

1-70th Scale Saturn 1B Builders Kit

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Additional Parts Required:

- 4) T104-34 x 34" long (available at balsa-machining.com)
- 1) BT-100 x 10.9" long (available at erockets.com)
- 1) Aerotech 29mm MMT x 17.75"
- 3) 36" nylon parachute
- 1) 10' x .5" elastic shock cord

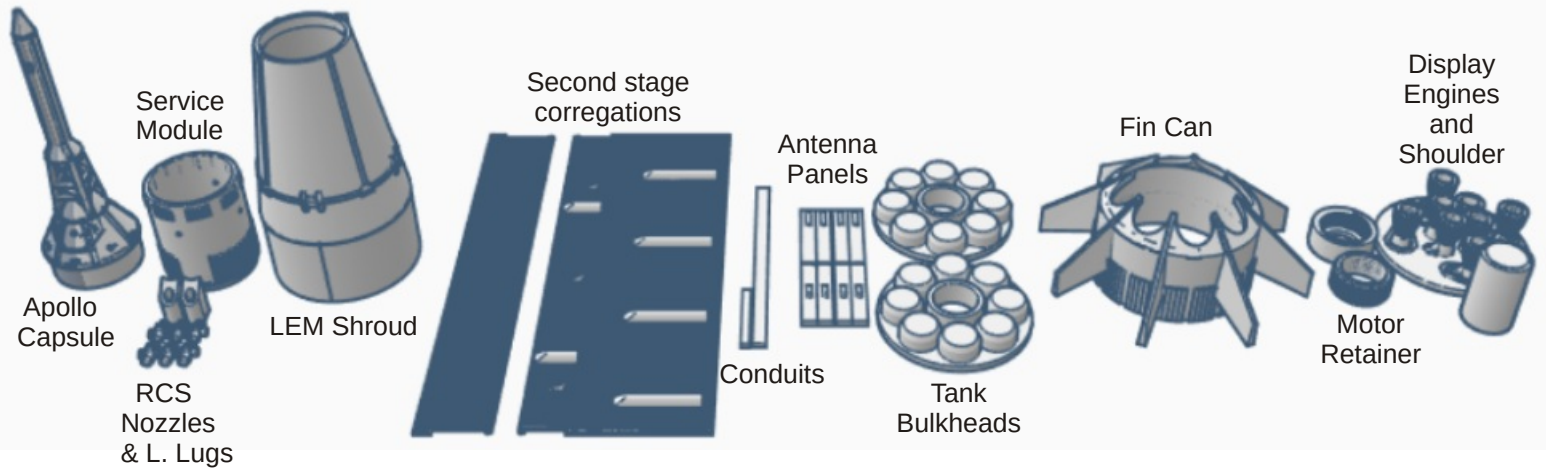
Plus assorted glues, sandpaper, paint and standard hobby tools.

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1:70th Scale Apollo Saturn IB 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:



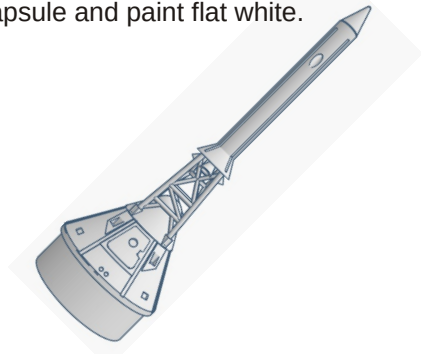
Prep all 3D printed parts for assembly and paint with 220 grit wet/dry sandpaper. Dry sand at first then follow with wet sanding until all surfaces are smooth to the touch. Give the parts a nice coat of gray automotive primer and allow to dry. Repeat the sanding steps then give the model a final coat of grey primer. Follow this up with wet sanding using 400 grit and you should have nice finished surfaces for painting. For a great video tutorial about finishing 3D printed parts watch:

<https://www.youtube.com/watch?v=0vgynnYzo08&t=22s>

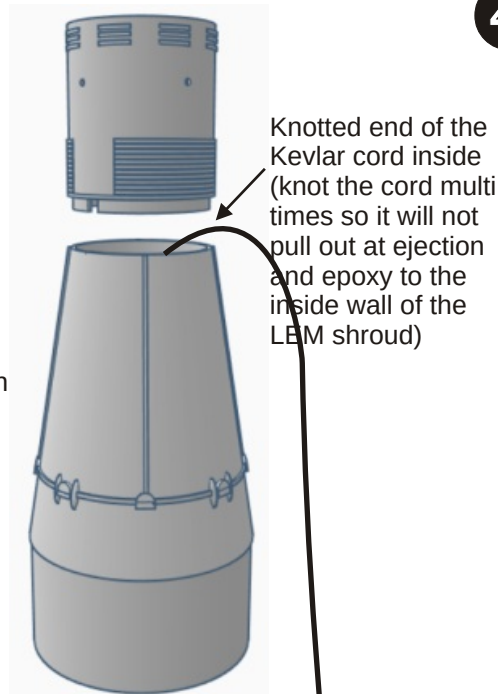
1 Sand the shoulders of following parts until they are a nice slip fit into each other. Some will glue together and others will stay a slip fit:

- 1) Capsule shoulder to Service Module
- 2) Service Module to LEM shroud
- 3) LEM shroud to second stage airframe tube (BT-100)
- 3) Second stage airframe tube to tank tube bulkhead
- 4) Second tank tube bulkhead to inside of fin can

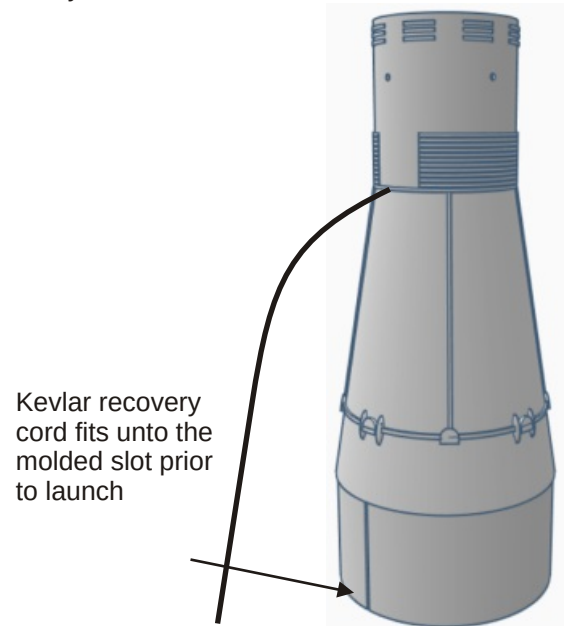
2 Sand your capsule and tower carefully with 600 grit sandpaper in preparation for paint. When done, clean the capsule and paint flat white.



3 Prepare to glue the Service Module to the top of the LEM shroud. Before you glue the parts to each other note that there is a alignment notch to assure the correct orientation of the parts. You will also need to knot the end of the Kevlar recovery cord and then position the knot inside the shroud opposite the alignment notch prior to gluing the parts together. The Kevlar cord should be in alignment with the slot in the shoulder of the LEM shroud.

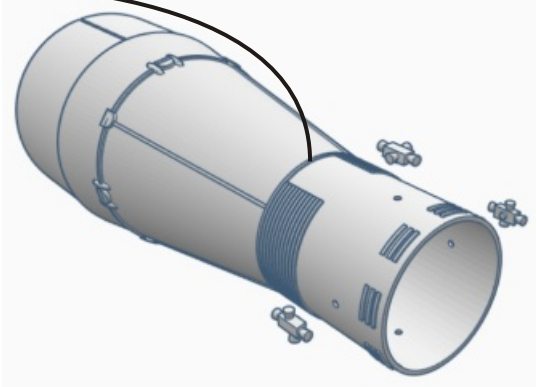


4 This is how the Service Module and LEM shroud will look after gluing the Kevlar recovery cord between them.

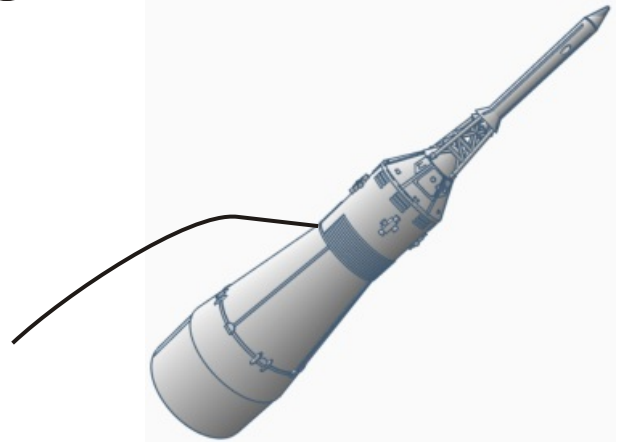


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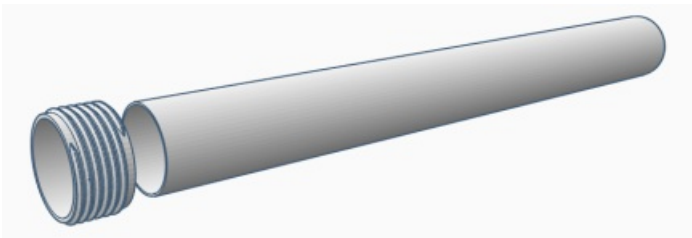
- 5** Carefully remove the RCS thrusters from the raft they are on. Clean them up with a sharp hobby knife or emery board. Glue them in place as shown below.



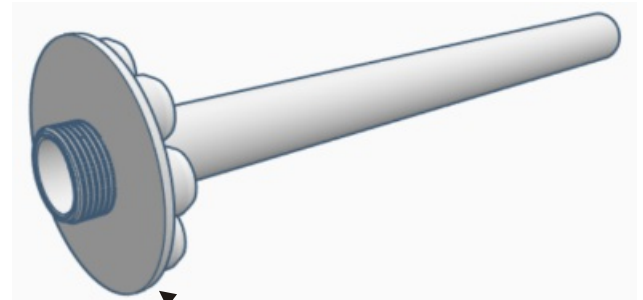
- 6** Set the Apollo capsule and LES on top of the completed assembly but do not glue the capsule in place yet.



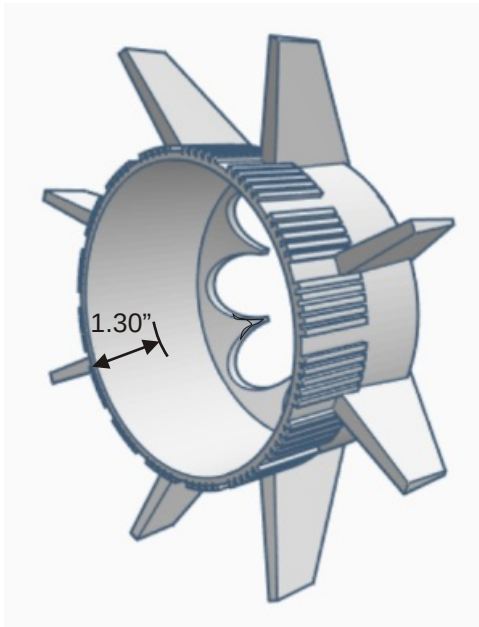
- 7** Cut a 16.00 inch length of LOC 29mm motor tube. Sand the cut edge to square it up if needed. Check the fit of the male motor retainer threads on the end of the tube, Sand if needed for a nice slide fit. Glue the male thread ring flush on the end of the motor tube.



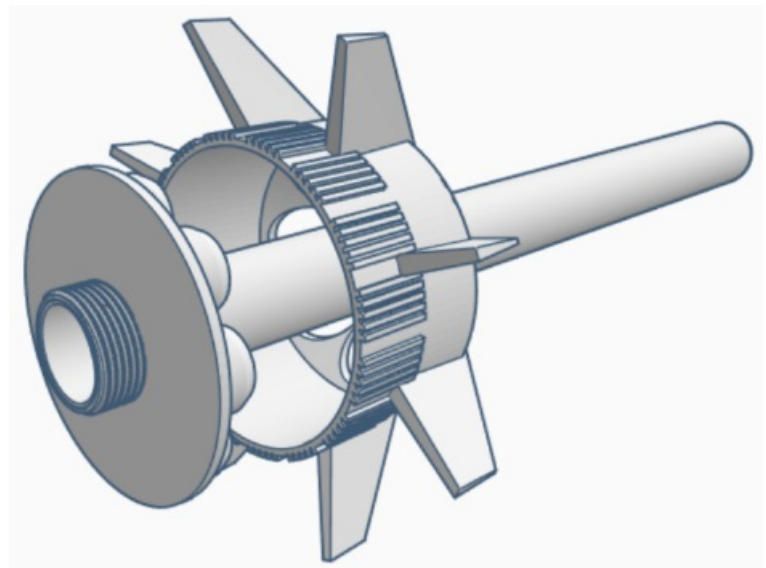
- 8** Find one of the two tank tube bulkheads and glue it in place on the motor tube against the motor retainer as shown.



- 9** Using a pencil make some marks 1.30" inside the fin can from the bottom edge. Mark at least three points around the inside of the can.

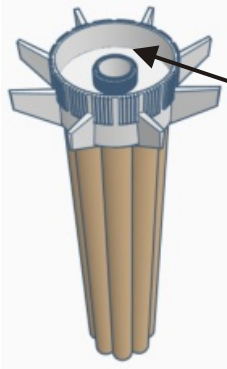


- 10** Test fit and slide the motor mount assembly into the fin can up to the pencil marks while aligning the tube mounts with the tube exit points on the top of the fin can.



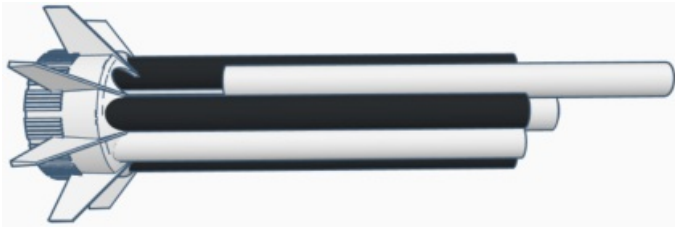
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- 11** Use all eight uncut BT-52 body tubes to temporarily get the tank tube bulkhead in the right orientation and depth (the bulkhead set to the pencil line depth). Apply epoxy to the bulkhead and fin can joint. Don't get epoxy on the body tubes! When dry, remove the tubes and paint the fin can flat white when dry.

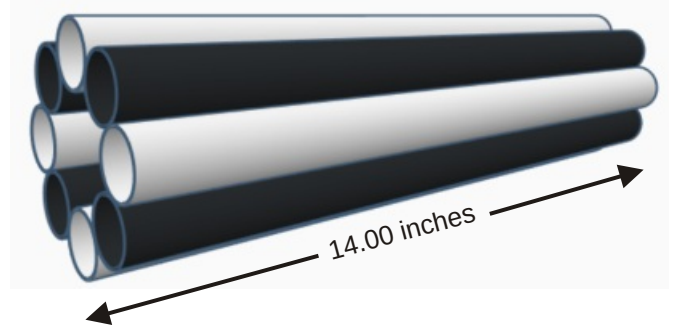


Apply a bead of epoxy to the joint between the fin can and the bottom of the tank bulkhead

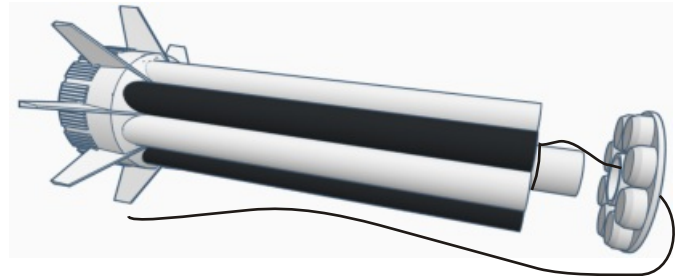
- 13** Proceed to glue the tubes (when dry) into the tank bulkhead alternating the black and white tubes. Make sure each tube is completely seated on its peg. The tubes should only be glued to the tank tube bulkhead, not to the fin can.



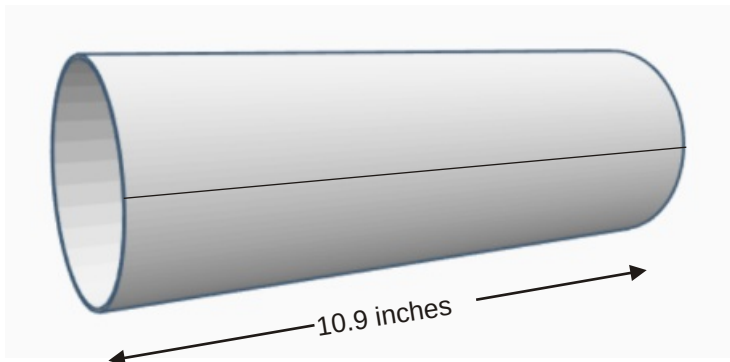
- 12** Cut your eight BT-52 body tubes to a length of 14.00 inches in length. Paint four of the tubes flat black and the remaining four tubes flat white.



- 14** After letting the assembly dry tie a length of 300 lb test Kevlar around the top of the motor tube. Make sure to apply ample superglue gel to the Kevlar and the top of the motor tube then slide the second tube bulkhead in place with the Kevlar line snaked through the center of the bulkhead. There is no need to apply epoxy to the tank tubes but, if you do, just epoxy the inside edge of the tubes.

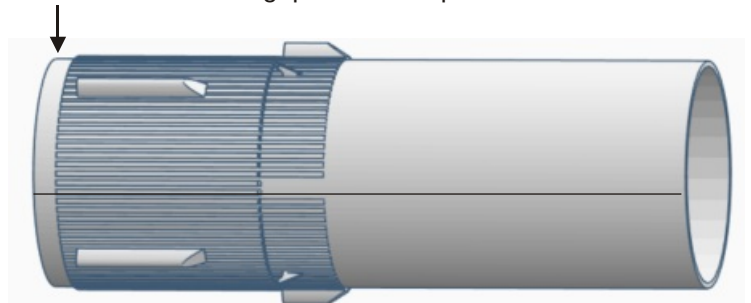


- 15** Cut a length of BT-100 body tube to a length of 10.9 inches. Draw a single pencil line down the center of the tube.



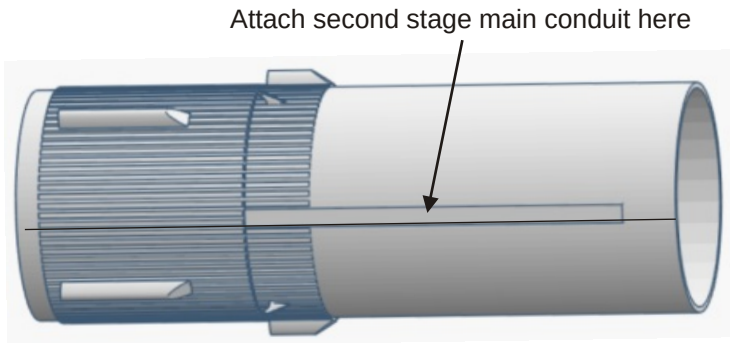
- 16** Align and glue bottom second stage wrap as shown below. We recommend extra strength 3M adhesive spray to attach the wrap, then super glue to seal the edges where the wrap meets. Use a micro superglue applicator.

Leave a $\frac{13}{32}$ inch gap before wrap starts

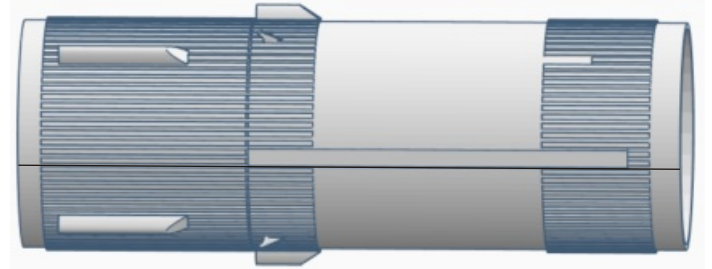


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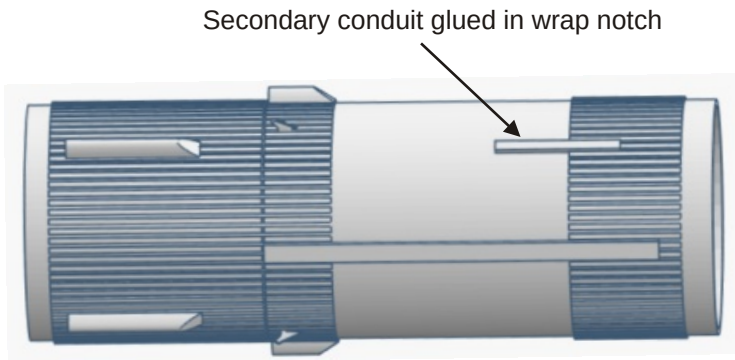
- 17** Attach the main second stage body conduit as shown below.



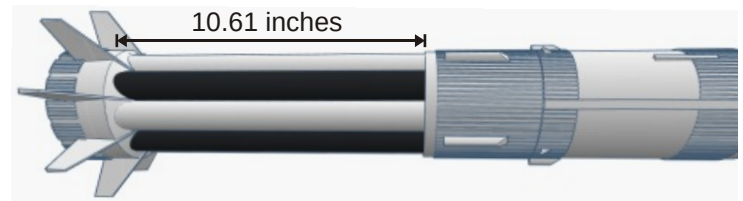
- 18** Attach second stage upper body wrap as shown below. Line up the wrap notch with the upper end of the main conduit.



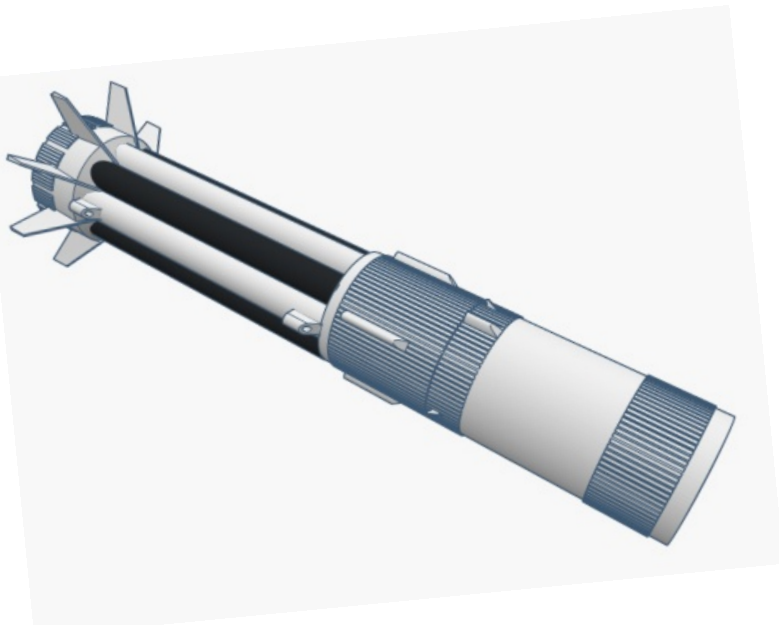
- 19** Attach the secondary second stage body conduit as shown below.



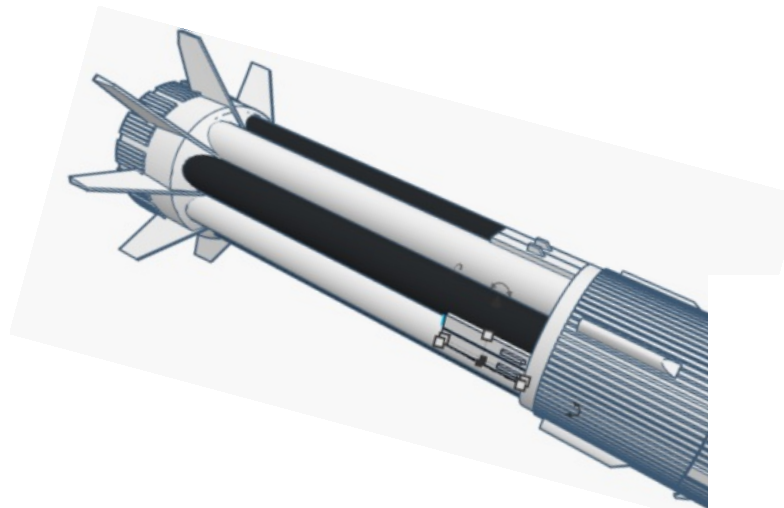
- 20** Epoxy the second stage airframe tube to the first stage assembly as shown. Measure 10.61" from the top angle joint of the fin can and apply 4 small strips of blue painters tape on the white tubes so that the measurement is aligned with the top of the tape. Make sure the first stage tank tubes are aligned as shown and epoxy them into the second stage up to the tape marks. When dry remove the tape and fillet the tank tube bulkhead edges from inside the tube.



- 21** Determine the placement of the two launch lugs. We recommend placement on one of the white tank tubes as shown below. Make sure the placement does not interfere with the wrap details. Also make sure to sand the attachment areas and poke pin holes in the body tube to insure good adhesion.

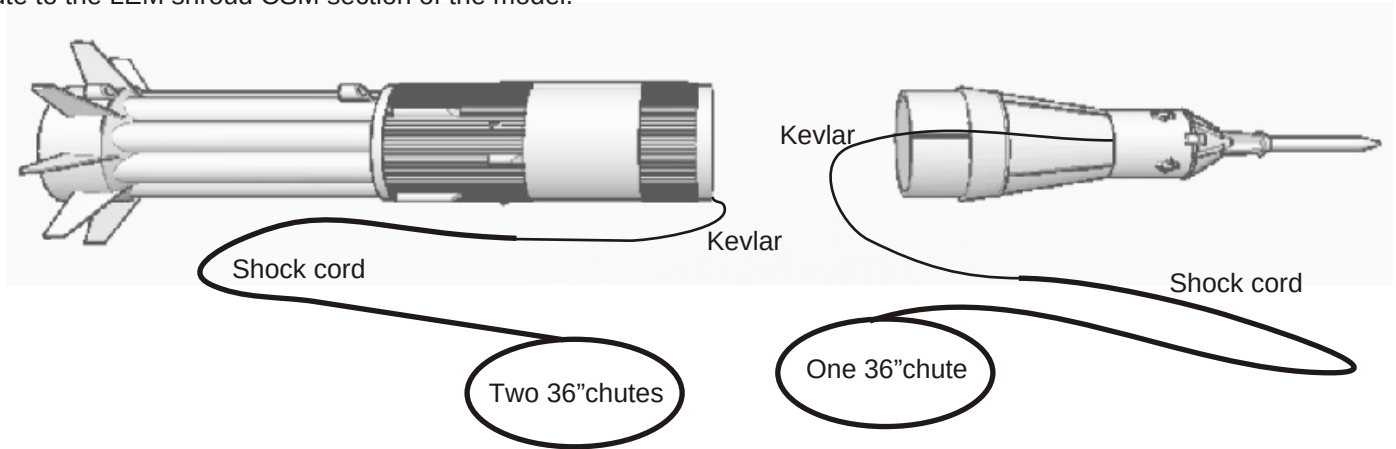


- 22** Find the antenna panels and paint them flat white. Use the drawings at the end of these instructions for proper placement. Attach in the same manner as you did with the launch lugs.



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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 a five foot long shock cord to the end of each section of Kevlar cord. Tie two 36 inch nylon chutes to the bottom half of the model and a single 36 inch chute to the LEM shroud CSM section of the model.



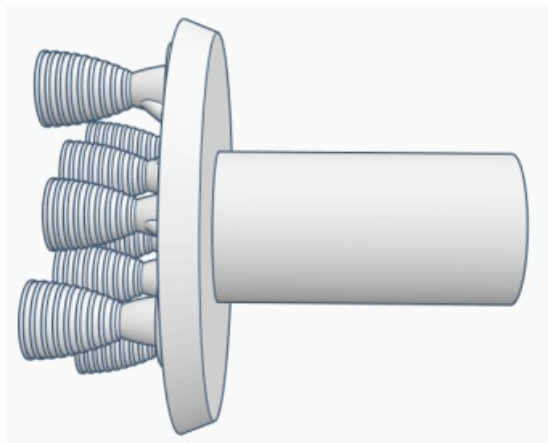
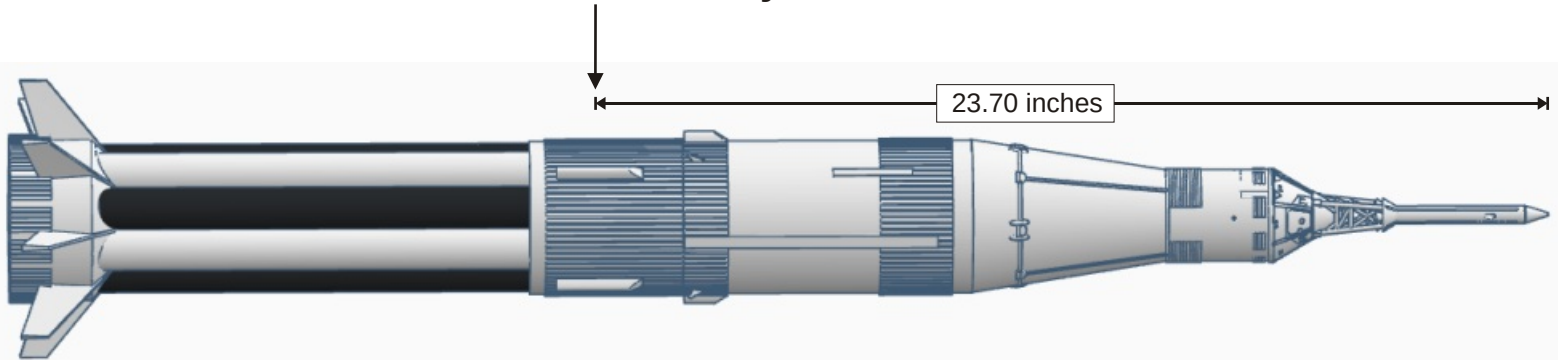
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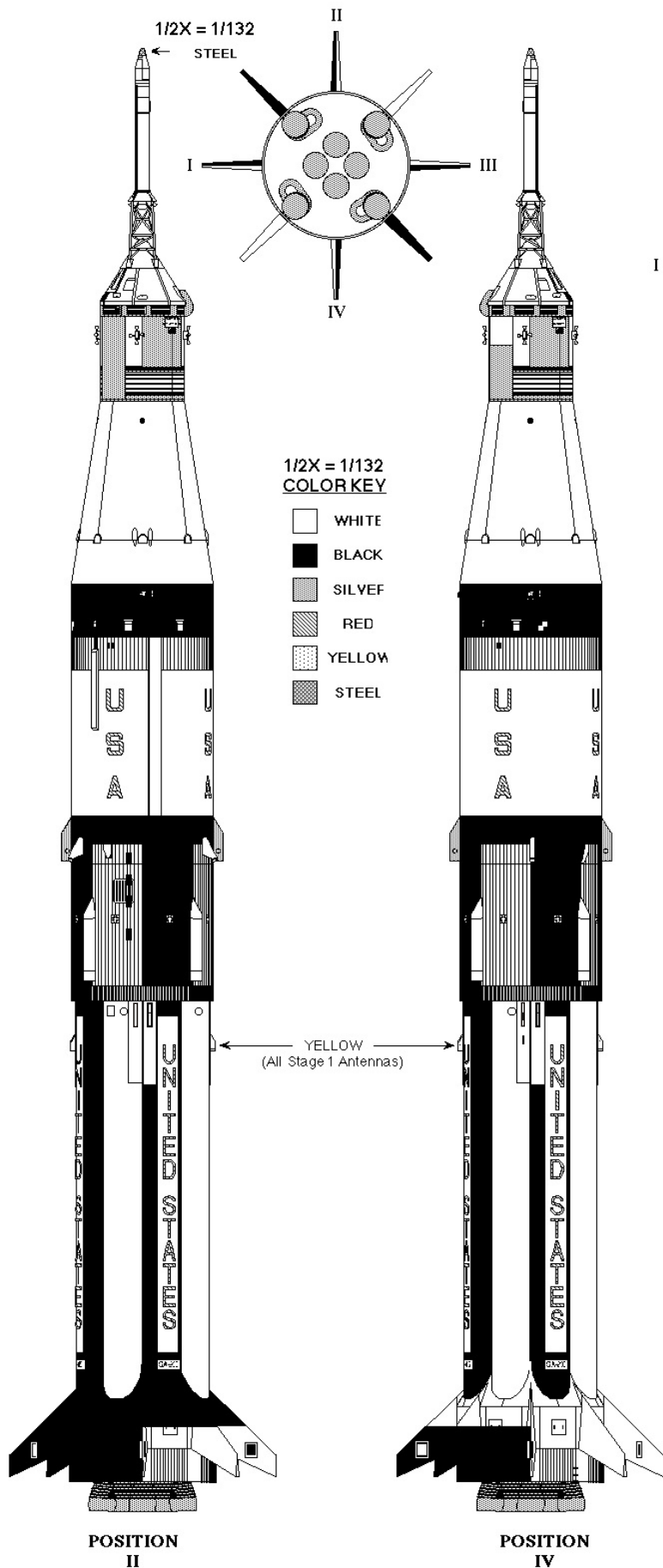
Put an Aerotech 29mm G74-6W rocket motor in the model then add epoxy and lead weights (fishing split shot weight) to the base of the capsule until the model balances at the required center of gravity (CG) as shown below. Failure to do so will result in a unstable flight that could injure someone, damage personal property and damage the rocket! After balancing the nose cone may be glued in place.

CG-Center Of Gravity



Assemble the display engine assembly as shown. Slide in place for static display of your model.

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PAINT AND DETAIL THE MODEL AS SHOWN BELOW:

There are a lot of painting and marking references on the web for the Saturn 1B. Feel free to super detail your model with all available resources.

Decal Application:

The decals for this model are printed on both white and clear waterslide decal stock. To apply you must carefully cut the decals out individually using a straight edge and then soak them for a few seconds until the backing starts to slide off. The tank tube decals must be cut just inside the colored edge and then applied to the black tank tubes. Make sure to apply a coat of clear acrylic spray to seal and protect the decals after you complete their application. Please note and follow the directions on the decal sheets.



Flight Prep:

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

The recommended motors for this model are Aerotech F67-4W and G74-6W. Use the screw on retainer to hold the motor in place to prevent it from ejecting itself when the delay charge fires. If the motor does not have a built in motor block make one with wraps of 1/8th inch wide masking tape at the bottom of the motor.

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!