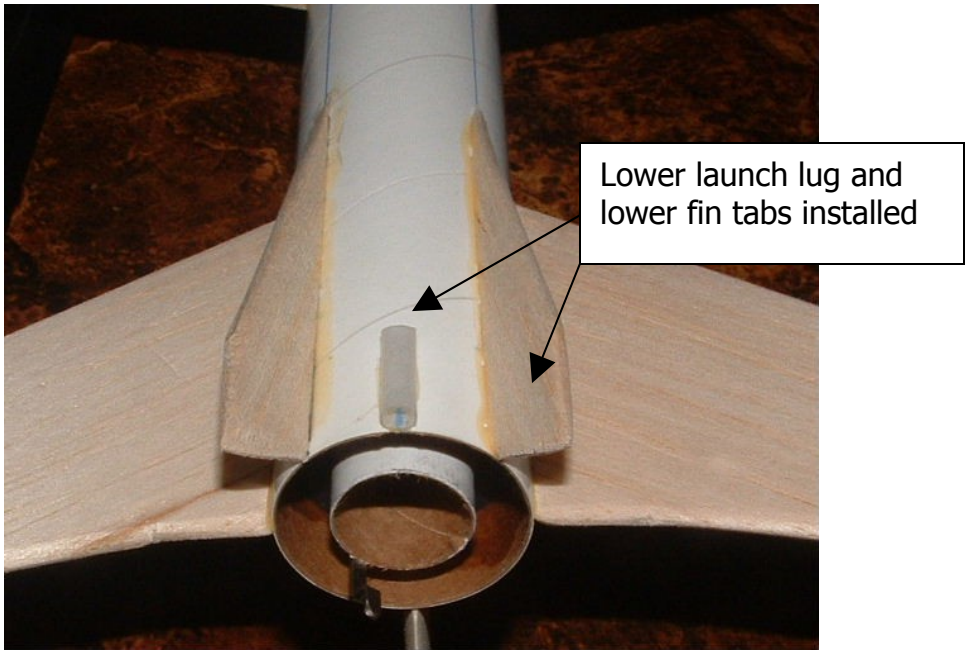


4. Once the wing section is dry, begin gluing them to the same reference line as the horizontal fins. The trailing root edge of the wings should be 5.25" from the exhaust end of the body tube. This will allow for proper spacing from the horizontal stab fins.

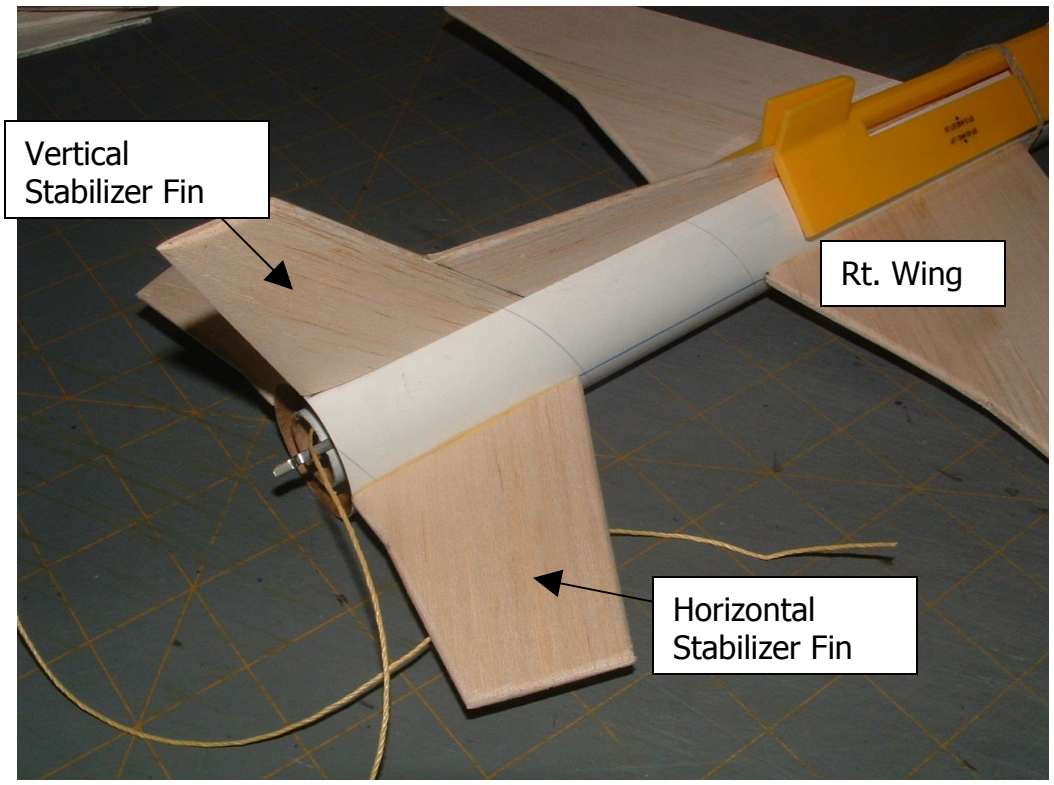
Double check the alignment by eyeing it while the glue sets. Keeping these fins in line will help insure steady, stable flights.



5. Once the wings are dry, make a mark 8 inches from the aft end of the body tube on the launch lug line. Cut the launch lug in half and bevel the ends to a 45deg angle. Glue one lug section at the base of the body tube (see photo below) and the other at the 8 inch reference mark you made earlier.
6. Glue the aft lower fin tabs in place. Actual lower fins are larger than photo.



7. Glue the Vertical Stabilizer Fin assembly in place.



When everything has a chance to dry, go over all of the fin joints with a second coat of glue.

The Intake-

The intake is made by taking the enclosed body tube, making an angle cut at each end and slitting it length wise! To make the angle cuts, try using a hobby miter, or razor saw. These can be found at most hobby chops and are a valuable asset to anyone's work bench!

1. Using the "Intake Template", make a 45 degree cut at one end of the tube and a 60 degree angle cut at the other end. MAKE SURE THAT YOU CUT THE TUBE SO THAT THE INTAKE IS SHAPED AS ILLUSTRATED ON THE TEMPLATE. This operation is best done with a hobby saw such as a Xacto type saw.

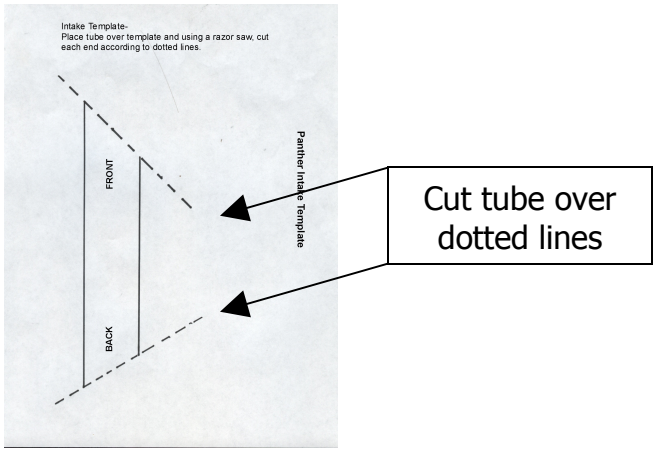
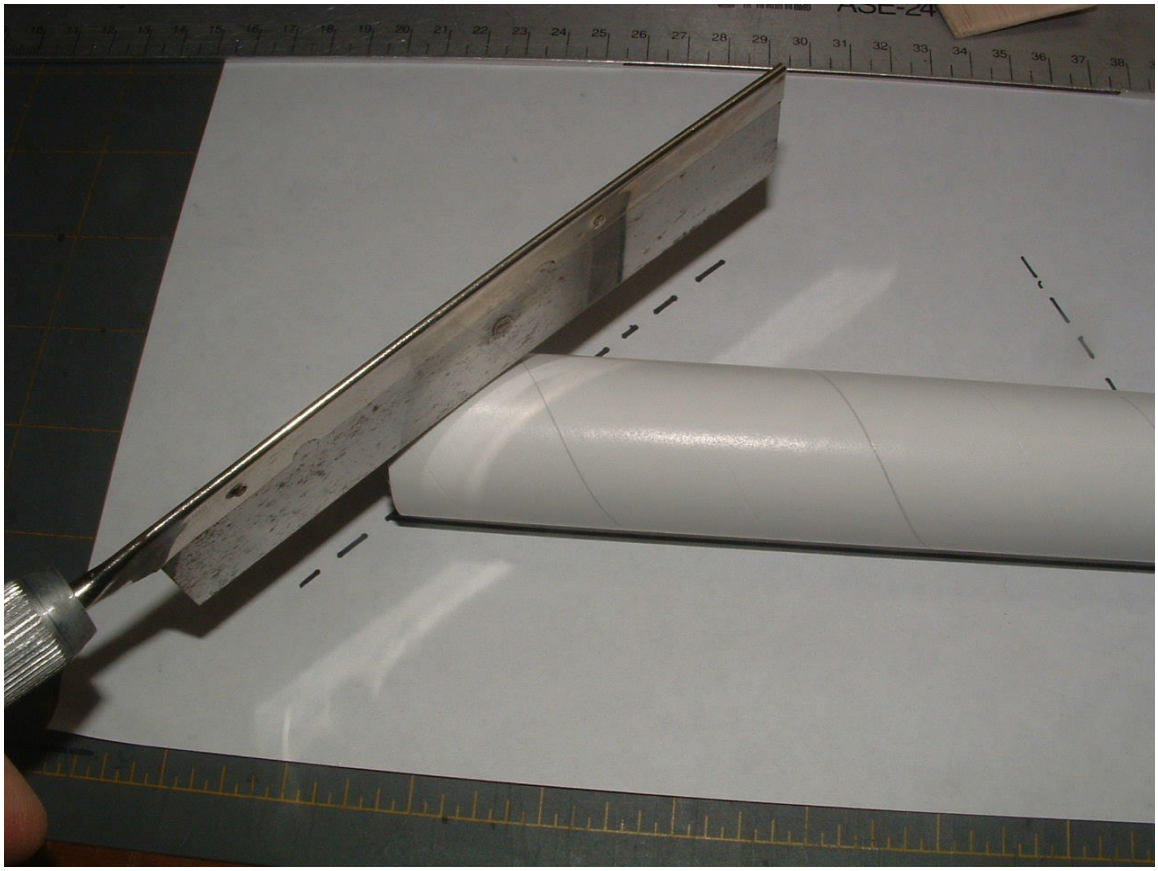
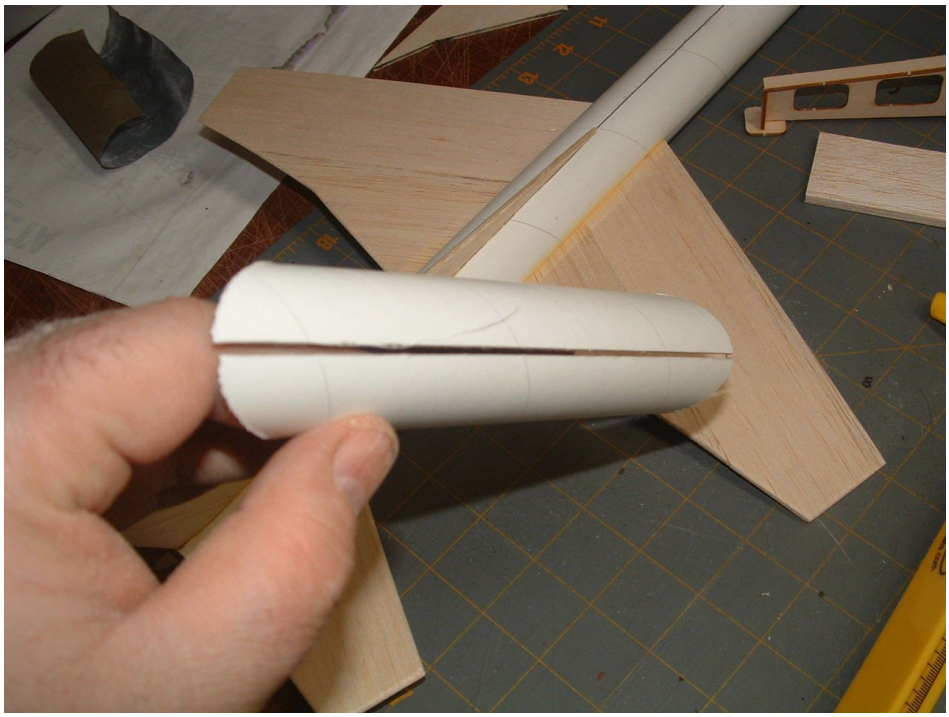


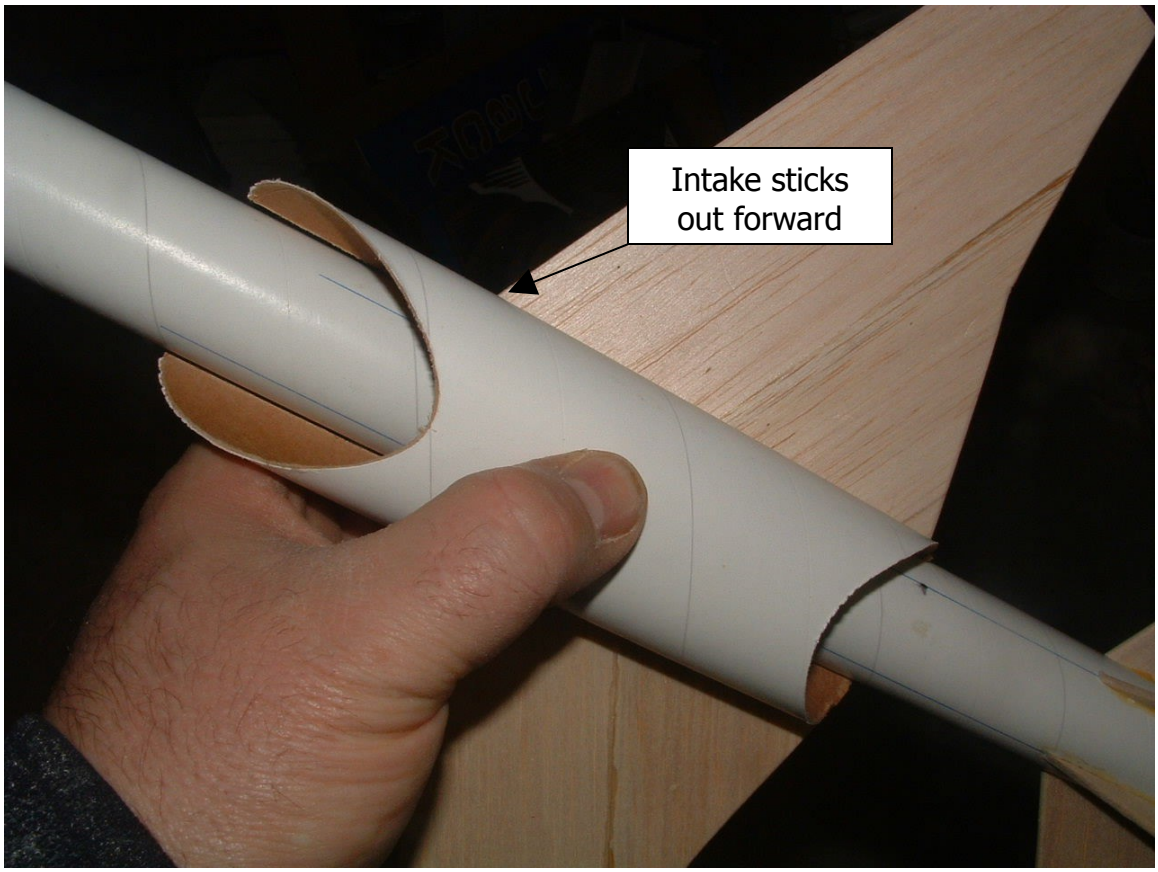
Photo shows tube cut over template. Do not move or rotate the tube during this process.



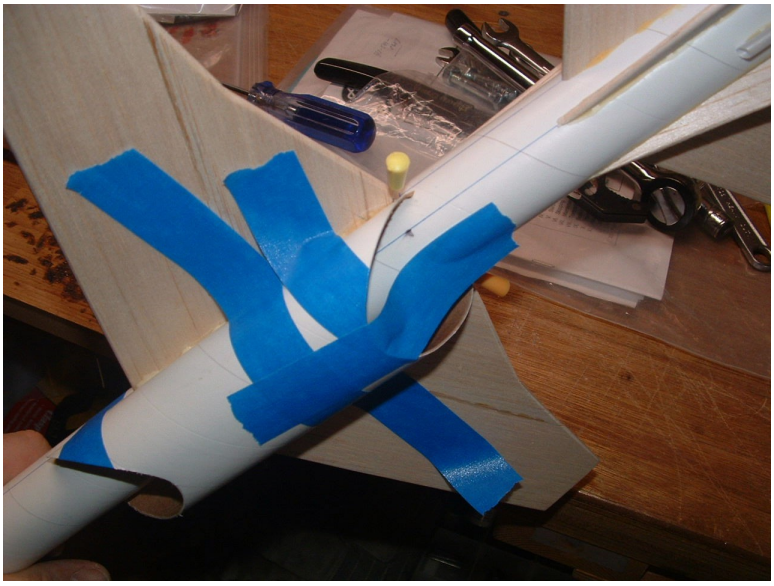
2. Make one long straight slit down the longest part of the tube. Do not cut tube in half. Only make one cut. See next photo for clarification.



3. Spread the tube at the cut and dry fit against the bottom of the wing so that the back of the intake is flush with the trailing edge of the wings. If needed, lightly sand the tube for the best fit. Notice the "Steeper" cut faces forward.



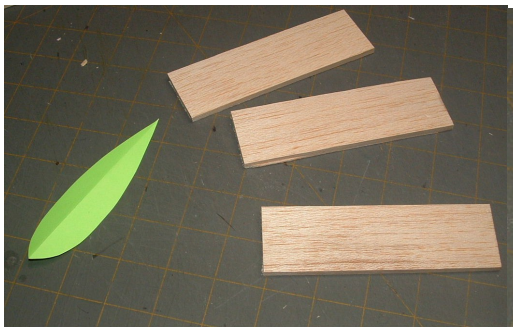
4. When you're satisfied with the fit place a bead of glue where the intake will mate with the body tube and wing root area and carefully apply the intake. Tape and pin intake in place if necessary.

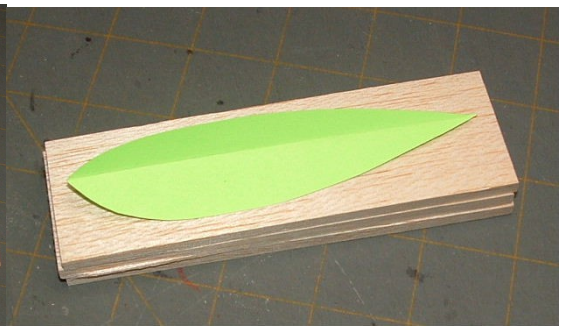


Let dry overnight.

The Canopy

1. Stack and glue together the 3 3/16" balsa pieces and place a weight on top of them as they dry.
2. Cut the canopy template from the template sheet.



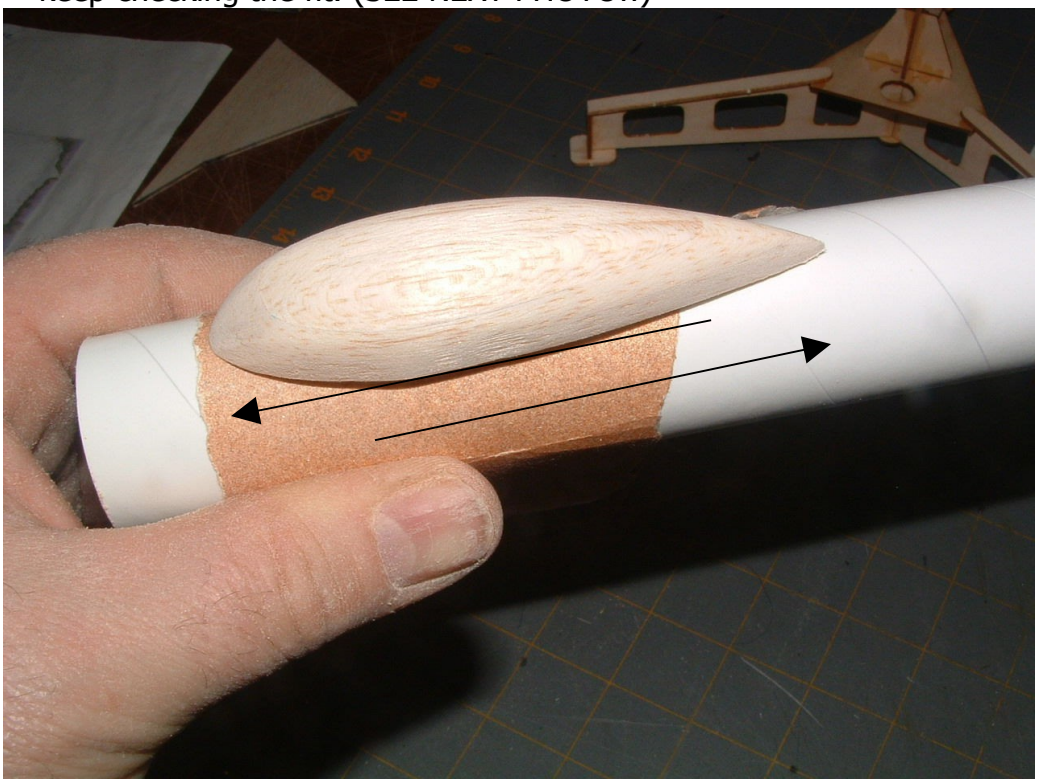


3. Once the laminated stack of the 3/16" balsa has dried, place the canopy pattern on top and trace it out the outline.

4. Using a hobby knife begin to remove the material from the sides until you just start touching the outline of the canopy.

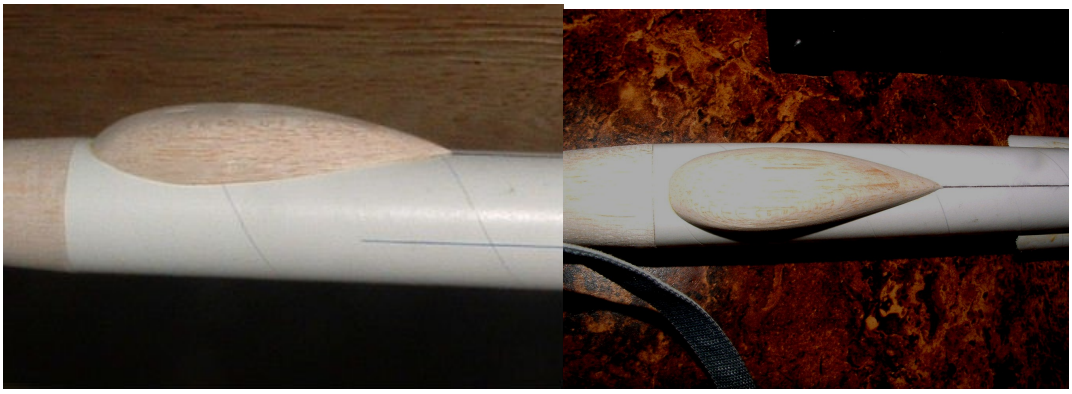
5. Once the basic outline is achieved, round and shape the rest of the canopy. Shaping will be easier of you sand the sides first, and then shape the top.

6. Because we want the canopy to fit against the body tube and have a "blended" in look, take a piece of sandpaper and wrap it around the body tube. Take the canopy and pass it over the sand paper front to back until enough material is removed to make a perfect fit! Do a little at a time and keep checking the fit. (SEE NEXT PHOTO!!)



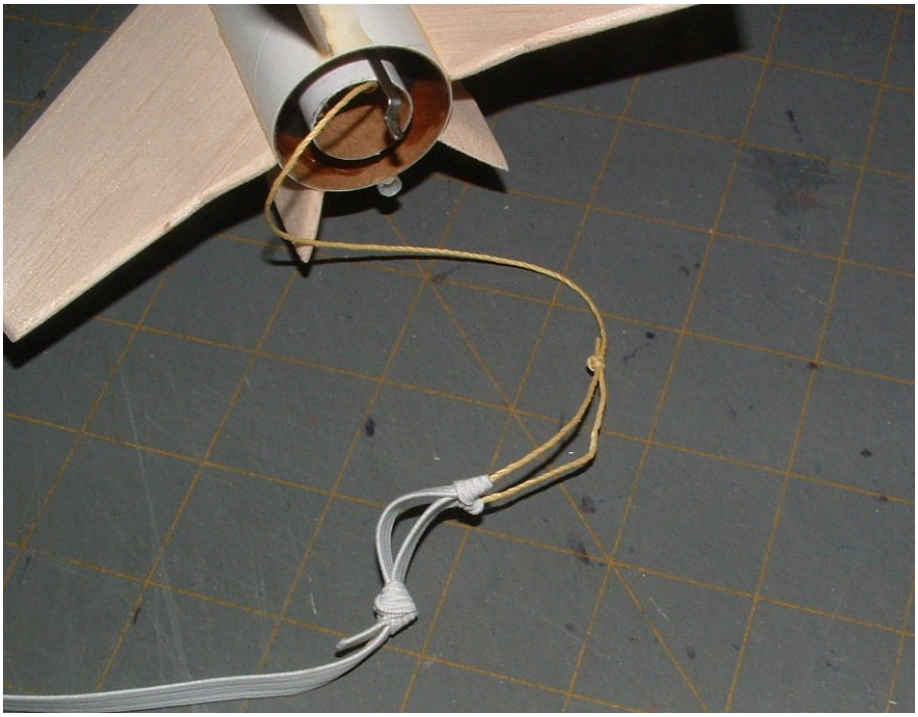
Moving the canopy back and forth over the sandpaper will create a curved surface under it. This will allow the canopy to blend in to the body tube!

7. Using the Vertical Stab fin line as a reference, glue the canopy so that the forward part of the canopy is about ¼" behind the forward end of the body tube. You can use a small piece of tape to hold it in place.

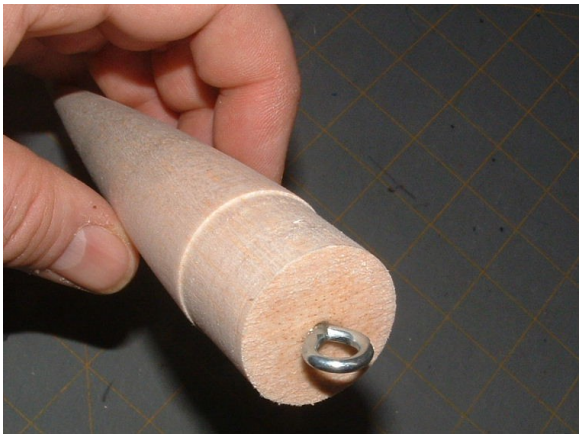


Recovery System-
I find that this easily done of the Kevlar cord is has been left hanging out of the back of the motor tube. The steps below are written accordingly

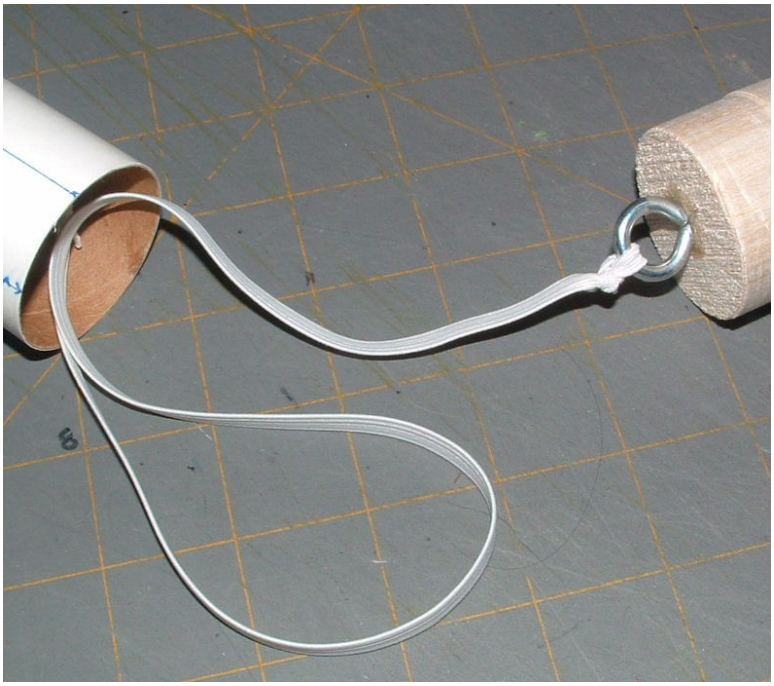
1. Tie a loop in the Kevlar. Tie the shock cord (elastic) to the Kevlar loop.
2. Put a dab of glue on each knot to hold them secure.



3. Thread the shock cord back through to the front of the body tube.
4. Glue the steel eyelet into the nose cone.



5. Tie the shock cord to the eyelet. Put a drop of glue on the knot for security



6. Assemble the parachute according to the directions in the pack.

Finishing-

1. Sand all balsa portions of the rocket including the nose cone.
2. Also sand the intake lips, front and back.
3. Use a sanding sealer such as Elmer's Fill and Sand and finish sand to desired smoothness.
4. To achieve a high gloss finish, use a good quality primer that is sandable.
5. Always use a tack cloth before painting and follow all manufacturers' recommendations for painting and finishing.
6. Decals- Dress up your panther any way you like or use the photos to guide you.
7.

Flight Prep-

1. Assemble parachute according to instructions.
2. Attach parachute to Steel eyelet by way of snap swivel.
3. Use appropriate wadding and pack chute as usual.
4. For first flight, it is recommended that you use either a B6-4 or a C6-5. "A" motors are not recommended for this model!
5. Be sure and follow al NAR safety guidelines when launching this rocket. If you would like to review them, go to: http://www.nar.org

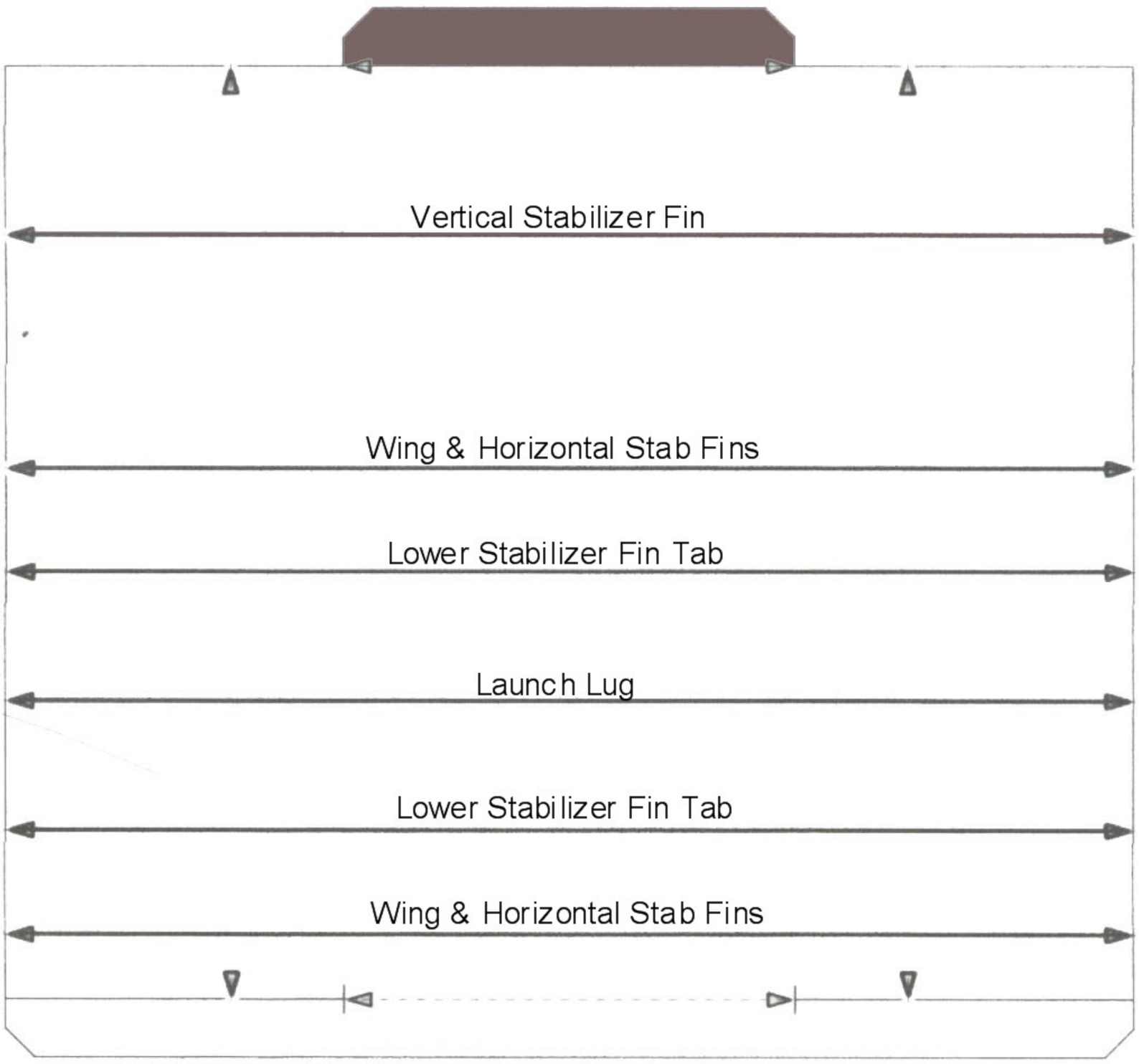
If you have any questions, please feel free to e-mail me at rocketman1959@netzero.com

Rocket Specifications:

Length.....23.4 inches
Diameter.....1.325 inches
Weight.....4.0 oz.
Recommended motors..... B6-4 First Flight, C6-5
Parachute Diameter.....18 inches
Anticipated Altitudes..... 300-700 feet
Design Type.....Sport
Skill Level.....3
Designer.....John Rowan-Stern

If you have any questions, feel free to e-mail me a
rocketman1959@netzero.com

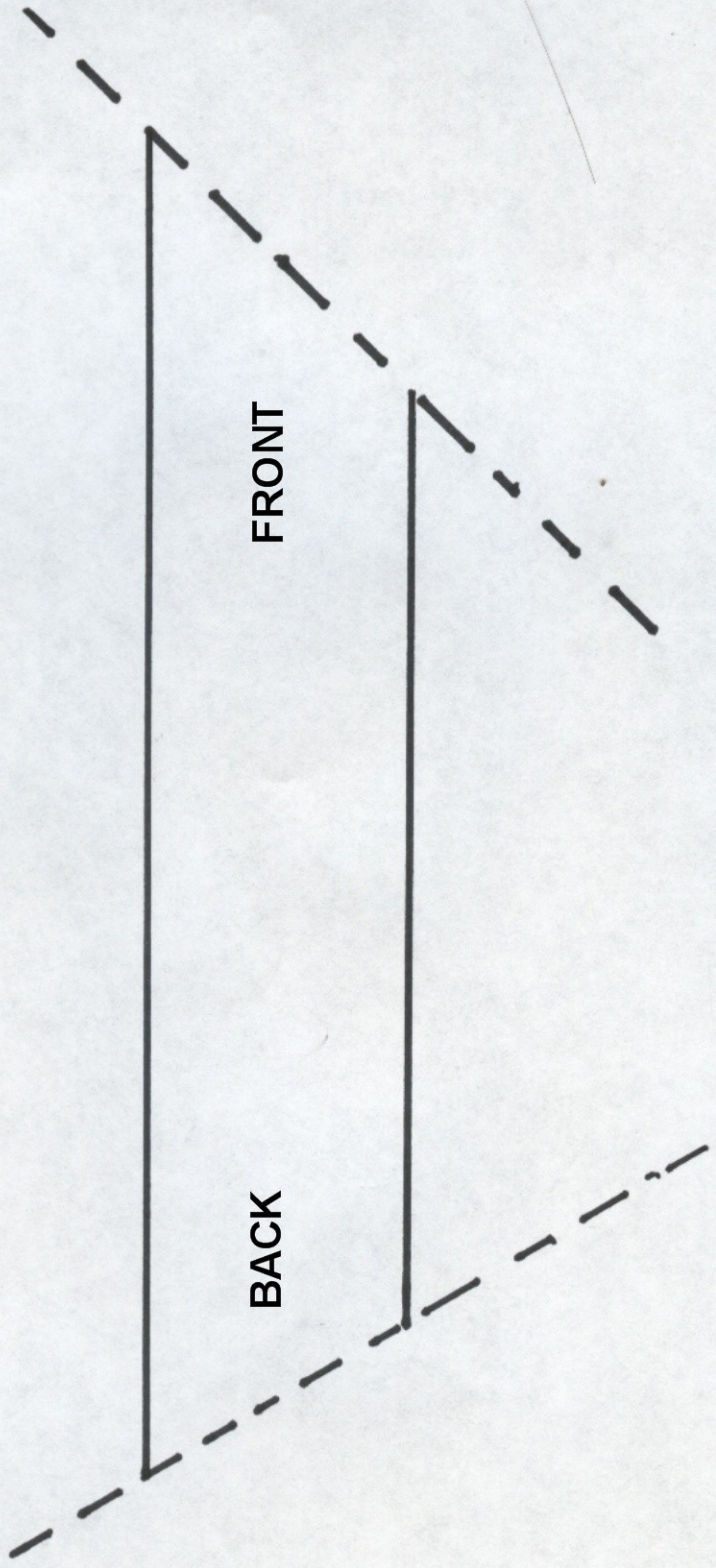
This model was coated with two coats of sandable primer (Krylon, GILZ). I filled all balsa surfaces (including nose cone) with either Elmer's Fill and Sand, or thin CA. I used 220 and 320 sandpapers. The topcoat is Krylon Gray with Krylon Black accents on the intake and nose cone. I used Dupli-Color (silver metallic) for the canopy and finished the canopy with fin black pin-striping tape (3M).



F-24 Panther Fin Wrap Around Guide

1. Cut out fin wrap around guide.
2. Wrap guide around body tube and tape into position so it does not move during marking.
3. Make a mark at each of the arrows.
4. Label marks according to component listed on guide.
5. Remove guide and draw lines the entire length of body tube using a piece of angle stock or door jamb.

Intake Template-
Place tube over template and using a razor saw, cut each end according to dotted lines.



Panther Intake Template

Lower Fin Stab (Make 2-left and right)