

Nike Smoke

10”

The Nike Smoke was developed in 1959 as a vehicle for observing high altitude wind patterns generally in preparation for launching another rocket. The Nike Smoke uses an air inlet at the tip of the nosecone to allow air to mix with a solution of sulfur trioxide and chlorosulfonic acid. The result was a dense smoke trail that was visible from the ground. Later versions added titanium tetrachloride and phosphorus to the smoke solution producing a more visible smoke trail. The operational version of the rocket had a service ceiling of 75,000 feet. The rocket was also flown in a two stage configuration to altitudes of 32 miles.

This kit features:

- Through the wall fin mounting
- Machined Baltic Birch fins and rings
- Fiberglass molded nose cone
- Pre-fiberglassed and pre-slotted body tube
- 98mm motor mount
- Dual Deployment or Apogee only
- Tubular nylon shock cords

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List of Materials:

- (1) Fiberglass nosecone
- (1) Nosecone bulkhead
- (1) Lower Body tube - slotted
- (1) Upper body tube
- (1) Lower body tube support ring
- (1) Coupler / Electronics bay
- (1) Upper electronics bay bulkhead
- (1) Lower electronics bay bulkhead
- (2) Electronics plate slides
- (1) Electronics mounting plate
- (4) Threaded Rods
- (24) 1/4-20 nuts
- (20) 1/4" washers
- (4) 1/4" wing nuts
- (3) Centering rings
- (4) Fins
- (1) 98mm motor tube
- (4) U-bolts with backing plates
- (2) Shock cord
- (2) Launch Lugs

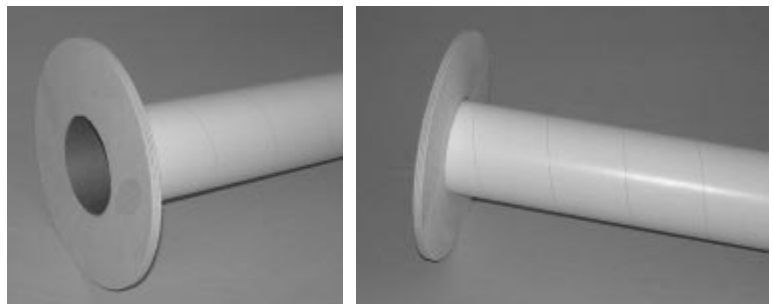
Construction

Please read and understand each step. The construction methods used in this kit differ from others in many ways. It is important to follow the instructions to ensure you get the most out of your kit.

Motor tube and centering ring assembly

If you plan to use motor retention that does not require the motor tube to be exposed, epoxy one of the undrilled 3/8" thick centering rings onto the motor tube so the tube is flush with the centering ring. Wipe away any excess epoxy on the motor tube side of this joint. If there is excess epoxy here the fins will not seat properly against the motor tube when they are installed.

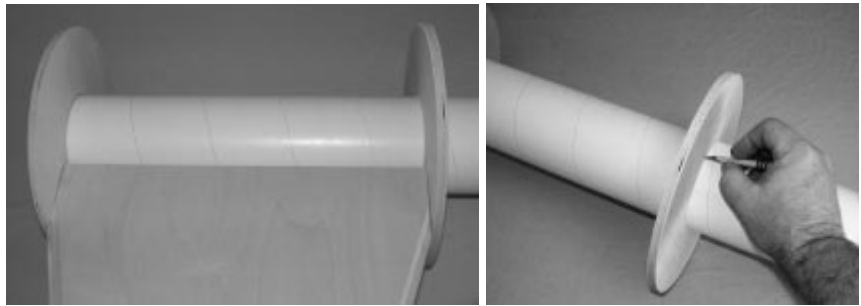
If you plan on using motor retention that attaches to the motor tube, leave the desired amount of motor tube exposed.



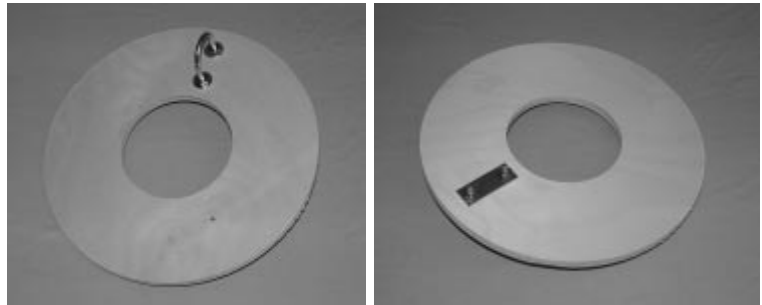
Using a fin as a guide, position the remaining undrilled centering ring onto the motor tube as shown. Mark the position of this centering ring. **DO NOT GLUE THE FIN IN AT THIS TIME.**

Remove the fin and slide the centering ring back toward the aft centering ring.

The fin is slid back so that when epoxy is applied to the motor tube to hold the ring, there will be no bead of epoxy where the fin will rest (between these two rings). Apply a bead of epoxy around the motor tube where this ring will rest and slide it back into position.

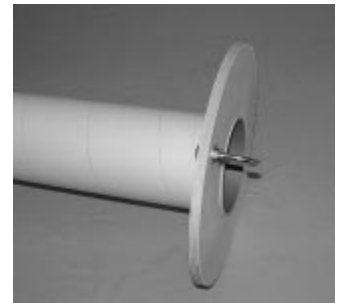


Assemble the forward (drilled) centering ring as shown. Tighten the U-Bolt nuts with a wrench or pliers and use either epoxy or a thread glue to ensure the nuts do not loosen up over time. The nuts on the back of the U-Bolt will not be accessible to tighten after assembly.



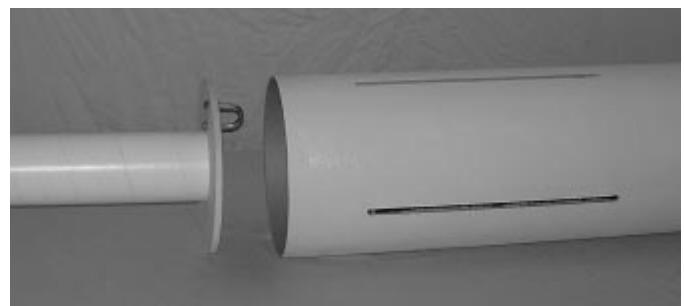
Epoxy the forward centering to the motor tube. Apply a fillet of epoxy around the motor tube as shown.

Rotate the motor tube assembly during the curing of the epoxy to prevent the resin from running. Allow to cure completely.



Lower Body section assembly

Apply a generous ring of epoxy inside the body tube where the centering rings will rest and slide the motor tube assembly into the body tube from the aft end. Slide the motor tube assembly into the lower body tube and seat the aft ring $3 \frac{15}{16}$ " in from the end of the body tube. Allow to cure.

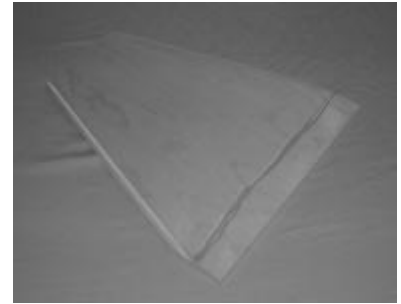


Epoxy the lower body tube support ring (10" diameter coupler section $3 \frac{15}{16}$ " long) into the aft end of the lower body tube. The lower body tube support should seat against the lower centering ring and also be flush with the end of the body tube. This ring adds support to the lower body tube to prevent damage from landing.



Test fit a fin into all the fin slots and make sure it seats all the way to the motor tube. It is critical to get a good bond between the fin and the motor tube. Failure to do so will result in structural failure of the rocket. Once a good fit has been achieved you are ready to epoxy the fins into place.

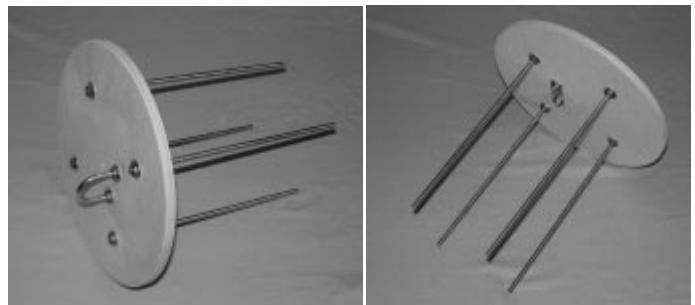
Apply a bead of epoxy on each side of a fin as shown. This bead should be approx. two inches in from the root. Apply a generous bead of epoxy on the root of the fin and the ends next to the root. Slide the fin into place and make sure it is seated against the motor tube. Ensure the fin is straight. Wipe away any excess epoxy from the joint of the fin and the body tube. Allow to cure. Repeat for the remaining three fins.



Electronics Bay / Upper body section assembly

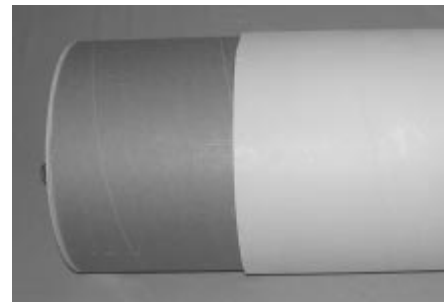
Assemble the upper electronics bay bulkhead as shown. The upper bulkhead is the drilled bulkhead WITHOUT the machined lip.

Use nuts and washers on both sides of the threaded rod. Secure the threads with epoxy or thread cement to prevent them from loosening up over time.

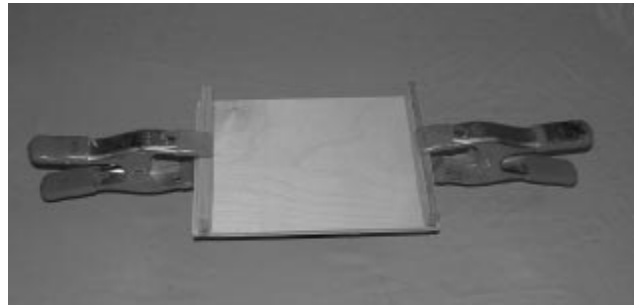


Install the U-Bolt in the lower electronics bay bulkhead with the U-bolt on the opposite side of the machined lip.

Assemble the electronics bay by putting the upper bulkhead onto the coupler and securing the lower bulkhead with the four threaded rods. Do not overtighten the wing nuts holding the lower bulkhead in place. Epoxy the electronics bay into the upper body section leaving six inches of the coupler exposed. **MAKE SURE YOU EPOXY THE BAY IN THE CORRECT WAY.** The lower (machined lip) bay should be outside. Use plenty of epoxy here. Allow to cure.



Assemble the electronics mounting plate as shown. Use ample epoxy on the joints but take care not to block the holes. Test fit the plate onto any two of the threaded rods in the electronics bay.



Nose cone assembly

Install the U-Bolt into the nose cone bulkhead. Secure the threads with epoxy or thread cement. Carefully install the bulkhead into the nose cone. Do not force it, you can split the nose cone. It should fit snugly. Sand if necessary. Epoxy the bulkhead into place. Use a generous amount of epoxy here and form a fillet. Allow to cure.



Final Assembly

Drill pressure holes in all compartments. There should be one in the lower fin can assembly, the upper area of the lower body section, one in the electronics bay, and one in the upper body section above the electronics bay. We recommend a 5/16" pressure hole.

Mount the launch lugs as shown. You may opt to use rail guides (not provided).

You must either use a rod or rail no longer than 80" or you must stand the guides off the body tube by 3/4", otherwise your rod or rail will hit the nose cone.



Epoxy the nose cone bulkhead into the nose cone. Use plenty of epoxy here and take care not to push the nose cone bulkhead too hard into the nose cone, it will deform the nose cone. Apply a fillet of epoxy around the joint, stand the nose cone up point downward and allow to cure completely.



Securely tie all shock cords into place. The longer shock cord is for the apogee section. Secure the knots with thin CA to prevent them from coming undone.

Use thin CA on all the edges of the body tube. This will prevent them from getting damaged when assembling the rocket or from landing.



The center of gravity should be 94" back from the tip of the nose cone. If built per the instructions you will not need to add any nose weight.

The rocket is designed to accept motors ranging from high thrust K motors up through N motors.

We recommend a 24" or 36" drogue and a 8' to 15' main parachute.

We hope you enjoy your Nike Smoke and would like any feedback you have.

Happy Flying!

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