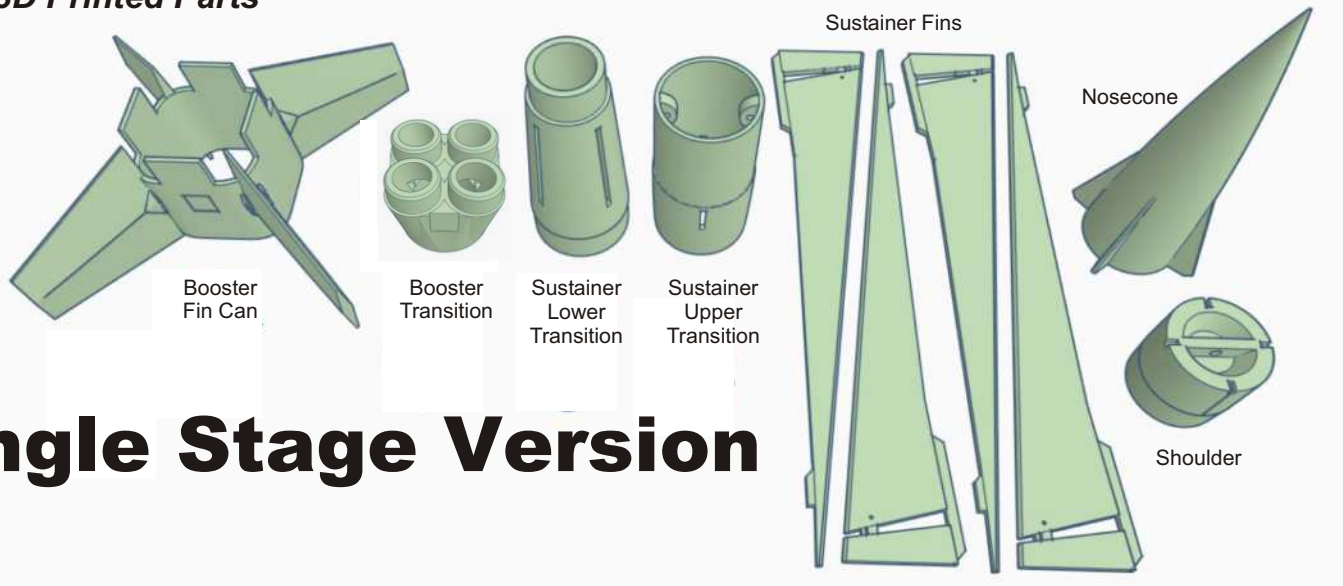


1/14th Scale Nike Hercules Builders Kit

Thank you for purchasing a Boyce Aerospace Hobbies 1/14th scale Nike Hercules kit. Please read these directions fully before you begin. All parts will be referred to in these instructions as labeled in the drawing:

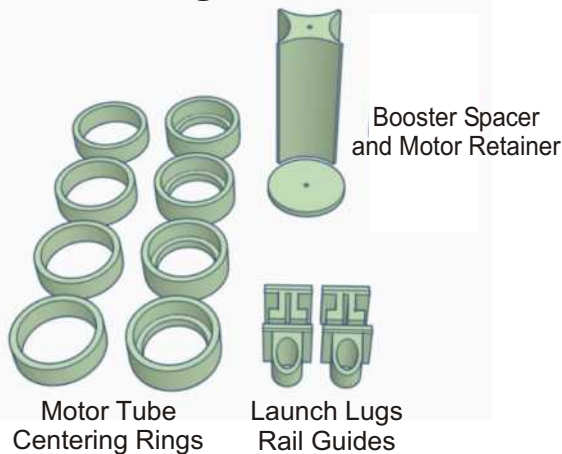
DISCLAIMER - The products sold by Boyce Aerospace Hobbies are intended for display and/or flight with use of explicitly stated model rocket motors. Launching of model rockets may be dangerous; use our products at your own risk. Boyce Aerospace Hobbies is not responsible for any damages or injuries incurred from the use or misuse of our products. Our kits are not intended to be modified or used with motor sizes different than stated. The product should be purchased by an adult and if used by a minor, under the supervision of a parent at all times.

Large 3D Printed Parts



Single Stage Version

Parts Bag #1 - Booster



Parts Bag #2 - Sustainer



Not Shown Above:

- 1) 24" Kevlar cord
- 1) #2 Screw long
- 1) Decal Set
- 1) Sustainer launch lugs/rails

Body Tubes Required:

- 1) BT-70 197 mm long
- 5) 29 mm BTH-52 motor tubes 244 mm long
- 4) 24 mm BT-50 motor tube 65 mm long

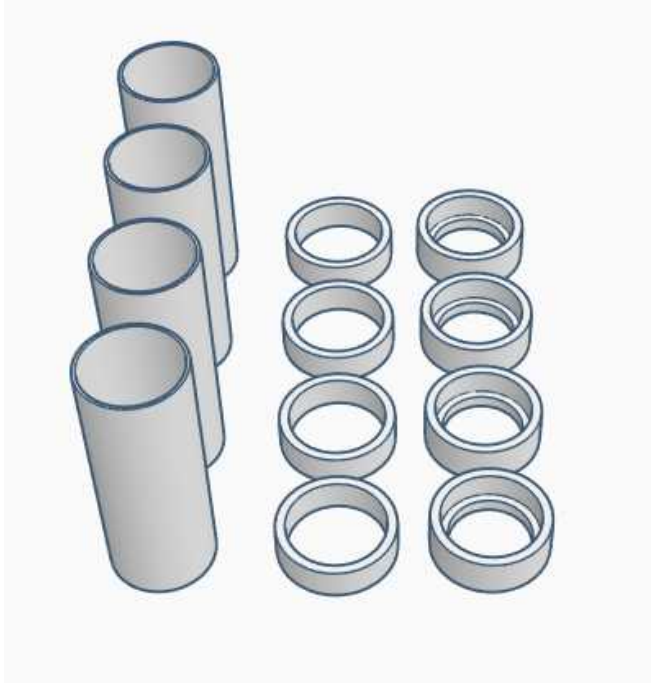
You'll also need the following supplies to complete your Nike Hercules kit:

- 1) 36 inch parachute
- Super glue
- Clay or lead nose weight
- Epoxy
- 220 and 400 grit wet/dry sandpaper
- Gray automotive spray primer
- Semi-gloss white spray paint
- Olive Green spray paint
- Painters tape
- Assorted modeling tools

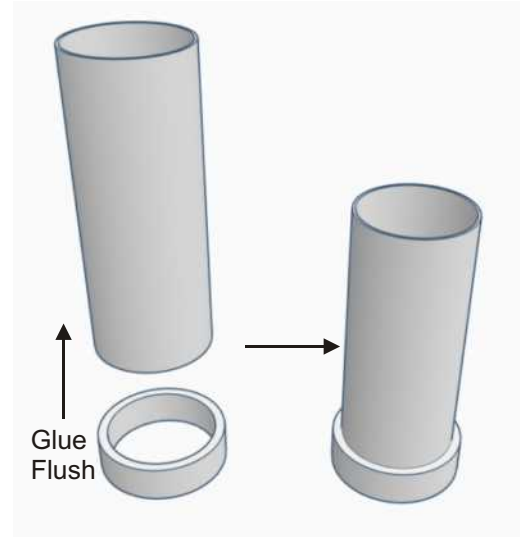
1/14th Scale Nike Hercules Flying Model Rocket

PART ONE: Booster Assembly

A) Gather the four short cut 24mm motor tubes and the 3D printed centering rings from PARTS BAG #1. Check the fit of the rings on the motor tubes and sand if needed.

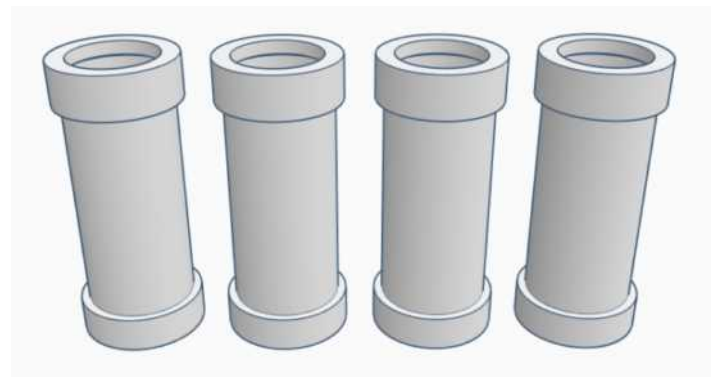
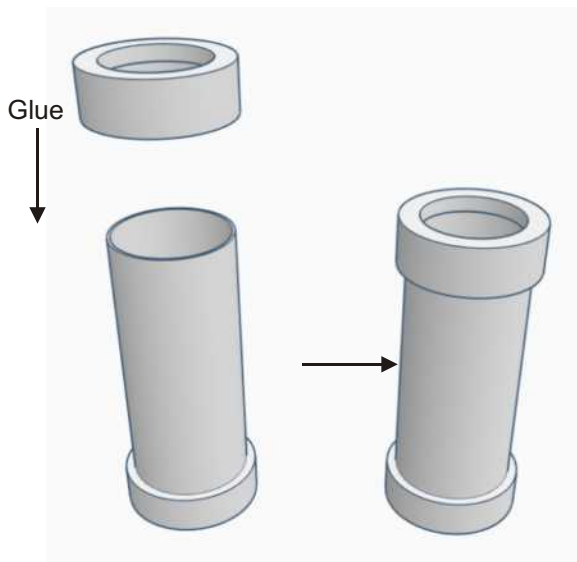


B) Super glue a centering ring flush with the base of each motor tube.



C) Glue the combination motor block/centering ring to the top of all four tubes.

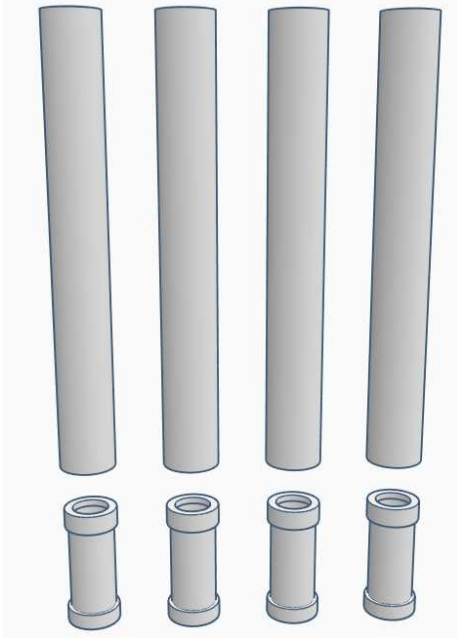
D) Your finished motor tubes should look like this.



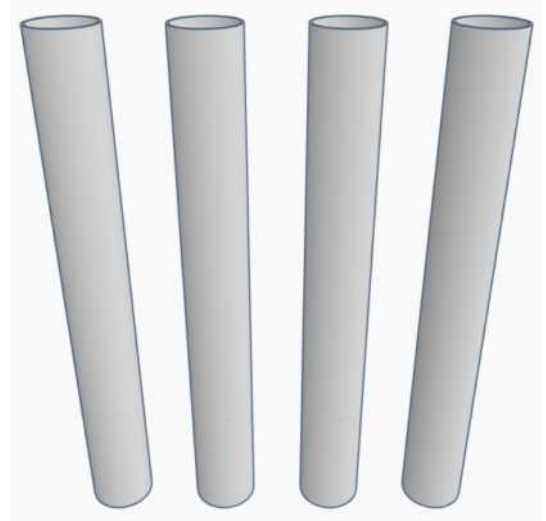
1/14th Scale Nike Hercules Flying Model Rocket

PART ONE: Booster Assembly

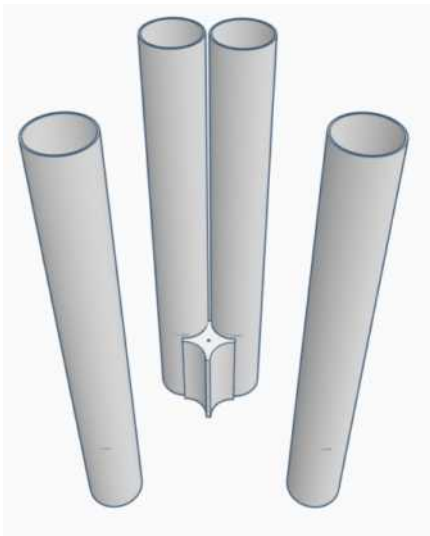
E) Glue a completed motor tube assembly into four of the 29mm tubes (244 mm long). Make sure the motor assemblies are glued flush with the bottom of each 29 mm tube.



F) The four completed booster tubes should look like this.



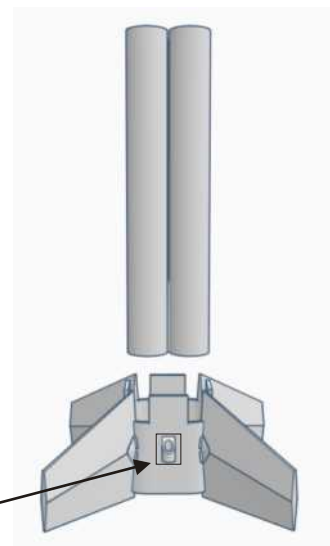
G) Arrange the four booster tubes as shown in the image below around the booster tube spacer (found in PARTS BAG #1). DO NOT GLUE! Test fit the four tube assembly into the booster fin can. If it is too tight, use sandpaper wrapped around a 29mm tube to sand the four sides of the booster spacer until a good fit is obtained. Now glue all four booster motor tubes flush with the bottom of the spacer. Hold the assembly with rubber bands until the glue is dry. Spray paint the booster motor tubes Army Olive Green.



H) Watch this great video on how to achieve a mirror like finish on 3D printed parts:

<https://www.youtube.com/watch?v=0vgynnYzo08&t=7s>

Follow the process in the video to finish and spray paint the fin can semi-gloss white. When dry, glue the fin can onto the booster motor tube assembly. Make sure that the tubes are flush with the base of the can (not the fins).

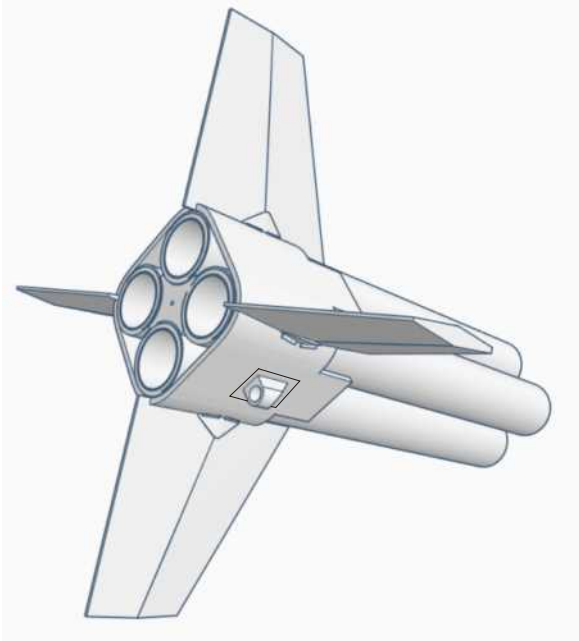


Note: Prior to painting the fin can decide if you will be using the launch lugs or rail guides and glue in place

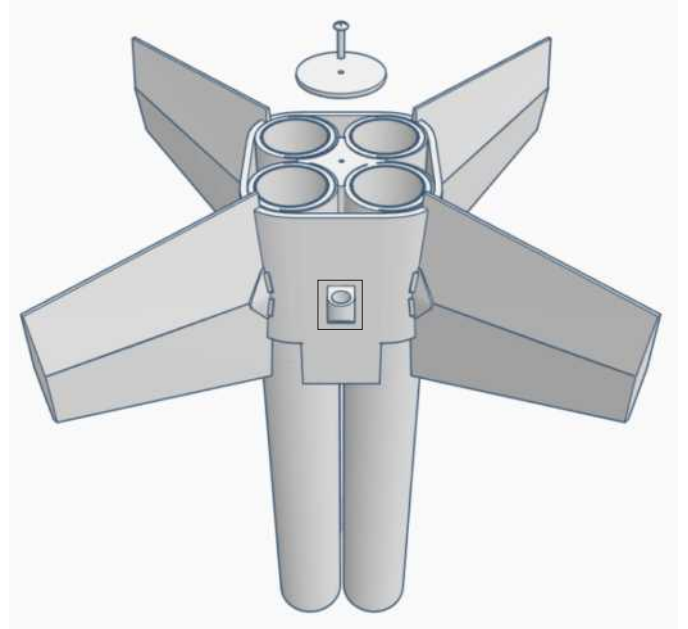
1/14th Scale Nike Hercules Flying Model Rocket

PART ONE: Booster Assembly

- I)** Booster tubes shown glued flush with the base of the fin can. Note that the fins extend slightly past the bottom of the fin can.

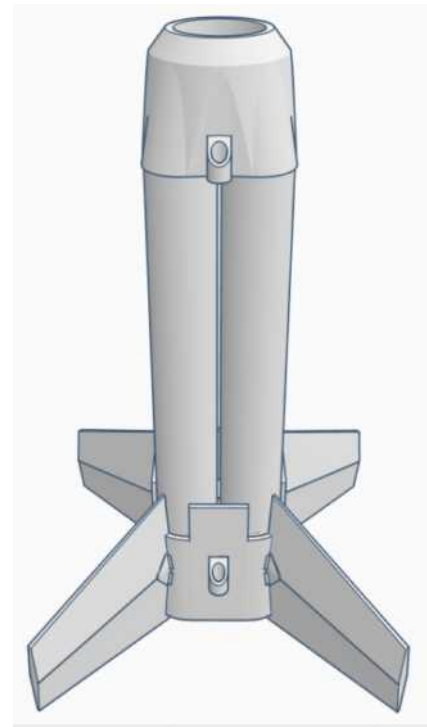
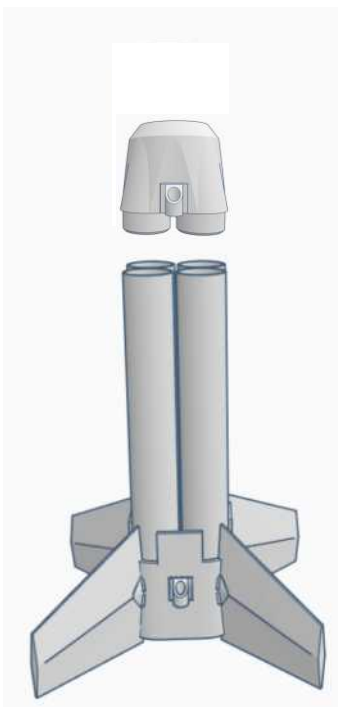


- J)** Install the motor retaining ring with the screw provided in Parts Bag #1.



- K)** Finish and paint the booster transition semigloss white. Do not paint the shoulders at the base of the transition. When dry line up the launch lugs or rail guides on the booster transition and the fin can and glue the transition to the booster motor tubes.

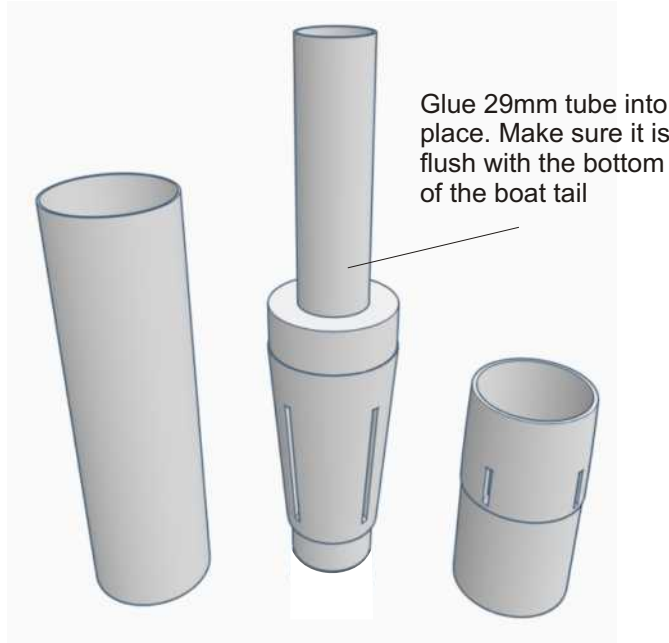
- L)** Your booster is not complete!



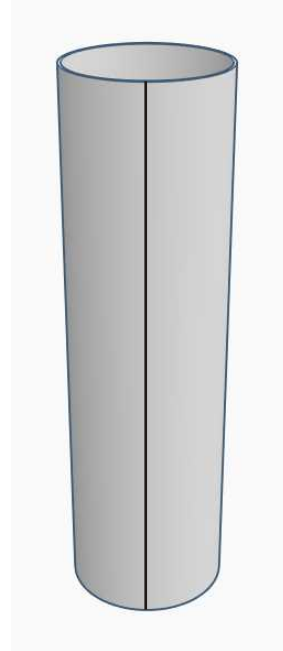
1/14th Scale Nike Hercules Flying Model Rocket

PART TWO: Sustainer Assembly

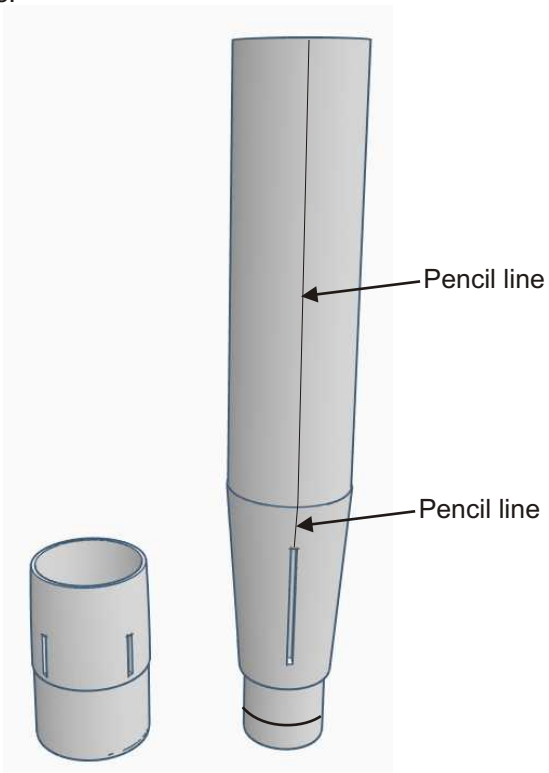
- E)** Gather your precut BT-70, one 29mm motor tube, and the kits sustainer boat tail and upper transition. Sand the inside of the boat tail until the 29mm motor tube is a good slide fit inside. Glue the tube in place flush with the bottom of the boat tail.



- F)** Using a door molding draw a pencil line the full length of the BT-70 as shown.



- G)** Using a straight edge draw another pencil line from the top of one of the boat tail fin slots to the top of the boat tail. Glue the BT-70 onto the top of the boat tail lining up the pencil lines.



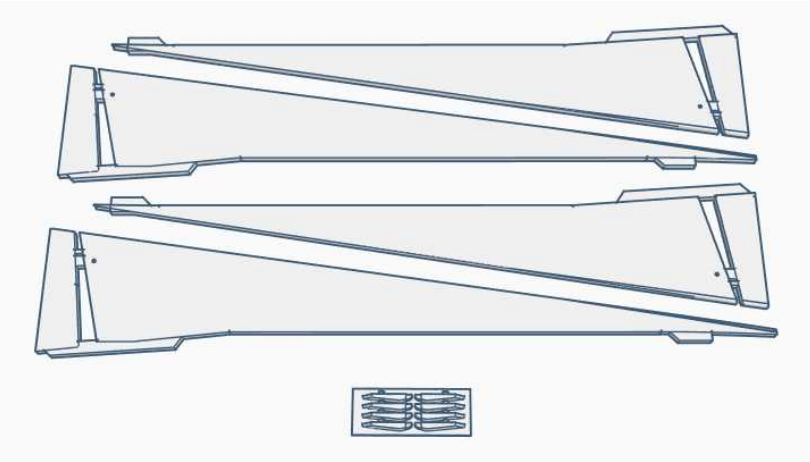
- H)** Tie a 24 inch piece of Kevlar to the two recovery system attachment points. Drop super glue on each knot. Glue the upper sustainer transition to the top of the BT-70 boat tail lining up one of the slots with the pencil lines drawn on the BT-70.



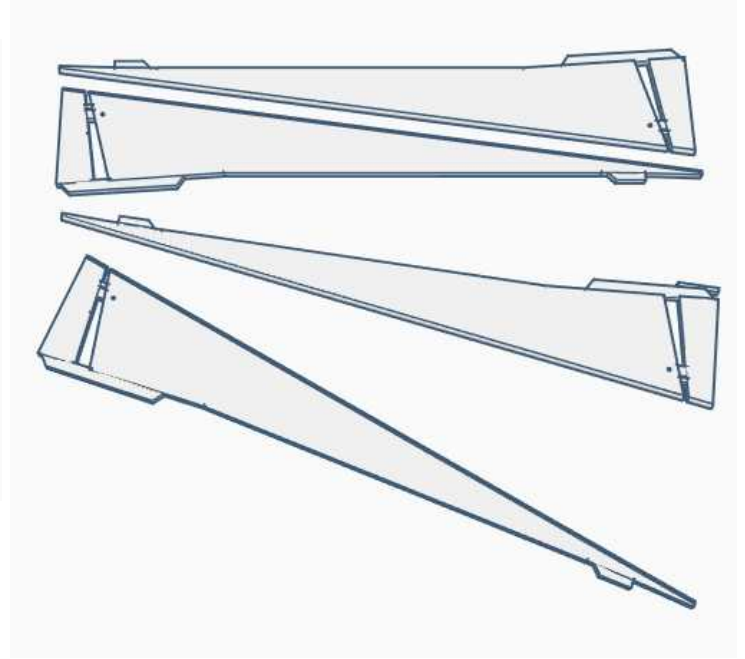
1/14th Scale Nike Hercules Flying Model Rocket

PART TWO: Sustainer Assembly

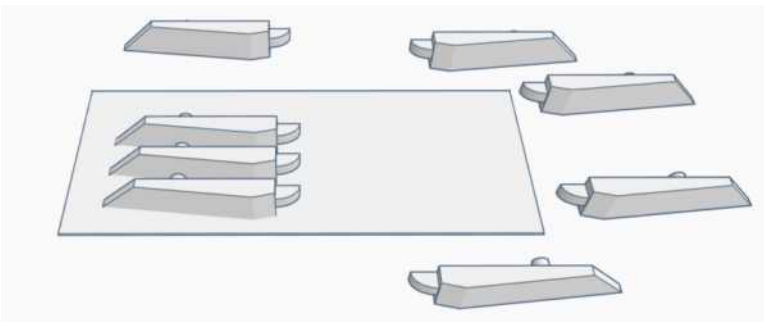
I) Find the four upper fins and the “raft” with the fin detail parts on it (the raft is in PARTS BAG #2).



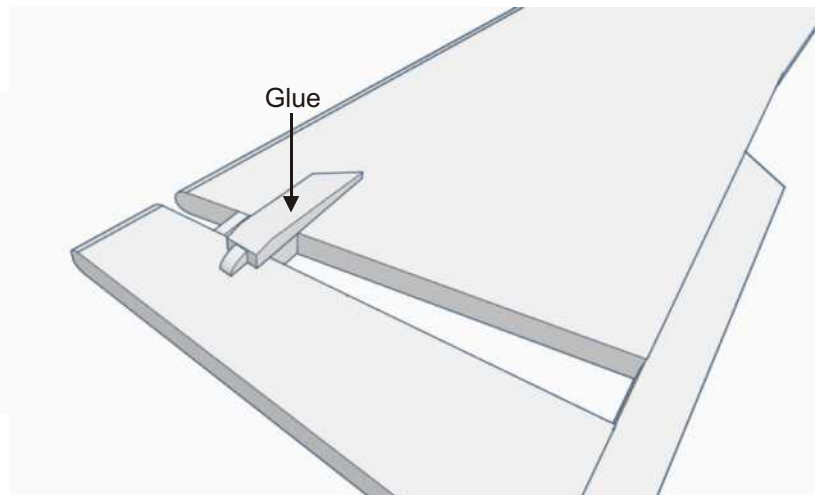
J) Sand the front and back sides of each fin in preparation for paint.



K) Carefully bend/flex the raft to pop off the detail parts. If some of the parts decide to be stubborn slide a hobby knife blade under them to remove.



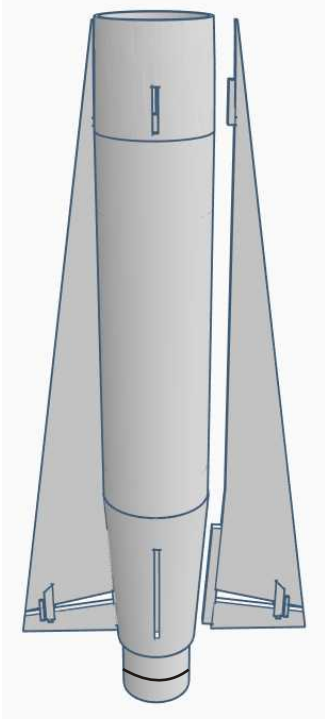
L) Glue each fin hinge detail piece to the fins as shown.



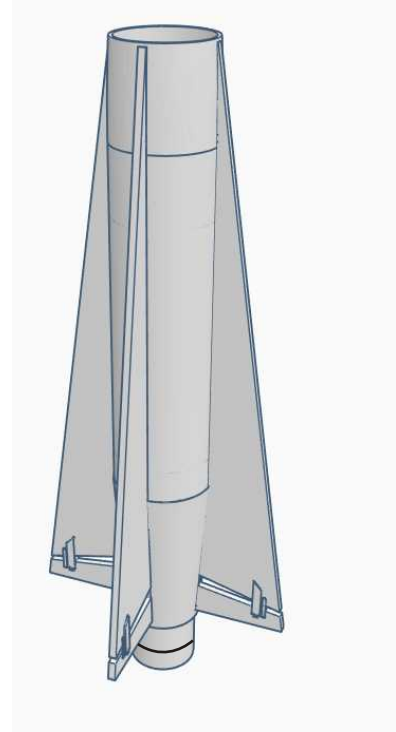
1/14th Scale Nike Hercules Flying Model Rocket

PART TWO: Sustainer Assembly

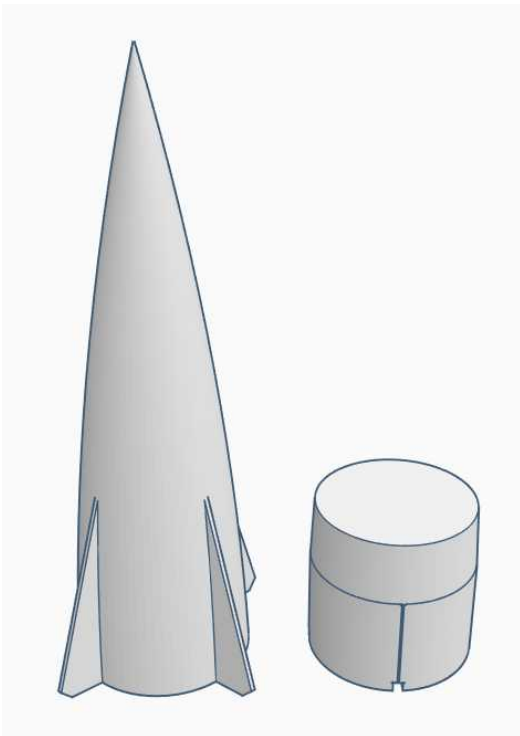
M) Test fit the fins and sand as needed for a good fit. Note Kevlar cord is rolled up and inside the sustainer upper transition.



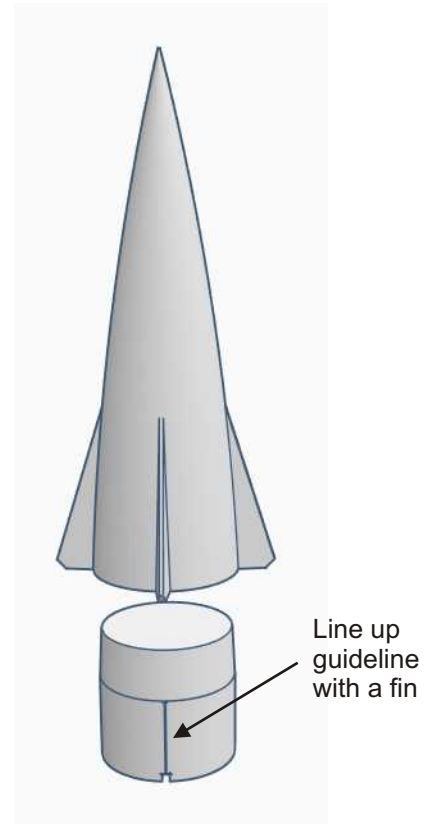
N) Super glue all four fins in place. Once the glue has dried apply small fillets to the root of each fin using super glue gel. When dry complete final sanding/primering of the sustainer.



O) Sand the nose cone shoulder until it is a good slide in fit with the top of the sustainer. The notches in the base of the shoulder engage the upper fin tabs in order to keep the nose cone fins aligned with the airframe fins. Sand and primer the nosecone



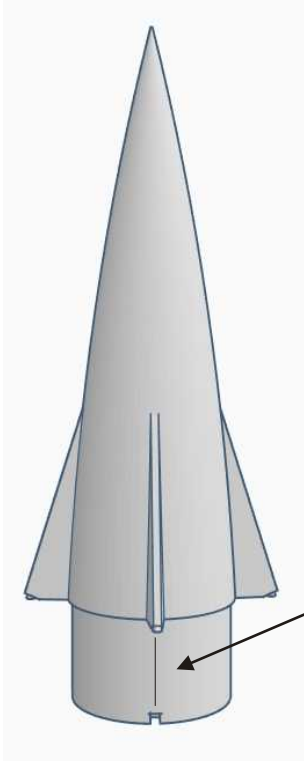
P) **DO NOT GLUE** the shoulder to the nose cone. It will be glued after nose weight is added to the model to insure stability. For now just insert the shoulder into the cone tightly.



1/14th Scale Nike Hercules Flying Model Rocket

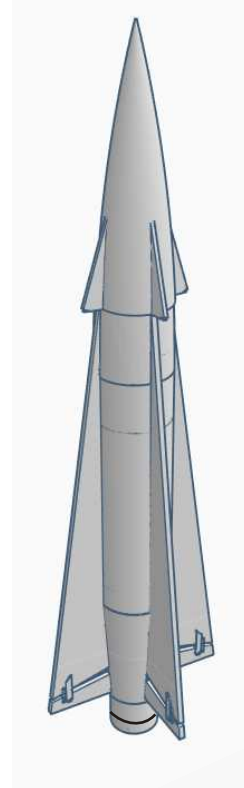
PART TWO: Sustainer Assembly

Q) Nose cone parts aligned and pressed together.

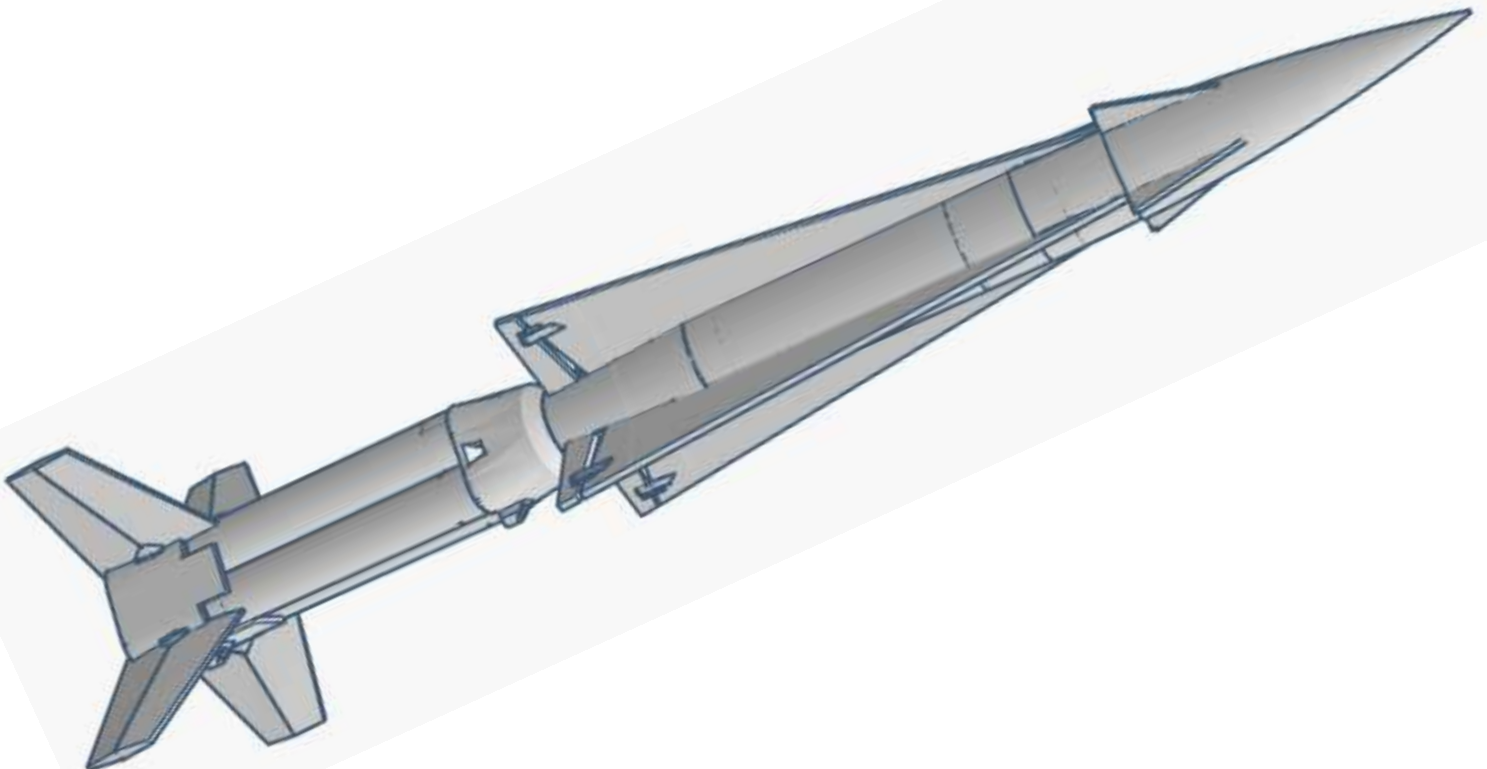


Pencil alignment mark

R) Complete final sanding/primering and paint the completed sustainer semigloss white. Do not paint the shoulder at the bottom of the sustainer.



S) Test fit the booster and sustainer together. Sand the shoulder and the inside of the booster upper transition until the parts slide together with a tight fit. Glue the two parts of the model together with high strength epoxy and align the sustainer and booster fins. Allow to dry.

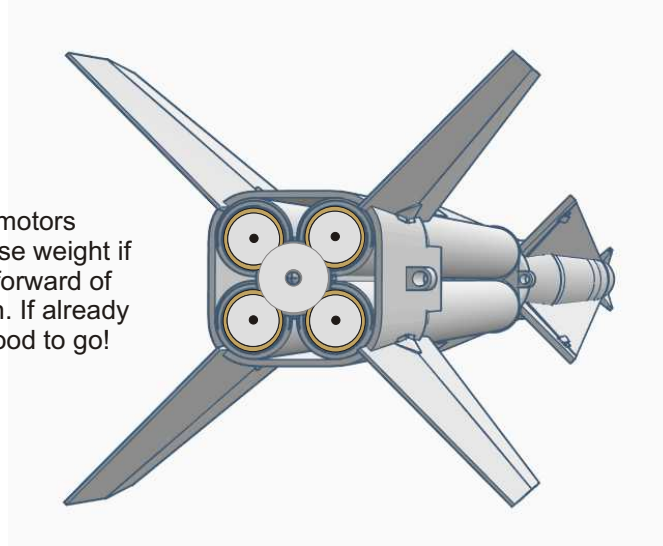


1/14th Scale Nike Hercules Flying Model Rocket

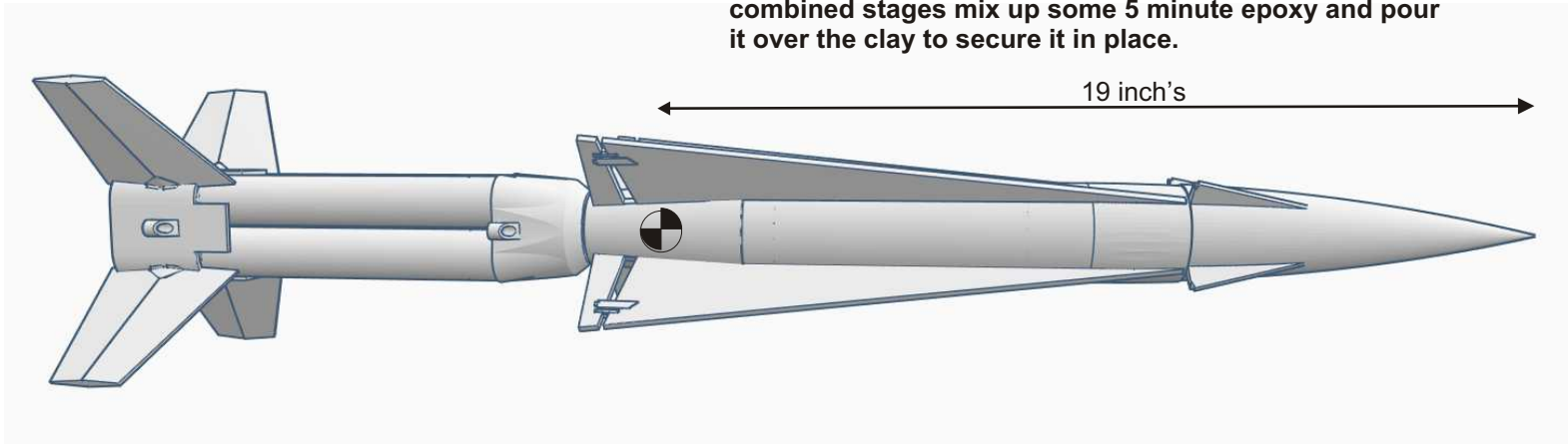
PART FOUR: Pre Flight Prep (CRITICAL)

The model must be balanced as a combined model. Place all motors, parachutes, recovery wadding, and electronics in the model as shown below (this page). Then follow the weight and balance instructions.

Install four D12-3 motors in booster. Add nose weight if vehicle CG is not forward of the position shown. If already forward you are good to go!



Note: The best nose weight is clay packed into the tip of the nose cone (use a dowel stick to pack the clay).. Once you reach your balance points for the upper stage and the combined stages mix up some 5 minute epoxy and pour it over the clay to secure it in place.

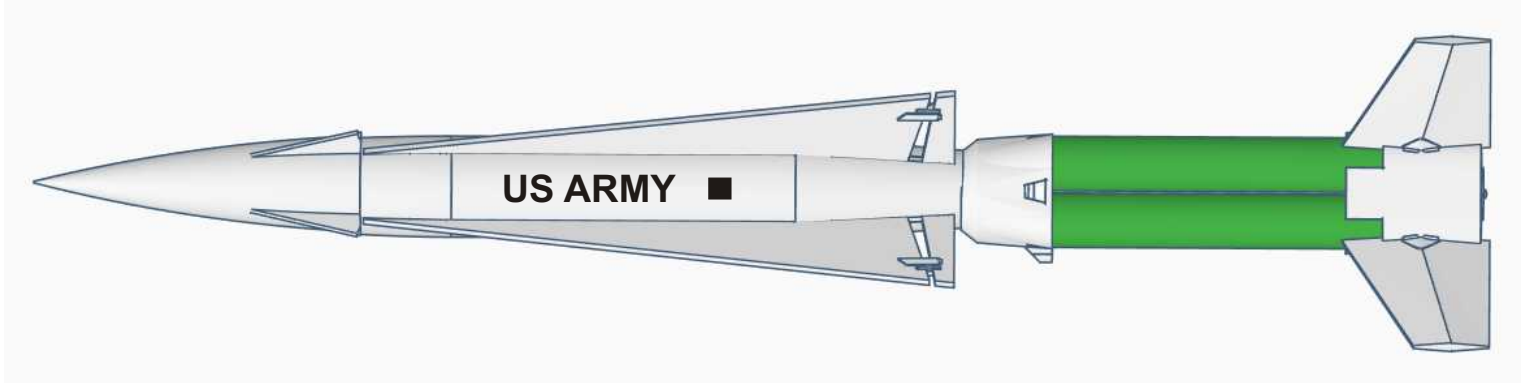


Note: After adding nose weight, the nose cone shoulder can be glued in place.

1/14th Scale Nike Hercules Flying Model Rocket

PART FIVE: Finishing Your Nike Hercules

Adhere your vinyl decals on both sides of the sustainer as shown. To make installation easy use a clean spray bottle filled with water and add two drops of liquid dish washing soap. Shake. Lightly mist the area where the decal will be placed. Peel the paper backing off the decal and position on the model. The soap in the water mist



Three different paint scheme variants shown in one picture. We prefer the Nike Hercules laying on its side!



1/14th Scale Nike Hercules Flying Model Rocket

PART SIX: Flying Your Nike Hercules

- 1) Mount 4 Estes D12-3 rocket motors in the booster. Secure with retaining disk and screw.
- 2) Place recovery wadding in the upper chute compartment.
- 3) Fold and pack a 36 inch chute in the chute compartment.
- 4) Place the nose cone on the model making sure the cone is seated into the transition and aligned.
- 5) Attach your preferred cluster ignition system. We highly recommend using a PVC Spider ignition system as described in a great article on Meatball Rocketry's website: <http://meatballrocketry.com/pvc-spider/> The PVC Spider will make igniting all four motors almost a guarantee, which is important due to the weight of the completed model.
- 6) Slide the model onto the launch rod or rail.
- 7) Count down and launch!

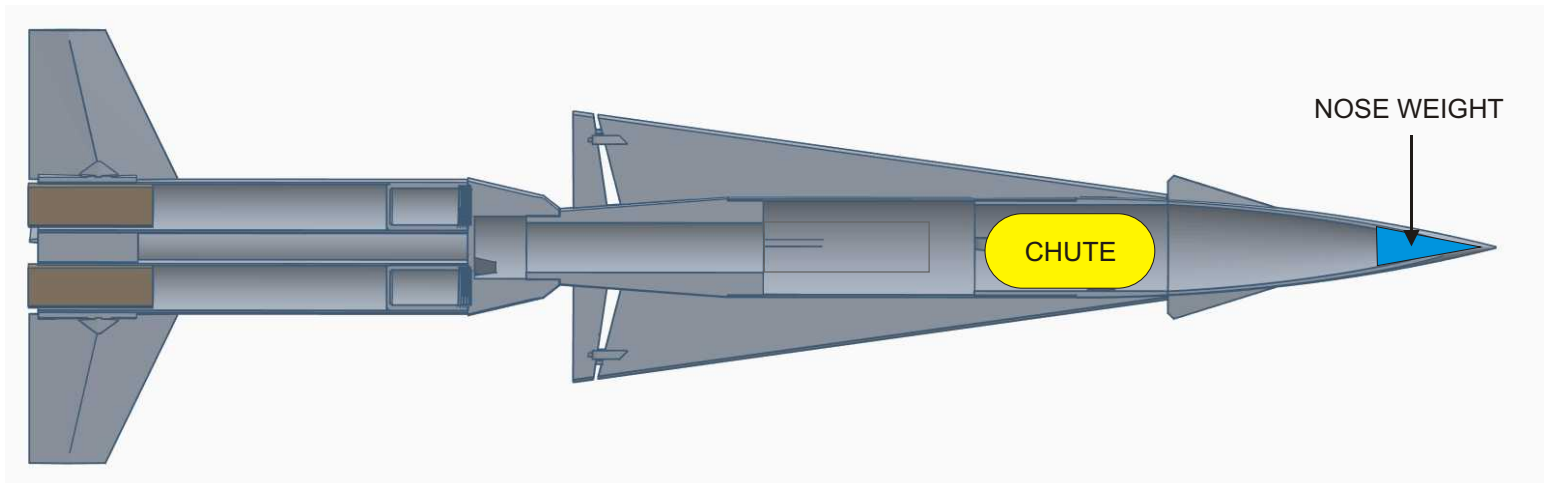
Recommended Motors:

Booster - 4) D12-5
Booster - 4) E9-6
Booster - 4) E12-6

Performance:

Apogee - 658 feet
Apogee - 852 feet
Apogee - 827 feet

Cut away view of the single stage Nike Hercules:



Use a software program such as ROCKSIM to model the rocket's flight once the model is balanced and weighed. Use the results to determine the proper motor delays to use.

Please follow all local laws and the NAR Model Rocketry Safety Code when flying this model. Fly safe and have fun!