1/195 Scale
Apollo-Saturn V Assembly Instructions

You are about to build a scale model of the Apollo-Saturn V Moon Rocket. This is a 1/195 scale replica of the version used to launch the Apollo J missions, Apollos 15, 16, and 17. These last three flights centered on longer scientific exploration of the Moon, as opposed to the early flights whose principal goals were to get to the Moon and get home. The J missions were best remembered for the lunar rovers, which allowed astronauts to explore miles of lunar landscape over the course of days.

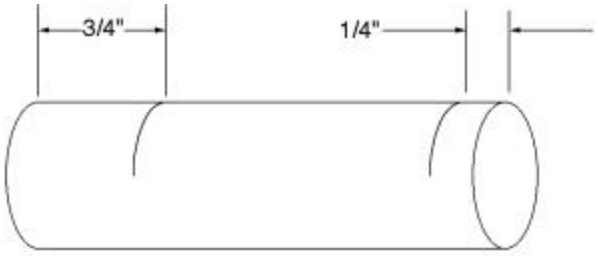
The J mission Saturn V's differed from the earlier rockets most visibly in a weight-saving measure. The small ullage rockets on the S-IC/S-II interstage were removed for these flights to save weight. Other weight savings and refinements gave the Saturn V the extra performance to carry a lunar rover and a couple of extra days' worth of supplies.

Apollo 15 lifted off from Cape Kennedy on July 26, 1971, carrying astronauts to explore the vicinity of Hadley Rille, a deep valley nestled in the Appenine mountains at the southeast edge of Mare Imbrium. Apollo 16 lifted off on April 16, 1972. The final Apollo mission, Apollo 17, flew on December 7, 1972.

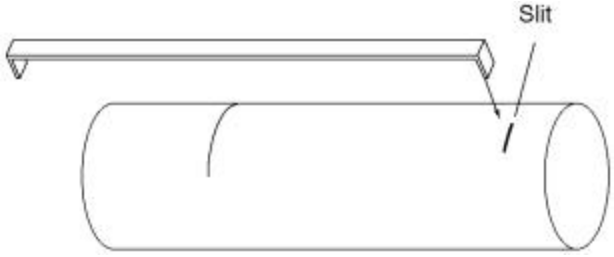
This kit is designed for modelers who have built a few flying rocket kits. Nothing in this kit should be especially tricky; however, there is some variability in the thickness of the plywood stock used for the detail parts. You may need to sand parts for a good fit.

Useful tools and supplies include:
Ruler
Pencil
Masking tape
Scotch "magic" tape
Scissors
Hobby knife
Carpenter's wood glue (yellow glue such as titebond)
Finishing sandpaper (the 3M assortment with #220, #320, and #400 is very handy)
Sanding sealer
Spray paint—I suggest Testors silver, which dries very fast, and your favorite brand of gloss white and gloss black.

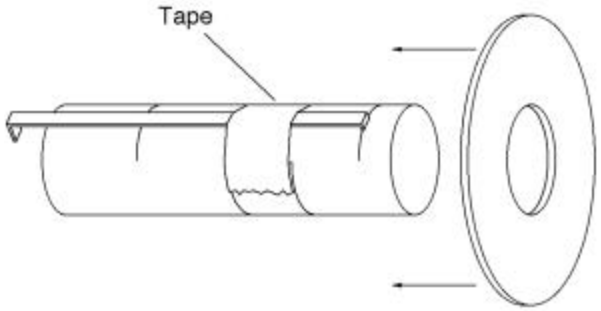
Step 1
Mark the Engine Mount Tube (3/4" diameter by 2 3/4" long) 1/4" from front end and 3/4" from rear end



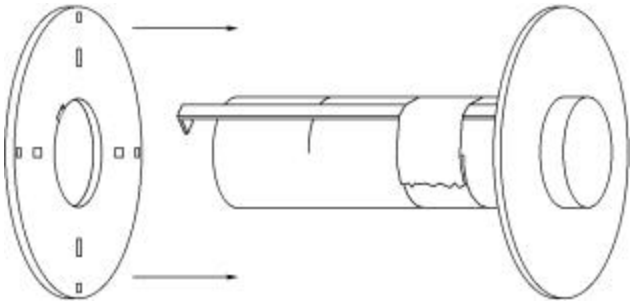
Step 2
Cut a small (1/8") slit in the tube at the front mark, and insert one end of the metal Engine Hook. Wrap tape around the hook halfway between your marks.



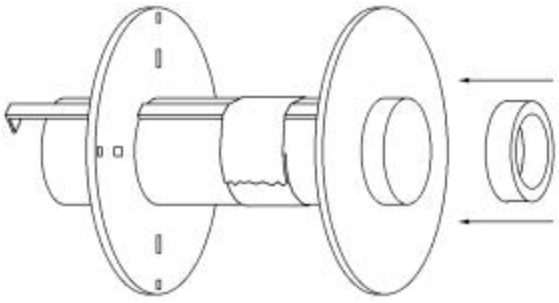
Step 3
Glue the plain Front Adapter Ring from the 1/16" plywood sheet to the front of the Engine Mount Tube, so that it rests against the end of the Engine Hook.



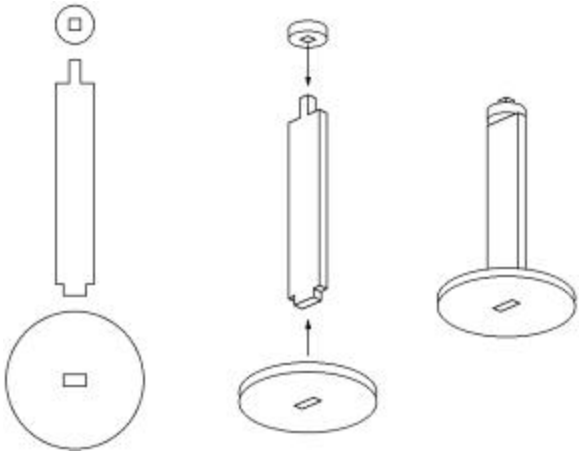
Step 4
Glue the Rear Adapter Ring (from the 1/16" plywood sheet with eight rectangular holes and a notch on the inside) to the Engine Mount Tube at the rear mark. The notch should fit over the Engine hook. The ring should be perfectly perpendicular to the tube—test fit in the big SIC/S-II Tube to insure the ring is flat against the end of the tube.



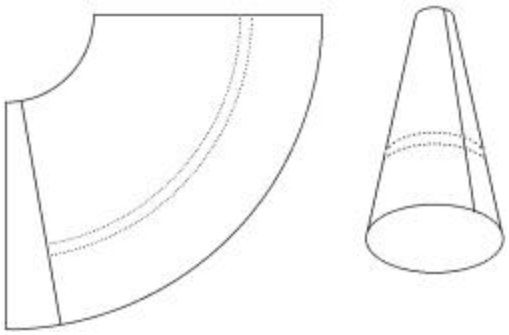
Step 5
Glue the Engine Block into the front of the Engine Mount Tube, up against the Engine hook.



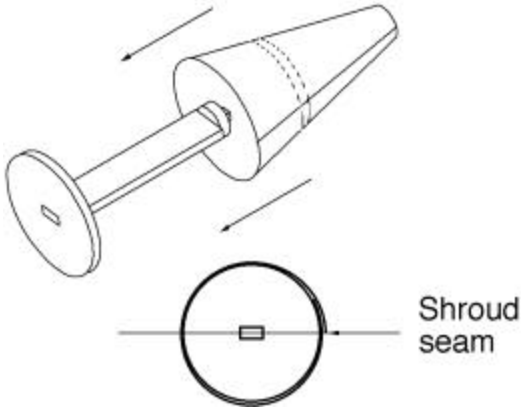
Step 6
Locate the three parts pictured below (from the 1/16" plywood sheet). These make up the framework for the four nozzles of your kit. Glue together four sets of nozzles, being sure that the disks are perpendicular to the central piece.



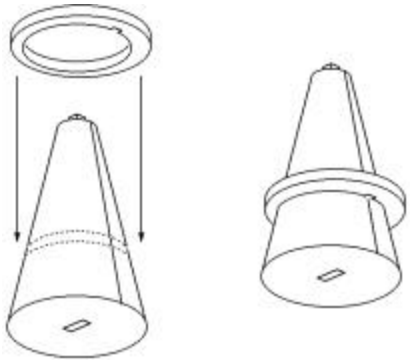
Step 7
Cut out the four Nozzle Shrouds from the cardstock sheet, roll into cones, and glue the overlap tabs.



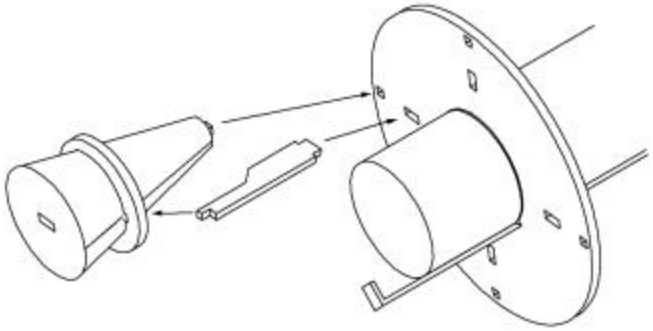
Step 8
Test fit the Nozzle Shrouds over the nozzle framework, sand as needed, and glue into place. Note that the seam in the shroud should line up with the slot in the bottom disk of the nozzle.



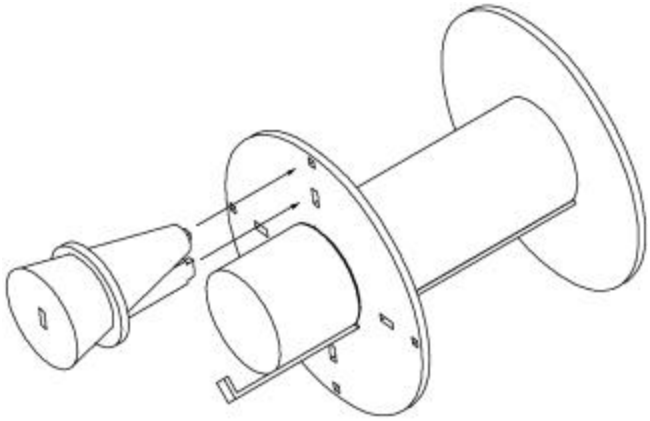
Step 9
Locate the Nozzle Ring Ring (from the 1/16" plywood sheet) Test fit the Nozzle Ring over the Nozzle Shroud. The ring should fit at the two dotted lines on the shroud. Sand the inside of the ring to insure it fits over those lines. You may also wish to sand the outer edges round. Glue into place with the notch in the ring in line with the shroud seam, and in line with the slot on the bottom of the nozzle.



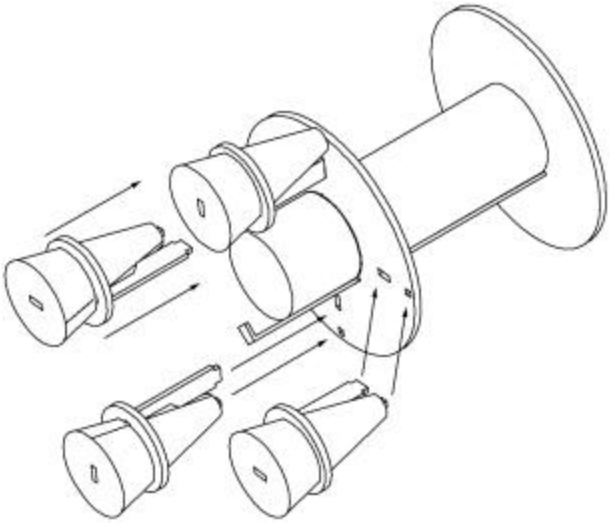
Step 10
Locate the Turbine Exhaust line (from the 1/16" plywood sheet). Test fit the smaller tab into the notch in the nozzle ring, and fit the whole nozzle into the rear engine mount ring. Trim or sand as needed for a good fit. Glue the Turbine exhaust line into the nozzle ring.



Step 11
Glue a nozzle into two of the holes in the Rear Adapter Ring.



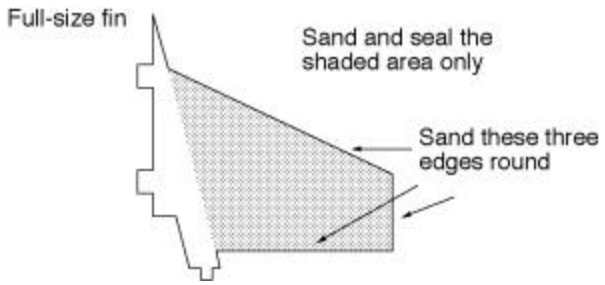
Step 12
Repeat with the other nozzles. Set the engine mount on the nozzles to dry, being sure that they are all straight.



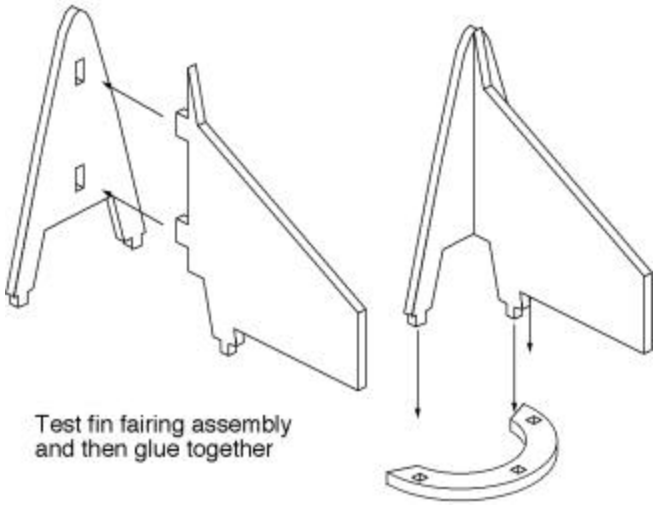
Step 13
Mask off the outside edges of the adapter rings with tape

Step 14
Paint the nozzles, the rear of the Engine Mount Tube, and the rear of the Rear Adapter Ring silver. I suggest Testors silver spray paint, which dries fast and gives a realistic matte finish.

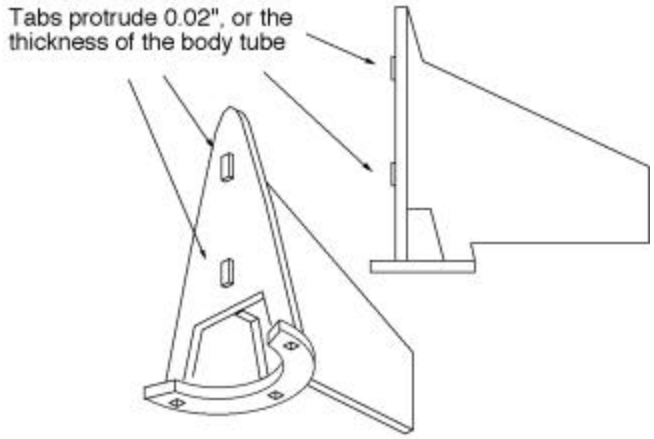
Step 15
Remove four Fins from the 1/16" plywood sheet. Sand the leading, tip, and trailing edges of the fins. Leave the internal edges square. Sand and seal the exposed portion of the fins.



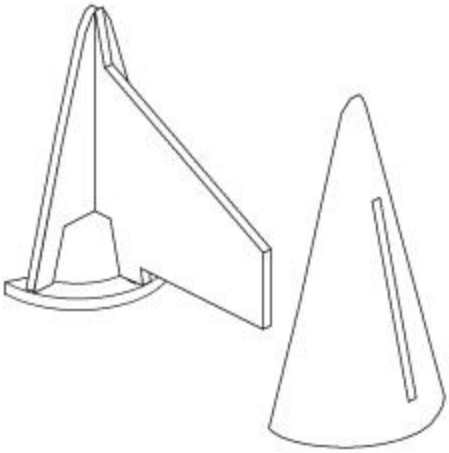
Step 16
Remove the four A-Frames and four C-Frames from the 1/16" plywood sheet. Test fit the Fins in the A-Frames and then fit the combined parts into the C-Frames. Sand as needed, then repeat the process with glue.



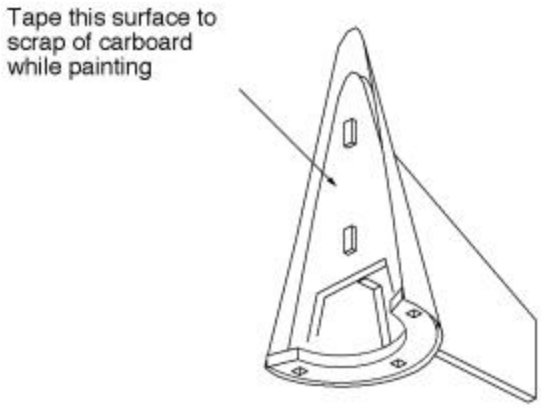
Be sure the fin tabs go all the way through the A-frames so they will fit into the body tube later



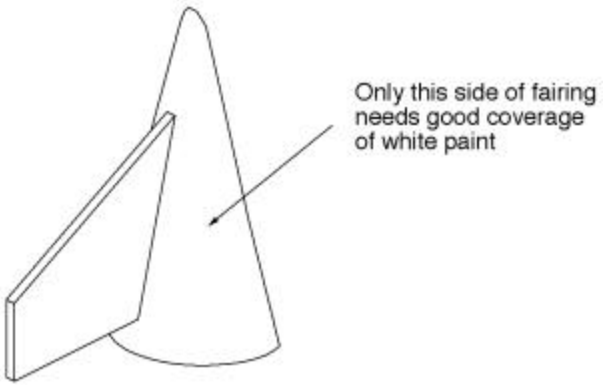
Step 17
Cut an engine fairing shroud from the cardstock sheet. Curl it over a smooth round object such as the shaft of a shiny chrome screwdriver. Apply a thin line of glue around the engine fairing frame and slide the shroud over the fin. Repeat with all four assemblies.



Step 18
Tape the four engine fairings to a scrap of cardboard with sticky-side-out loops of tape.



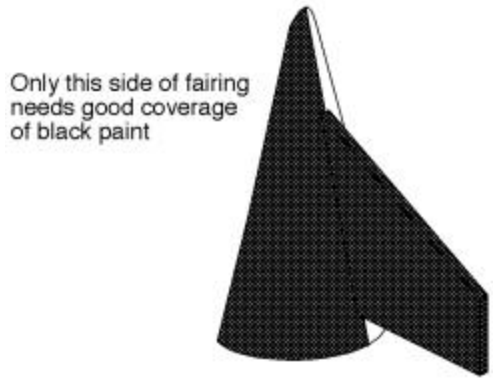
Paint all four fairings white. It's time to decide on a gloss or flat finish for your model. The decals will work better on gloss paint than on flat paint, but gloss enamel can take days to cure completely. This part doesn't have decals, but if the finish doesn't match the rest of the rocket it will look pretty awful. I'll assume you are painting with gloss for the rest of the instructions.



Skip to the rest of the model while the white paint dries. You will be applying two more colors of paint to the fairing/fin assemblies, and you will want the paint to dry completely before each coat. Other parts will only take one or two coats total. Come back to mask and paint the fairing/fin assemblies when they are completely dry and cured. If you paint over gloss enamel only a day or two after application, when it is not fully cured, you can get a heartbreaking wrinkled mess as the new paint attacks the old paint.

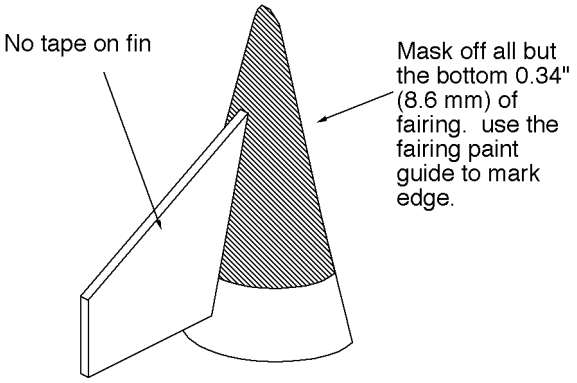
Step 19
Once the paint on the fairing is completely cured, mask off the right half of each engine fairing. You want to get a good sharp edge at the front end of the fairing, so press the tape securely down along that edge.

Step 20
Paint the left half of each fairing gloss black. Use the same brand of paint as the white. Don't worry about covering the fin—that will end up silver.

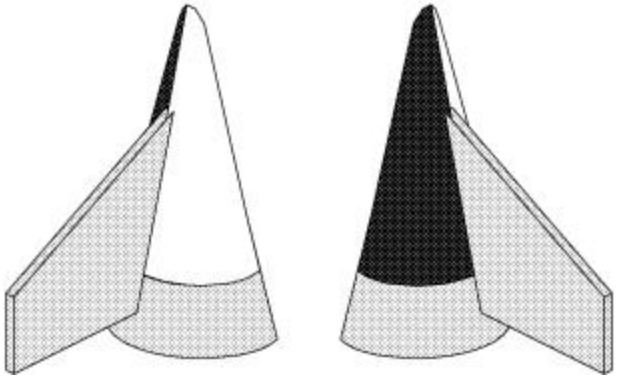


You can peel up the tape when the paint is reasonably dry—it doesn't have to cure completely. Then set the fairings/fins aside to cure completely before masking them again

Step 21
Once the black paint has completely cured, cut out the fairing painting guide, and lightly pencil the edge of the silver part of the fairing. Mask off the upper portion of the engine fairing. Leave both sides of the fin exposed.

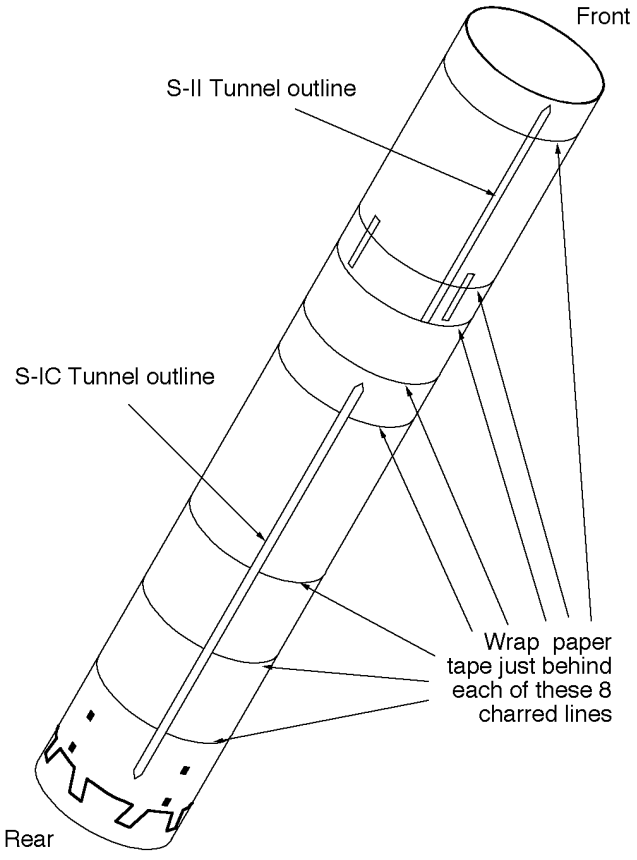


Step 22
Paint the engine fairing/fin assemblies silver. When the paint is reasonably dry, you can peel off the tape.



This diagram shows the final black, white, and silver paint pattern of the engine fairing/fin assemblies

Step 23
Locate the S-IC/S-II tube. The rear end has a jagged-shaped section of tubing protecting the protrusions for the engine fairings and eight small holes for the fins.

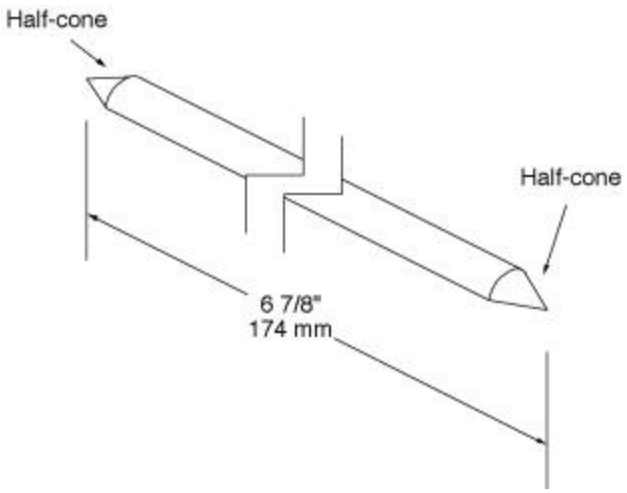


Apply a strip of self-adhesive paper tape around the tube, just behind the farthest forward charred line. (Step 48 has a nice drawing of the process for the S-IVB tube) The forward edge of the tape should lie exactly on this charred line

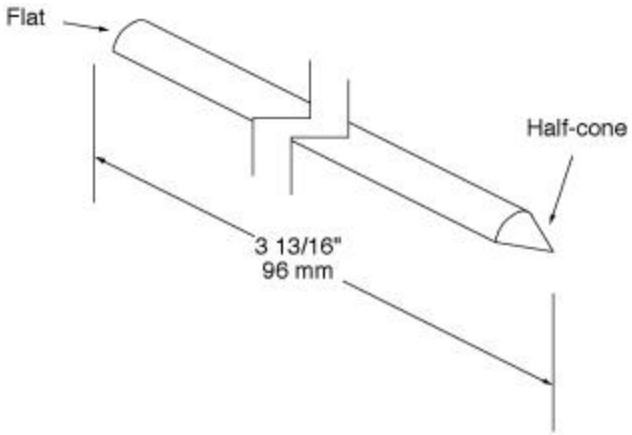
Begin wrapping inside the long, rectangular S-II Tunnel outline. When the wrap is complete, trim the end of the tape to leave a gap within the systems tunnel outline.

Step 24
Wrap tape just behind the other seven char lines around the tube. Where possible, start these wraps just inside a Tunnel outline, and end them just inside the outline, leaving a gap between the ends. Two pieces of tape don't go under systems tunnels. When you apply these, trim the tape so there is no gap or overlap between the ends.

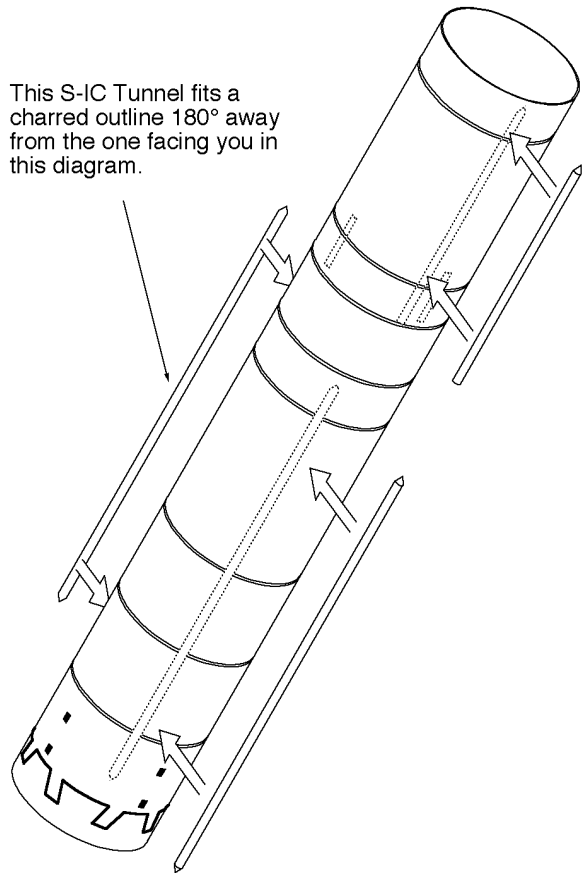
Step 25
Cut two 7" (18 cm) S-IC tunnels from the 1/8" x 1/16" half-rounds. (Save the leftover half-rounds. You will need some for the next step, and some for some additional details later on) Trim each end to a point, sanding to a half-cone shape, and to a length of exactly 6 7/8" (174 mm). The parts should match the outlines on the tube. You can sand and seal these parts before gluing in place.



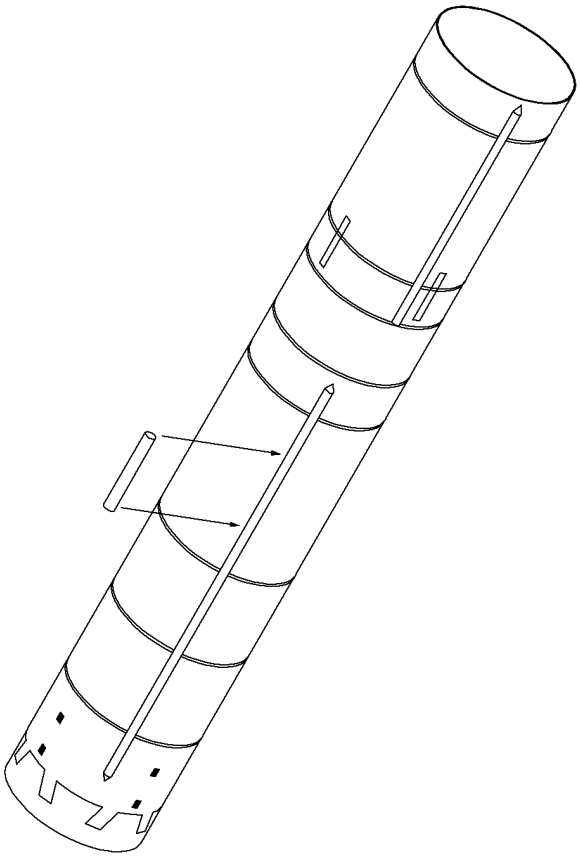
Step 26
Cut one 4" S-II Tunnel from a 1/8" x 1/16" half-round. Trim one end to a point, leaving one end flat. Sand the pointed end to a half cone. Sand or trim the flat end to a length of 3 13/16" (96 mm). The part should match the outline on the tube.



Step 27
Glue the S-IC tunnels to the long outlines on the S-IC/S-II tube, and glue the S-II Tunnel to the long outline on the S-IC/S-II tube, pointed end forward.

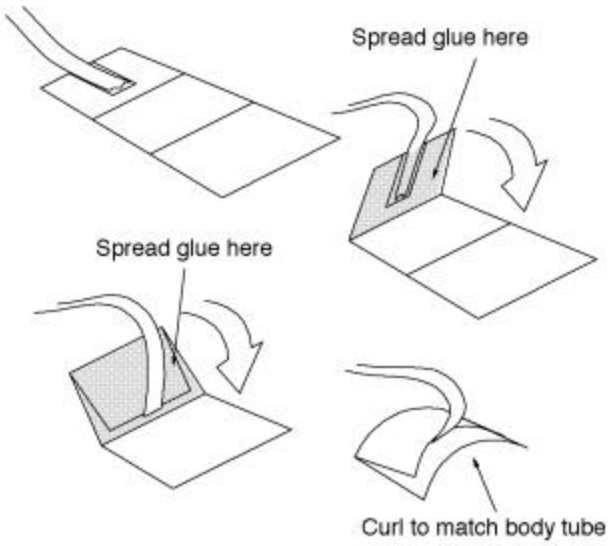


Step 28
Glue launch lug to tube along the left side of one of the S-IC tunnels, centered in the large gap between the third and fourth tape bands from the rear.

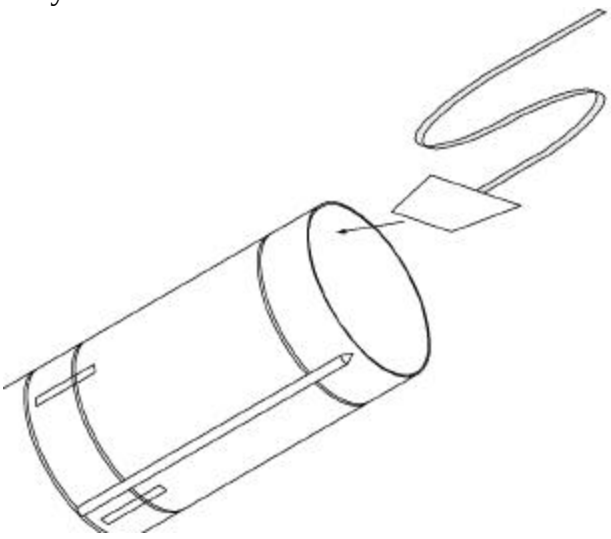


Here is Apollo 11 on the pad

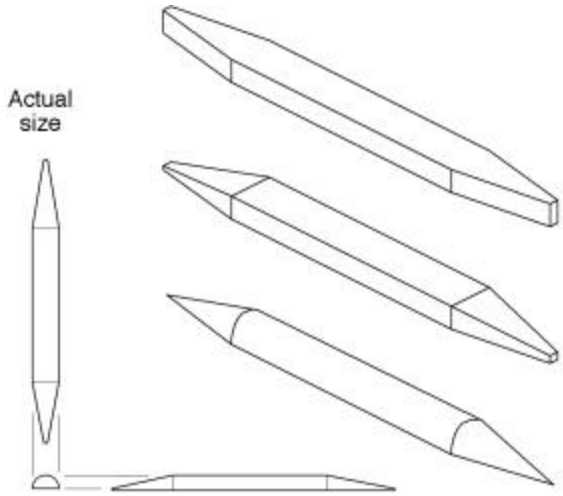
Step 29
Cut the shock cord mount from the cardstock sheet, and crease the two lines across it. Glue one end of the elastic shock cord to the narrow end of the mount. Cover the end of the cord and the first section of the mount with glue, and fold on the first line. Fold the mount at first line, spread glue again fold again, and curl to match the curve of the tube.



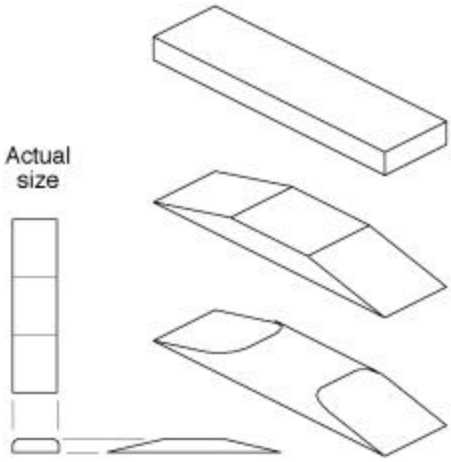
Step 30
Glue the shock cord at least one inch into the body tube.



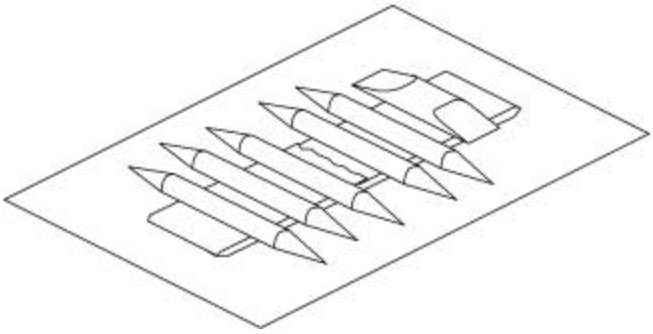
Step 31
Remove the five Liquid Hydrogen Lines from the 1/16" basswood sheet. Taper the thickness at each end on one side, then round all the edges on one side of each part, giving it a semicircular cross-section.



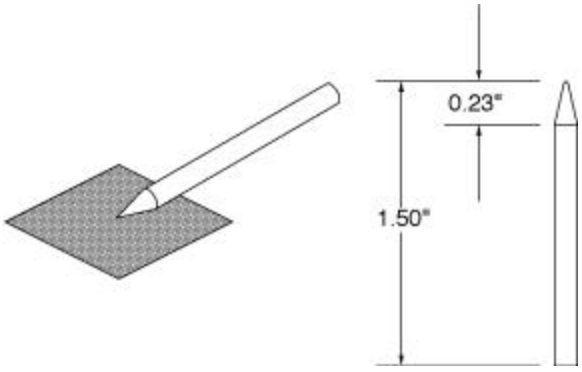
Step 32
Remove the LOX Vent Fairing from the 1/16" basswood sheet. Sand round the edges on the long sides. Sand a gentle wedge taper into either end of the part, as shown below. You will paint this before gluing it in place.



Step 33
Make a sticky-side-out loop of tape, and stick it to a scrap of cardboard. Stick the five Liquid Hydrogen lines and the LOX Vent Fairing, flat side down, to the tape, and paint them gloss white. Set aside to dry.

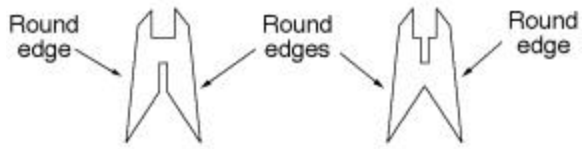


Step 34
Sharpen one end of the 1/8" x 1 5/8" Escape Motor dowel to a blunt cone 1/4" long (0.23"or 5.8 mm is exact). Sanding with #220 sandpaper on a hard work surface gives good results. Once you are satisfied with the result, trim the other end of the dowel fo give a total length of 1 1/2" (1.50" or 38.1 mm is exact)



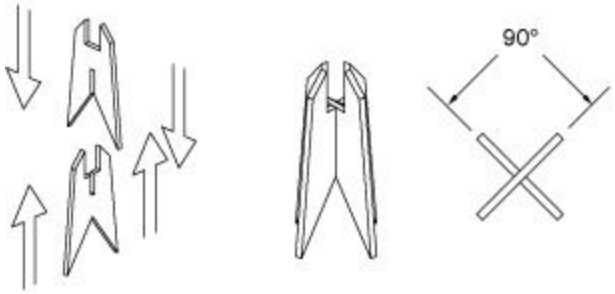
Step 35
Sand and seal the Escape Motor. Because about 1/8" at the base of the motor will be glued to other parts, I recommend sealing with wood glue.

Step 36
Remove the Escape Tower Supports from the 1/32" plywood sheet round the two outer edges of each support.



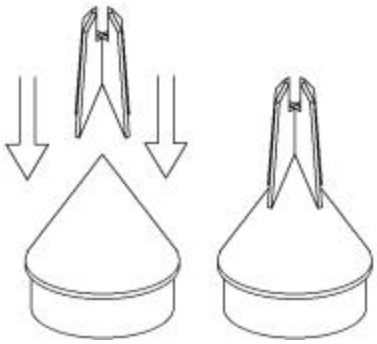
Step 37
Sand and seal the Escape Tower Supports with wood glue.

Step 38
Check the fit of the two tower supports together, then glue them together. Set the four bottom points on a flat surface. Be sure the two parts are aligned and perpendicular.

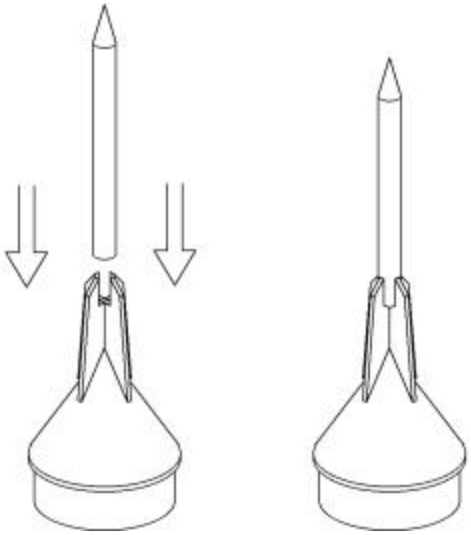


Step 39
Sand and seal the Nose Cone using wood glue. Be careful not to reshape the cone, as the Escape Tower Supports must fit on the top.

Step 40
Glue the Escape Tower Supports to the Nose cone.



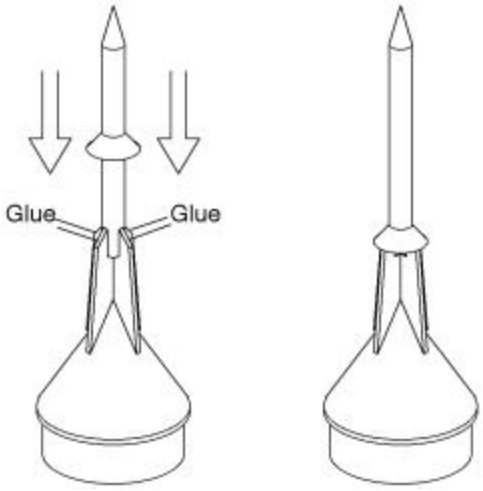
Step 41
Glue the Escape Motor to the Escape Tower Supports. It may be easier to check that the Escape rocket is on straight if you slip the nose cone into the Service Module Tube.



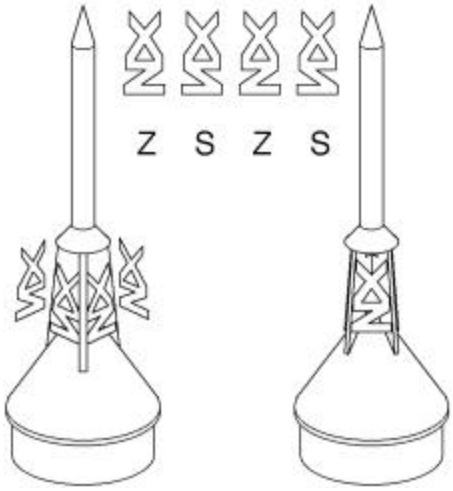
Step 42
Remove the escape motor shroud from the laser-cut cardstock sheet using your X-Acto Knife. Curl it into a cone, and glue. Check the fit over the escape rocket. There are extras you can cut from the printed sheet if you have trouble. In fact, you might want to cut one out of the instructions, because it might be easier to roll the thin paper. I've pasted a bunch at the bottom of this page, where I think there won't be anything important on the other side.

Extra Escape Motor Shrouds for step 42

Step 43
Apply glue to the tops of the Escape Tower Supports. Slide the Escape Motor Shroud over the Escape motor and into place.

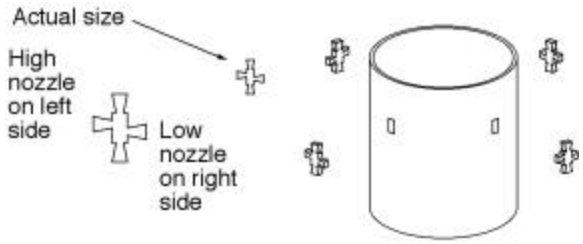


Step 44
Remove one of the Escape Tower Details from the laser-cut cardstock. Apply glue to the outer edges and place it span between edges of Escape Tower Supports. Youll probably need tweezers. Note that the bottom part of the Escape Tower Detail can be Z-shaped or S-shaped depending on which side you look at. Glue the remaining Escape Tower Details alternating Z and S orientations.

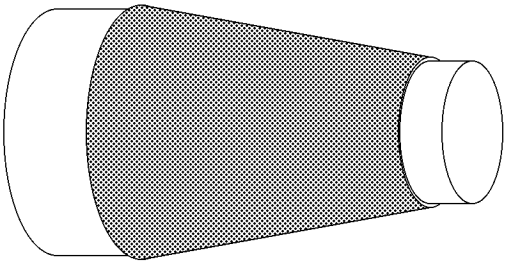


Step 45
Locate the Service Module Tube. There are four tiny rectangles burned into this tube where the RCS Thrusters will be glued. To improve glue adhesion, you can pick the outer layer of white paper from those rectangles. Push a tiny drop of wood glue into each hole.

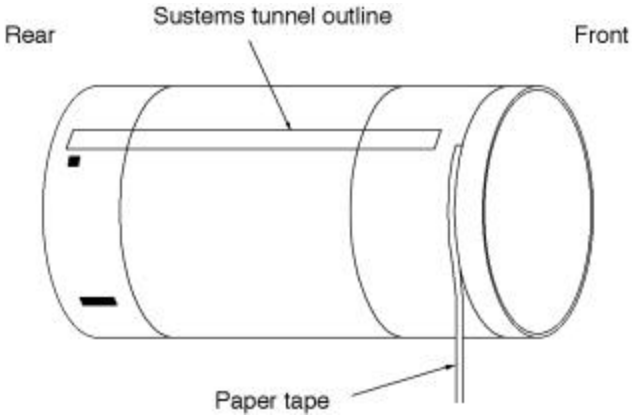
Step 46
Free four RCS thrusters from the laser-cut 1/32" plywood sheet (the rest are spares). Glue each one to one of the rectangles on the Service module tube. Note the correct orientation with the high nozzle on the left side and low nozzle on the right side.



Step 47
Sand and seal the Lunar Module Adapter. You won't be gluing anything to the outer surface, so use whatever sealer you like. Leave the shoulders unfinished.

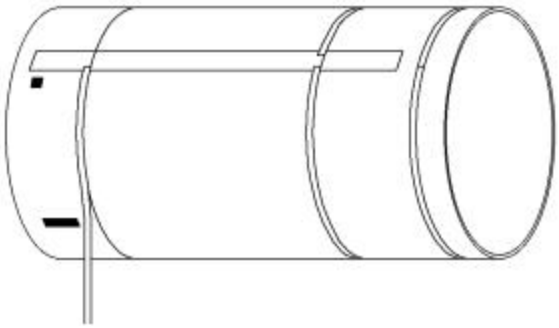


Step 48
Locate the S-IVB tube. The four rectangular holes in the tube are at the rear. Apply a strip of self-adhesive paper tape around the tube, just behind the fathest forward charred line. The forward edge of the tape should lie exactly on this charred line.

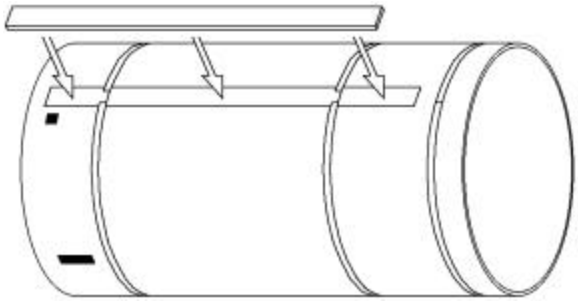


Begin wrapping just ahead of the long, rectangular Systems Tunnel outline. When the wrap is complete, trim the end of the tape to just touch the beginning of the tape with no overlap.

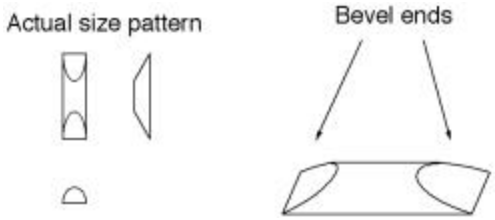
Step 49
Wrap tape just behind the other two char lines around the tube. Start these wraps just inside the Systems Tunnel outline, and end them just inside the outline, leaving a gap between the ends.



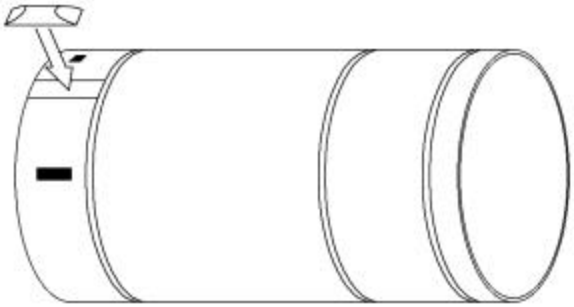
Step 50
Remove the S-IVB Systems Tunnel from the 1/32" plywood sheet. sand the round on one side (the outside surface). You may want to seal the wood on the outside surface now. Glue the systems tunnel to the systems tunnel outline.



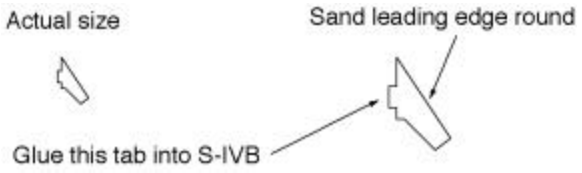
Step 51
Use the pattern below to cut the S-IVB Liquid Hydrogen line from the 1/8" x 1/16" half-round. Bevel the ends of the S -IVB liquid hydrogen lines as shown, using #220 and #320 sandpaper. You may want to sand and seal the outside surface now.



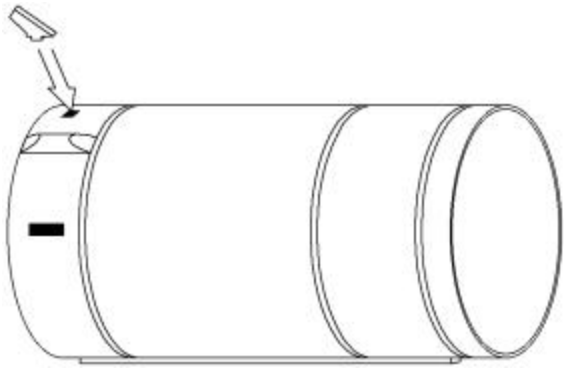
Step 52
Glue the Liquid Hydrogen Line between the lines just behind the rearmost strip of tape on the S-IVB Tube. If the part sticks out behind the tube, sand it flush when it is dry.



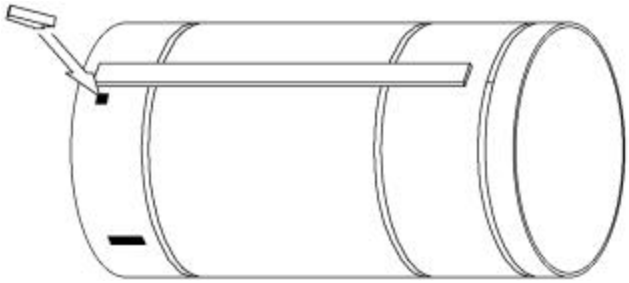
Step 53
Remove the two S-IVB Ullage Rockets from the 1/16" basswood sheet. Sand the leading edges round.



Step 54
Glue the S-IVB Ullage Rocket in place, fitting the tab into a tiny square hole near the rear of the S-IVB Tube.

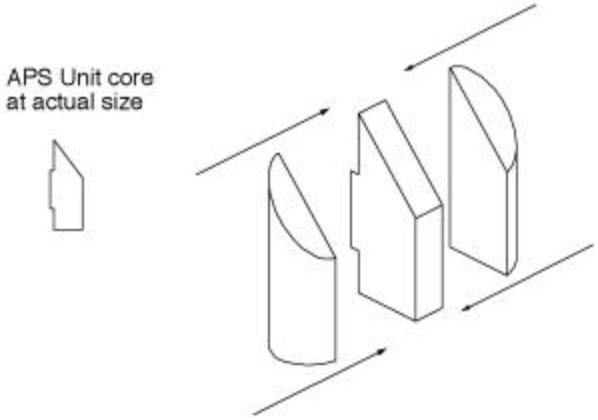


Step 55
Repeat with the second S-IVB Ullage Rocket on the opposite side of the tube.

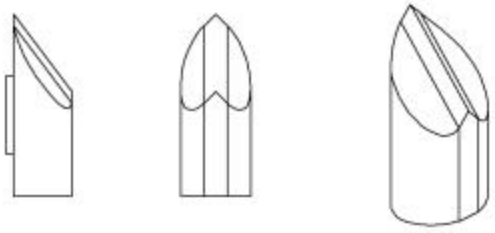


Step 56
Cut two APS Unit Left Sides and two APS Unit Right Sides from a 1/8" x 1/16" using the pattern below.

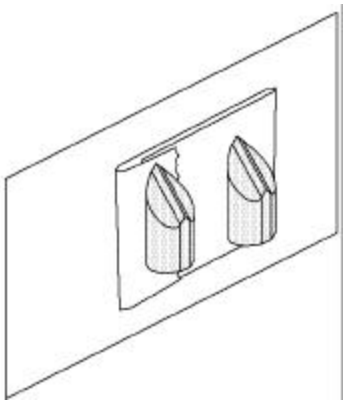
Step 57
Remove the APS Unit Cores from the 1/16" basswood sheet. Glue a left and right side to each part. Be sure the sides are flush with the rear of the cores and that they do not interfere with the tabs on the cores



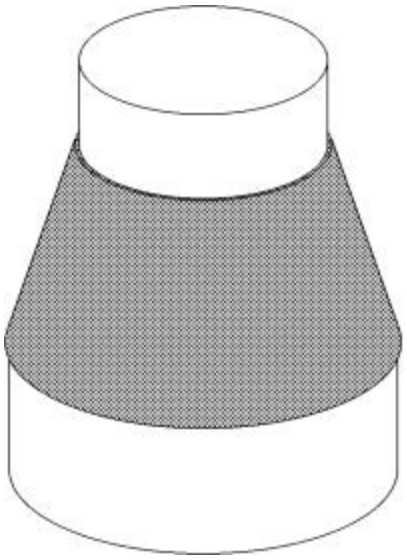
Step 58
Trim and sand the front ends of the APS units to the wedge shape shown below.



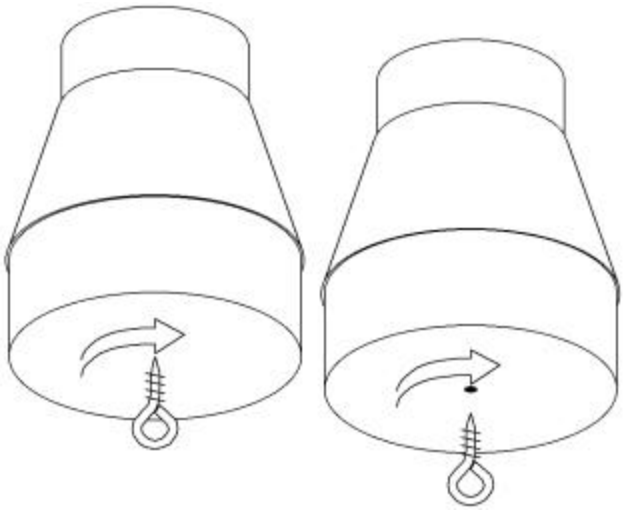
Step 59
Make a sticky-side-out loop of tape, and stick it to a scrap of cardboard. Stick the two APS units, tab-down to the tape, and paint them silver. Set aside to dry. Wait until the S-IB is painted before gluing them in place.



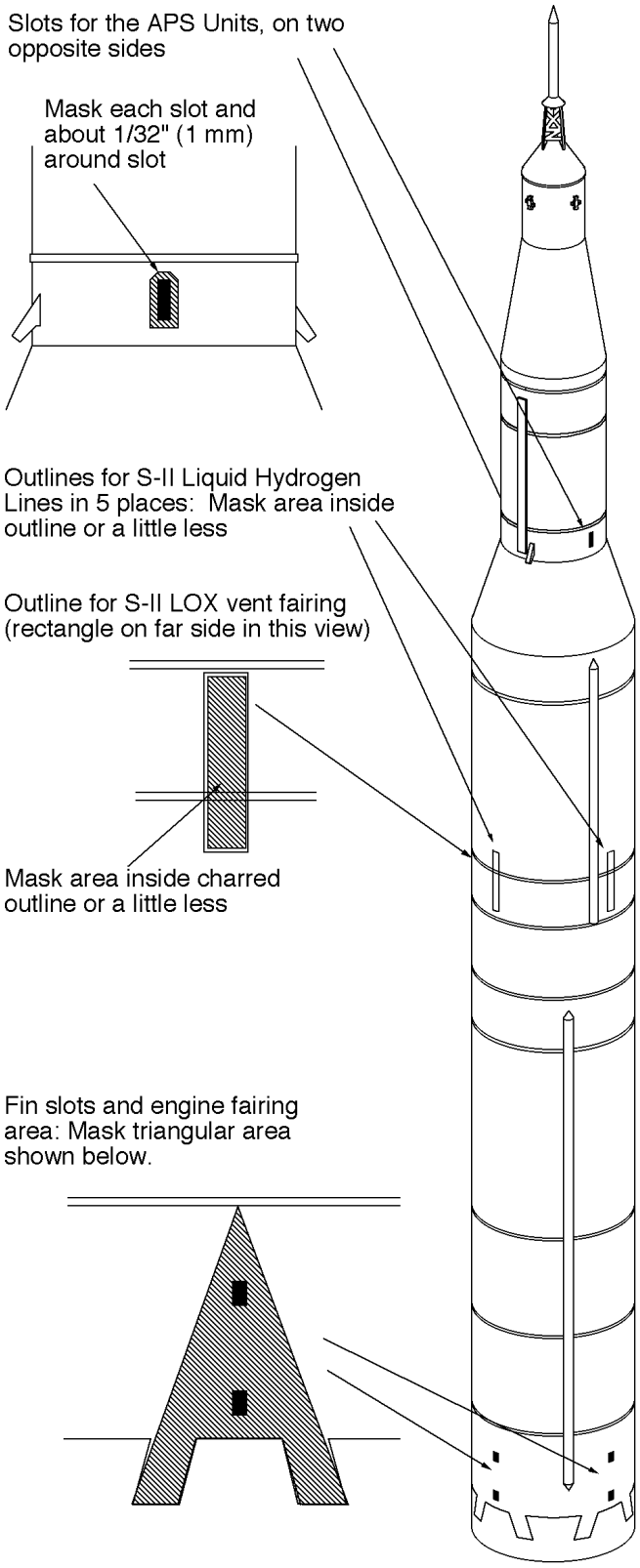
Step 60
Sand and seal the S-II/S-IVB Adapter. You won't be gluing anything to the adapter, so use any sealer you like. Leave the shoulders unfinished.



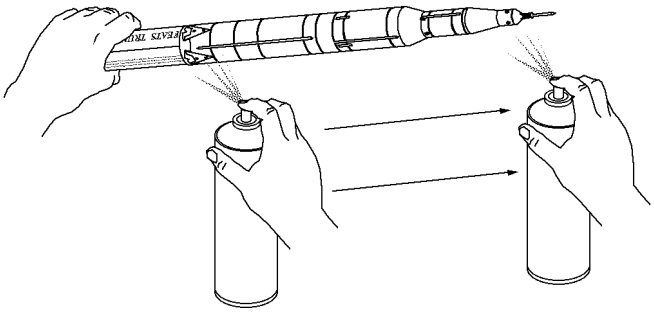
Step 61
Twist the screw eye into the base of the S-II/S-IVB Adapter. Unscrew it. Squirt glue into the hole, and screw it back in.



Step 62
Test fit the complete stack of completed parts together—the Nose Cone, Service Module Tube, Lunar Module Adapter, S-IVB Tube, S-II Adapter, and S-IC/S-II tube. Mask off the areas indicated in the diagram at right so that there will be areas of unpainted tube to glue detail parts in place after painting.



Step 63
Fit the complete stack of completed parts together—the Nose Cone, Service Module Tube, Lunar Module Adapter, S-IVB Tube, S-II Adapter, and S-IC/S-II tube. Roll up a newspaper or magazine and insert it into the rear of the S-IC/S-II tube to hold the model during painting, and to keep the interior free of paint. Use your favorite choice of spray paint (and primer if you like—but beware, thick coats of primer can make the model heavy, and this can't hold anything bigger than a C engine) to paint the model gloss white. A gloss finish will improve decal adhesion.

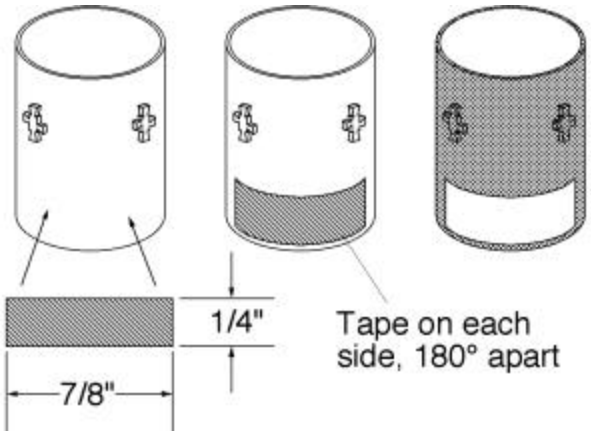


Step 64
When the gloss white paint is dry to the touch, take apart the Nose Cone, Service Module Tube, Lunar Module Adapter, S-IVB Tube, S-II Adapter, and S-IC/S-II tube. The Nose Cone and Lunar Module Adapter will remain all white. Allow the paint to cure for a full week before masking the other parts.

You can do steps 67, 68, 69, and 84 before the gloss white paint fully cures.

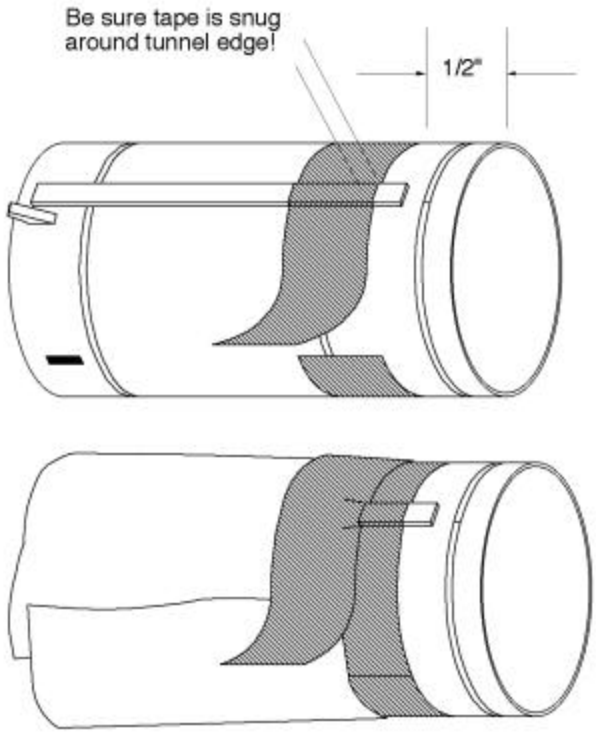
****

Step 65
I hope you had a reasonably pleasant and productive week. You didn't leave this model half-built for months, did you? Don't tell me your father started this model before you were born! I guess if he did, I'm probably dead by now, so you can't tell me anyway. I wonder if anyone else has landed on the moon by the time you read this. I'll never forget watching the first moon walk late at night on the old black and white TV when I was 9 years old. We kept my brother's Saturn V model close at hand at the time as we stared at the ghostly images on the TV screen. Cut out a 7/8" x 1/4" rectangle of Scotch Magic tape, and apply it, centered between thrusters, about 1/32" from the rear of the Service Module tube. Repeat with a second rectangle of tape on the opposite side.

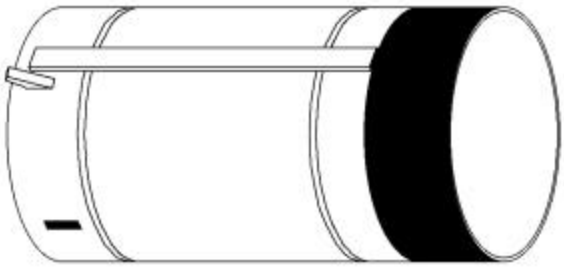


Paint the Service Module tube silver. I suggest Testors Silver spray paint which dries quickly with a matt finish that resembles the real Service Module. Remove the tape when the paint is dry.

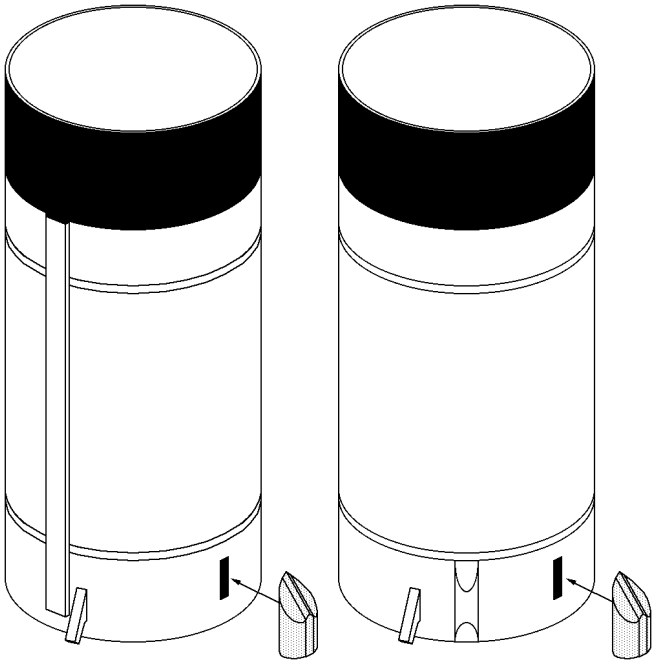
Step 66
Mask off all but the front 1/2" of the S-IVB tube. Use foil to protect most of the part, to minimize damage from peeling up the tape.



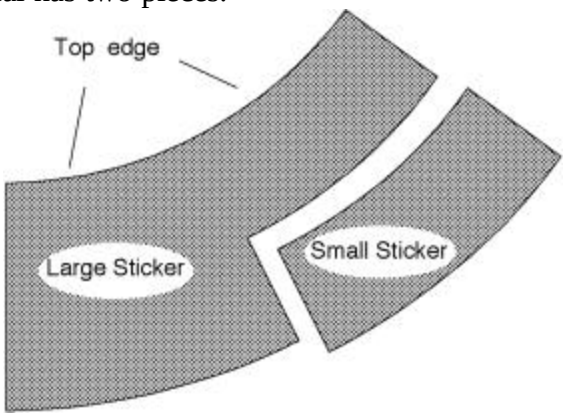
Spray the front of the tube black, and remove the tape and foil. Also remove the small pieces of tape from the APS Unit slots at the rear of the tube.



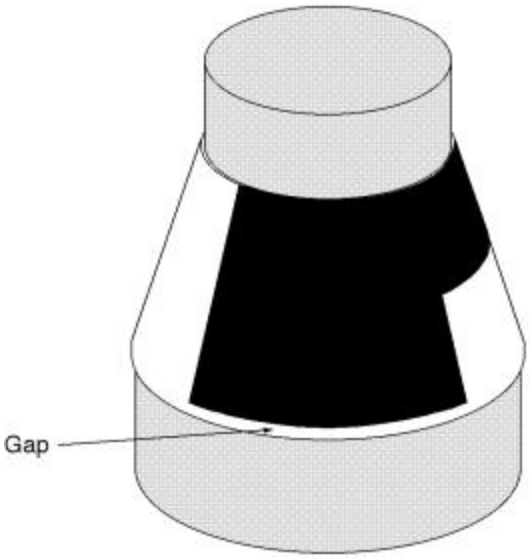
Step 67
Glue the APS Units in place, wiping up any excess glue inside the S-IVB tube.



Step 68
Note that the black adhesive vinyl Roll Pattern decal has two pieces.

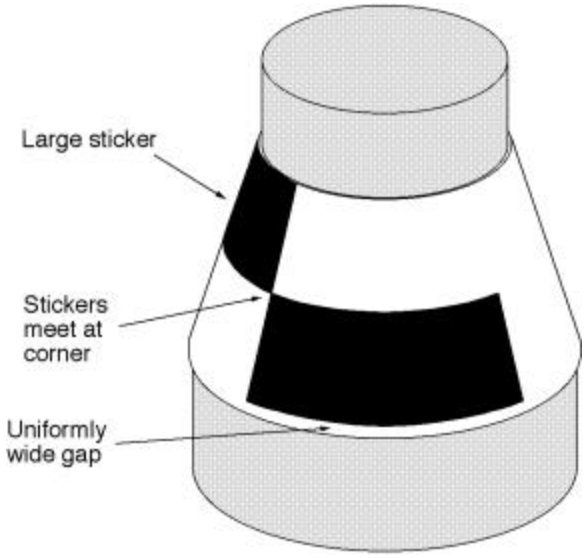


First apply the large piece to the S-II/S-IVB adapter. Apply it so that the top edge is against the top edge of the exposed part of the adapter. This will leave a gap about 1/16" wide at the bottom of the adapter, where it is not tapered.



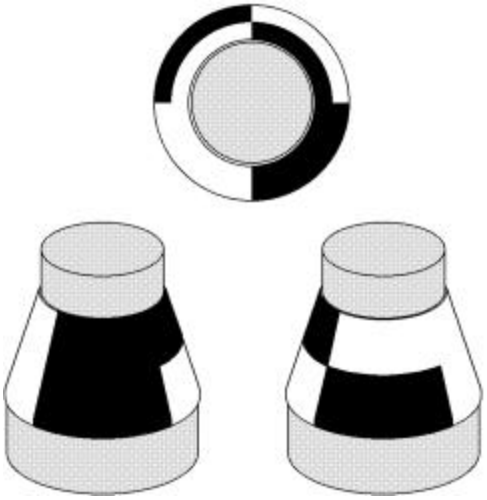
Step 69

Apply the small sticker to the adapter as shown, so that the corners meet.



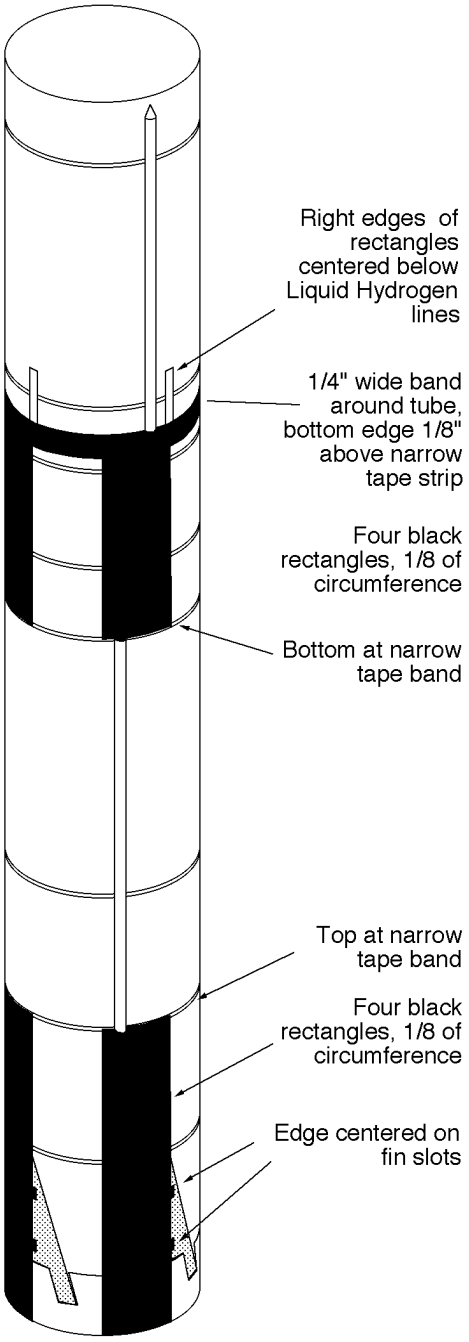
Step 70

You may wish to fill in the gap between the bottom edges of the stickers and the bottom of the adapter with gloss black paint or a fine-tipped permanent marker (Sharpie).

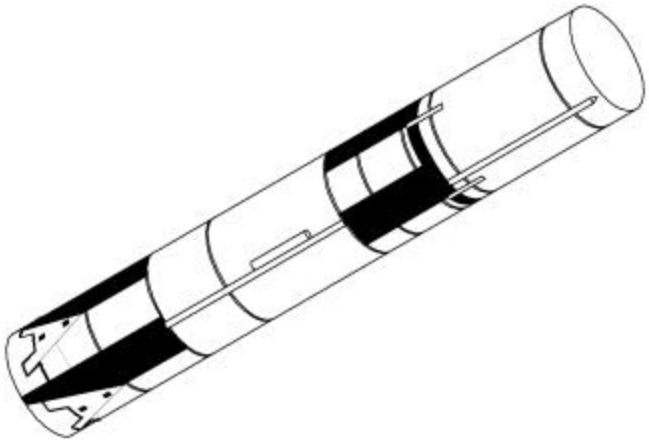


Step 71

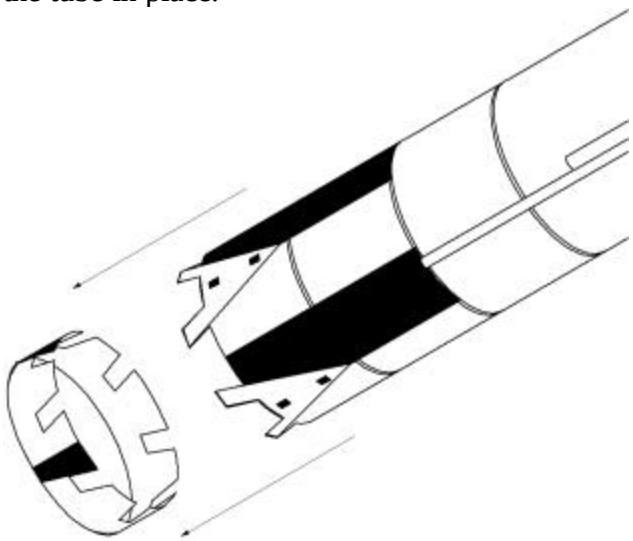
Mask the S-IIC/S-II tube, leaving the black areas uncovered.



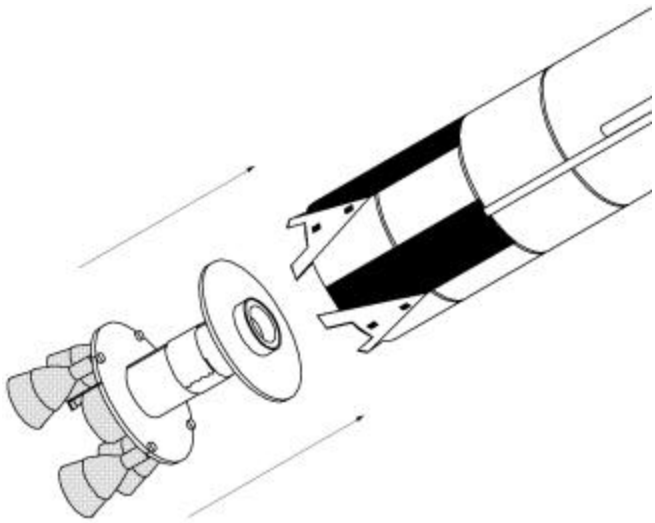
Step 72
Spray paint the S-IC/S-II Tube black. Remove the tape from the white areas, and then remove the tape protecting the bare tube where the Fins, Liquid Hydrogen Lines, and LOX Vent fairing will be attached.



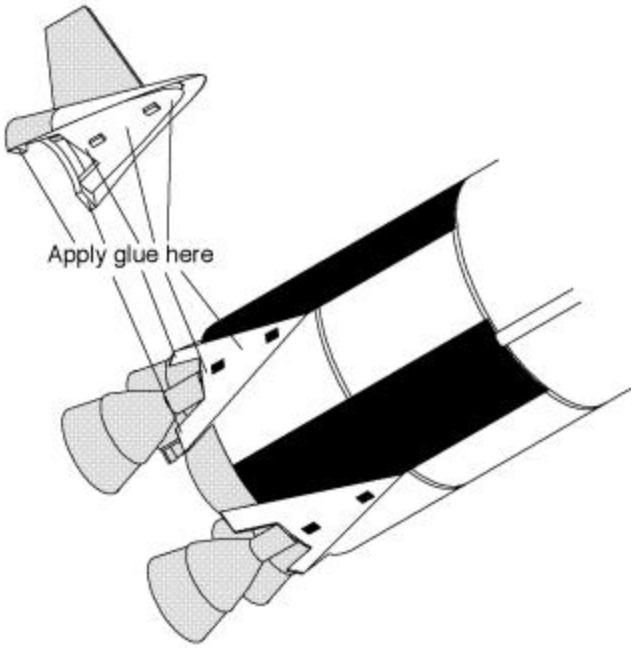
Step 73
Remove the rear section of the S-IC/S-II Tube, using a hobby knife to cut the small tabs that hold the tube in place.

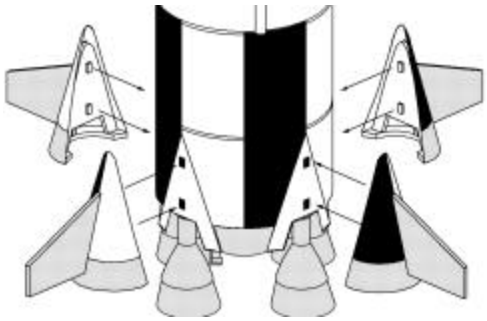


Step 74
Glue the engine mount into place. (Hey—that's not what your nozzles look like! Yes, I changed the nozzle design. You have neat little detail thingies that aren't in this drawing.) The nozzles should be in line with the fin slots. Be sure to clear away any glue that might block a fin slot.

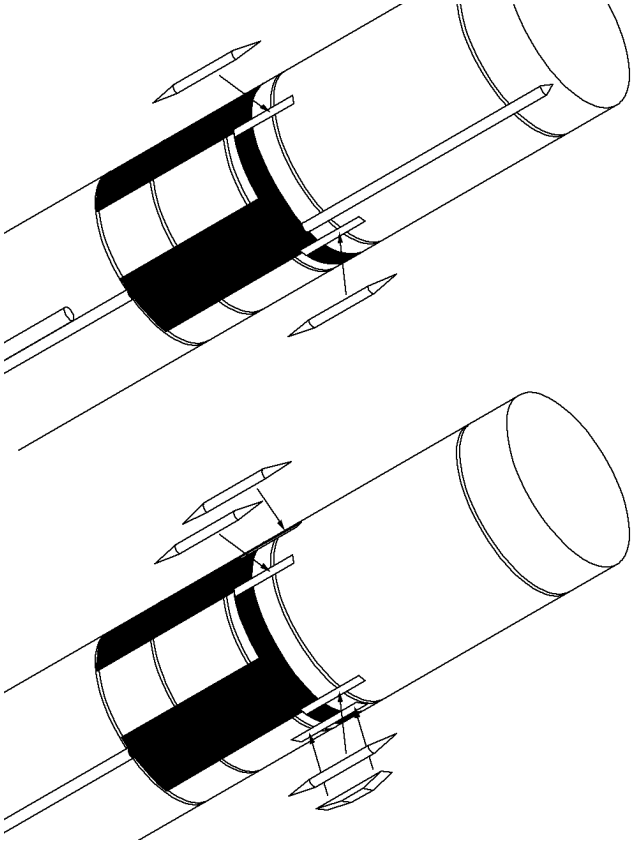


Step 75
Test-fit the fin/fairing assemblies in the fin slots in the body tube. The paper fairings should rest against the body tube. Then glue them into place.

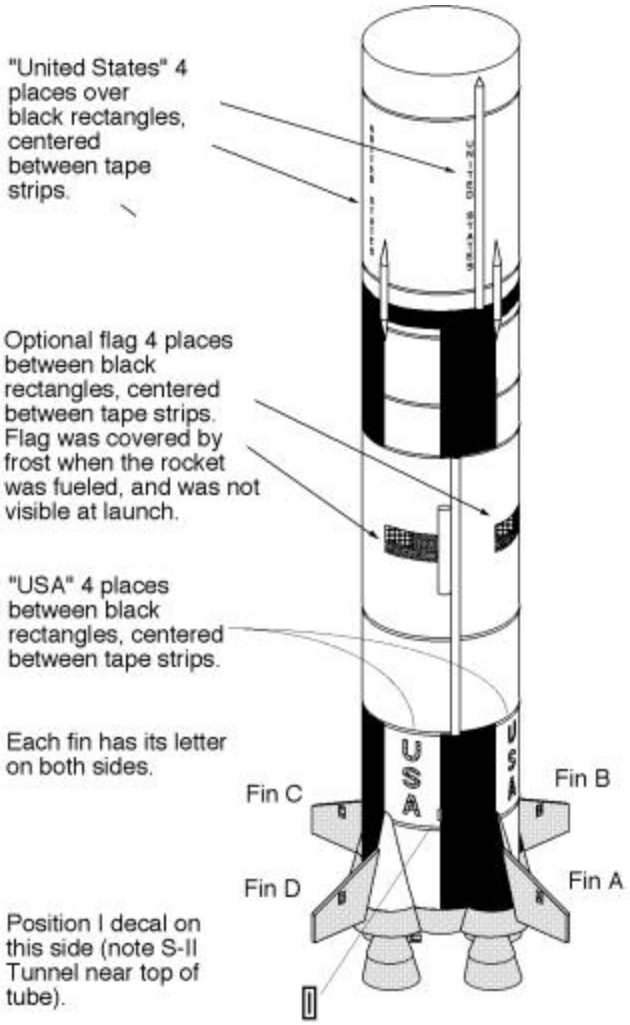




Step 76
Glue the five Liquid Hydrogen Lines in place, centered over the five masked rectangles for them. Glue the LOX Vent Fairing to its masked rectangle.



Step 77
Apply decals to the lower stage assembly. Cut apart individual decals to apply one at a time. Soak each decal in water until it slides freely, and slide the decal from the decal paper to the model. One little trick I've learned—you just dip the decal in the water for a few seconds, then you let it sit on the work table, dripping wet. This way if the decal comes off it won't go floating around the water bowl, but stay on the paper.

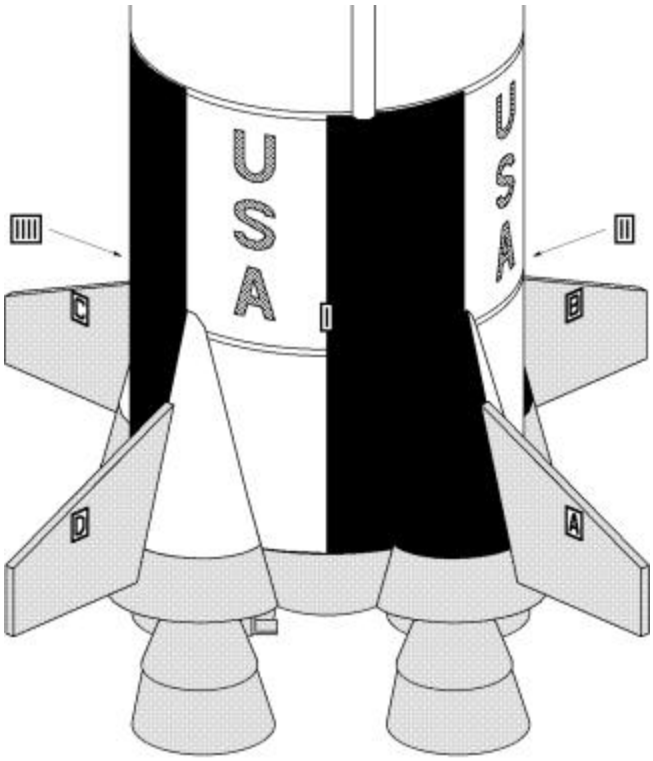


The four "United States" decals are centered horizontally over the painted black rectangles. They are centered vertically between the two forward-most tape strips.

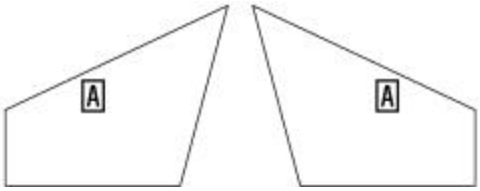
The four US flags are optional. They were not visible at launch because frost condensed on the SI-C liquid oxygen tank when the Saturn V was fueled. They were visible as the rocket was assembled and transported to the pad. They should be centered horizontally between black rectangles, and vertically between the third and fourth tape strips from the rear.

The four "USA" decals should be centered horizontally in the space between black rectangles

and vertically between the first and second tape strips from the rear.

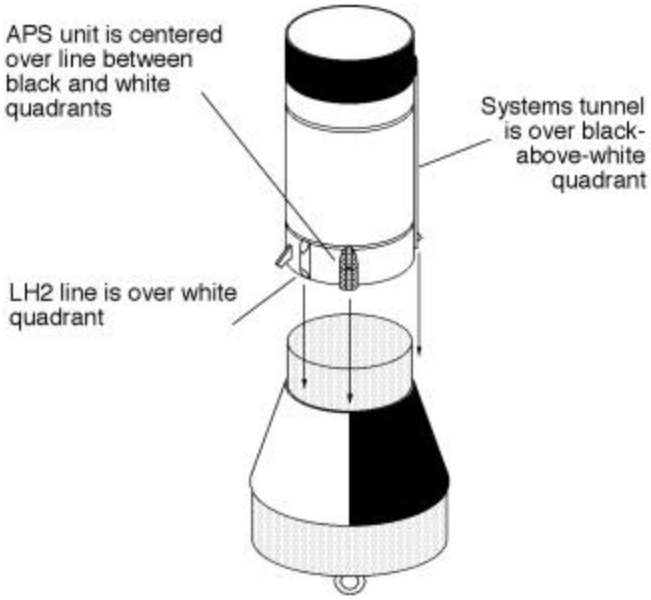


The position decals (rectangles with Roman Numerals I, II, III, and IIII) are centered horizontally between fins, and are located vertically 1/8" above the rearmost tape strips. Position I is just to the left of the S-II Tunnel near the top of the tube. Postion II is 90º to the right. Postion III is another 90º to the right. Position IIII is yet another 90º to the right (90º to the left of Position I).

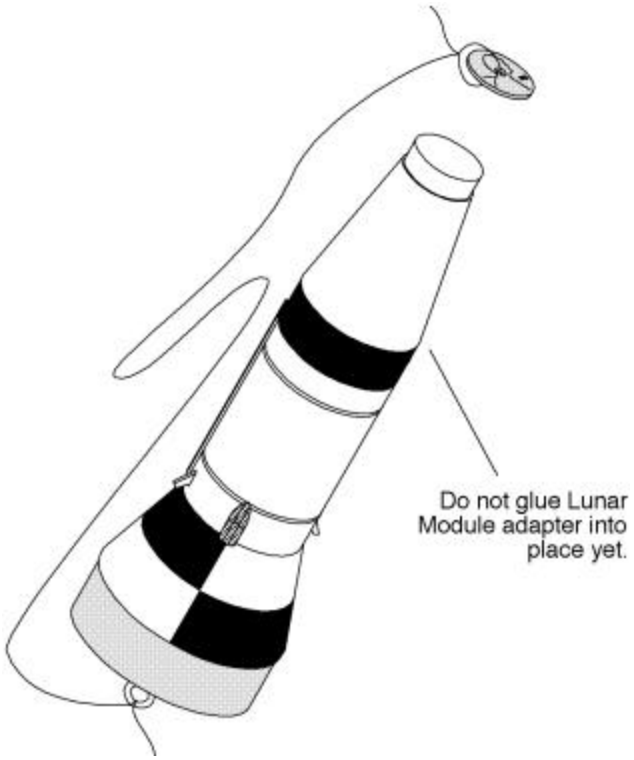


The fin letters go on each side of each fin. The letters are centered horizontally above trailing edge of the fin. Vertically, they go about 1/32" from the leading edge. Fin A is to the right of Position I, Fin B is to the right of Position II, Fin C is to the right of Position III, and Fin D is to the right of Position IIII.

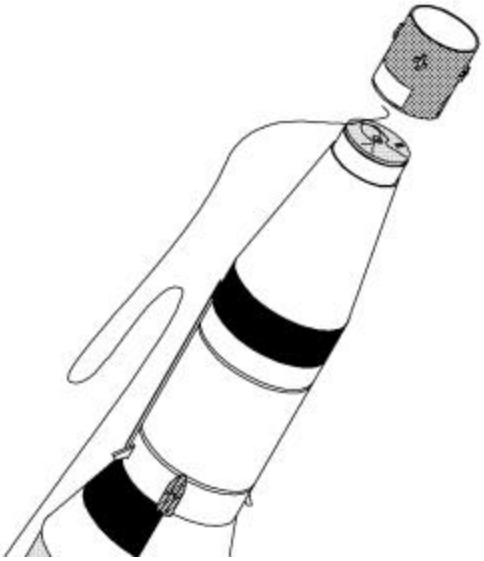
Step 78
Glue the S-IV tube to the S-II/S-IVB adapter. Note the correct orientation in the diagram below.



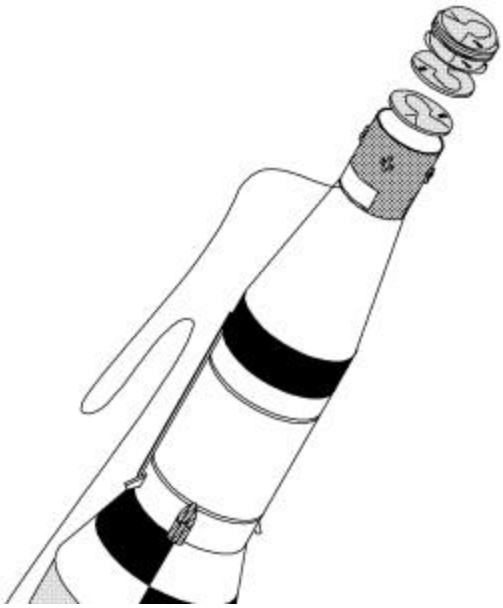
Step 79
Locate the penny with a hole punched in it. Tie one end of the fine Kevlar thread to the screw eye, and the other to the punched penny. Slip the Lunar Module adapter in place, but don't glue it yet.



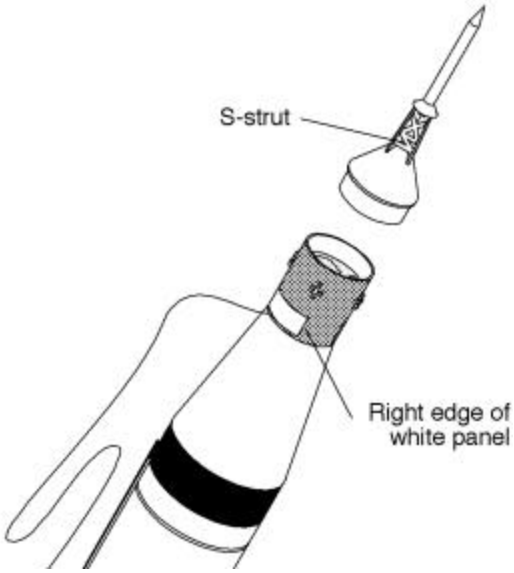
Step 80
Tighten the knot on the punched penny and glue the Service Module in place. The Kevlar thread will be pinched between the Service Module Tube and the Lunar Module Adapter. Be sure the knot an the loose end of the thread are completely inside the tube.



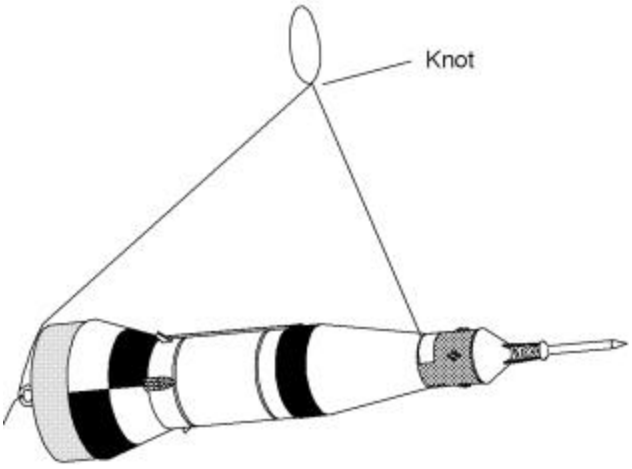
Step 81
Stack the remaining seven pennies into the Service Module tube. The pennies in your kit are special—they are older, pre-1982 pennies. In the 1980's the US Mint replace solid copper pennies with zinc-core pennies that weigh less. The tube can hold just enough older pennies to balance the model. Test fit the nose cone.



Step 82
Glue the nose cone in place, securing the pennies. Note that a paper "S" strut detail should be over the right edge of each white panel on the Service Module Tube.

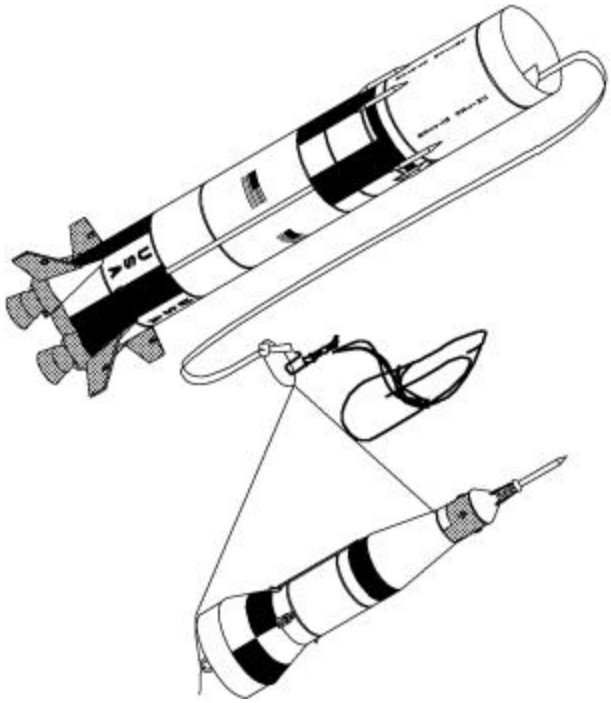


Step 83
Knot the Kevlar thread to make a loop. Locate the loop so that the front of the model balances with the escape rocket above horizontal. The forward part of the line should be long enough so that you can fit the loop in the main body tube behind the S-II/S-IVB adapter. I drew the line a little too short in this picture, but you have enough line so that you can make it work on your model.

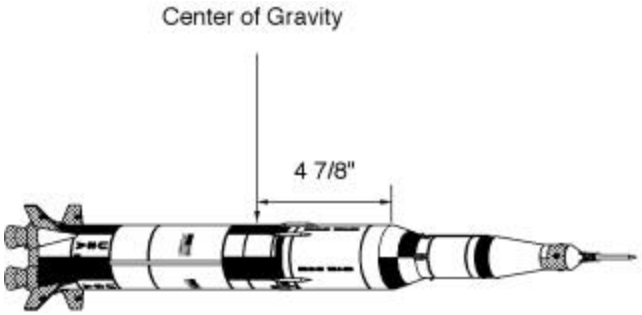


Step 84
Build the parachute according to the instructions in its package.

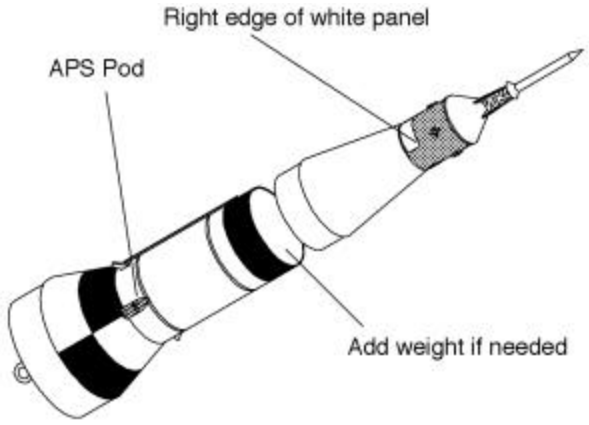
Step 85
Tie the shock cord to the loop in the Kevlar line. Hook the parachute snap swivel to the loop in the Kevlar. It's not a bad idea to hook it into the shock cord knot, too, if you can swing it.



Step 86
Place a C6-5 engine in the engine mount of your rocket, and find where the model balances. It should balance no farther than 4 7/8" from the front end of the large tube. However, some modelers may find that their model balances farther back. If yours does, add extra weight in the S-IB stage—I suggest wood screws in the rear of the Lunar Module adapter, or clay on the rear of the adapter. Don't let modeling clay touch the S-IVB tube though, or the oils in the clay will soak into the tube and possibly damage the finish.



Step 87
If your model balances correctly, glue the Lunar Module Adapter to the S-IVB tube. Line up the right edges of the white panels on the Service Module with the APS units on the S-IVB.



Step 88
When nobody is around, set your model upright on the table and count down from 10. Make roaring noises and slowly lift the model.

Your Mighty Saturn V is done!

When someone who appreciates how cool it is that human beings once walked the surface of the moon is around, stuff some wadding in the tube, pack up the 'chute, stuff the shock cord in the tube with just the upper part of the nose bridle showing, and fly it on a C6-5, B6-4, or B4-4. My prototype model weighs 4 ounces. If your model comes out a lot heavier, or if you get scary late ejections, go to C6-3 and B6-2 engines.