# Nike Smoke 4”

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 visable from the ground.
Later versions added titanium tetrachloride and phosphorus to the smoke solution producing a more visable 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
- Fiberglass molded nose cone
- Pre-fiberglassed and pre-slotted body tube
- Baltic Birch fins and centering rings
- 54mm motor mount
- Tubular nylon shock cords
- Shock cord mounting hardware

This kit is designed to fly on motors ranging from G through K impulse. You will need a 36” to 50” parachute, depending on motor selection and landing site conditions.

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## List of Materials:

(1) Fiberglass nosecone
(1) Nosecone bulkhead
(1) Body tube - slotted
(4) Fins
(3) Centering rings
(1) 54mm motor tube
(2) U-bolts
(8) 1/4” Nuts
(8) 1/4” Washers
(1) Shock cord
(2) Rail Guides
(2) 8-32 screws for Rail Guides
(4) 8-32 nuts (rail guide standoffs)

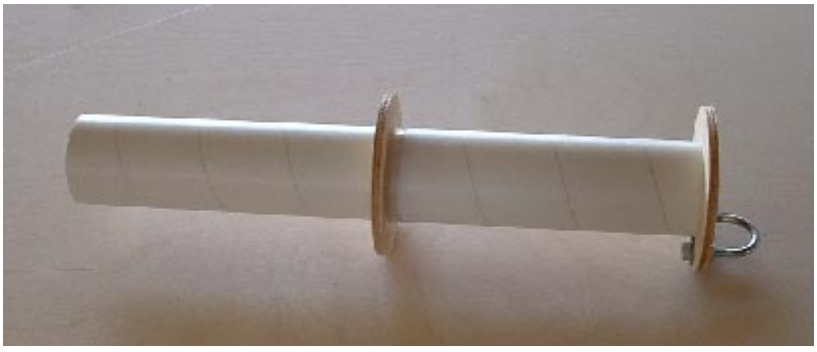
# Construction

*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.*

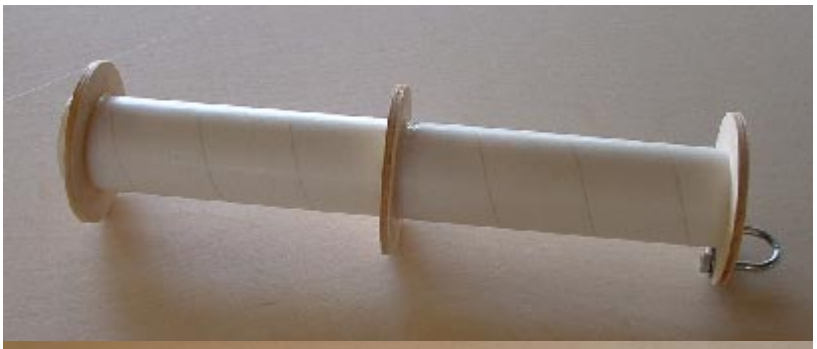
## Assembly

Install the U-Bolt and hardware into the forward centering ring as shown. Tighten the nuts with a 7/16” wrench. Secure the threads with thread lock or epoxy to prevent them from loosening up over time.

Epoxy the upper two centering rings onto the motor tube. Leave 1/8” of tube exposed at the upper end (the end with the U-Bolt), and leave 7 3/4” of motor tube exposed at the aft end. Allow to cure completely.



Epoxy the remaining centering onto the aft end of the motor tube. Leave 1/2” of motor tube exposed at the aft end. This is used to attach motor retention if desired. Allow to cure completely.

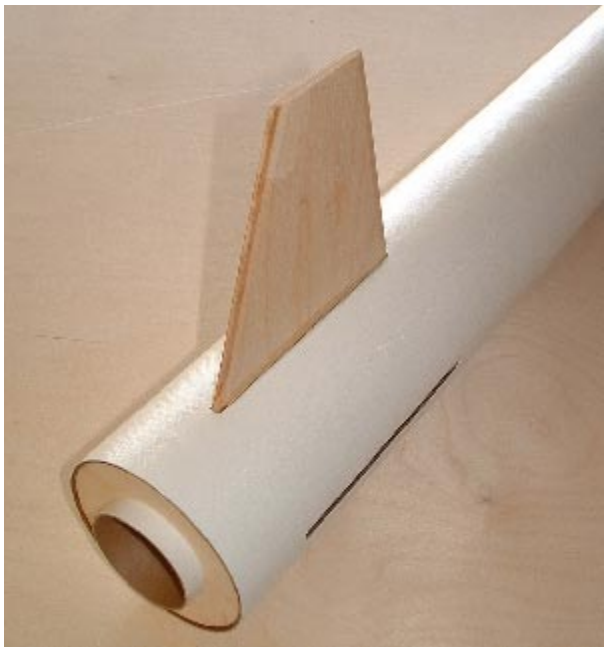


Securely tie the shock cord to the Ubolt as shown. Use CA or epoxy on the know to keep it from coming undone over time.

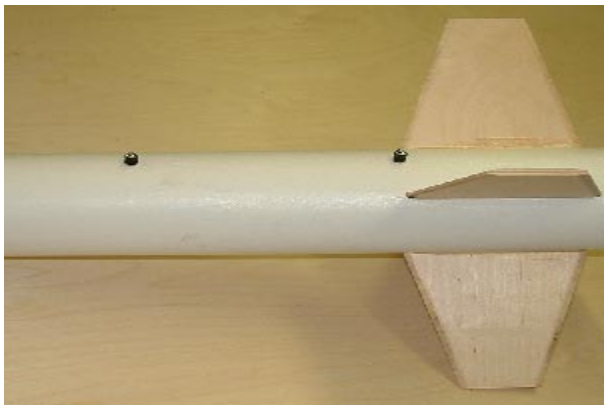
Wrap the remaining shock cord up and tuck it inside the motor tube. This will allow you to asseble the rocket without getting eopxy onto the shock cord.

Test fit the motor tube assembly into the body tube as shown. It should be a snug fit. Remove the assembly. Apply epoxy to the inside of the body tube and slide the motor mount assembly into the body tube as shown. The middle centering ring should just be visable at the forward edge of the fin slot. The fins will rest against the middle centering ring. Stand the body tube verticle and allow the epoxy to cure completely.

Test fit all four fins into their slots. Make sure the root of the fins makes solid contact with the motor tube. Epoxy the fins into place by spreading epoxy on the fin root and along the sides of the fin that will touch the body tube. It is easiest to do two opposing fins at the same time, as it is easy to line then up with each other. Allow the epoxy to cure completely on the each fin or set of fins you glue. A weak glue joint here is not desirable. Excess glue is not needed, and fillets (either internal or external) are not recommended. This joint is designed to fail in the event of a crash or extra hard landing. The joint is plenty strong for any flight situation, but if you overbuild the joint the plywood fin will break rather than popping, making a repair very difficult.



After the fins have cured completely, drill a 1/8" hole for the upper and lower rail guides. The holes should go into the upper and middle centering rings. You can use a dowel to measure the distance from the upper end of the body tube to the upper centering ring. The middle centering ring is lined up with the leading edge of the fins.
The rail giudes use two 8-32 nuts as standoffs to allow clearance for the nose cone on the rail.



Install the U-Bolt and hardware in the nose cone bulkhead in the same manner as the previous centering ring. Remember to secure the threads. Test fit this bulkhead into the nose cone as shown. DO NOT FORCE THE BULKHEAD INTO PLACE. Epoxy the bulkhead into place. Apply a generous bead of epoxy around the bulkhead to prevent it from ripping out.

Drill a pressure hole in the body tube appx. half way between the upper rail guide and the top of the body tube. The hole should be a 3/16" hole.

The rocket will not need any nose weight.

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