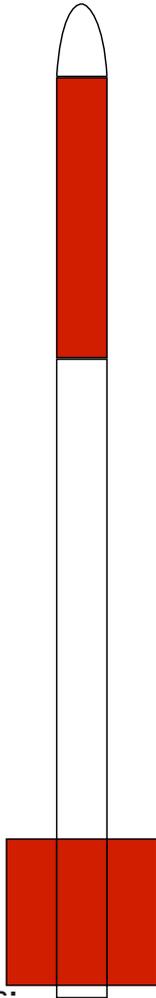


# ***That Tube Rocket!***



## Specifications:

Length: 18.75"/47.6 cm

Diameter: 0.98"/24.9 mm

Weight: 1.5 oz/44 gm

Streamer Recovery

Recommended Engines:

A8-3; B4-4; B6-4; C6-5

Skill Level: Beginner

This is a model rocket kit requiring construction. Tools, adhesives, finishing materials, launch equipment and engines are not supplied.



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## Parts List - Be sure to check the following list to assure your kit is complete:

1 Long Body Tube (White); 6 Short Tubes (Red); 1 Payload Tube (Red); 1 Engine Tube (Red); 1 Metal Engine Hook; 1 Engine Block; 2 Centering Rings; 1 Balsa Wood Nose Cone; 1 Nose Cone Dowel; 1 Balsa Wood Bulkhead; 2 Metal Screw Eyes; 2 Nose Weights (Metal Washers); 1 Kevlar® Shock Cord; 1 Plastic Streamer Material; 1 Craft Stick.

## Tools & Materials - You will need the following to complete your model:

Required: Adhesive (A wood glue, such as Elmer's Carpenters Glue or Titebond can be used for all steps and is recommended); ruler; tape (cellophane, aka Scotch Tape, or masking tape).

Optional: pliers; sanding sealer (or balsa fillercoat); thinner (appropriate type for the sanding sealer); paint brush; paint (Spray paint, such as Rustoleum, Krylon or Testors is recommended. Be sure not to mix different types or brands of paint without testing.) - primer (optional), colors as desired & clear (optional); sandpaper (medium - 220 or 280, fine - 320 or 400, & [optionally] extra fine - 500 or 600); tack cloth.

## Assembly Instructions - you can use the checkboxes to mark off each step as they are completed.

□ 1) First you'll make the engine mount, refer to Figures A and B as needed for this step. Locate the red engine tube (the smallest red tube), the Kevlar® cord (it looks like a piece of heavy thread), the metal engine hook, the two centering rings (the larger ring shaped pieces that fit the outside of the engine tube) and the engine block (the small ring shaped piece that fits inside the engine tube). Test fit the engine tube into the centering rings. If the engine tube does not fit smoothly, you may need to sand the inside of the rings. Take the engine tube, and with your hobby knife make a small horizontal slit about 1/8" wide and 1/4" from one end of the tube. Make a pencil mark 3/4" from the other end of the tube.

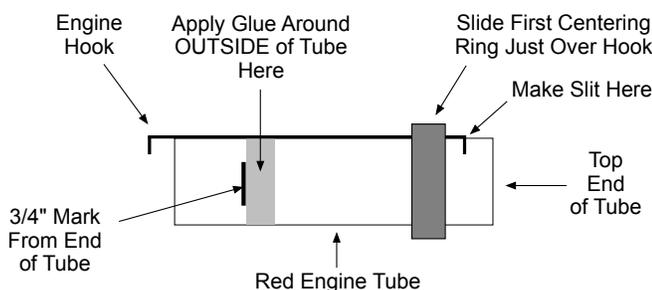


Figure A

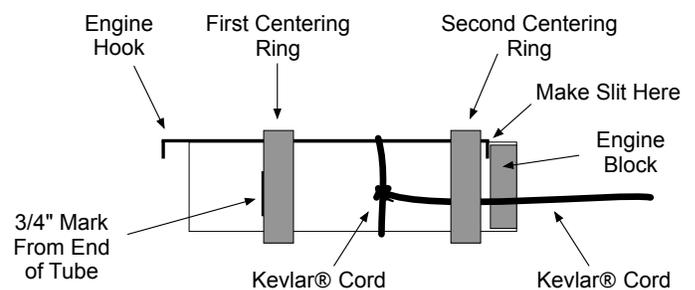


Figure B

Slip one of the "hook" ends of the metal engine hook into the slit (you can hold the hook in place with a small piece of tape if you need to) - be sure the hook is straight along and parallel to the tube. Slip one of the centering rings over the top end of the tube (the end closest to the slit) and down just over the hook. Apply a thin layer of glue to the outside of the engine tube just above the 3/4" mark (see Figure A) and slide the centering ring down until it is in the proper location (see Figure B, this is the location of the "First Centering Ring") - be sure to check the alignment of the engine hook. Take the Kevlar® and tie one end firmly around the middle of the engine tube and hook as shown in Figure B. Slip the second centering ring over the loose end of the Kevlar® and down over the end of the tube. Apply glue around the outside of the tube and slide the second ring in place as shown.

Apply a small amount of glue inside the top of the tube above the end of the metal hook and push the engine block into place. Allow the glue to dry thoroughly.

□ 2) When the engine mount has completely dried it is time to glue it into the body tube. First take the loose end of the shock cord and thread it through the top end of the engine mount tube (the end the engine block is in) so that it hangs out the back of the tube (see Figure C) - this will help to prevent from getting glue on the shock cord while you are gluing the engine mount in. Test fit the engine mount assembly into the body tube. If needed, sand the outside of centering rings for a smooth, but snug, fit. You should be able to slide the engine mount into the tube in one smooth motion. Remove the engine mount from the body tube. Locate the wooden craft stick and make a mark on the craft stick 2" from one end. Put some glue on the end of the stick and spread a generous, even layer of glue about 2" up on the *inside* of the body tube (see Figure D).

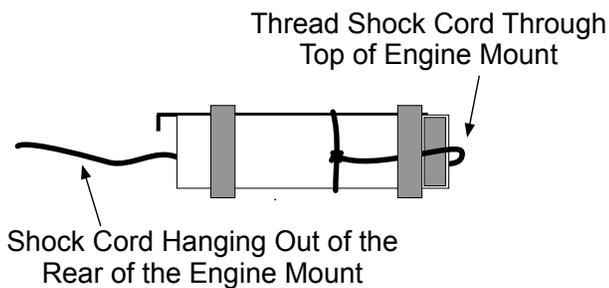


Figure C

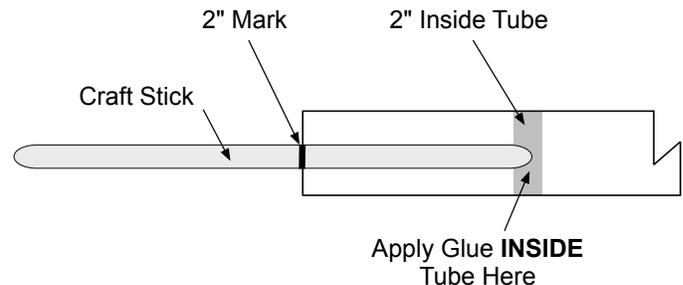


Figure D

Next apply a thin layer of glue to the outside of the rear centering ring (the one further away from the engine block, see Figure E). In one smooth motion insert the engine mount into the bottom of the body tube (be sure to insert the end with the engine block first!). The end of the engine tube should be even with the end of the body tube and the metal hook should be extending out from the end of the body tube as shown in Figure F. Wipe away any excess glue that may have come out near the rear centering ring and allow to dry completely. After the mount is dry, thread the shock cord back through the engine mount so that the cord is inside the body tube.

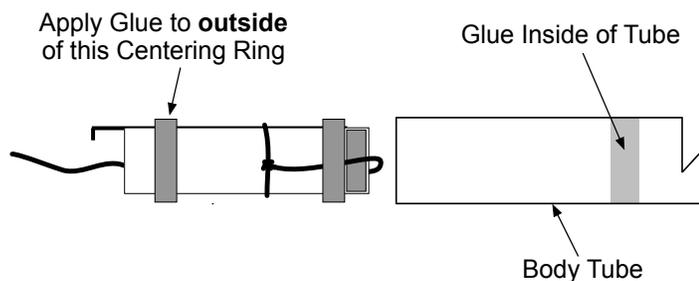


Figure E

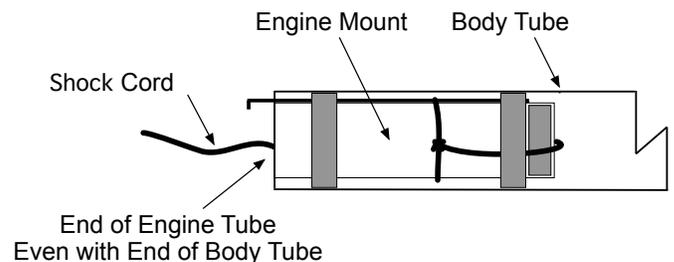


Figure F

□ 3) Make a pencil mark on the body tube 1/2" from the bottom end (the end where the engine mount is glued into). Take one of the shorter red tubes (there are six tubes of equal length and same diameter as the white body tube) and apply glue on a straight line down the tube and glue to the white body tube with the end of the short tube at the 1/2" mark (see Figure G). You can lay the tubes down on a flat surface to be sure they are even and allow to dry.

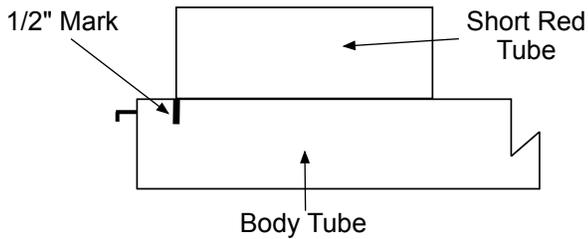


Figure G

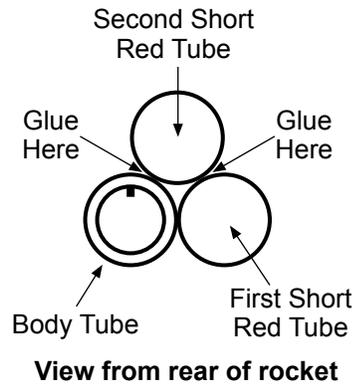


Figure H

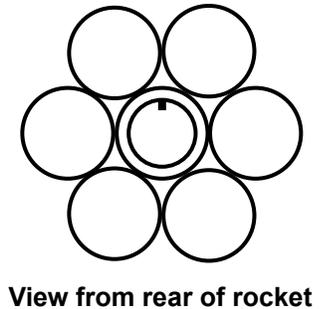


Figure I

□ 4) One at a time, fit one of the short red tubes next to the one already glued to the body tube and note where it will contact both the body tube and the short tube next to it. Apply glue on straight lines down the tube and glue to the body tube and the short tube next to it (see Figure H). The ends of all the short tubes should be even with each other. Allow to dry then continue to attach the short tubes until all six are glued together at the end of the rocket (see Figure I).

□ 5) Refer to Figure J as needed for this step. Locate the longer red tube, the balsa wood bulkhead (that fits inside the red tube), and one of the metal screw eyes. Take the screw eye and thread it into the center of the bottom of the bulkhead. Remove the screw eye and put some glue into the hole and thread the screw eye back into the hole until it fits snugly. Apply glue up inside one end of the red tube and insert the balsa bulkhead about halfway into the tube (so that about 1/2" to 3/4" is exposed) and allow the glue to dry.

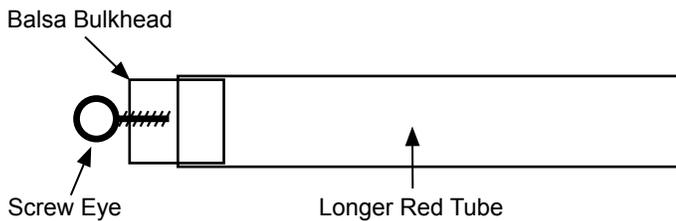


Figure J

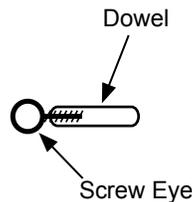


Figure K

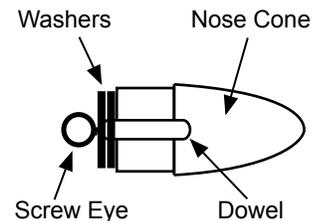


Figure L

□ 6) Take the remaining screw eye, the two metal washers, the balsa wood nose cone, and the nose cone dowel (that fits inside the hole in the bottom of the nose cone). Take the screw eye and put a small amount of glue on the tip. Thread it into the hole bored in one end of the dowel (see Figure K). Slip the two washers over the dowel and test fit the dowel into the hole in the nose cone. Get the dowel as far up into the cone as possible so that the washers are held close to the bottom of the nose cone (see figure L). You may find it helpful to hold the end of the screw eye with a pair of pliers rather than just using your fingers. Remove the dowel and squirt some glue into the hole then reinsert the dowel. The nose cone can now either be glued into place in the top end of the longer red tube, or you may friction fit it tightly using tape wrapped around the shoulder of the nose cone. If you friction fit the nose cone, it will allow you to use the red tube as a payload section for altimeters or other payloads if desired. See Figure M. Note: the extra weight of the washers is required for stable flight when using C engines.

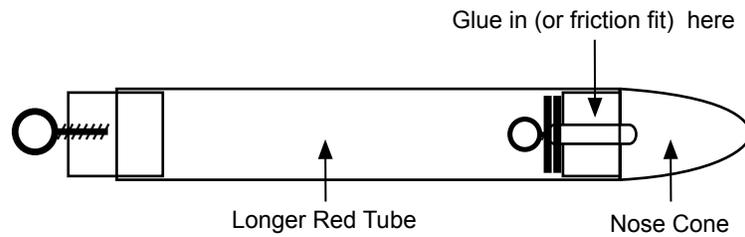


Figure M

□ 7) Take the Kevlar® shock cord from the main body tube and firmly tie the loose end to the screw eye at the end of the bulkhead. Locate the plastic streamer material. Lay the shock cord over the streamer about 2" from the screw eye. The cord should be about 1" from one end of the streamer as shown in Figure N. Firmly tape the shock cord to the streamer. Next fold the short piece of the streamer back over the shock cord and apply another piece of tape to tape the streamer to itself (see Figure O).

Fold the streamer in half lengthwise. Fold in half again two or three more times then roll the streamer into a small cylinder. Wrap some of the shock cord around the streamer to hold the streamer into a cylinder. Insert the shock cord then the streamer into the body tube - if the streamer doesn't fit easily, rewrap tighter until the cylinder fits easily. Slip the upper section into place.

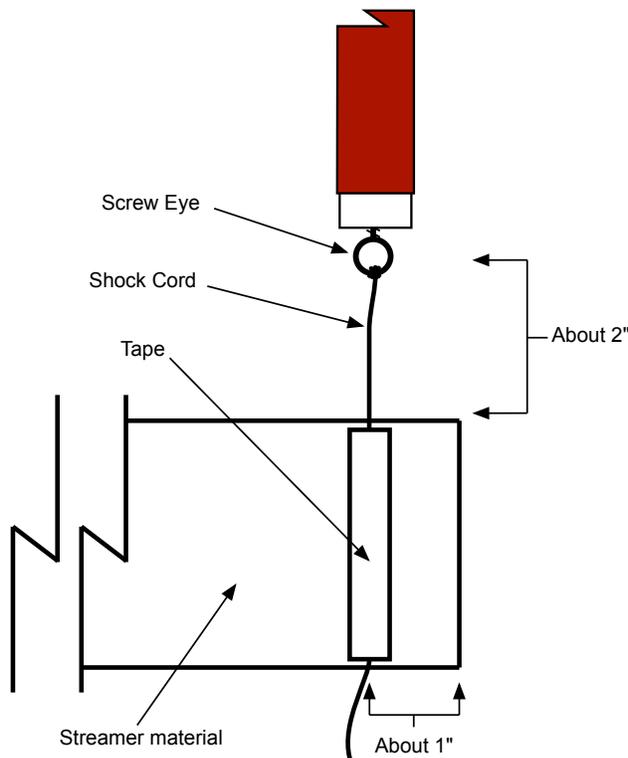


Figure N

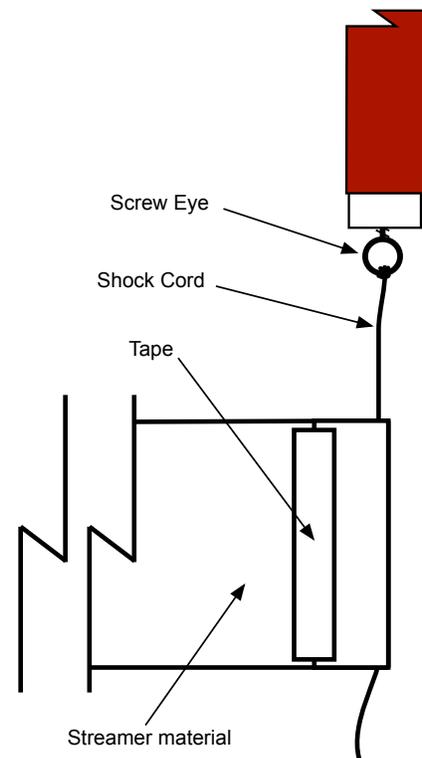


Figure O

## Finishing and Decorating

The model may be decorated and/or painted in many ways, depending on how you want it to look and how much time you wish to put into it. The following instructions refer to a full finishing of the model including filling the wood grain. Be sure to do all balsa filling, painting, etc. in a well ventilated area. Alternately you may simply decorate the model with any colors of felt tip markers, decals/stickers, etc. You may paint the model with spray or brush paint without filling the wood grain as described below, but the finish will be rougher and it may take several coats to get the color(s) as desired as the wood nose cone can soak up the paint. If you decide not to fully finish the model as described below, skip on to the Flight Preparation and Launching section.

□ 8) Prior to beginning this step, be sure to read any instructions on the brand of sanding sealer you are using - follow the manufacturers directions if they vary from those below. Be sure to use the thinner recommended by the manufacturer to clean your brush. Using fine sandpaper (then extra fine, if desired) go over the wood nose cone to ensure it is smooth. Next apply a coat of sanding sealer - it is not necessary to seal the nose cone shoulder (the part of the nose cone that will fit into the tube). Allow the sealer to dry then apply a second coat. After the second coat is dry, sand with medium or fine sandpaper until the surface is smooth. Continue with single coats of sealer, sanding in between each coat, as needed until the wood grain is completely filled and the surface is smooth.

□ 9) You will need to use something such as a dowel or a section of newspaper rolled into a tight cone inserted into the base of your model to hold it while painting. If desired, lightly go over the model with a tack cloth to remove any excess dust or other particles which could mar the finish. It is a good idea to do this before applying each coat of primer and paint. Be sure to read the instructions on the brand of paint you are using - follow the manufacturers directions carefully. Be sure not to mix different types or brands of paint without testing. It is recommended (but not absolutely necessary) that you apply one or more coats of primer before the color coats of paint - this will give a much smoother surface to your model and allow the paint to adhere better. If using primer, sand with fine and/or extra fine sandpaper after each coat is completely dry. Use as many coats as needed to get a smooth finish before proceeding to the color coats.

□ 10) First give a base coat of the lightest color you will be using on the model - several light coats are preferable to one or two heavy coats (this will be true for all the colors you will be using). Apply as many coats as needed to get a nice even color. Allow to dry thoroughly.

□ 11) If applying other colors, use masking tape to cover up the areas of the model you do not wish to paint with the second color. Apply the second color as you did the first and allow to dry. Continue this process if other colors are desired. After the paint has dried carefully remove the masking.

□ 12) At this time you may apply any decals, stickers, trim tape, etc. if desired. To protect the paint and other decorations, you may apply one or more coats of clear paint (such as Krylon Crystal Clear or similar) and allow to dry.

## Flight Preparation & Launching

Remove the upper body section and streamer from the body tube and loosely insert some flame - proof recovery wadding (such as that made by Estes or Quest) into the body tube. Use enough wadding to fill the tube to a depth of at least one and a half body diameters (usually about three or four squares of wadding).

Pack the streamer as you did in Step 7. Insert the shock cord, then the streamer down into the body tube. Slide the bulkhead of the upper section into the body tube. Be sure to check the fit, if too tight, sand the bulkhead down, if too loose, wrap with tape - it should be loose enough to slip out easily, but tight enough so that you can turn the model upside down without it falling out.

Select an engine from the list of recommended engines. Slip the engine into the rear of the engine tube (be sure the nozzle end is facing out!) until the metal hook holds the engine in place. Insert the igniter according to the manufacturers directions.

Place the rocket on the launcher by sliding the launch rod through one of the small gaps between the short tubes and the body tube (see Figure P). Attach the micro - clips to the igniter. Move back to a safe distance & be sure the launch area is clear. Check for low - flying aircraft, give the countdown & launch!

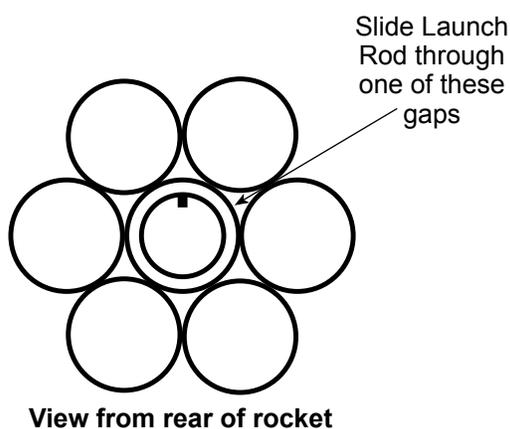


Figure P

To fly your model again, remove the used engine (be careful if you just flew it, it may be hot!). You may need to use a pair of pliers to grasp the exposed end of the engine to help pull it out. Then repeat the instructions above.

### **Be sure to read & follow the NAR Safety Code before flying this or any other model rocket!**

(Note: the NAR Safety Code is normally included with each package of Model Rocket Engines and can also be found on the National Association of Rocketry web site at [www.nar.org](http://www.nar.org))

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