

# I-100TH SCALE SATURN IB BUILDERS KIT

**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.*

## Additional Parts Required:

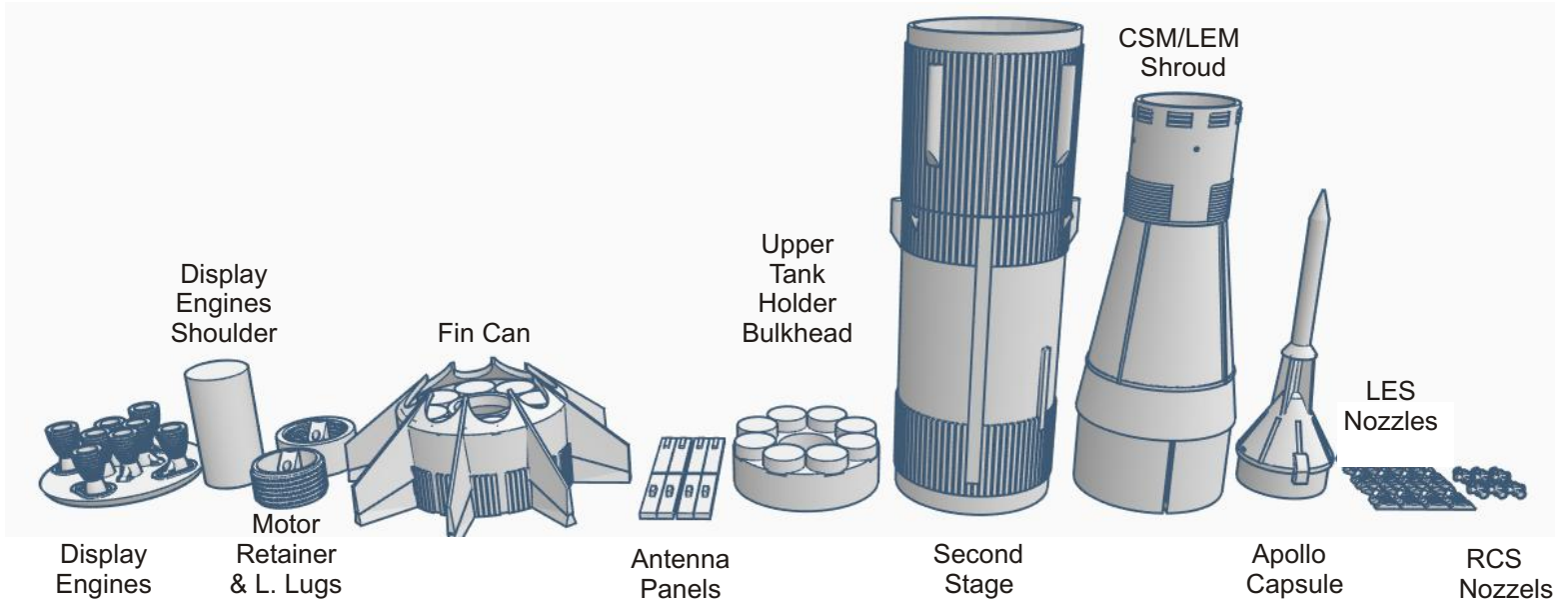
- 4) BT-19's x 18" long (available at [erockets.com](http://erockets.com))
- 1) BT-50
- 1) BT-50 24mm motor block
- 1) 24" parachute
- 1) 36" parachute
- 1) 4' elastic shock cord

Plus assorted glues, sandpaper, paint and standard hobby tools.



# 1/100th Scale Apollo Saturn 1B Flying Model Rocket

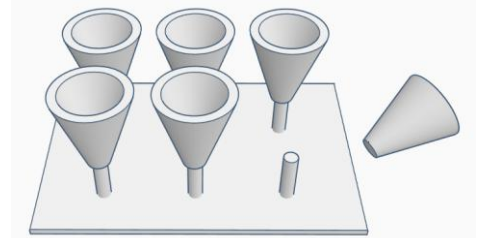
Thank you for purchasing a Boyce Aerospace Hobbies Saturn 1B Builders Kit. Please read these directions fully before you begin. All parts will be referred to in these instructions as labeled in the drawing:



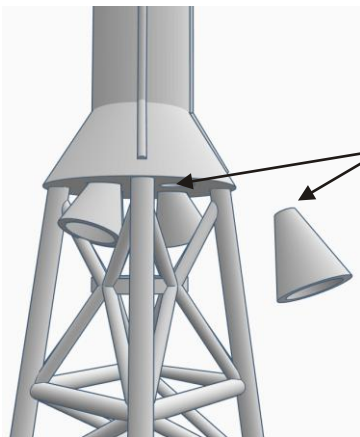
**1** Sand the following parts until they are a nice slip fit into each other. Some will glue together and others stay a slip fit:

- 1) Capsule shoulder to CSM/LEM Shroud
- 2) CSM/LEM Shroud to second stage airframe
- 3) Second stage airframe to first stage airframe
- 4) Motor mounts to inside of first stage airframe

**2** Pop all of the LES rocket nozzle parts off the 3D printed "raft". You can flex the raft to help detach them. If they are stubborn you can carefully use a hobby knife to assist in removal. Set four of the nozzles in front of you. Sand the attachment point of each nozzle to remove any remaining raft supports. Note that two extra nozzles are provided in case you lose one or two.

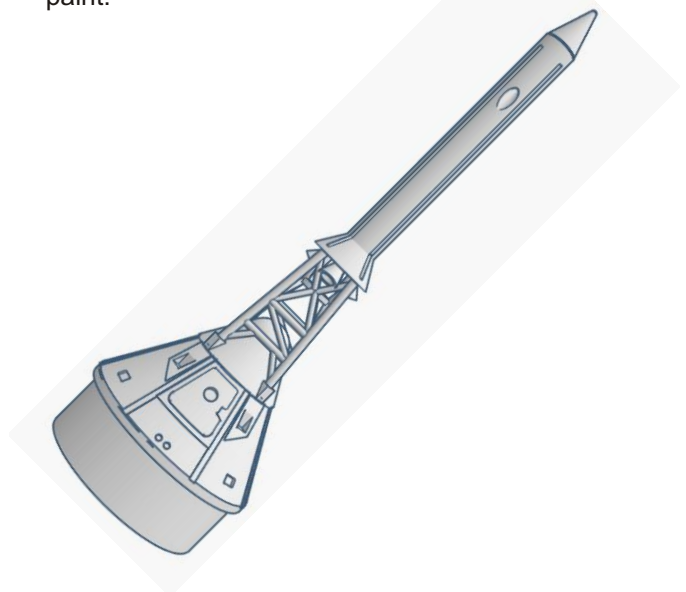


**3** Using a toothpick and tweezers apply super glue to tip of each nozzle and set them in place one at a time. Hold each nozzle in place with tweezers until the super glue sets up.



Apply super glue and hold in place with tweezers.

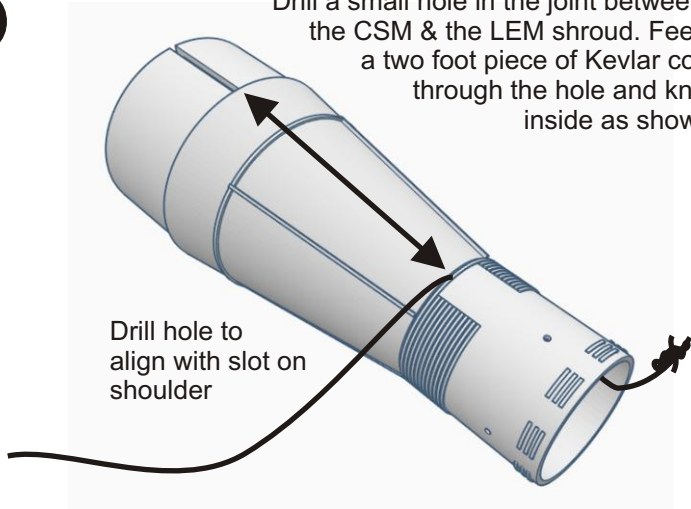
**4** Once dry your capsule and tower can be carefully sanded with 600 grit sandpaper in preparation for paint.



# 1/100th Scale Apollo Saturn 1B Flying Model Rocket

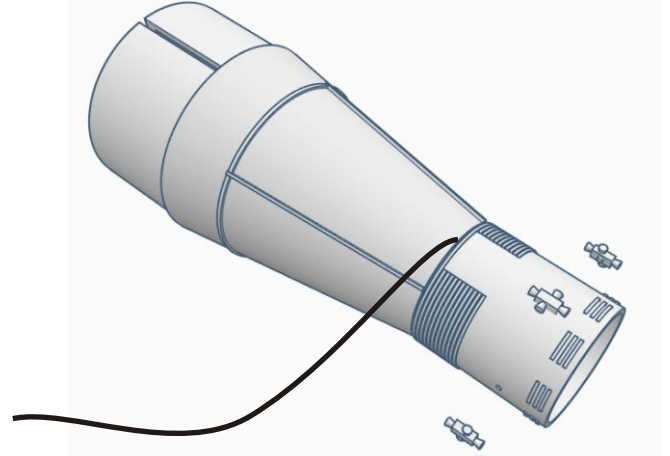
5

Drill a small hole in the joint between the CSM & the LEM shroud. Feed a two foot piece of Kevlar cord through the hole and knot inside as shown.



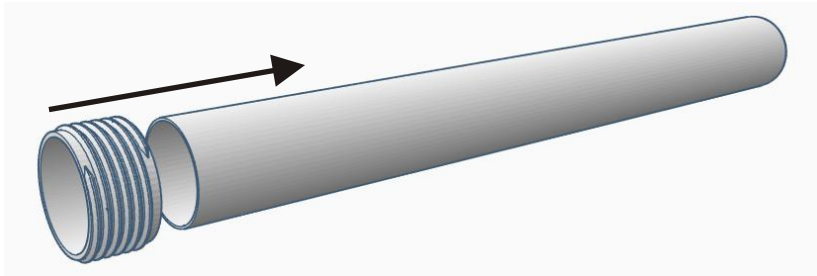
6

Carefully remove the RCS thrusters from the raft they are on. Clean them up with a sharp hobby knife or emery board. Glue them in place as shown below.



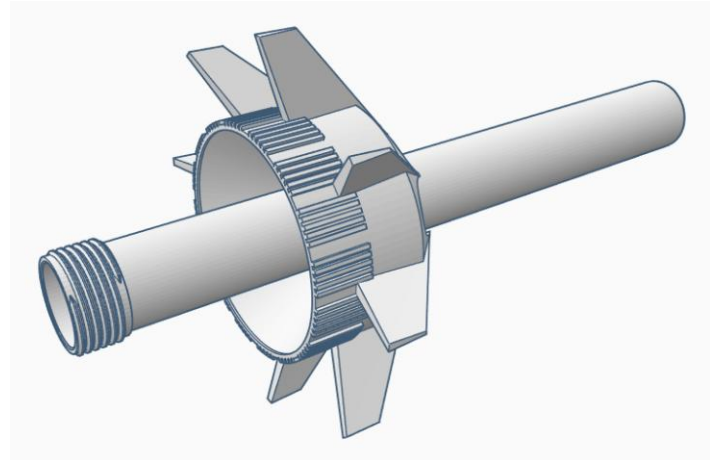
7

Cut a 235 mm length of BT-50 motor tube. Sand the cut edge to square it up if needed.



8

Sand the motor tube hole in the fin can until the BT-50 is a smooth slide fit into the fin can. Remove the motor tube from the fin can.



Sand the inside of the retention ring until it is a smooth slide fit on the BT-50. Super glue the threaded retainer ring onto the end of the BT-50 tube. Make sure the ring is flush with the end of the tube.

9

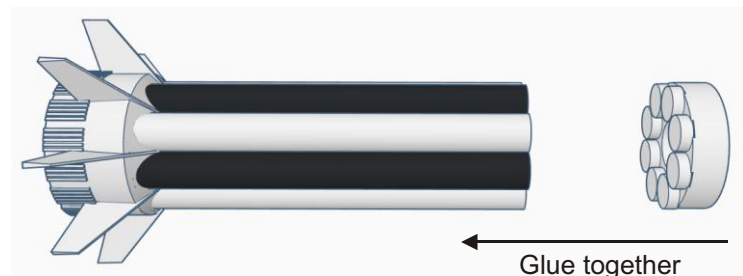
Cut eight 194 mm lengths of BT-19 tubing for the first stage tanks. It is critical that all eight tubes are exactly the same length. Paint four tubes white and four tubes black. Set them aside to dry.

When the paint is dry carefully sand, primer and paint the fin can. When dry glue the motor tubes in place one at a time alternating the black and white tubes as shown below.



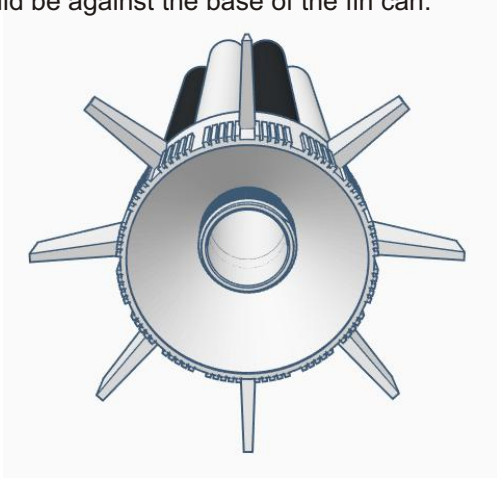
10

Glue the upper tank tube bulkhead onto the first stage tanks.

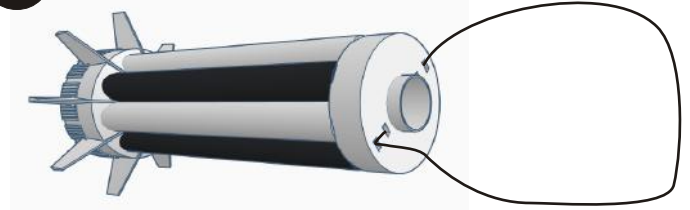


# 1/100th Scale Apollo Saturn 1B Flying Model Rocket

- 11** Super glue the motor tube assembly into the first stage assembly as shown. The retention threads should be against the base of the fin can.

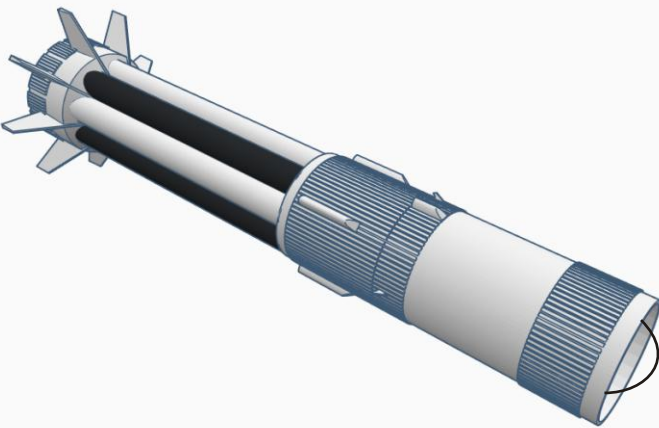


- 12** Attach a piece of Kevlar cord to the recovery system mounting points in a loop as shown.

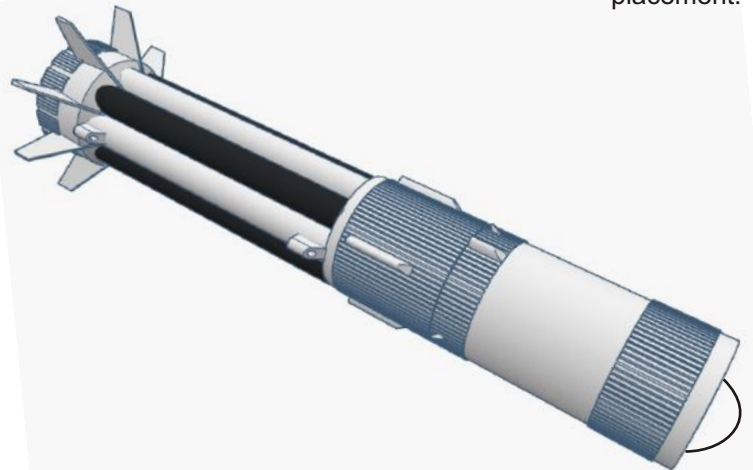


Note: A motor block ring is included with the model if the model is only to be flown with Estes 24mm motors. To install the motor block get a flown Estes 24mm motor and use it to slide the motor block into place within the motor tube. We suggest using an E9 motor. Use the retainer ring over the base of the motor and seat the motor into the tube with 1/8th left outside. Remove the motor and carefully drip super glue into the gap between the ring and the tube. Do this from above the motor block ring so you will not make motor installation difficult by coating the inside of the motor tube with glue.

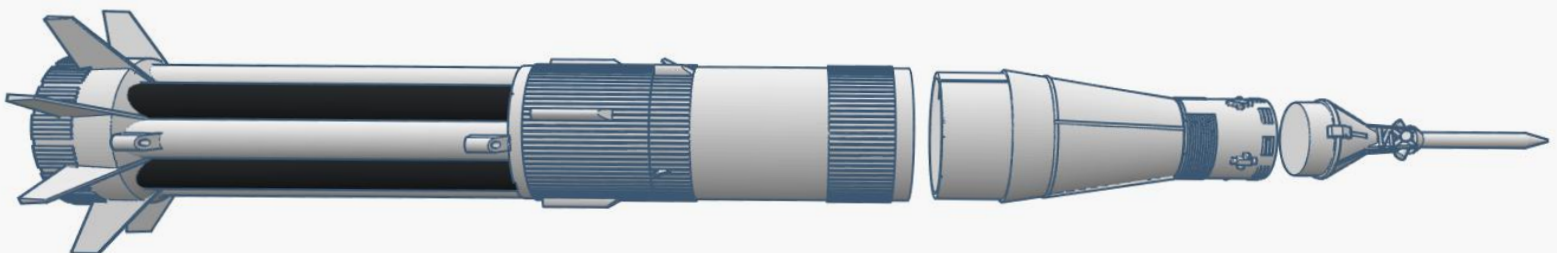
- 13** Glue the second stage airframe tube to the first stage assembly as shown. Make sure the first stage tank tubes are resting against the bottom of the second stage. Align as shown.



- 14** Determine the placement of the two launch lugs. We recommend placement on one of the white tank tubes as shown below. Make sure to sand the areas and poke pin holes in the mounting locations to insure good adhesion. Do the same with the antenna panels. Use the drawings at the end of these instructions for placement.



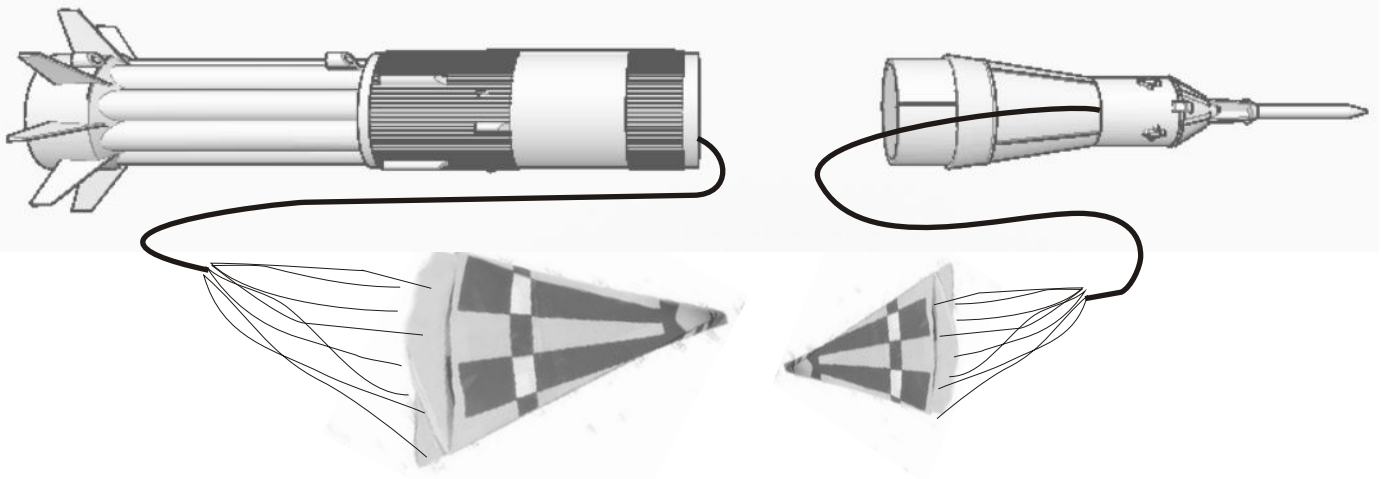
- 15** The model can now be dry assembled (do not glue) in preparation for paint and CG balancing. After painting and balancing are completed the capsule/tower assembly can be glued in place on the LEM/SM transition.



# 1/100th Scale Apollo Saturn 1B Flying Model Rocket

16

We're getting close to completing the assembly of your Saturn 1B kit. At this point slide the capsule onto the CSM/LEM shroud **but DO NOT GLUE!** Nose weight will be added to the inside of the capsule after the model has been completed. Attach your shock cords and parachutes to the two sections as shown below. We recommend a 24 inch chute for the top half of the rocket and a 36 inch chute for the bottom.



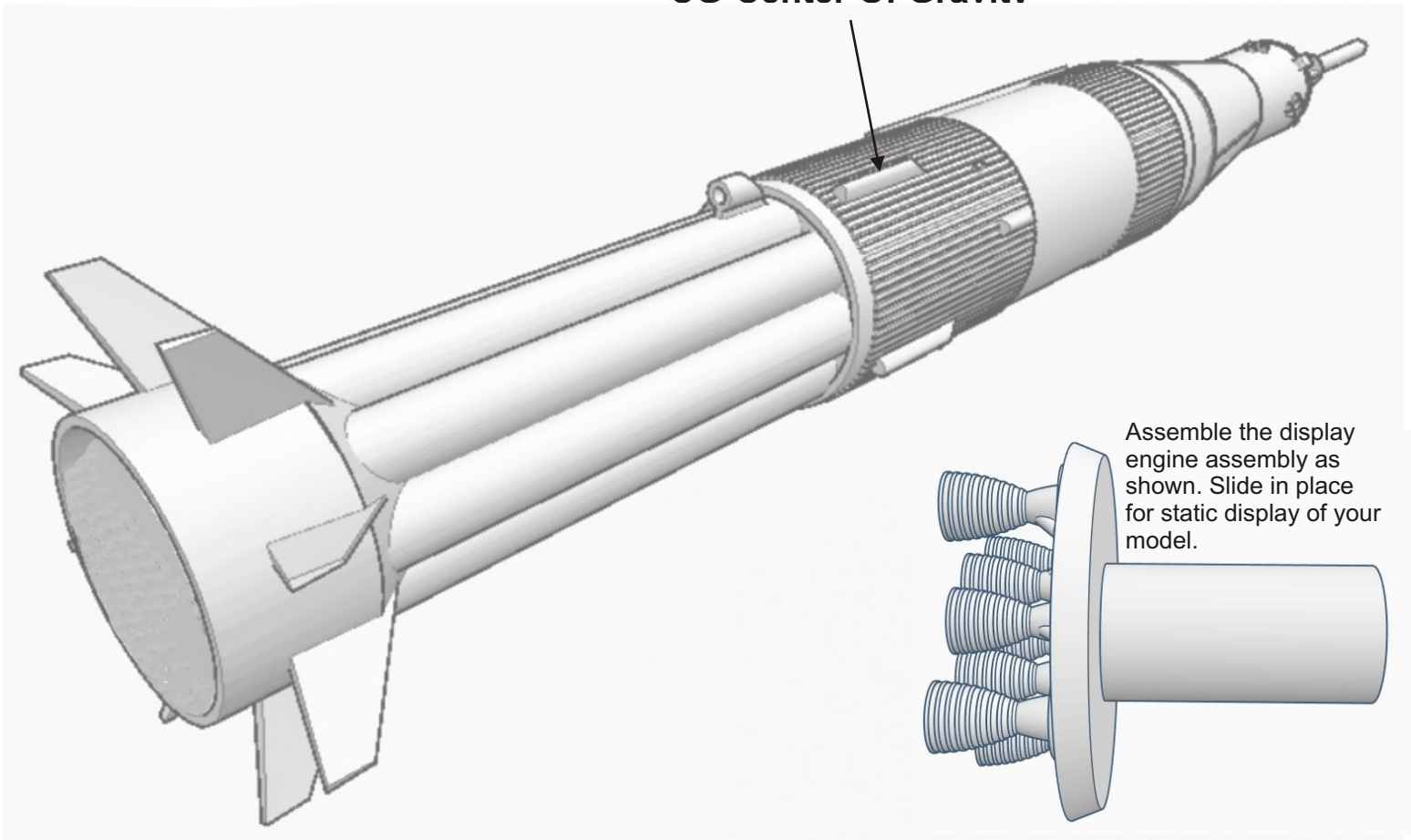
**IMPORTANT!**

**IMPORTANT!**

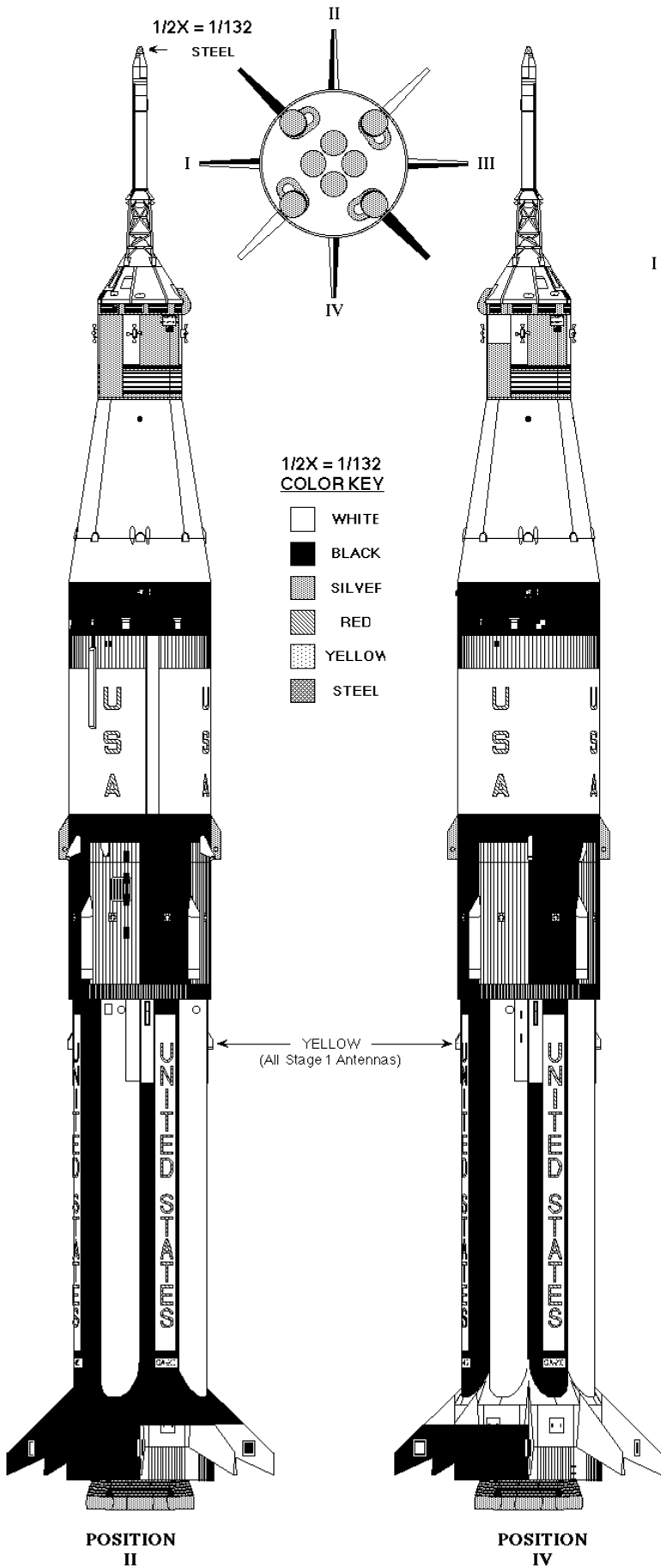
**IMPORTANT!**

Put a rocket motor in the model then add epoxy and lead weights (fishing split shot weight) to the base of the capsule until the model balances at the required center of gravity (CG) as shown below. Failure to do so will result in a unstable flight that could injure someone, damage personal property and damage the rocket! After balancing the nose cone may be glued in place.

**CG-Center Of Gravity**



# 1/100th Scale Apollo Saturn 1B Flying Model Rocket



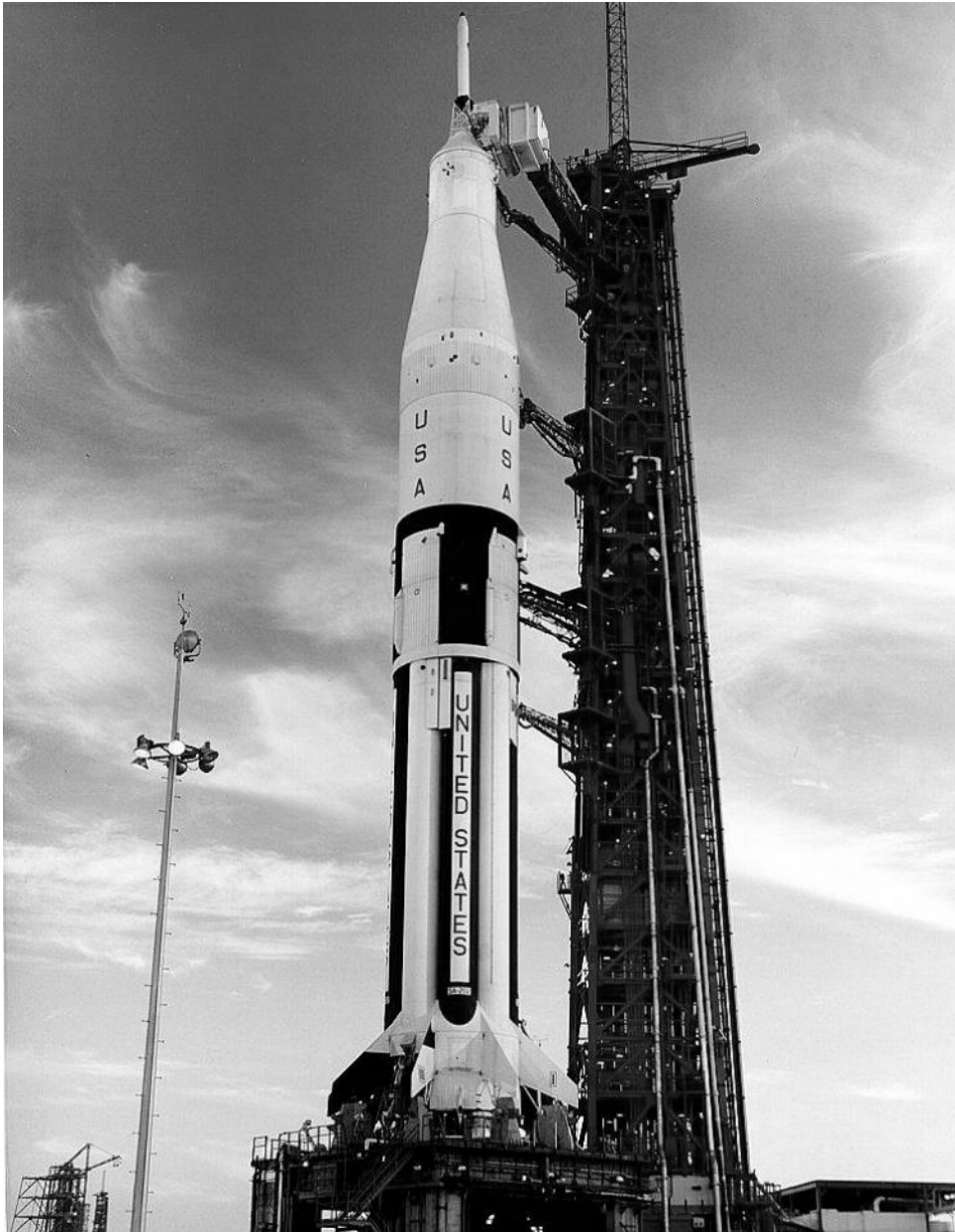
# 1/100th Scale Apollo Saturn 1B Flying Model Rocket

Sand any rough areas on the capsule or airframe with 220 grit wet/dry sandpaper. Dry sand at first then follow with wet sanding until all surfaces are smooth to the touch. Give the model a nice coat of gray automotive primer and allow to dry. Repeat the sanding steps then give the model a final coat of grey primer. Follow this up with wet sanding with 400 grit and you should have a nice finished surface for painting.

For a great video tutorial about finishing 3D printed parts watch: <https://www.youtube.com/watch?v=0vgynnYzo08&t=22s>

## PAINT AND DETAIL THE MODEL AS SHOWN BELOW:

There are a ton of painting references on the web for the Saturn 1B. I printed just one photo to give you some motivation. Painting was never my strong suit so please send me some photos of your finished model....Thanks Alex.



### Flight Prep:

Use recovery wadding and carefully pack your parachutes. Pack the upper half of the rockets chute in first (after the recovery wadding) then place the bottom half of the rockets chute on top of that. Doing this will insure that both chutes deploy.

Use an Estes D12-3 motor with a spacer for your first flight. Use the screw on retainer to hold the motor in place to prevent it from ejecting itself when the delay charge fires.

Use a software program such as ROCKSIM to model the rockets flight if higher performance motors are used. Please follow all local laws and the NAR Model Rocketry Safety Code when flying this model. Fly safe and have fun!