1-27TH SCALE MERCURY REDSTONE BUILDERS KIT

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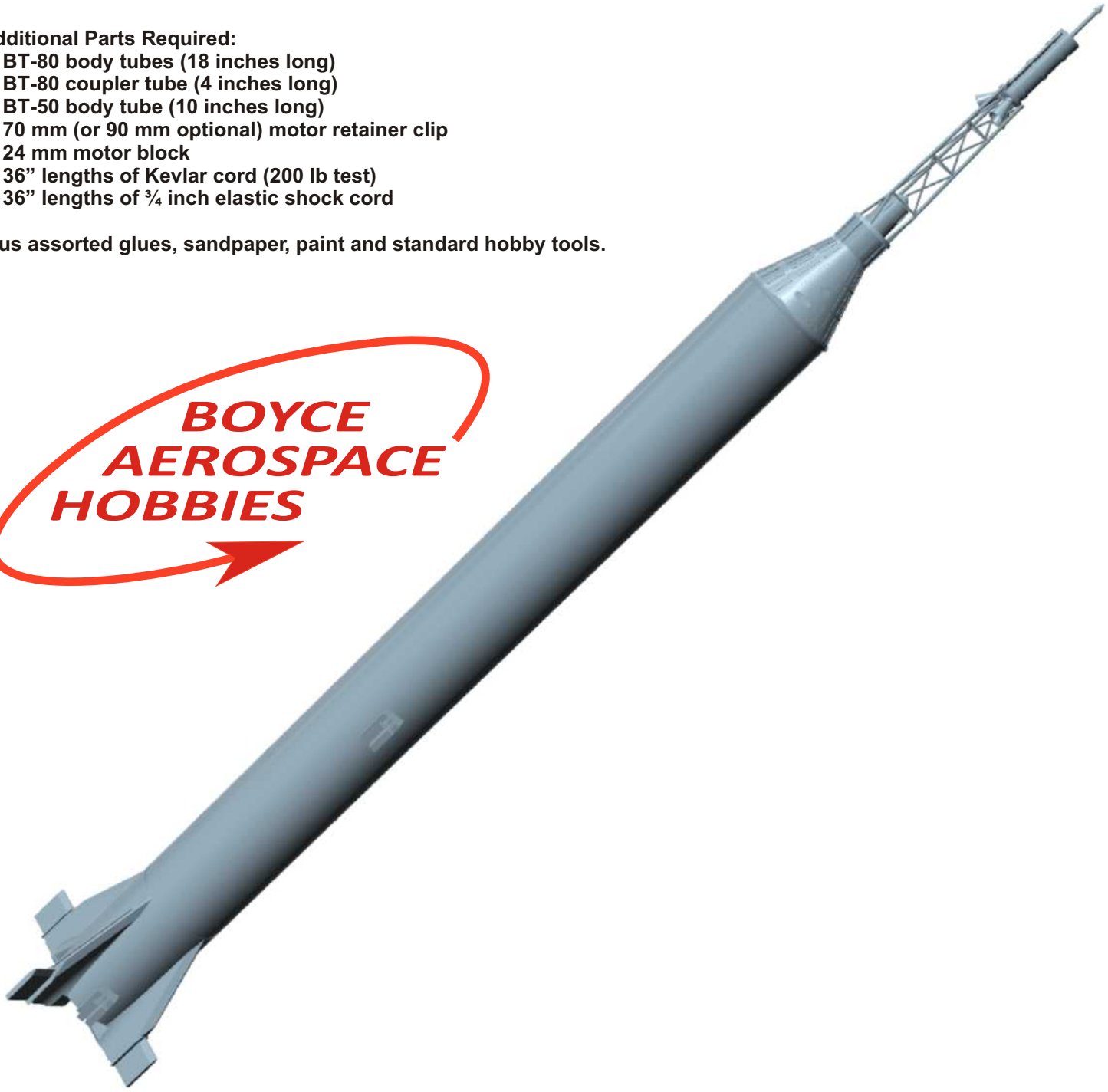
Additional Parts Required:
2) BT-80 body tubes (18 inches long)
1) BT-80 coupler tube (4 inches long)
1) BT-50 body tube (10 inches long)
1) 70 mm (or 90 mm optional) motor retainer clip
1) 24 mm motor block
2) 36” lengths of Kevlar cord (200 lb test)
2) 36” lengths of ¾ inch elastic shock cord

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

BOYCE AEROSPACE HOBBIES

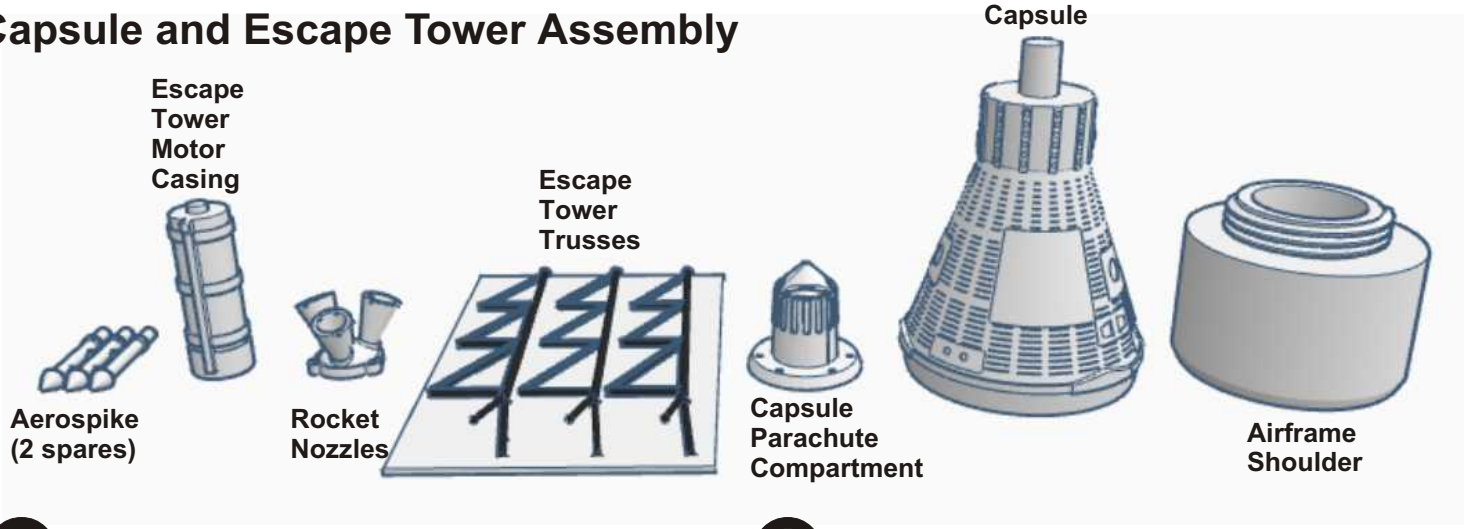


1/27th Scale Mercury Redstone Model Rocket Kit

Thank you for purchasing a Boyce Aerospace Hobbies Mercury Redstone kit. Please review the drawings below before gluing and assembling your kit. Also please visit us at boyceaerospacehobbies.com for more scale model rocket kits.

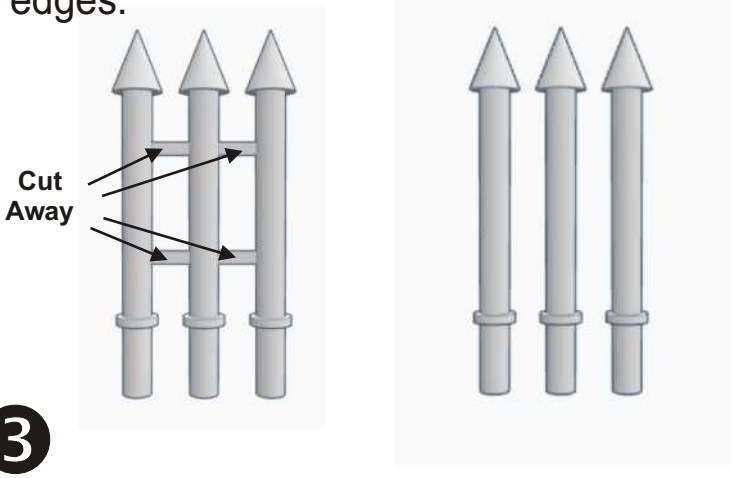
Start by sanding all parts with 220/400 grit sand paper either wet or dry (your preference). Test fit all parts before gluing and until you have a nice slide fit between all mating parts. Once the model is complete wet sand the model until smooth then spray one coat of grey automotive primer over the model. After the model is dry repeat the wet sanding and primer steps until you have a nice paintable surface. Detail the model using modeling resources on the internet (see backside of these instructions).

Capsule and Escape Tower Assembly



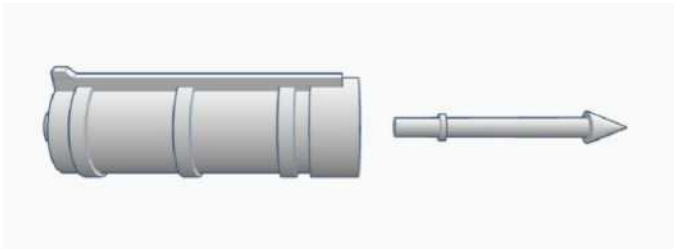
1

Carefully cut apart the three aerospikes provided. Use a hobby knife and 400 grit wet/dry sandpaper to clean up any rough edges.



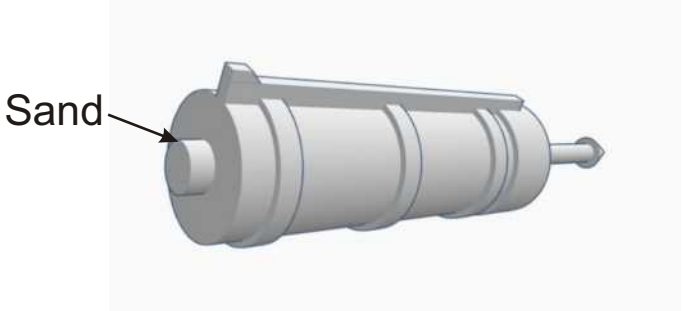
2

Test fit the aerospike into the top of the escape motor casing. Decide if you want to glue the aerospike in or just leave it a pressure fit so it can be removed for flight.



3

Sand around the sides of the male alignment tab with an emery board until it is a nice slide fit with the escape tower rocket nozzles.



4

Test fit the rocket nozzle base plate with the escape tower rocket motor. <u>Do not glue at this time.</u>

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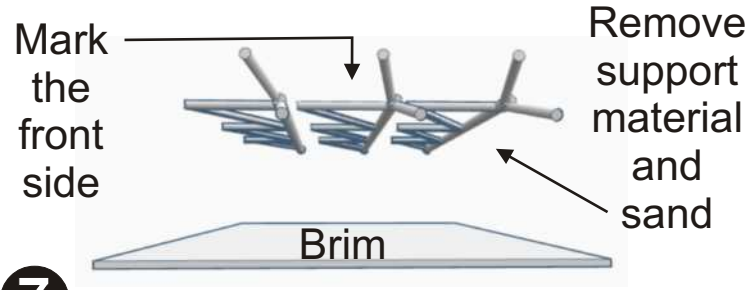
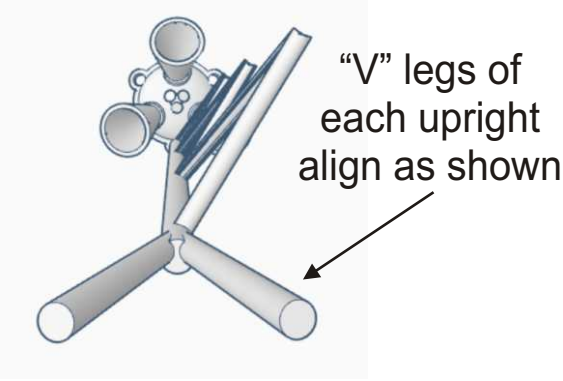
5

Mark the front of each tower upright. Pull the “brim” away from the escape tower uprights. Carefully remove the support material from the back side of the uprights. Sand the back side of the uprights until smooth.



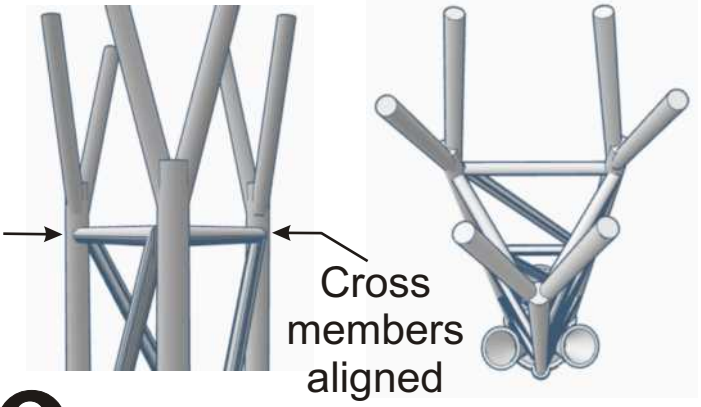
6

Lay the escape tower nozzle assembly upside down on a smooth flat surface. Fit all uprights in the holes in the nozzle assembly until they touch the surface (see step 8 image). Align as shown below.



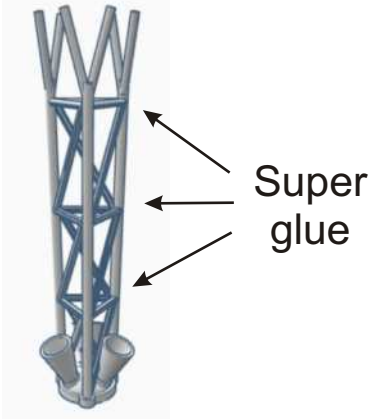
7

Align the uprights to the nozzle assembly as shown. Align the cross members as shown.



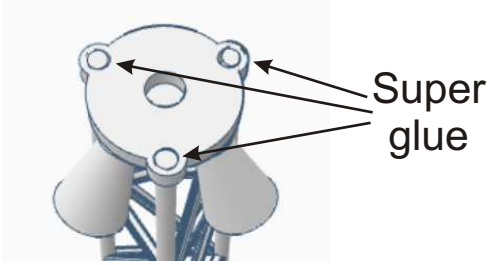
8

After all 3 uprights are seated and aligned apply super glue to each cross member/upright joint and hold till dry. Repeat for each upright.



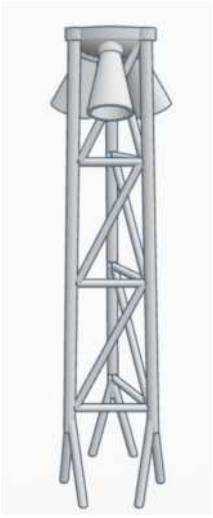
9

Carefully flip the tower assembly over and insure each upright is fully inserted into its hole in the nozzle assembly. Apply a drop of super glue to the top of each tower upright through the holes.



10

After the tower is dry, check it for vertical trueness on each of its 3 sides. Carefully sand the base legs of the tower to adjust trueness if needed.



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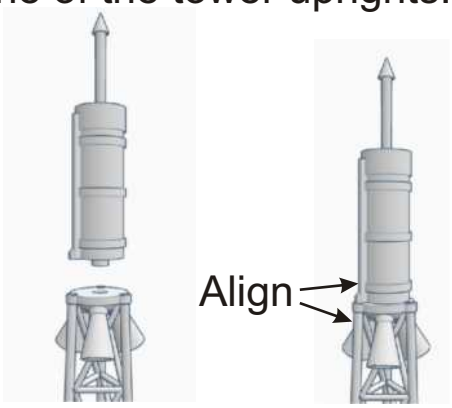
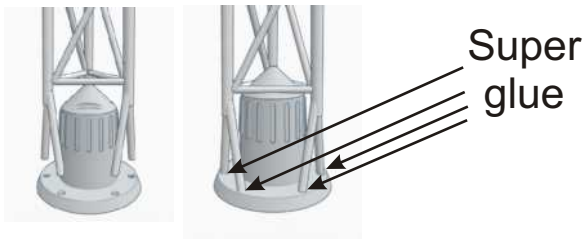
11

Glue the escape tower rocket motor casing in place. Make sure to align the tunnel on the side of the casing to one of the tower uprights.



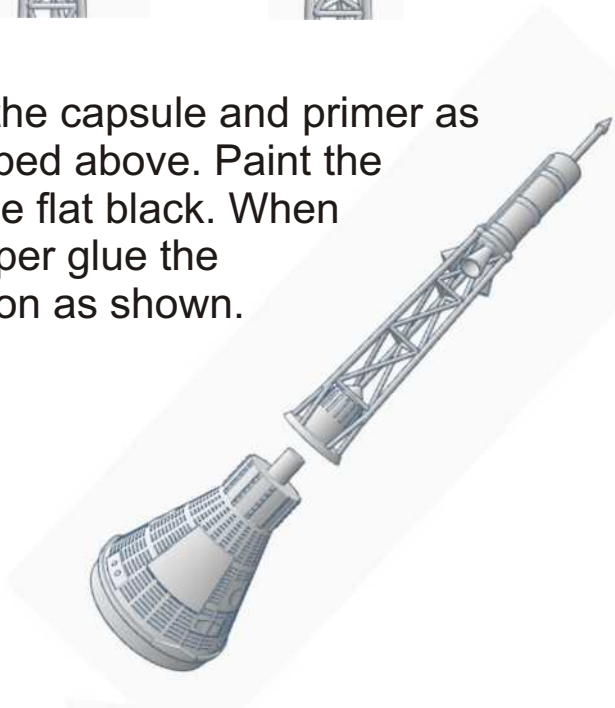
12

Sand and use auto spray primer to coat the tower. Sand and repeat until tower is ready for paint. Spray the tower bright red. Using a drill bit the same size as the tower “V” legs, drill angled holes in the positions indicated on the tower attachment base. Sand and paint the base flat black. Glue the tower to the base as shown.



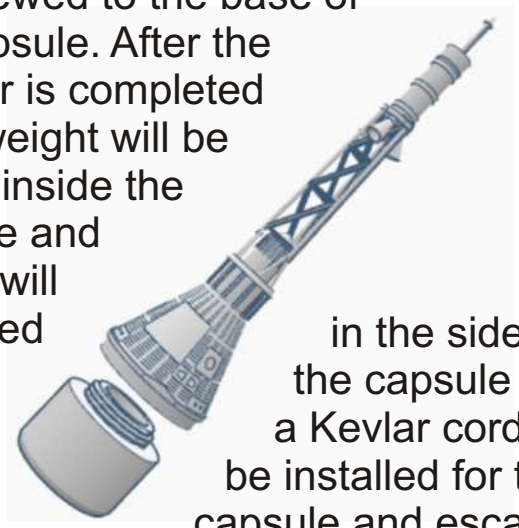
13

Sand the capsule and primer as described above. Paint the capsule flat black. When dry super glue the tower on as shown.



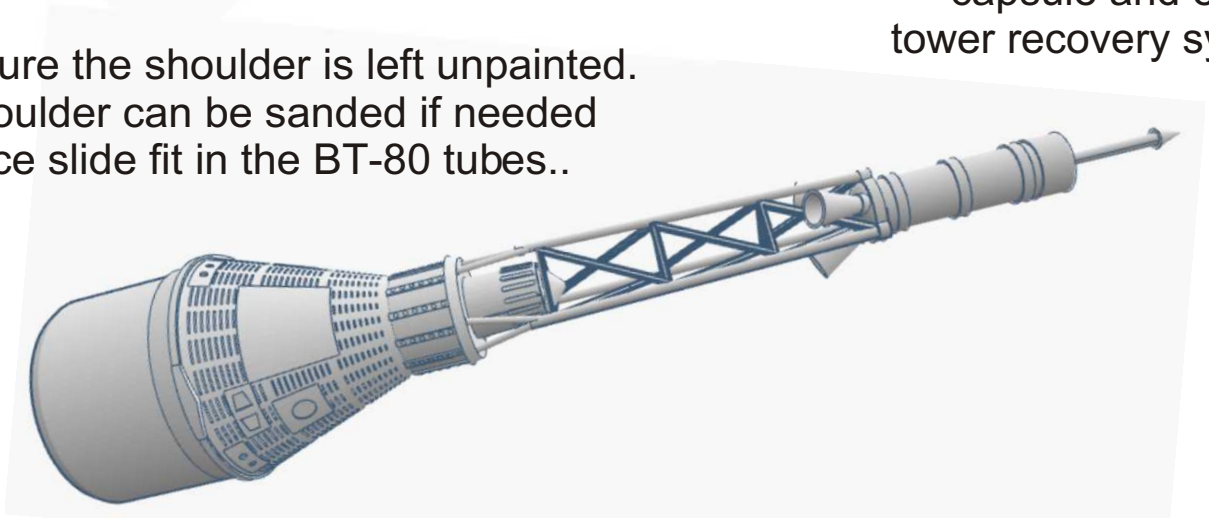
14

The capsule shoulder can now be screwed to the base of the capsule. After the booster is completed nose weight will be added inside the capsule and a hole will be drilled in the side of the capsule for a Kevlar cord to be installed for the capsule and escape tower recovery system.



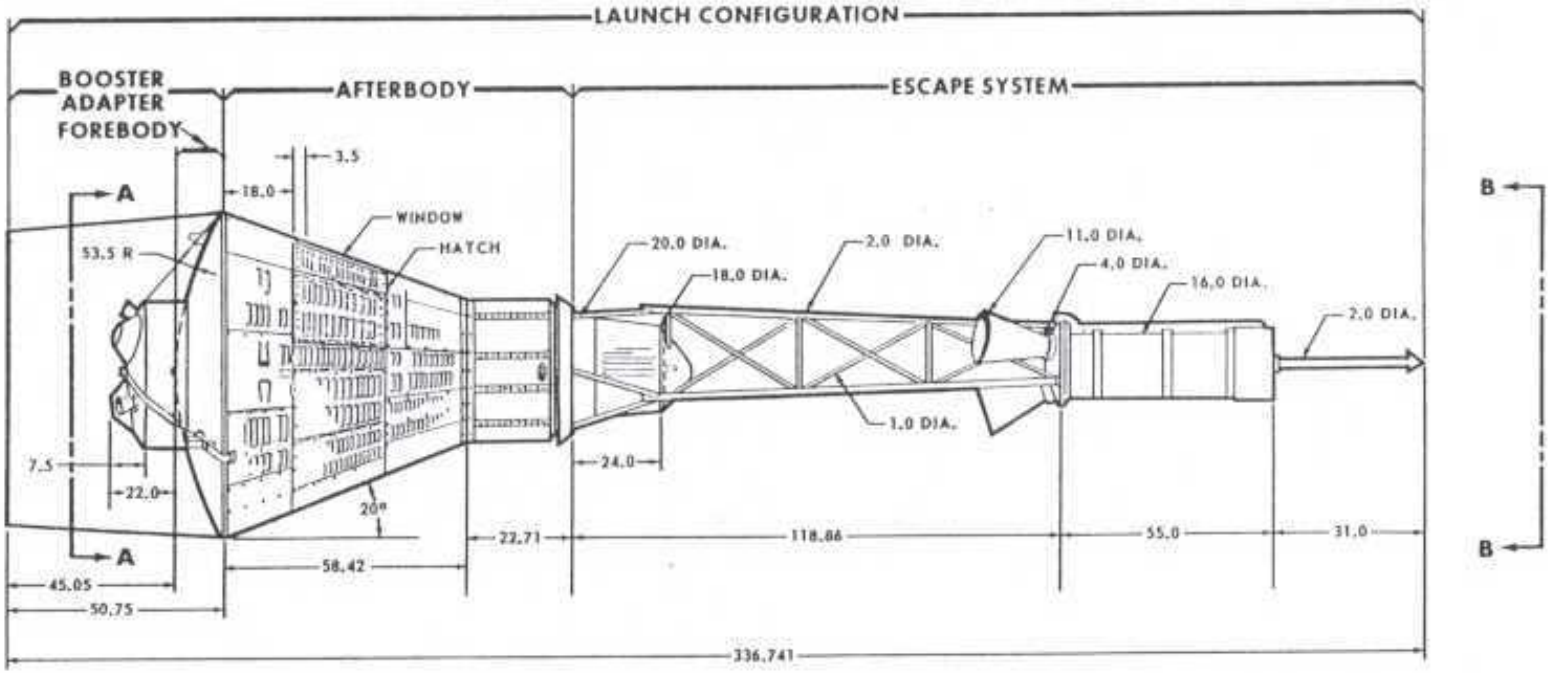
15

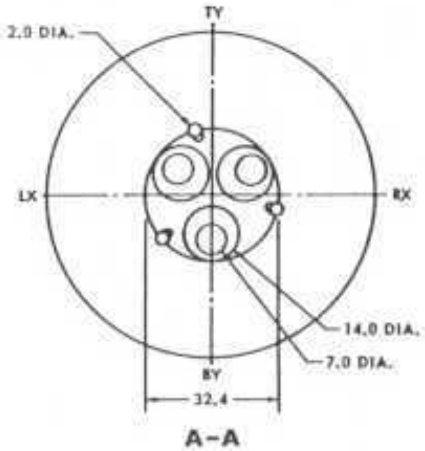
Make sure the shoulder is left unpainted. The shoulder can be sanded if needed for a nice slide fit in the BT-80 tubes..



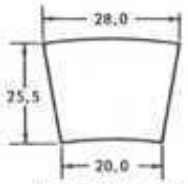
MCDONNELL MERCURY SPACECRAFT

FIRST FREE MAN IN SPACE

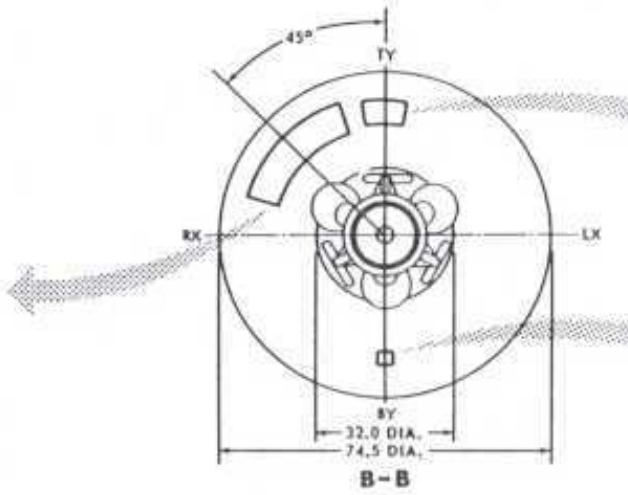




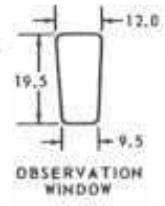
A-A



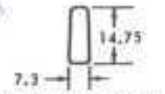
ENTRANCE AND EMERGENCY EGRESS HATCH



B-B



OBSERVATION WINDOW



UMBILICAL DOOR

ALL DIMENSIONS IN INCHES

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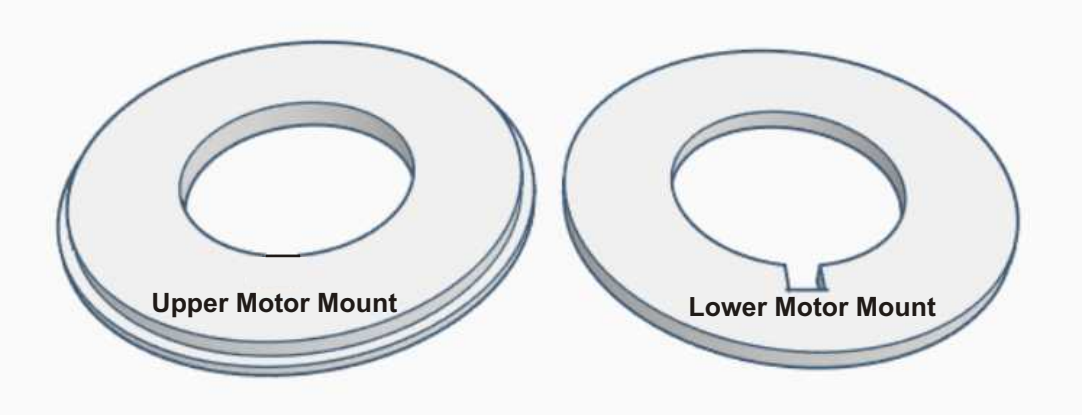
Redstone Booster Assembly

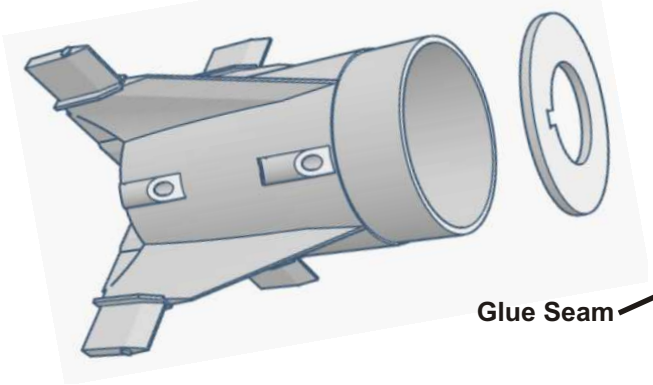
16

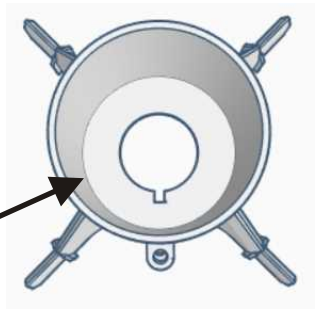
Sand the inside hole edges of both motor mounts until they are a nice slide fit with your 24 mm motor tube. Test fit both motor mounts into the fin can. The lower mount should slide all the way to the bottom of the fin can. The upper mount will just fit on the top of the fin can.

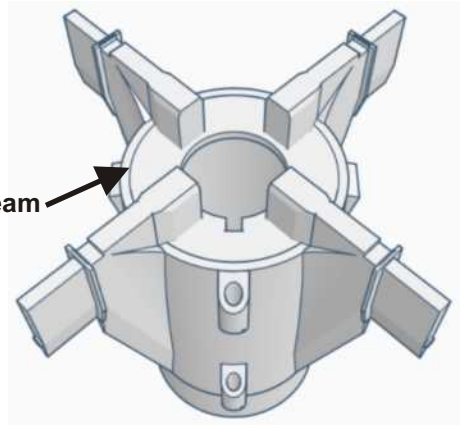


17

Install the lower motor mount into the fin can with the motor retainer notch aligned with the launch lugs on the fin can. Apply super glue (CA) to the mount from inside the fin can. Roll the fin can at an angle to spread the super glue all the way around the mount. When dry carefully apply super glue to the joint between the motor mount and the fin can allowing the glue to wick into the joint.

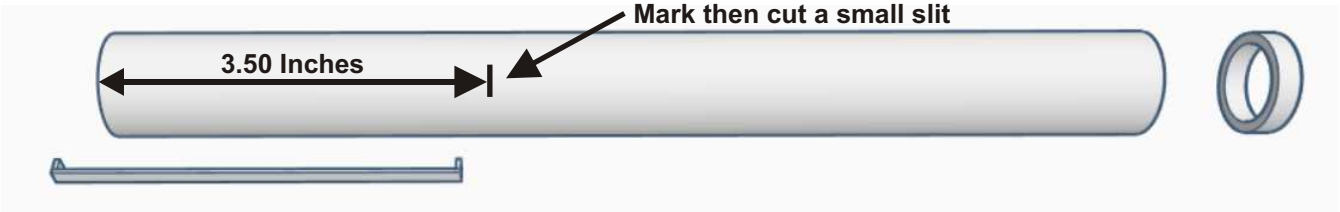






18

Using a pencil mark on end of the 24 mm motor tube at a point 3.5 inches from one end. Using a hobby knife cut a small slit in the tube at the mark for the end of the motor retension clip.



19

Install the motor retention clip and masking tape in place as shown. Using a dowel stick spread white glue in the motor tube just above the top of the motor clip. Use the dowel stick to slide the motor block into place.

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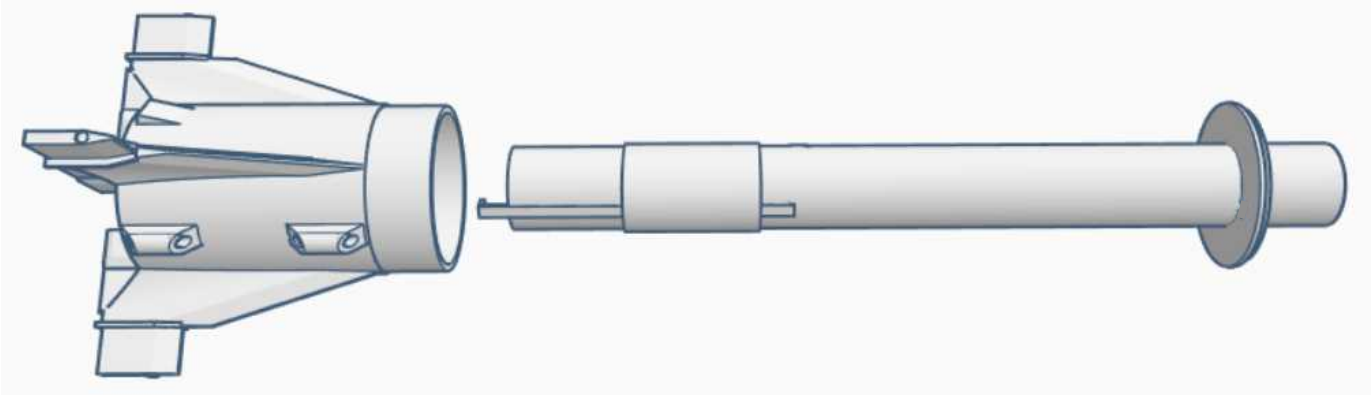
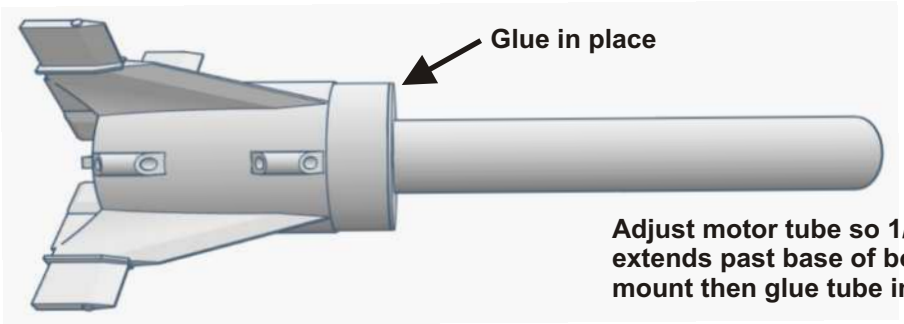
20

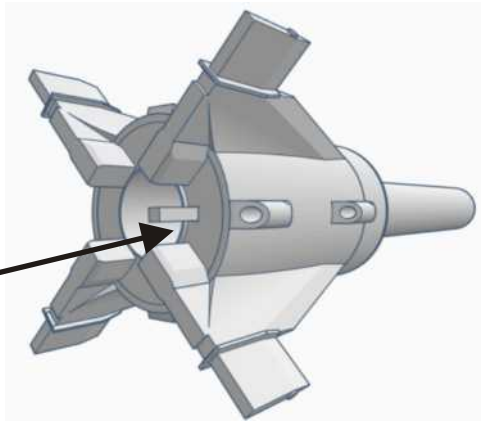
Slide the top motor mount onto the motor tube and slide the assembly into the fin can as shown.



21

Super glue the top motor mount onto the top of the fin can. After the glue has dried adjust the motor tube so just 1/8th of an inch of the motor tube extends past the bottom motor mount of the fin can. Super glue the motor tube in place from both sides of the fin can.



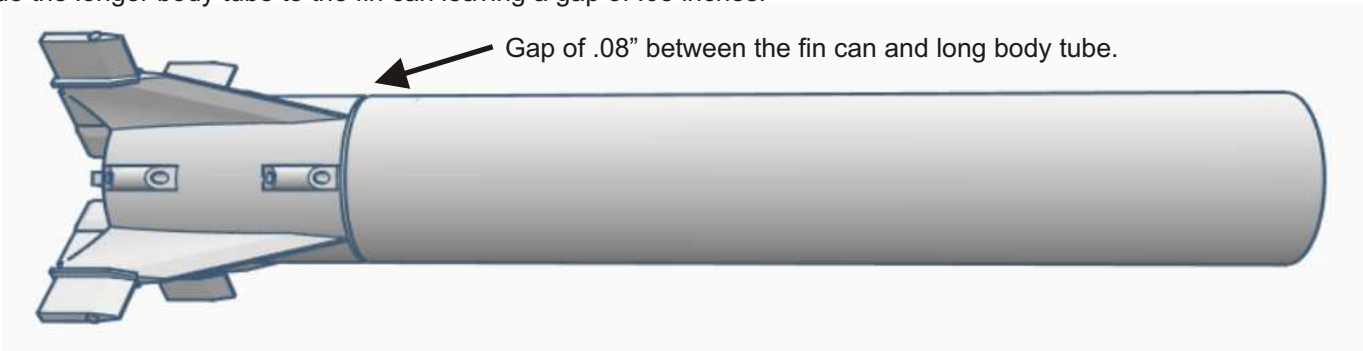


22

Using a sharp hobby knife cut two pieces of BT-80 body tube to the following dimensions:

Lower Body Tube: 424.5 mm long
Upper Body Tube: 133.87 mm long

Super glue the longer body tube to the fin can leaving a gap of .08 inches.



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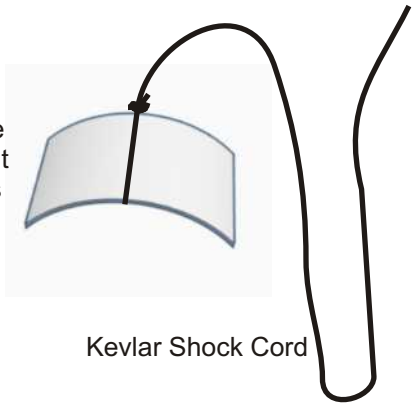
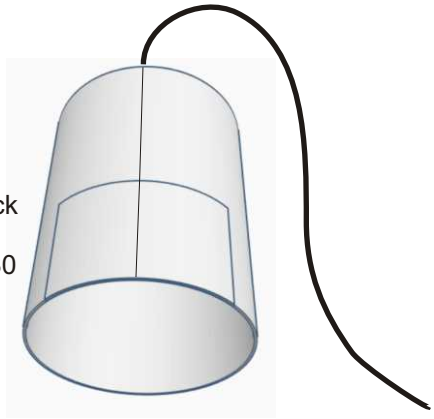
23

Locate your BT-80 coupler tube and Kevlar shock cord. Cut a scrap section of BT-80 as shown below and tie the end of the Kevlar shock cord around it. Epoxy the piece inside the end of the BT-80 coupler as shown.

Srcap piece of BT-80 cut to shape as shown.



Epoxy shock cord mount inside BT-80 coupler as shown

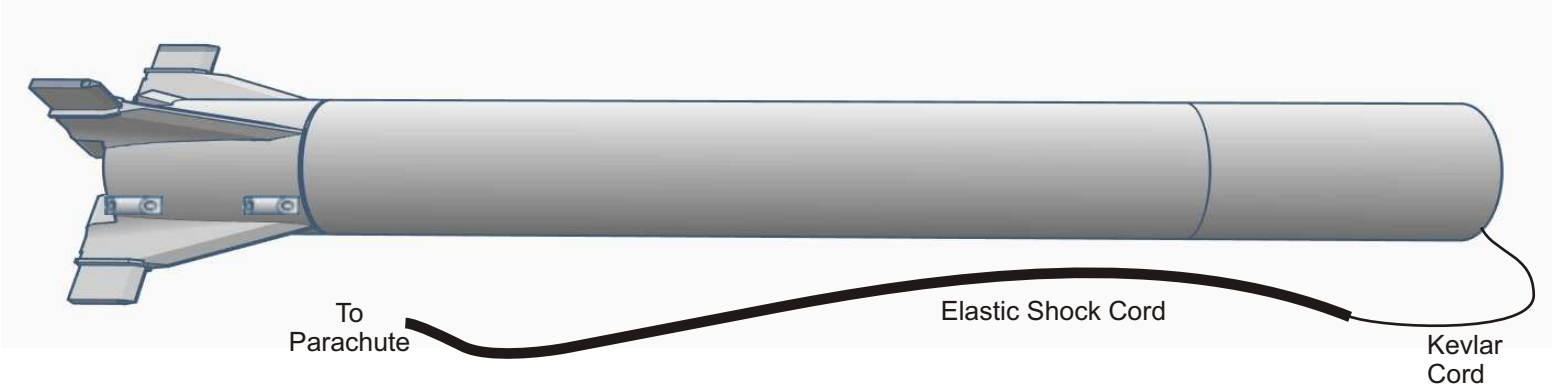


24

Mark the BT-80 tube coupler at its midway point. Glue the coupler into the long length of BT-80 up to the mark. Make sure the Kevlar shock cord is extended through the last sections of body tube.

25

Glue the last section of BT-80 onto the coupler after passing the Kevlar shock cord through the tube. Tie a length of elastic shock cord to the end of the Kevlar cord then tie a 36 inch parachute to the shock cord.



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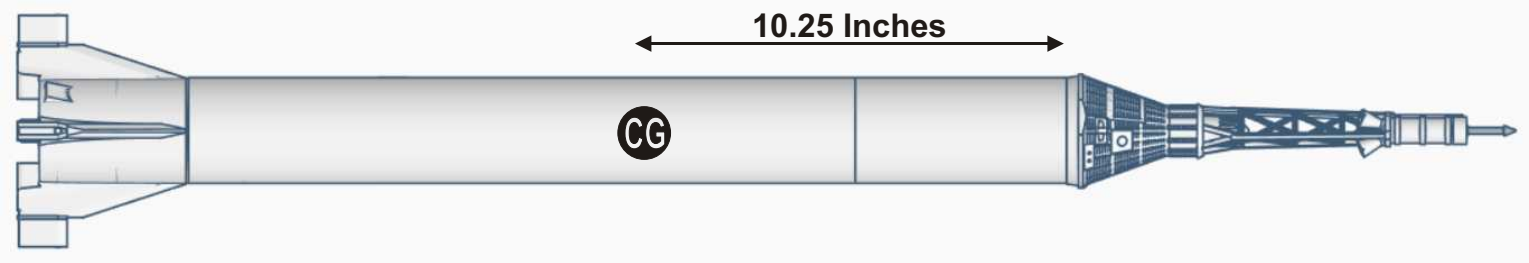
26

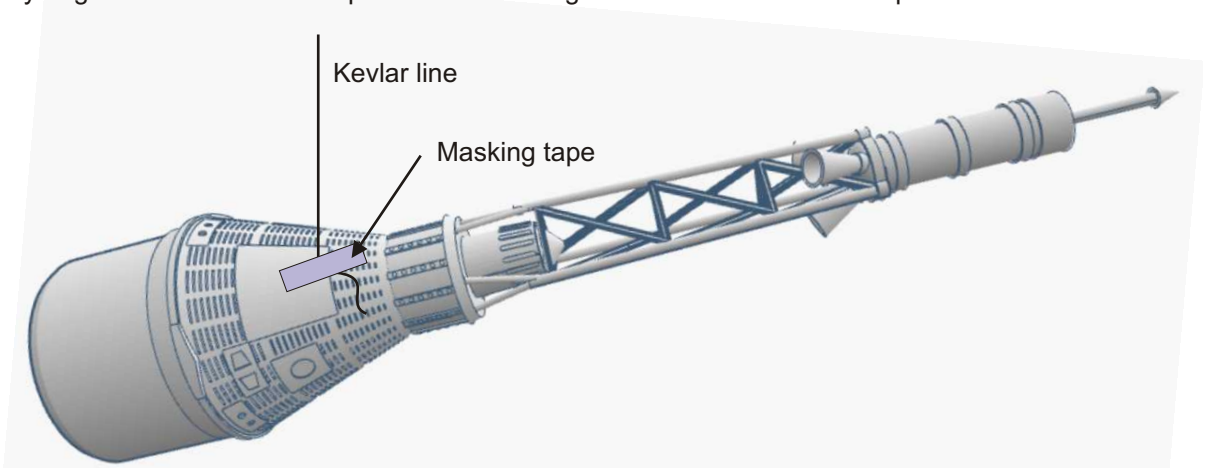
At this point nose weight must be added to move the models center of gravity ahead of it's center of pressure in order to assure the model's stability. Slide the capsule section onto the airframe and install the motor you plan on using for the first flight. Apply a piece of masking tape to the model and draw a line on the tape exactly 10.25 inches from the front edge of the airframe tube. The model must balance at or forward of this point. To add nose weight we recommend unscrewing the capsule shoulder and pressing clay into the recess in the capsule until the model is balanced as shown.

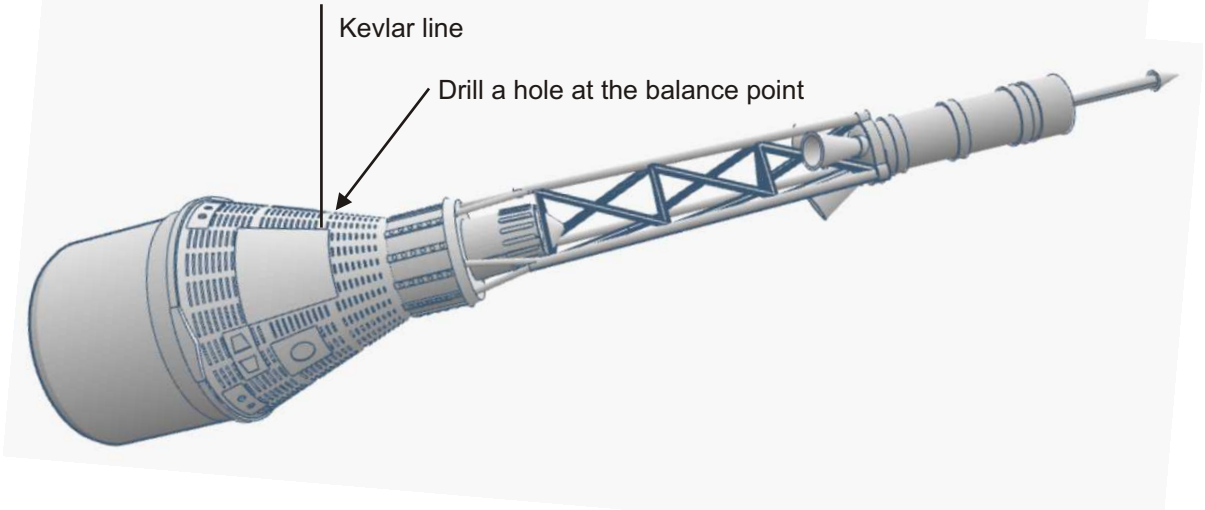


Please note that this procedure must be repeated if you use a larger/heavier rocket motor on later flights. Failure to correct the models center of gravity may result in an unstable flight which can damage or destroy the model and cause harm to personal property and human life.

27

Now that the nose weight has been added to the capsule the Kevlar line for the capsule's recovery system may be installed. Using the short piece of Kevlar line use masking tape and test various points on the capsule until you find the point where the capsule balances as shown below. Drill a hole with a small drill at the balance point and feed the Kevlar line into the capsule. Use epoxy to glue the line into the capsule. Attach a length of shock cord and a 24" parachute to the Kevlar line.





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Use spray primer to begin the painting process on the Redstone booster. The primer will fill in the 3D printing layer lines on the fins. Sand the model after each coat of primer paying extra attention to the fins and launch lugs.

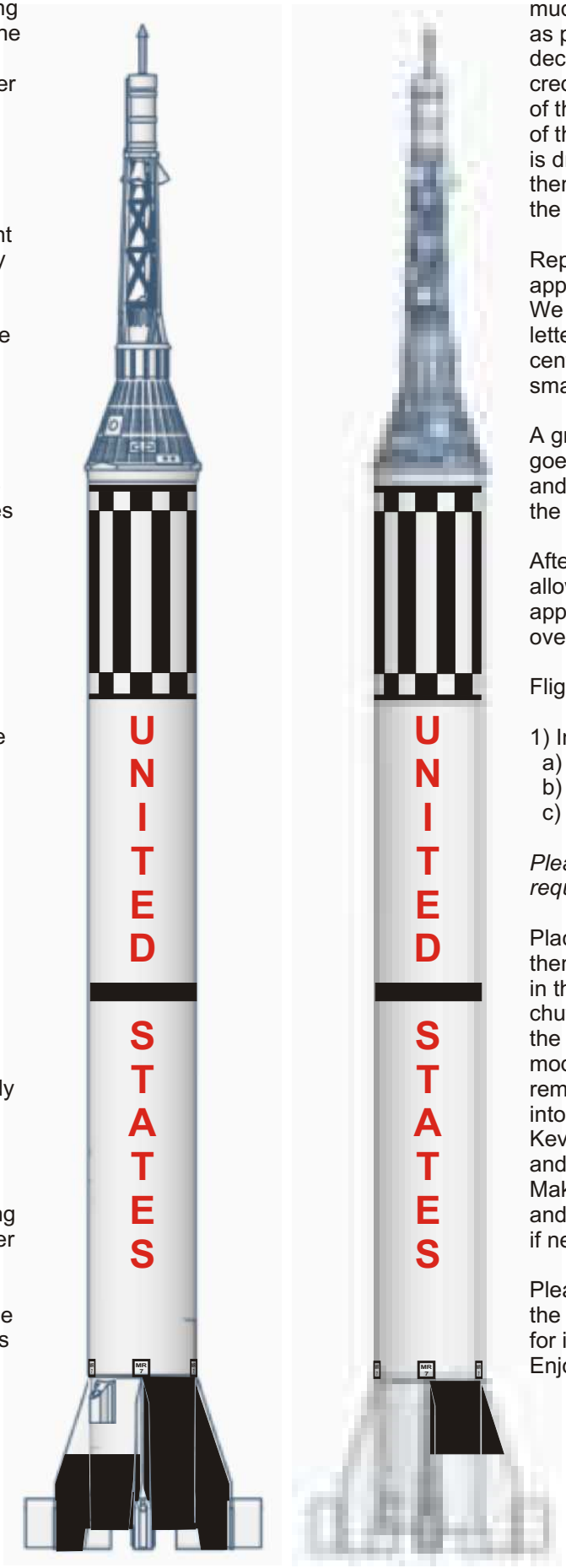
After about 3 coats of primer the 3D printed layer lines will disappear and the model will be ready to paint. Paint the entire booster with a good quality semi-gloss white enamel spray. Let each coat dry before the next coat is applied. Give the model at least three spray coats of paint.

After the paint has dried (24 hrs or more depending on temperature) carefully mask the paint pattern on the fin can. The images on this page show the fin roll patterns 180 degrees opposite each other. Tape a large garbage bag over the rest of the airframe and spray paint the fin roll pattern with semi-gloss black paint. When dry carefully romove all masking tape and the bag.

The decals provided are the upper roll pattern, the center stripe, and the vertical United States lettering. To prepare the decals for use first cut around each decal leaving a margin of about ½ inch. Use a credit card to apply pressure to the tape “mask” over the decal in long firm strokes. This will help the decal to peel off its backing paper and remain affixed to the “mask”.

Get a small bowl and fill it half way with warm water. Drop two to three drops of dish washing detergent into the water and mix. You are now ready to proceed.

The first decal applied should be the booster roll pattern. Carefully peel the backing paper off the decal. Using a small sponge apply the soapy water to the decal. This will allow you to move and position the decal during its application. Lay the decal left edge in line with the launch lugs/rail guides and line up the top of the decal with the top of the booster airframe tube. Slowly wrap the decal around the body tube (repositioning as needed) so that the top of the decal lines up with the top of the boosters body tube. Once the positioning is good, use the credit card to work out as much of the soapy water under the decal as possible. Be careful not to stretch the decal. As the decal starts to dry use the credit card to apply pressure to each part of the decal in order to assure adhesion of the decal to the model.When the decal is dry use the sponge to wet the “mask” then slowly peel it off the model leaving the roll pattern decal in place.



Repeat the process described above to apply the remaining decals to the model. We suggest applying the United States lettering decals second followed by the central black band and then finally the small MR-7 box decals.

A great method to make sure your decal goes on straight is to dry fit the decal and apply painters tape as guides for the edges of the decals.

After all the decals have been applied allow them to dry for 24 hours then apply a good quality clear coat spray over the decals to keep them in place

Flight preparation for the model:

1) Install your flight motor:
   a) Estes E9-4 (Apogee 467’)
   b) Aerotech E15-4 (Apogee 772’)
   c) Aerotech F32-6 (Apogee 1121’)

Please note that 70 mm long motors require a 20 mm spacer ring.

Place ejection wadding in the rocket then fold and place the capsule chute in the body tube. Follow the capsule chute with the booster chute. Placing the chutes in this order improves the models recovery reliability. Pile the remaining shock cord and Kevlar cord into the model. Tuck the capsules Kevlar cord along the capsule shoulder and slide the capsule onto the booster. Make sure the shoulder slides smoothly and does not bind. Sand the shoulder if needed.

Please follow the NAR safety code and the motor manufacturer’s instructions for igniting and flying your model. Enjoy your Boyce Mercury Redstone!

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