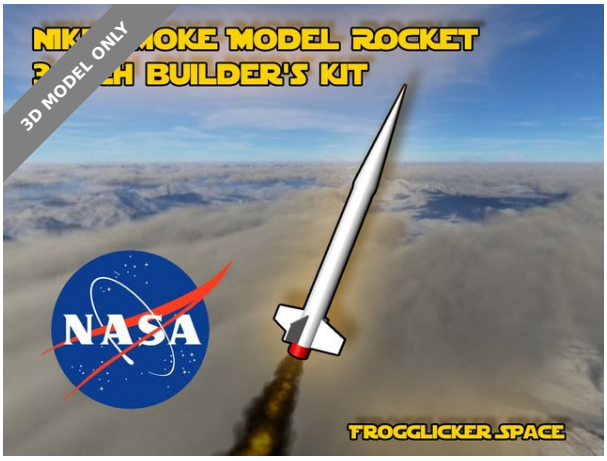


# Nike Smoke Model Rocket -- Power Series - 3in

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VIEW IN BROWSER

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## Summary

Nike Smoke Model Rocket Builder's Kit on a 3-in Body Tube airframe with 38mm and 54mm motor mount tube option!

Hobby & Makers > RC & Robotics

Tags: motor rocket model stem power science level 3 kit inch eggtimer high 54mm hpr highpower 38mm nar builder aerotech frogglicker tripoli mpr level1

Updates:

7/4/2024: Fixed a minor fitment issue with the Nosecone MID section. Now at v1.2

7/5/2024: Added a forward CR for 54mm with a cutout for 13mmx3mm tubular nylon shock cord.

7/7/2024: I flew this model on its maiden flight. See Maiden Flight below for details.

7/8/2024: Published the video of this rocket's maiden flight

7/15/2024: I added Epaulet models to the kit

- Detached Epaulets - for attaching to existing 3-in nosecones. It has been shaped to fit mine but the concave curve should be close for use on the Estes nosecone
- Epaulets incorporated into the Nosecone AFT model. No glue necessary (batteries not included)

**Introduction**:

The Power Series of Builders Kits were designed to incorporate more traditional techniques of high-power rocket building, using modern manufacturing techniques. These are the big brothers/sisters of those in the Extreme Series. The power series rockets can take much larger rocket motors requiring Level1/Level2 HPR certifications to fly them. If you don't have a certification, you can still enjoy these beautiful models, but I encourage you to start with one of the kits from my Mini or Extreme series.

If you have built a high-powered rocket before, you will instantly feel right at home. They are built around the LOC/Precision rocket body and motor tubes, with centering rings, retaining rings, Nosecones, etc. If you are not familiar, I have links to some videos that will be helpful. There is nothing weird in the construction. You need to take your time, follow the assembly steps, and you'll be in great shape.

First, a couple of things about the design. The nosecone is a 3-piece printed nosecone that assembles easily with epoxy and can house various electronics including multiple flight computers, GPS tracking, or other scientific instruments. Included in the kit is an avionics sled designed for an Eggtimer Quantum flight computer, a sled designed for the Eggtimer Quasar, a flight computer with GPS tracking, or a nosecone plug to house simple altimeters or nothing at all. Each is attached by screwing the part into the base of the nosecone. A 1⁄4-in eyebolt can be screwed and epoxyed into the bottom center of the part to attach to the rest of the model.

Also included is a detailed OpenRocket simulation file with potential motors that should work.

If you print and enjoy this model, please consider clicking on the LIKE (Heart) button and posting a Make. It helps me and I would love to see other models made from this.

**Models Included**:

- Nosecone Folder
  - Aft, Mid, and Forward nosecone sections
  - AV sleds for Quantum and Quasar flight computers
  - Nosecone AV plug
  - Nosecone AFT with Epaulets - NEW
  - Epaulets Detached - New (in case you want them and already printed the AFT Section)
- Fin Folder - These fins were inspired by CWBULLET's Nike Smoke Fins
  - Fin for 54mm MMT (4x)
  - Fin for 38mm MMT (4x)
  - Fin slot marking/cutting guide

- Centering Ring Folder
    - Forward and Aft centering rings for 54mm MMT
        - Alt. FWD CR for 54mm.
    - Forward and Aft centering rings for 38mm MMT
- Retainer Folder
    - Ring and Cap for 54mm MMT
    - Ring and Cap for 38mm MMT
- Modified Rail Guides for 1010 Rail - you will need these or some other solution to account for the bulge of the nosecone

**Materials Needed:**

- 30 inches or more of LOC/Precision body tubing
- 38mm or 54mm LOC/Precision Motor Mount tubing (MMT) - 14 inches but too much is never a bad thing
- 15 (or more)-minute epoxy. I use QuickCure 15 and PC-7
- 1⁄4-20 eye-bolt (or two) for the sled/plug and forward centering ring
- 15 feet of 13mm tubular nylon shock cord
- 45-inch parachute
- dog barf recovery wadding(optional - or is it?)
- fire blankie
- 2-3, 3/16 Quicklinks
- Paint, tape, acid brush or disposable brushes, beer, brownies ;)
- 8-32 x 9/16-in( screws (2x) for the rail buttons. M4 x 14mm equiv.

**What's all this above?**

I recommend LOC because I have used their tubes and other products enough to feel comfortable about recommending them to others. Since this build revolves around their 3-in tube, it's convenient to get the other parts from them, too. If you have a preference, you're fine to use what you're comfortable with.

**Printing Instructions:**

All parts were tested using Elegoo Rapid PETG on a Comgrow T300

Default settings:

- PETG - As easy as printing with PLA/PLA+ but stronger and heat-resistant
- 0.4mm nozzle
- 0.2 resolution
- 250c nozzle temp
- 80c bed temp (unless otherwise stated)
- 25% infill (unless otherwise stated)

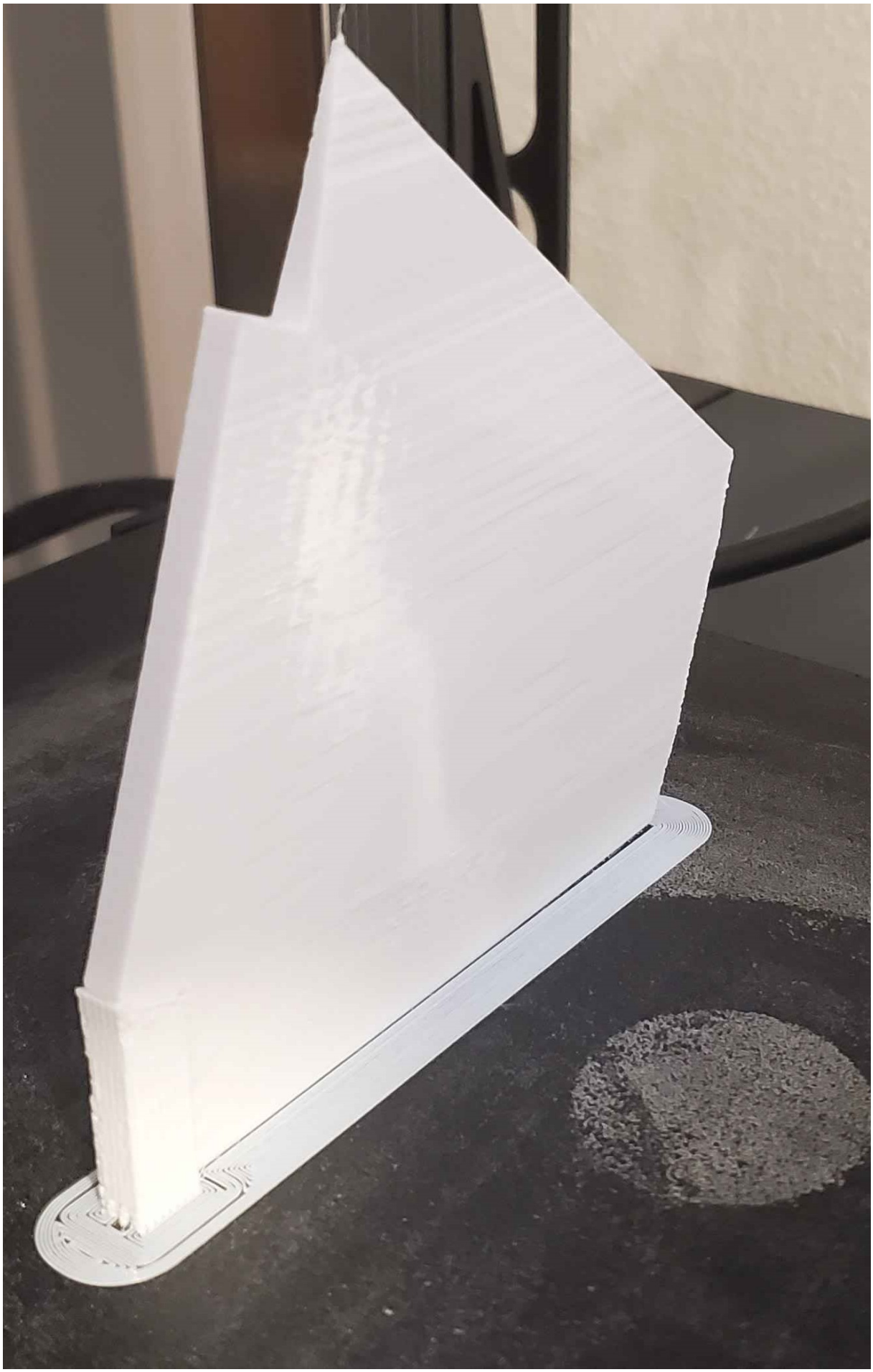
**Nosecone:**

These parts tend to warp on the bottom due to heat and not having any support in the middle. Use extra glue, PEI sheet, large brims, and supports for internal overhangs to give the model more surface area on the bed.

- Slower speeds -- I printed the AFT and FWD sections with the nominal settings, but the MID with 250c/65c at 50% speed. All parts turned out great

**Fins:**

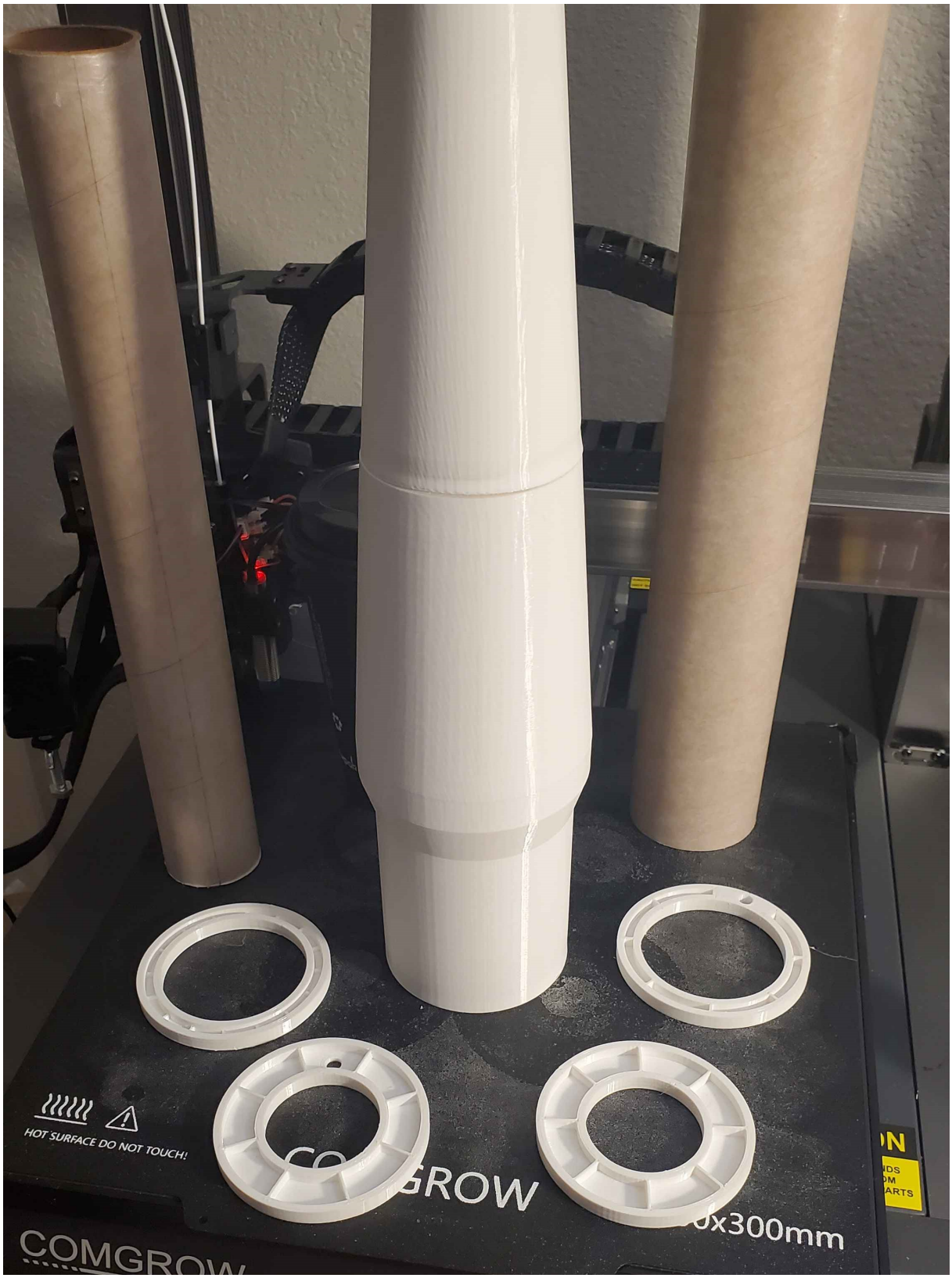
Print four of the fins from the motor mount you decide on. I test-printed both but only built my first rocket with the 54mm option. Printing these in a vertical orientation with the trailing edge on the build plate does not give much stability (tall and skinny=bad), so add some supports on the fin tab. I printed each one individually and didn't have any issues. See Pic.



**Fin Print Orientation**

**Centering Rings:**

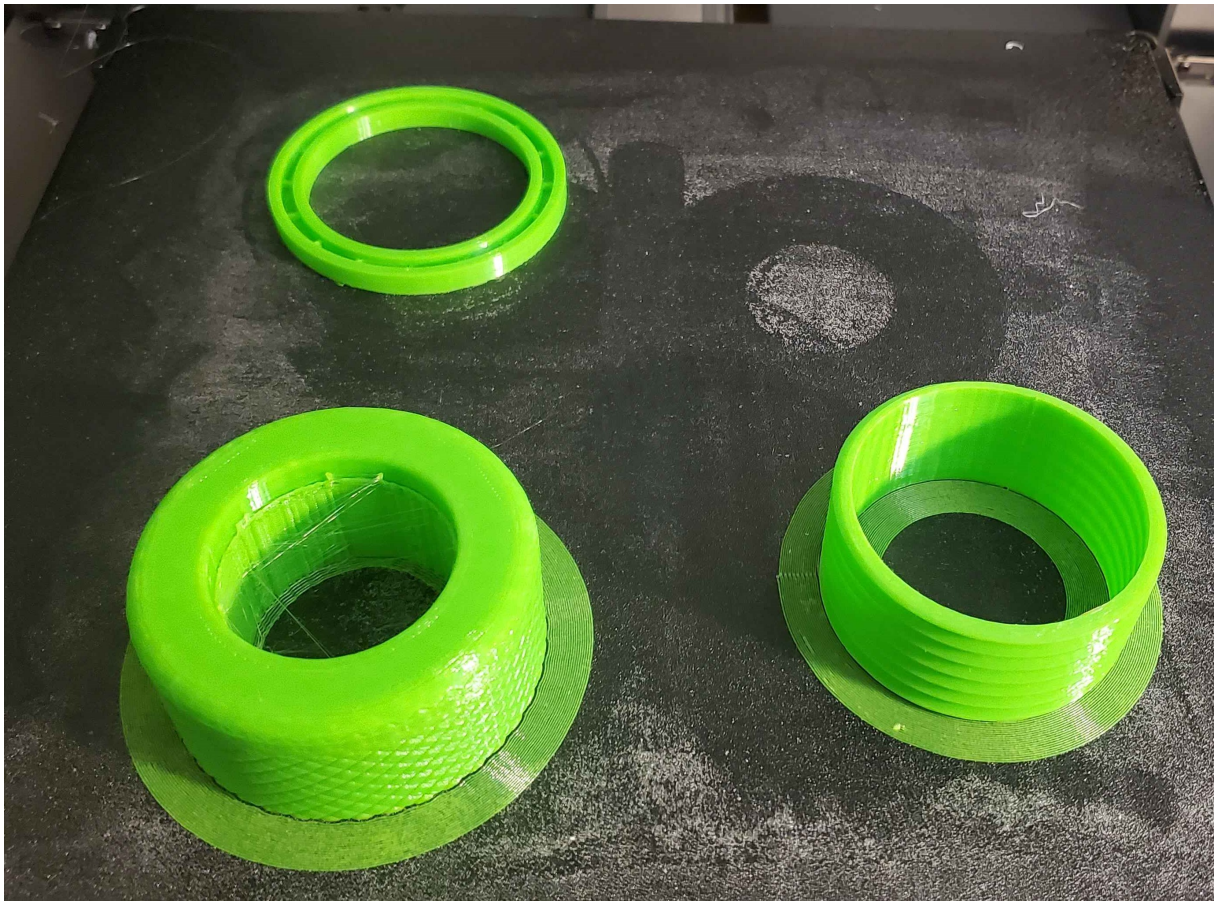
If you like having three centering rings, then print 2x aft centering rings and one forward centering ring with default settings. Be sure to select the correct sized set based on your motor mount tube choice (54 or 38mm)



**Centering Rings for 54mm and 38mm MMTs**

**Motor Retainer:**

Each set contains a ring and cap. Select the correct size and print with default settings. You can slow down these prints to get better thread results. I like my cap to not have the PEI indentions so I print it facing up with supports on the internal overhangs. Do not print supports on the threads.



**Centering Ring and Retainer for 54mm MMT with inner/outer brim**

**Rail buttons:**

Print these at 100% infill with slower times for best results. They are contoured on the bottom, so use a little support. These are quick to print. You can print them to match your final color. I would not paint them, but you do you.

**Avionics Sleds:**

Both the Quantum and the Quasar have plenty of surface area for grip. Print with default settings.

NOTE: This part is attached to the nosecone via threads. I have tested this numerous times without failure, however you should increase the infill, balancing strength with weight. I used 35% infill

**Fin Slotting Guide:**

Finding the perfect slot location can be difficult. Some use paper guides where I use printed slots. Print this, slip it on the end, mark your slots for a nice, tight fin tab fit.

**Quasar AV Sled, Modified Rail Guides, and Fin Slotting Guide**

laminating

**Building Instructions (may vary with modifications to parts):**

(Build Thread on TheRocketryForum)

**Nosecone:**

Do a dry fit to make sure everything fits. These parts when printed correctly (no defects or warping) should fit flush, making the seams very difficult to see.

Take the three parts and prep them by sanding the insides with 120gt sandpaper. You don't have to get animal with this, just rough up the surface. Sand the interface surface, where each part touches the other and the slots/tabs. We will be using a fair amount of epoxy on the joints.

Optional Step: Using laminating epoxy or thinned out (with Iso alcohol) 30 min epoxy and an acid brush or other disposable applicator, lightly coat the insides of each part. Keep epoxy off the interface surfaces for now. This epoxy layer should be very thin, just enough to fill in the layer lines. Because the nosecone will be taking a good bit of force from the deployment charge, it will provide a little reinforcement to the nosecone. The epoxy should be thin and will run, so set the parts aside on wax/parchment paper to cure. Check it periodically, to clean up and drips.

Place painter's tape or masking tape at the bottom of the interface on the forward part and top of the mid part. You will peel this off after epoxying the joint. Apply a generous amount of epoxy to the interface surfaces and join together. Clean the squeeze-out off the e external services, being careful to not get any on the external side. Clean up epoxy with Iso alcohol. Once the two parts are together, remove the tape to reveal a nice, clean joint. Clean up any residual epoxy and set aside to cure, tip down.

You will repeat these steps to join the two epoxied parts to the aft part of the nosecone. Be absolutely careful to keep all epoxy off the threads. You can apply petroleum jelly or SuperLube to the threads to be extra sure. When done, tip it upside down so any epoxy runs to the tip.

**Fin Slotting Guide and cutting the slots:**

Decide on an aft end for your tube and write AFT inside the aft end to help you maintain orientation. Slide the fin slotting guide onto the aft end of the tube, with the thicker section to the back end. How many times can I say aft? The picture above shows the orientation with the thin end forward,

and thick end aft. This will give your fins the correct location so that the aft tip of the fin ends right at the end of the tube.

Secure the slotting guide with tape to the tube. Using the openings, mark your slots. You can take the slotting guide off or use it as a cutting guide. Take your time cutting the slots. When you are done, you can also use the slotting guide to cut off excess tubing cleanly.

The rest is pretty much standard assembly. Make sure to sand well the surfaces where epoxy will be touching before using epoxy, and the joints will be permanent.

Maiden Flight:

On 7/7/2024, I flew this model for the first time. It was incredible, reaching 1506ft. The flight was short of the simulated 2200ft. We had issues with the rail earlier in the day which may have contributed to the loss. However, the simulation file is probably not accurate regarding weight. Please be mindful of that and weigh all your parts.

One thing about the nosecone is that it has thick walls. My first print came out to over 550g which is too much unless I launched on J or K-powered motors. I would suggest printing with 4 walls at 25% infill and be sure to laminate the interior. I reprinted and rebuilt my nosecone right before I left for the launch. The rocket flew great without any issues with fins (default print settings) or the nosecone).

**Safety Police Disclaimer:**

Rocketry is a safe and rewarding hobby. With knowledge and experience, you can experience the excitement of yeeting a rocket thousands of feet into the sky. There is nothing else like it.

Having said that, you are responsible for the rockets you fly. If you build and fly one of these rockets, you should understand the NAR Safety Code and the potential risks involved with launching any rocket, especially these. They were not designed to be toys. They are real rockets that can potentially go very high and carry significant energy. This rocket is intended to be built and flown by experienced rocketeers who understand the risks and can mitigate potential issues through experience. By printing and flying this model, you do so at your own risk. You are solely liable for any unexpected results and you agree to hold me and any manufacturer harmless of any liability. I recommend you join NAR or Tripoli, join a club, and ask lots of questions. Launching a rocket as a NAR/TRA member at a sanctioned event provides you with insurance you don't get at the park. </ end of Safety Rant>

# Model files

**Nosecone** 8 files

**nosecone-fwd.stl**

**nosecone-mid.stl**

Version 1.2

**nosecone-aft.stl**

**nosecone-aft_with_epaulets.stl**

**av-sled-quasar.stl**

For Eggtimer Quaser Flight Computer

**av-sled.stl**

For Eggtimer Quantum Flight Computer

**nosecone-plug.stl**

Used for base of Nosecone without AV bay/sled

**epaulet_detached.stl**

## Fins

3 files

**38mm-mmt-fin.stl**

**54mm-mmt-fin.stl**

**fin-slotting-guide.stl**

Version 1.1

## Centering Rings

5 files

**54mm-cr-fwd-with-shockcord-cutout.stl**

**cr-54mm-fwd.stl**

**cr-54mm-aft.stl**

**cr-38mm-fwd.stl**

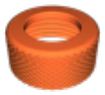
**cr-38mm-aft.stl**

## Motor Retainers

4 files

**retaining-ring-54mm.stl**

LOC Tubing only



**retaining-cap-54mm.stl**

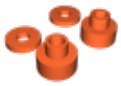
LOC Tubing only

**retaining-ring-38mm.stl**

LOC Tubing only

**retaining-cap-38mm.stl**

LOC Tubing only



**rail-guides-fat-base.stl**

Thicker base for Nosecone clearance

# Other files

**nikesmoke-power-series-3-in-54mm-simulation.zip**

Simulation file for OpenRocket or RocSim

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