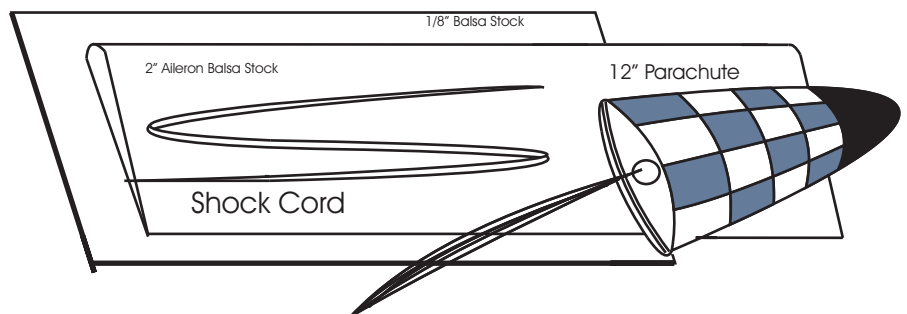
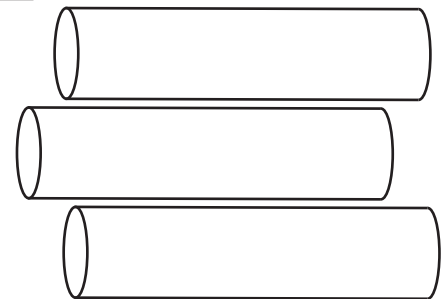
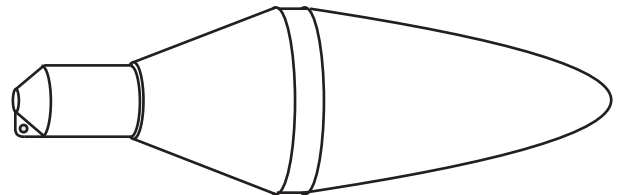
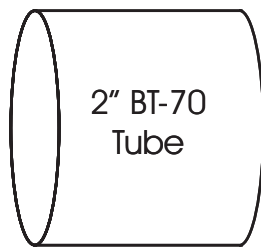
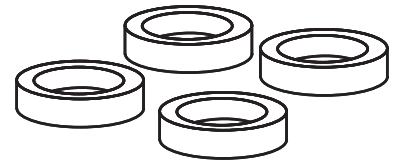
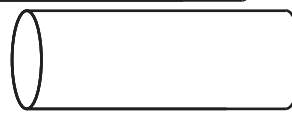
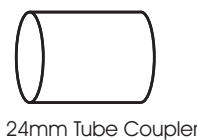
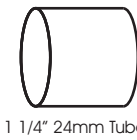
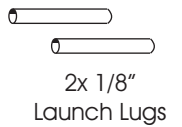
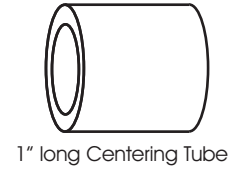
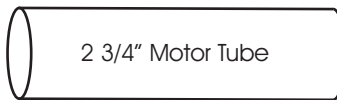
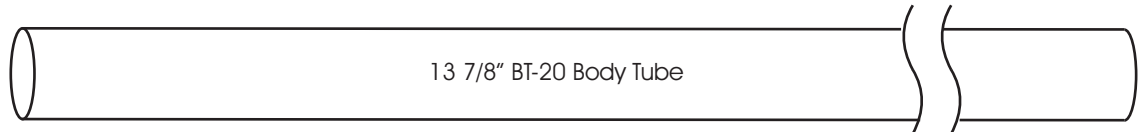
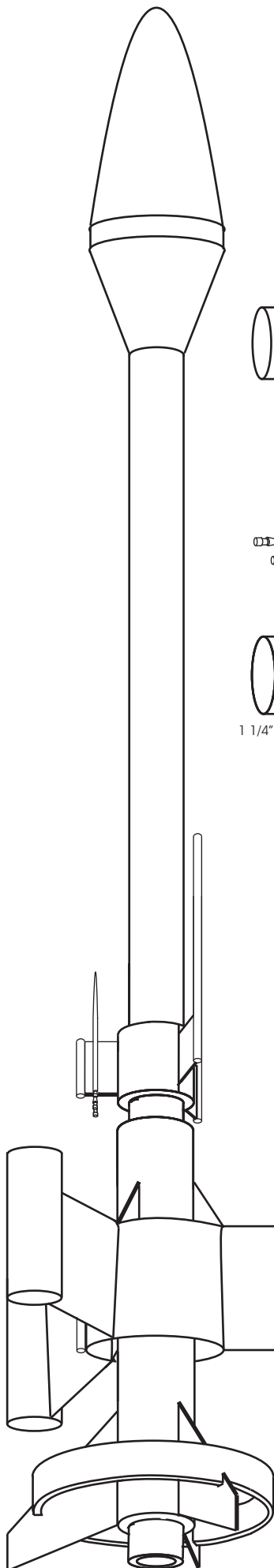


THE AVENGER

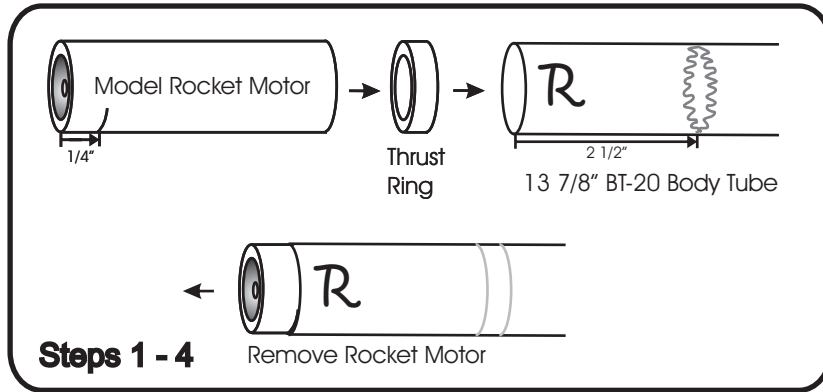
A Douglas Gardei Design

Parts List: Gather these materials to build the Avenger Rocket!

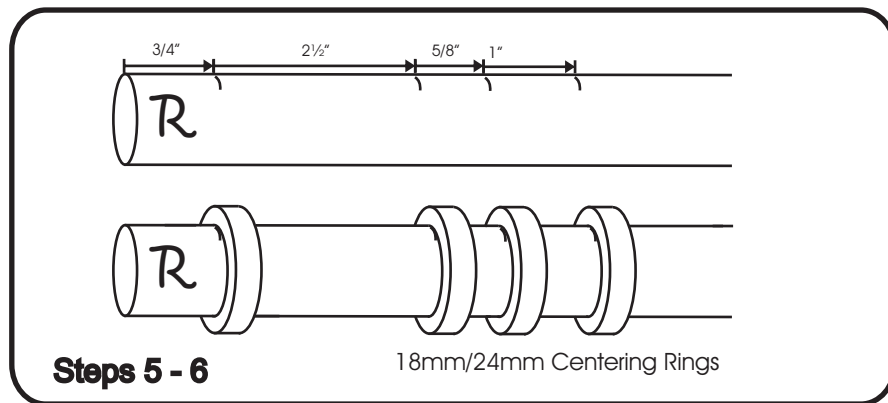
Note: Drawings are not to scale and should only be used for reference.



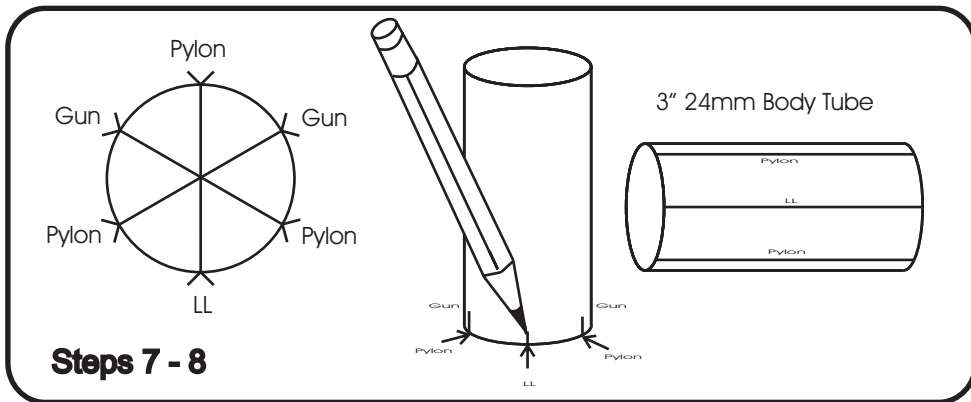
It is recommended to use Yellow Glue during the construction of this rocket and to allow each application of glue to dry before moving on to the next step. Areas where Glue is applied is indicated by Squiggly lines, Bold Dotted Lines, or shaded areas. You will also need the follow tools to build this rocket: Hobby Knife, Razor Saw, Scissors, Ruler, Pencil, Sandpaper, and a Doorframe or angle tool to draw lines down tubes.



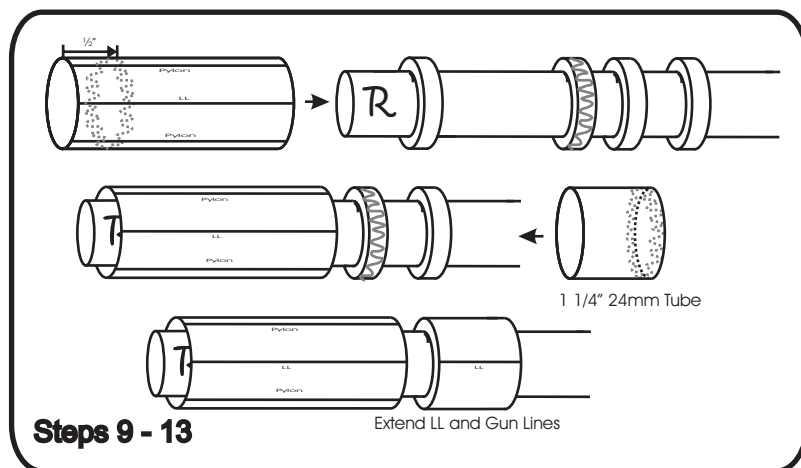
- 1.) Mark a spent 18mm Rocket Motor 1/4" from the nozzle end.
- 2.) Smear Yellow Glue inside the Body Tube 2 1/2" from the rear end of the tube.
- 3.) Push the Thrust Ring into the Body Tube with the spent rocket motor until the mark from step 1 is even with the end of the tube.
- 4.) Quickly remove the spent Rocket Motor.



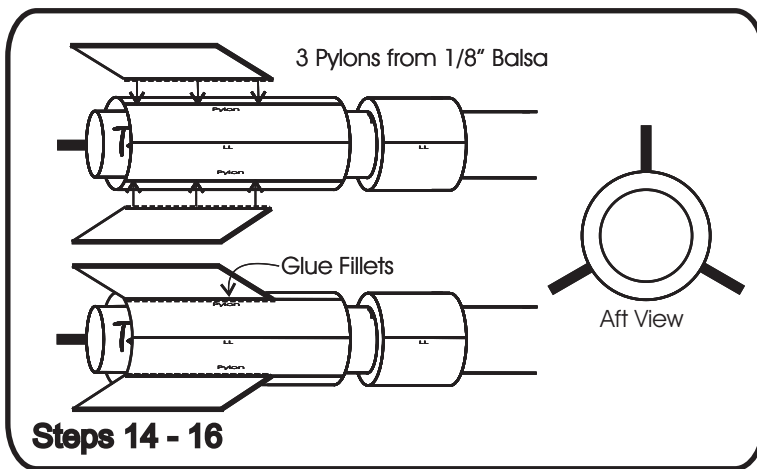
- 5.) Mark the Body Tube at the locations shown. These marks will be positioned on the **Left Side** of each Centering Ring that will be attached to the body tube.
- 6.) Using Yellow Glue, attach all four Centering Rings to the **Right Side** of each mark.
- 7.) Use the provided Fin Marking Guide to mark the three "Pylon," two "Guns," and the Launch Lug locations on one of the 3" long 24mm Body Tubes.



- 8.) Extend each line the entire length of the tubing.
- 9.) Apply Glue inside the 24mm Tube 1/2" from the aft end, and apply Glue to the second Centering Ring from the end of the Motor Tube.



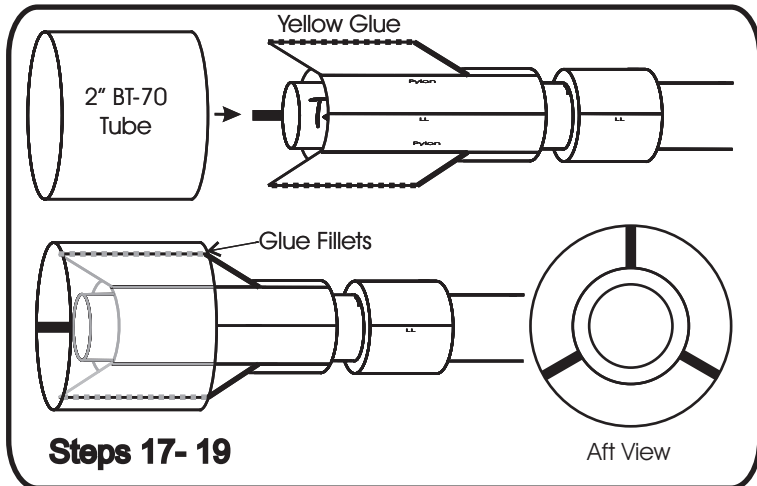
- 10.) Attach the 24mm Tube so the forward end is flush with the top of the Centering Ring.
- 11.) Apply Glue inside the front end of the 1 1/4" 24mm Tube and on the second Centering Ring from the top.
- 12.) Attach the short 24mm Tube so the edges are flush with the Centering Rings.
- 13.) Extend the LL and Gun lines to the 1 1/4" 24mm Tube.



14.) Use the Pylon Pattern located on the Pattern Sheet and cut out three pylons from 1/8" Balsa stock. Make sure the grain of the balsa is parallel to the leading edge.

15.) Glue the three Pylons to each "Pylon" line with Yellow Glue. Make sure each fin is 120 degrees from each other.

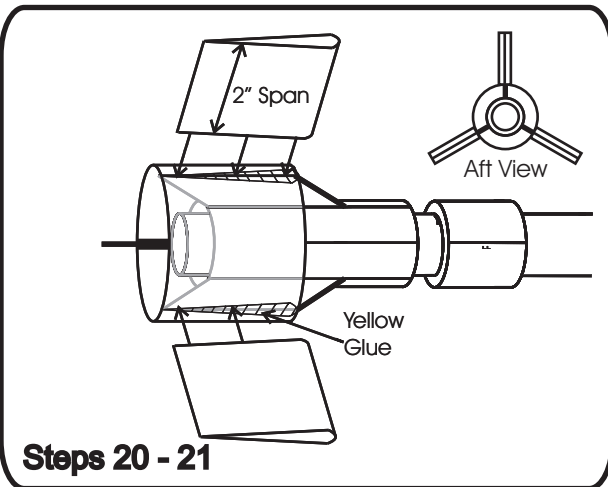
16.) After each fin is dried, apply several Glue Fillets to each Pylon/Body joint. Let the Glue dry between each application.



17.) Test fit the 2" long BT-70. If required, sand the Pylons till the tube fits over each Pylon while staying round.

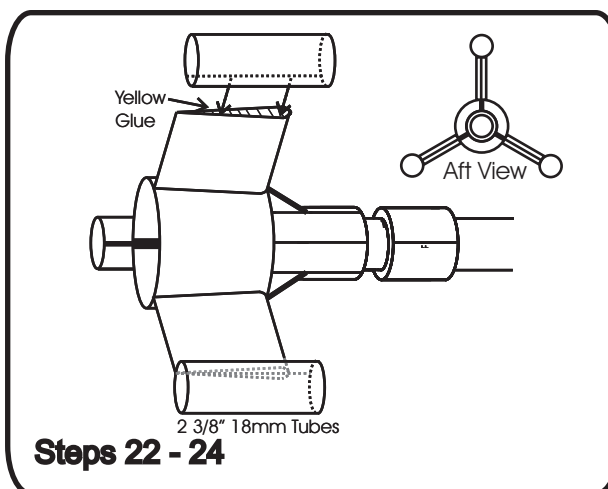
18.) Apply Yellow to each Pylon and Slide the BT-70 Tube into its proper position.

19.) After the Glue has dried, apply several Glue Fillets to each Pylon,/Tube joint. Let the Glue dry between each application.



20.) Using a razor saw, cut out three 2" long Fins from the 2" wide "Aileron" Balsa stock. Sand the Root Edge and Fin Tip flat.

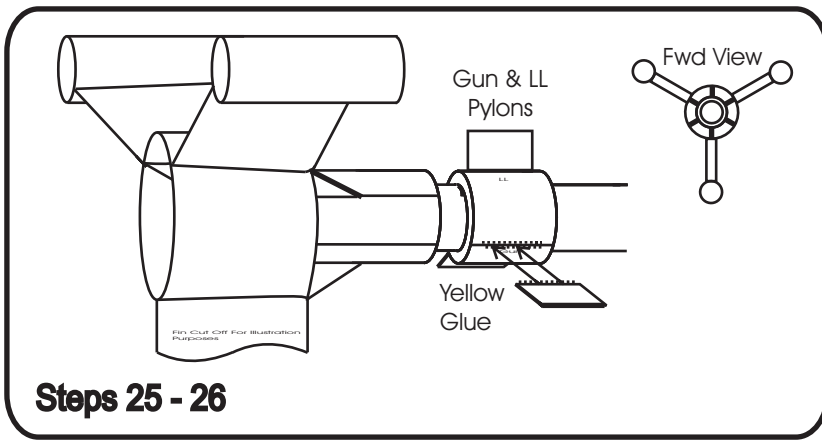
21.) Glue each Fin on the BT-70 tube directly centered above each Pylon with Yellow Glue. Make sure each Pylon is positioned 120 degrees from each other.



22.) Extend a line the entire length of each 2 3/8" long BT-20 Tubes.

23.) Glue each Tube to the top of each Fin with Yellow Glue. Make sure each Tube is centered on the leading and trailing edge of each Fin.

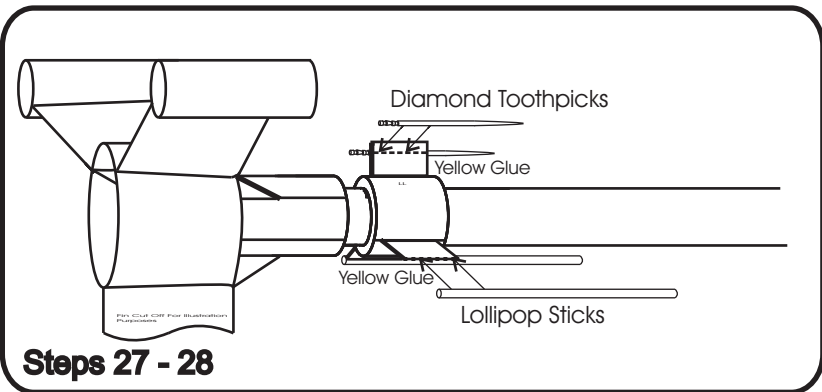
24.) Apply several Glue Fillets to each Fin/Tube joint. Let the glue dry between each coat.



25.) Cut out three rectangles measuring 1" wide by 5/8" tall from the 1/8" balsa stock. Make sure the balsa grain is parallel to the short side.

26.) Glue a Pylon on both Gun lines and Launch Lug line. They should be centered between the edges of the Tube.

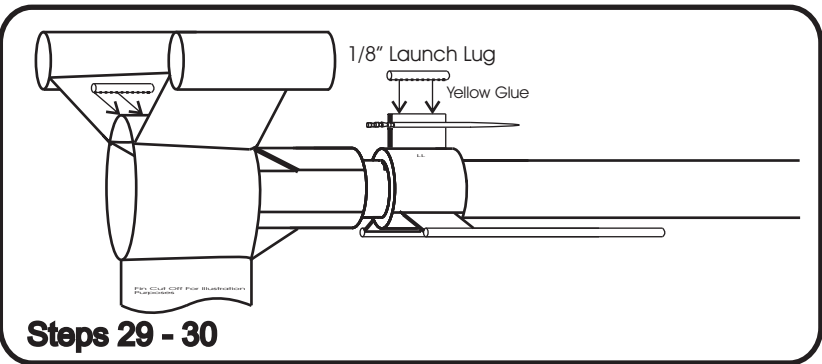
Steps 25 - 26



27.) Glue a Lollipop stick on each Gun Pylon.

28.) Glue a "Diamond" Toothpick on each side of the Launch Lug Pylon about 1/4" from the edge. These are the Avengers "Missiles."

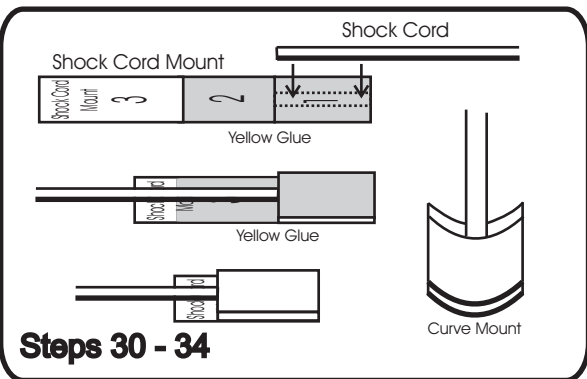
Steps 27 - 28



29.) Glue a Launch Lug on top of the LL Pylon.

30.) Glue the other Launch Lug on the BT-70 Tube so that its aligned with the forward Launch Lug.

Steps 29 - 30



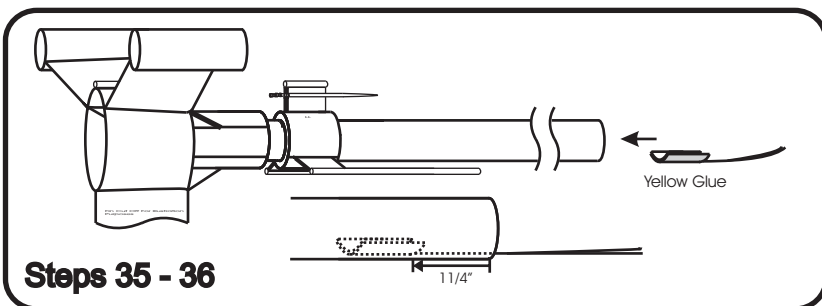
31.) Cut out the Shock Cord mount from the Pattern Sheet.

32.) Apply Yellow Glue to Section 1 and 2. Place the Shock Cord centered on Section 1. Fold Section one over onto section 2.

33.) Apply more Yellow Glue on the folded over section. Then fold this section onto section 3.

34.) While the Glue is setting, curve the mount so it matches the curve of the body tube.

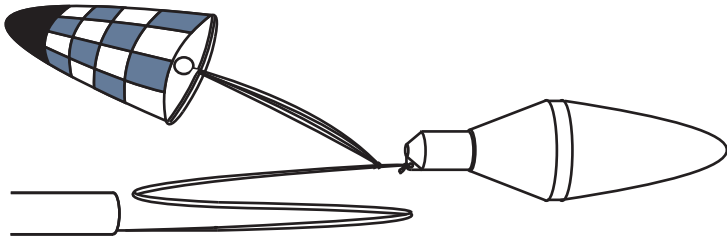
Steps 30 - 34



35.) When the mount is dried completely, apply Yellow Glue to its backside.

36.) Place the mount inside the forward end at least 1 1/4" from edge.

Steps 35 - 36



Steps 37 - 39

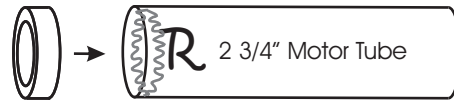
37.) Use a Hobby Knife to clean up the plastic flashing and open up the eyelet on the Custom Eggloft Cone.

38.) Tie the shockcord to the nosecone. It is easiest to cut the tip of the shock cord in a sharp point and press that through the hole. Grab the point from the other end and pull the cord through.

39.) Attach the 12" Parachute to the Shockcord just below the nosecone.

Booster Assembly

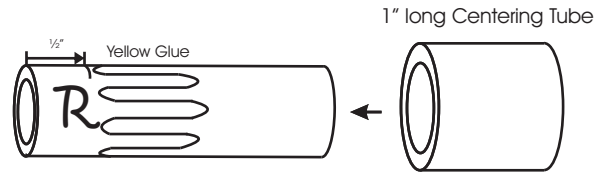
40.) Glue a Thrust Ring to the Aft end of 2 3/4" long motor tube.



Step 40

41.) Mark the motor tube 1/2" from the aft end.

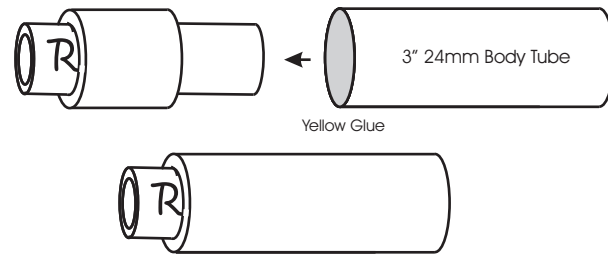
42.) Smear a healthy amount of Yellow Glue around the Motor Tube above the 1/2" mark.



Steps 41 - 43

43.) Slide the 1" long Centering tube over the forward end of the motor tube and stop at the 1/2" mark.

44.) Smear Yellow Glue inside one end of the remaining 3" long 24mm Body Tube.

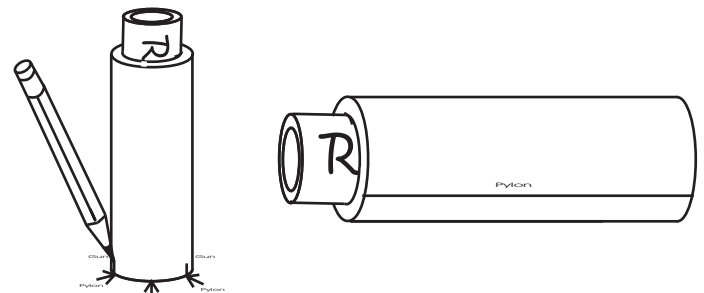


Steps 44 - 45

45.) Slide the motor mount assembly into the Booster Tube until the Aft end of the tube is flush with the edge of the Centering Tube.

46.) Use the provided Fin Marking Guide to mark the locations of where the Pylon/Fins will go on the Booster Tube.

47.) Extend the Pylon/Fin lines down the entire length of the Booster Tube.

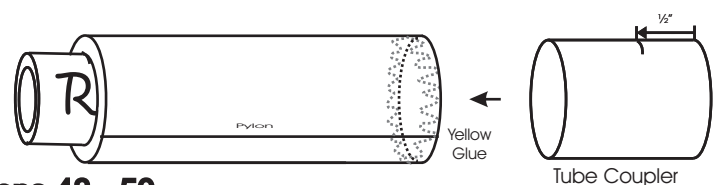


Steps 46 - 47

48.) Place a mark on the Tube Coupler 1/2" from the forward end.

49.) Smear Yellow Glue inside the forward end of the Booster Tube.

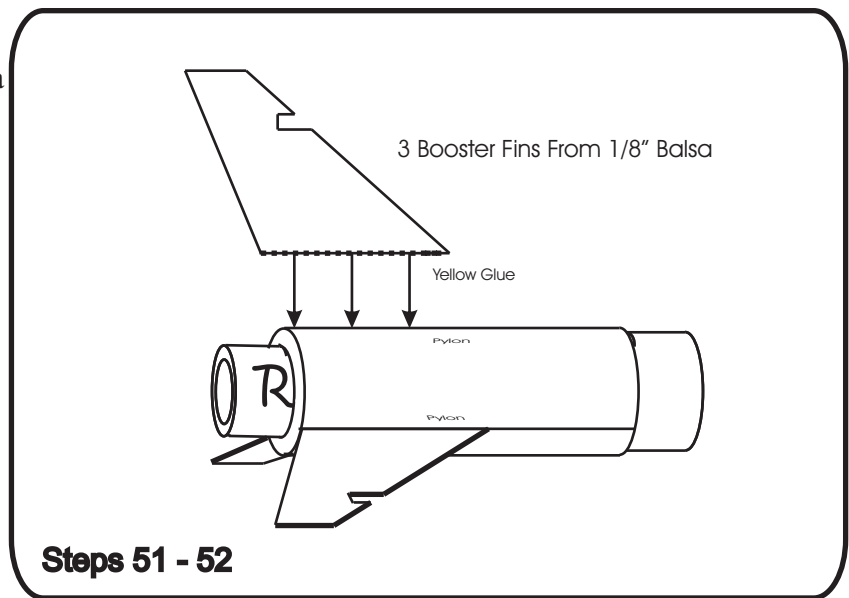
50.) Slide the Tube Coupler into the Booster Tube and start at the 1/2" mark.



Steps 48 - 50

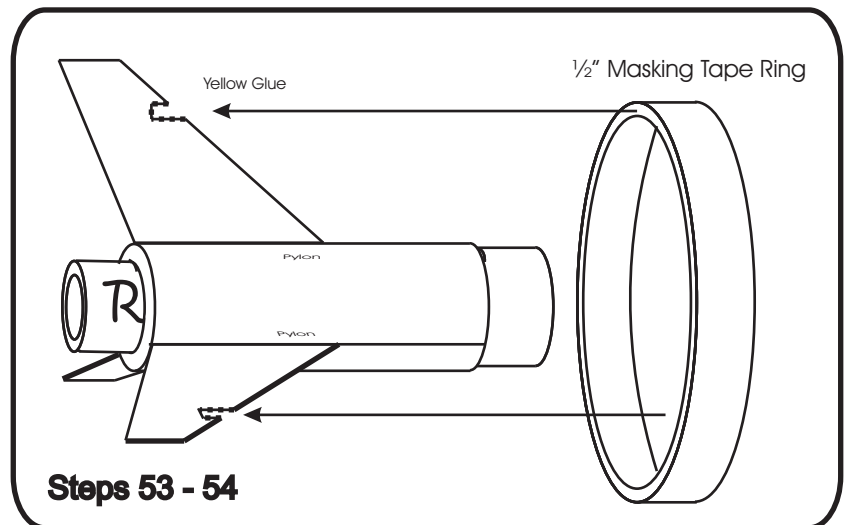
51.) Use the Booster Fin Pattern located on the Pattern Sheet and cut out three Fins from 1/8" Balsa stock. Make sure the grain of the balsa is parallel to the leading edge.

52.) Glue a Booster Fin to each Pylon Line on the booster using Yellow Glue. Make sure each Fin is 120 degrees from each other.



53.) Test Fit the 1/2" Masking Tape Ring on the Fins and adjust the slots if necessary.

54.) Apply Yellow Glue to each slot and attach the Ring.



55.) After all the Glue is dried, apply several Glue Fillets to each Fin/Body joint and Fin/Ring joint. Let the Glue dry between each application.

Finishing

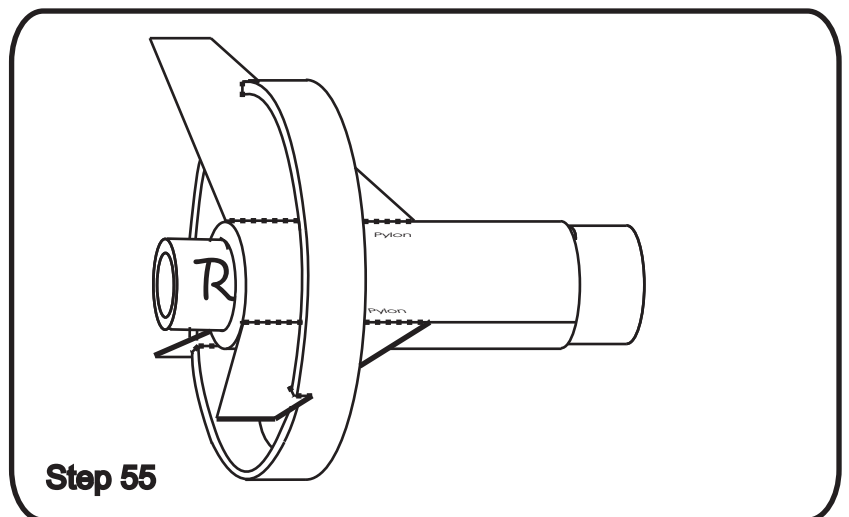
56.) Apply several Glue Fillets to each joint where still needed. Let the Glue dry between each application.

57.) Use a filler like Bondo Glazing and Spot Putty to fill in the gaps between the Aileron Fin and the tubes they connect to.

58.) Coat the rocket with several coats of Light Gray Primer, sanding between each coat.

59.) Paint the rocket with a base coat of Gloss White. Allow to dry completely

60.) Paint the "Fin Tip Tubes" and the center section of the nose cone Gloss Red.



61.) Paint the Top Portion of the Nose Cone Yellow.

62.) Paint the Bottom Portion of the Nose Cone Black.

63.) Paint the Toothpick Missiles with a brush. The nose is Silver, and the "Nozzle" is painted Black, Red, and Silver.

64.) Once all paint is dried, Apply the decals.

Flying

1.) Insert 3 - 4 squares of wadding into the forward portion of the nosecone.

2.) Fold the parachute in a manner so it fits loosely inside the Body Tube and is capable of deploying properly.

3.) Tuck the shock cord into the Body Tube, followed by the parachute and nosecone. If the nosecone fits to loosely, wrap some masking tape around its shoulder till you get a good fit. If the nosecone is to loose, sand the shoulder till it fits.

4.) Decide if you want to fly the rocket single stage or Two Stage.

Single Stage

Recommended Motors:

B6-2, C6-3

5.) Friction fit the motor into the Motor Tube using masking tape in such a manner that the motor will not eject from the rocket when the ejection charge goes off.

Dual Stage

Recommended Motors

Booster: B6-0 Sustainer A8-3, B4-4, B6-5. C6-5
Booster C6-0, Sustainer A8-5, B4-6, B6-6, C6-7

5a.) Tape the Booster Motor to the Sustainer Motor with Scotch tape.

5b.) Friction fit the Sustainer Motor in the Upper Stage Motor Tube in such a manner that the motor will not eject from the rocket when the ejection charge goes off.

5c.) Slide the Booster onto over the Booster Motor and carefully insert the Booster's Tube Coupler into the Upper Stage Body Tube.

6.) Install the Motors Igniter into the Motor.

7.) Slide The Avenger onto the Launch Pad.

8.) With the Safety Key removed from the Launch Controller, Connect the Micro Clips to the Igniter Leads.

9.) Insert the Safety Key into the controller and check the Continuity. If the light does not turn on, check the igniter.

9.) Check for aircraft or other obstacles

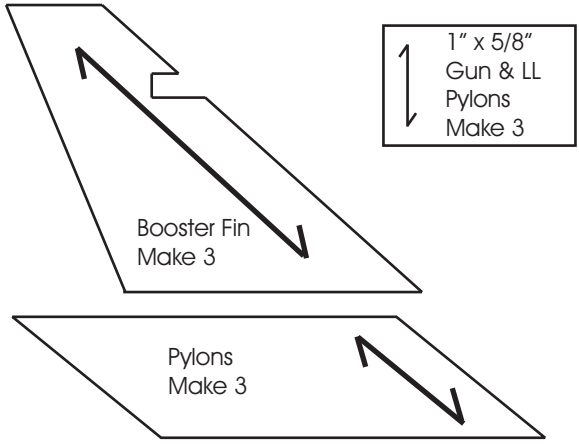
10.) When safe to launch, give a audible 5 second countdown.

11.) Press the launch button and the rocket should launch.

12.) Remove the Safety Key and go recover The Avenger.

13.) Reload the Rocket and Fly Again!





Shock Cord Mount
3
2
1

Avenger Pattern Sheet