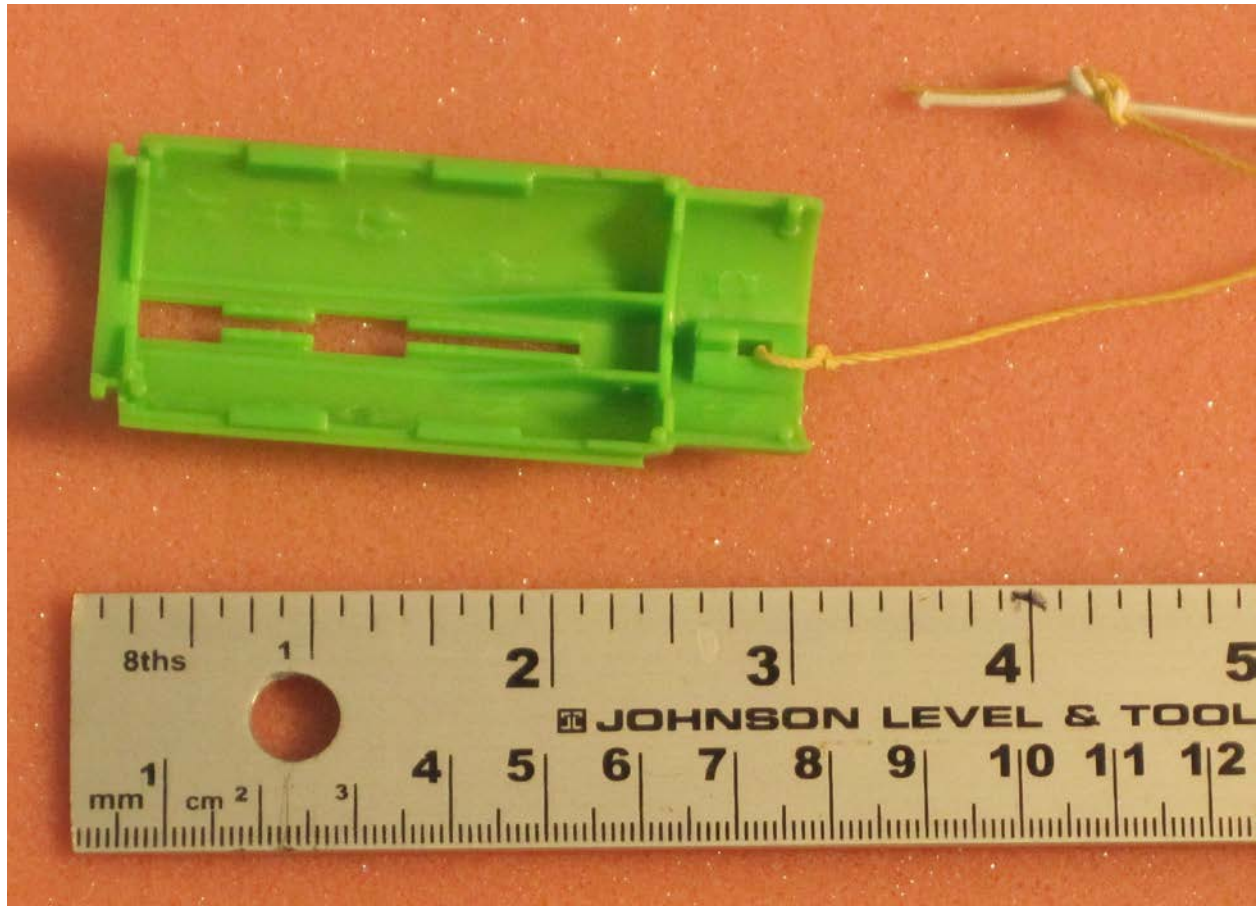
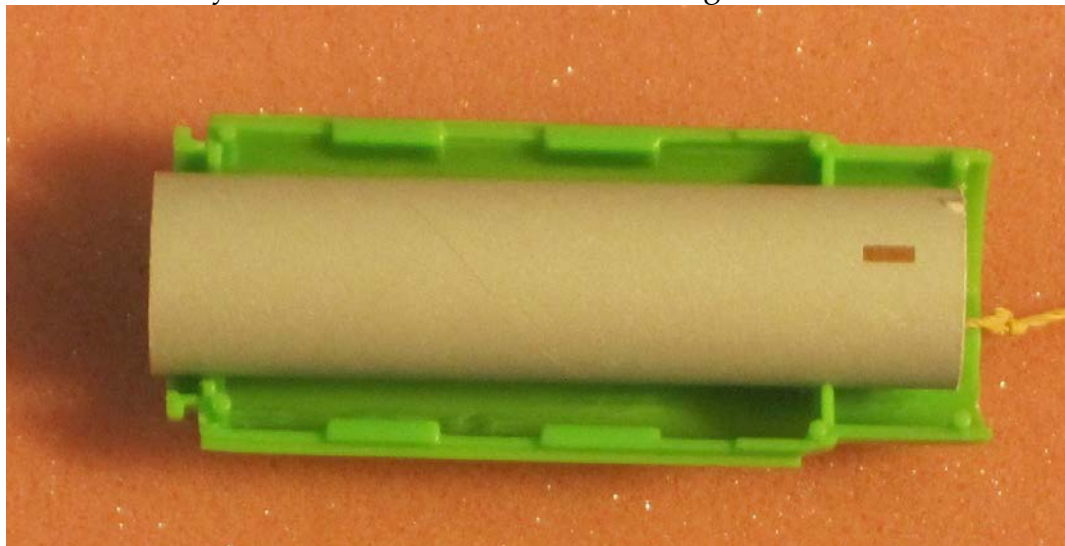




The knots in Step 1 are shown below. The overhand knot in Step 1B can be replaced with a figure 8 knot (as shown) for extra strength. The double knot in Step D is also known as a double half hitch.



Placement of the Gray Motor Tube in the Motor Housing is shown below.

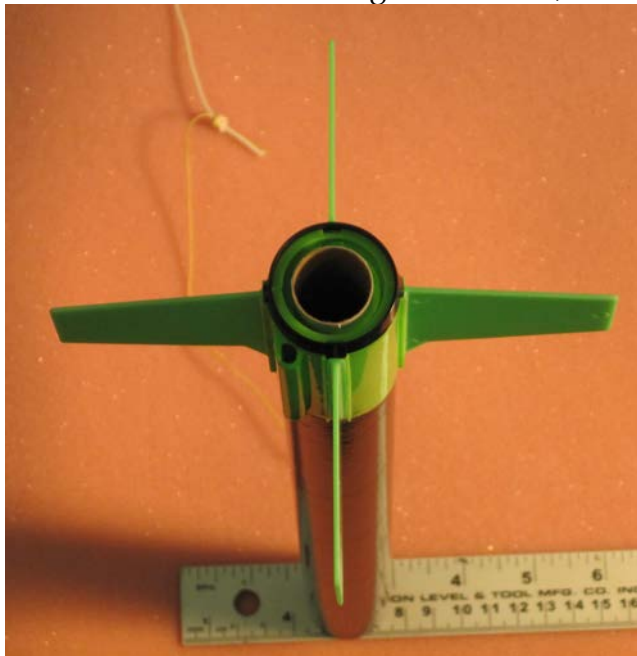




The assembly after Step 2 is shown below. The blue tape is not necessary, but helps to hold the parts together while the plastic model cement hardens.

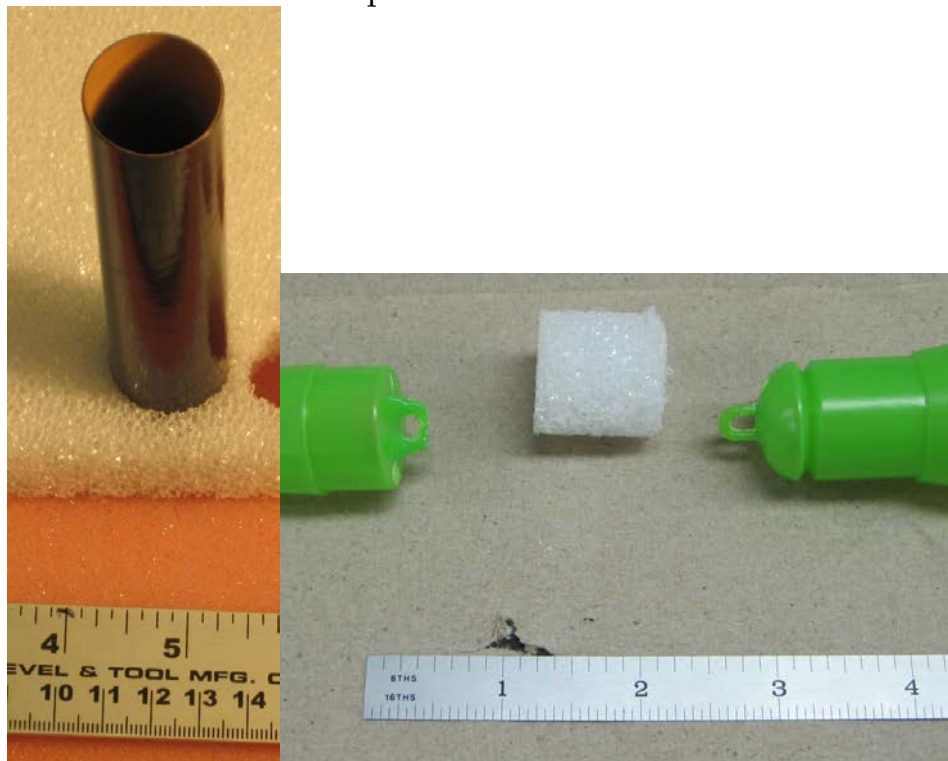


The assembly after Step 3 is shown below. You can be quite generous with the plastic model cement in Step 3. If needed, blue tape can be used to hold the fins straight as the cement hardens. The straighter the fins, the better the rocket flies.



Replace Step 4 in the model instructions with the following steps:

1. Using a 1-inch-tube-punch (the stainless tube) or the Payload Tube, punch out two plugs of the 1-in thick white foam (one at a time). Rotate the tube as you push down. The white foam is roughly 1 in thick, is rigid, and comes in sheets. *Do not* use any other foam in the lab for this step.



2. Use a .5 in diameter (or larger) dowel or a large carriage bolt to push each plug back out of the tube.

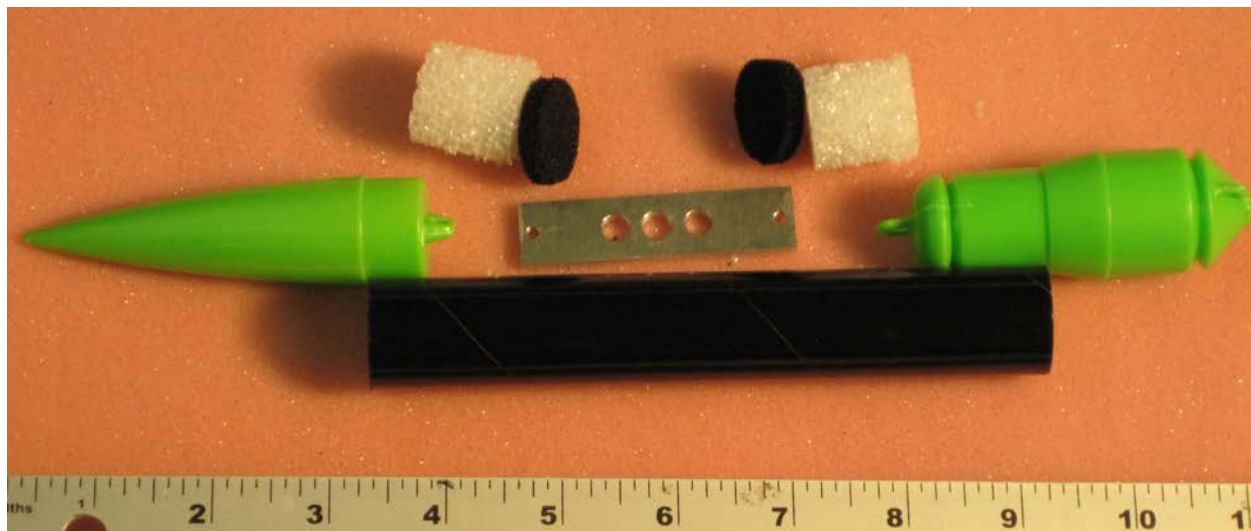


Figure shows the two white foam plugs and two of the conductive foam plugs before assembly.

3. Carefully sand or abrade one piece of foam to reduce the diameter slightly, so that it fits easily in the Small Payload Tube. This piece will be attached to the Blow Mold Transition.

4. One piece of foam needs to be pushed onto the loop in the Nosecone, and the other onto the loop on the small end of the Blow Mold Transition. You can align them by hand if you are very careful, but it's easier to put the foam and the Nosecone or Blow Mold Transition into one end of the Small Payload Tube, put the .5 in dowel in the other end and push together until the loop penetrates the foam

5. The foam on the Blow Mold Transition needs to be compressed further until its shape conforms largely to the Blow Mold Transition. Do not over-compress the foam. Punch out a new piece of foam if you went too far.

6. For both the nose cone and the Blow Mold Transition, remove the foam. Apply plastic model cement to the Nose Cone or Blow Mold Transition and reattach the foam to the Nose Cone or Blow Mold Transition respectively. *Do not apply plastic model cement directly to the foam.* The plastic model cement is a solvent and will turn your foam into a gooey mess if you use too much. It's probably wise to apply gentle pressure to the foam while the cement begins to harden.

7. Double-check the fit of the foam plug and the Blow Mold Transition in the Small Payload Tube. If necessary, carefully sand the outside of the foam plug glued to the Blow Mold Transition until it slides freely into the Small Payload Tube.

8. Cut three disks of conductive foam to the diameter of the Small Payload Tube. You can use a 1-inch-tube-punch to assist in the process. The conductive foam is roughly  $\frac{1}{4}$  in thick and comes in sheets. **Do not** use any other foam in the lab for this step. It's easiest to push a 1-inch-tube-punch gently into the conductive foam to create an outline and then trim around the outline with scissors, although you can completely cut the foam with the a 1-inch-tube-punch with enough force.



9. Trim one of the conductive foam disks with scissors until it is slightly smaller than the payload tube inner diameter. Use a generous amount of white glue on the conductive foam and glue it onto the end of the foam plug attached to the Blow-Molded



Transition. The white glue takes a while to set. A little gentle pressure while setting doesn't hurt.

10. Use a generous amount of white glue and glue one of the remaining foam disks to the foam attached to the nose cone. The white glue takes a while to set. The completed assemblies should look like the photo below. The intent is that when assembled, the altimeter will be held in place by the two conductive foam disks.

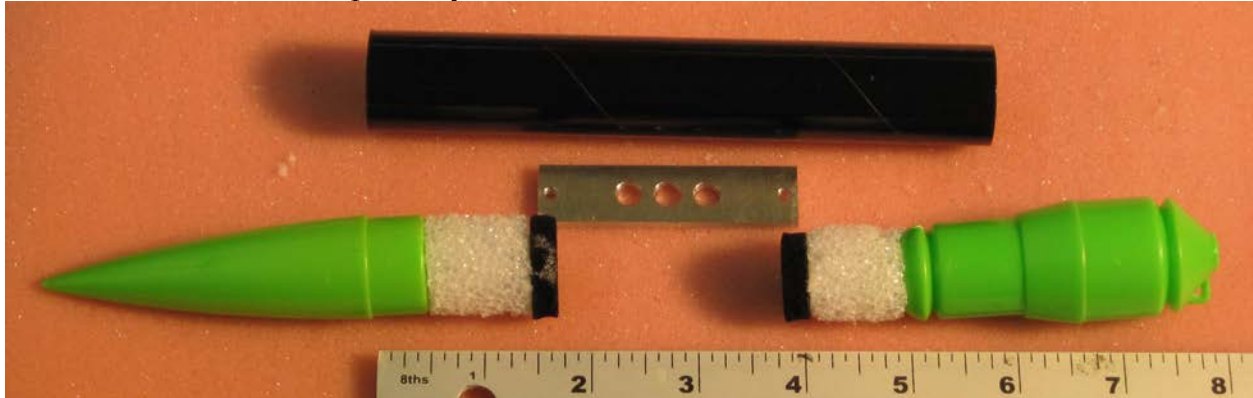
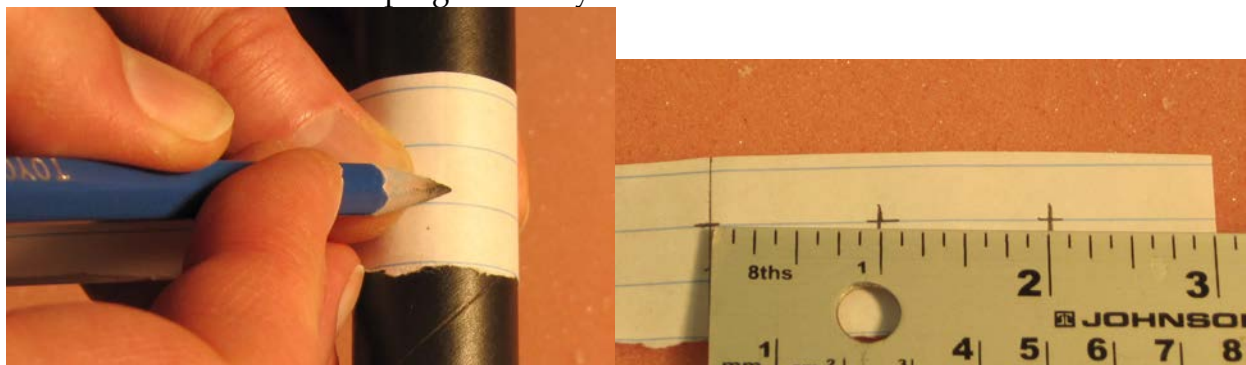


Figure shows the assembled foam stacks with the altimeter simulator.

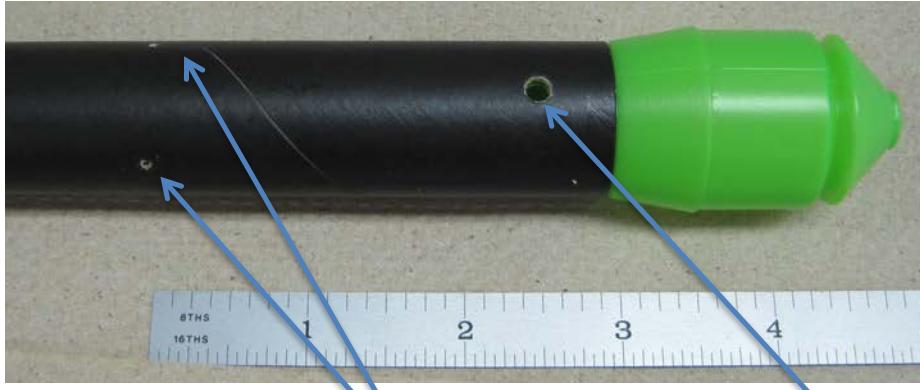
11. Apply a generous amount of plastic model cement to the shoulder (the constant diameter section) of the Nose Cone. Try to avoid getting any on the white foam. Insert the conductive foam – white foam – nose cone assembly into one end of the Payload Tube and twist gently until the top of the shoulder of the Nose Cone rests against the Payload Tube. Quickly wipe away any excess glue with paper towel. **Do not** glue the conductive foam – white foam – blow-molded-transition assembly into the Payload Tube. It must be free to slide in and out so that you can insert and remove the altimeter.

12. The conductive foam – white foam – blow-molded-transition assembly should slide easily into the other end of the payload tube. If it doesn't, reshape the foam parts until it does.

13. Insert the conductive foam – white foam – blow-molded-transition assembly into the payload tube. Drill holes for static vent  $3.00 \pm .25$  (or at a position you calculate) from the blow-molded-transition end of the Small Payload Tube. Holes should be spaced at  $120^\circ$  around the tube. Calculate the hole diameter from the [Adept Rocketry guidelines](#). Use the +100% size option. Do not make the holes smaller than .050 regardless of your calculations. Smaller holes plug too easily.



14. Drill a tapping hole for a #6 nylon screw. The hole should be  $.500 \pm .050$  from the end of the Small Payload Tube, and  $.1065 \pm .002$  (36 gauge) in diameter. Drill simultaneously through both the tube and the transition into the hollow center. **Do not** drill clear through the Payload Tube and out the other side. Remove the Payload tube and enlarge the hole in it with a  $.144 \pm .002$  (27 gauge) drill bit. Tap the hole in the transition with a #6 tap. Be sure to use a #6 nylon screw in the threaded hole for your launches. The nylon screws are *reusable*. Please reuse them.

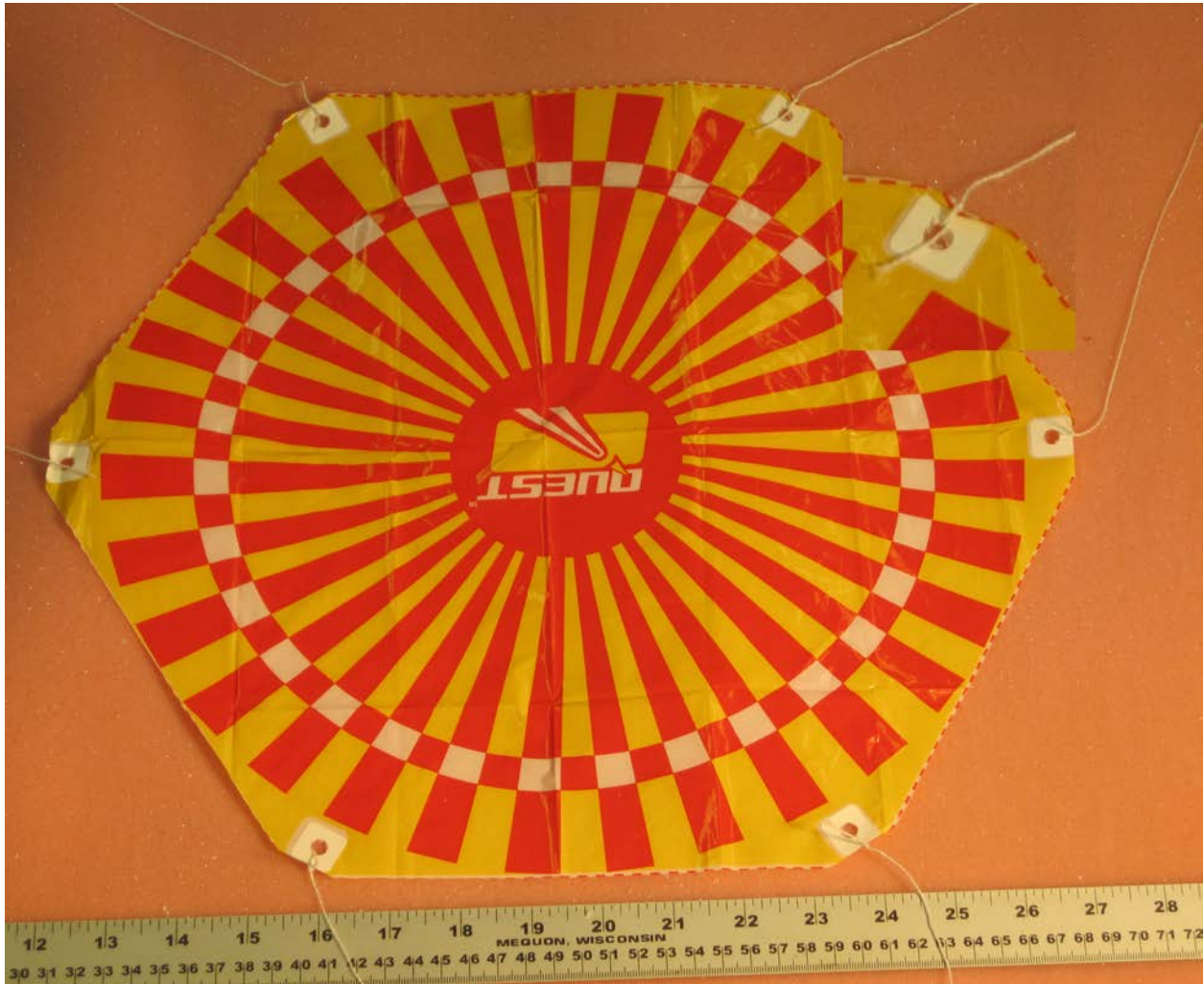


Vent Holes

Hole to Tap (not to scale)

15. In Step 5 of the kit instructions, attach the parachute you put together to the loop in the white shock cord attached to the lower portion of the rocket, as per the on-line instruction, not those in the kit. The knot on the end of the shock cord is a figure-eight knot on a bight. Attach the nylon Top Flight parachute to the payload section, as per the on-line instruction, not those in the kit. You may find the plastic loop in the Blow Mold Transition too small to accept the parachute lines. A  $5/32$ " hole drilled in the transition near the center hole (as per the example) may solve the problem.





16. Regarding Step 6, we recommend you put your parachutes inside your rocket only when you are prepping for launch. Leaving them inside the rocket can cause them to take a set and not unfurl in flight. The results are not happy.

17. Regarding Step 7, the circumferential stickers add strength to the body tubes. They should be added. The other stickers are optional. However, please put one of your Section and Team Stickers on the booster section, and one on the payload section. With so many identical rockets, it's easy to get confused without ID on your rocket. Be sure to re-drill any holes you cover with the stickers. You can also drill the holes after you place the stickers, instead of before.

18. The third conductive foam disk can have a slot cut into it for centering the altimeter in the payload bay if you desire, but it is completely optional.



