BARCLONE
Rocketry Products

Antares

Designed By C. P. McGraw

Skill Level 3

Revision Date: Dec 14, 2005

Length	**23.75”**
Diameter	**0.976”**
Fin Span	**8.075”**
Weight	**2.13 oz**

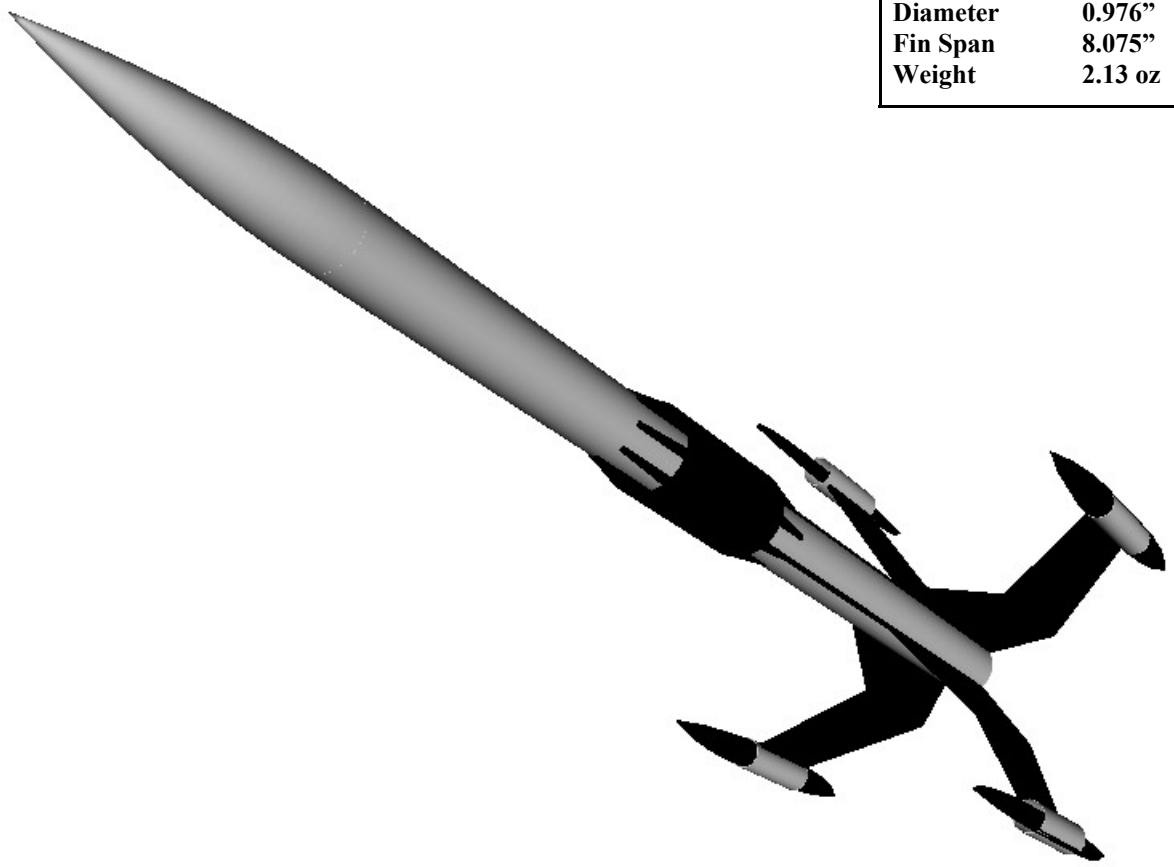


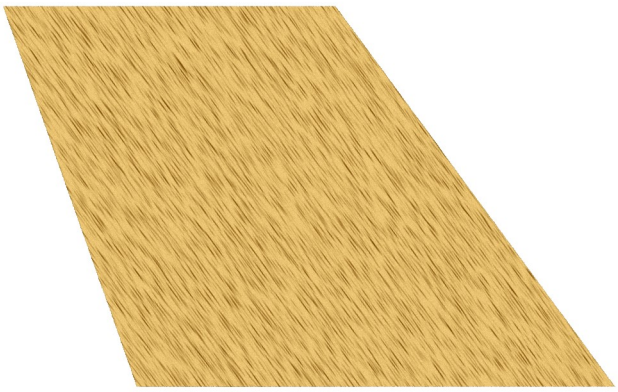
Image created with RockSim v8

Main Parts List

Main Nose Cone	BNC-50Y
Main Body Tube	BT-50
Pod Nose Cone	(4) BNC-5AX
Pod Tail Cone	(4) BNC-5E
Pod Body Tube	(4) BT-5BJ
Reactor Shroud	BT-55J
Motor Tube	BT-20J
Centering Rings	(2) CR-2050
Thrust Ring	CR-520
Engine Hook	EH-2
Main Fin Stock	1/8″ Balsa Sheet
Cooling Vanes	1/16″ Balsa Sheet
Launch Lug	(2) LL-2
Parachute	18″ Diameter
Shock Chord	SC-24
Shock Chord Mount	SCK-24
Screw Eye	SE-1
Snap Links	(2) #12

Fin Templates

Main Fins



Outer Fin Half

Inner Fin Half

(Make 4 each from 1/8" balsa sheet)

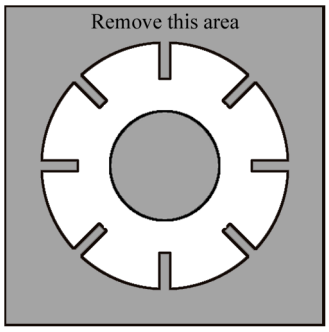
Reactor Cooling Vanes

(Make 8 from 1/16" balsa sheet)

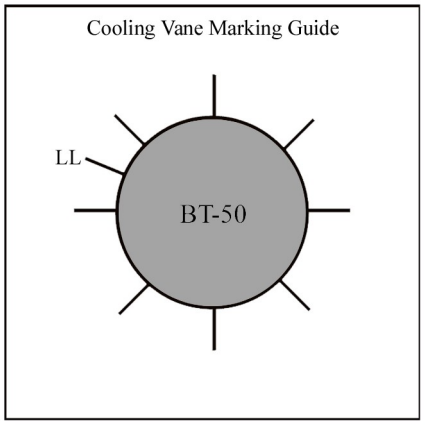
Alignment Guides

Reactor Cooling Vanes
Alignment Tool Parts List

RCV Alignment Guide End Pieces.....(2) 0.05″ Fiberboard
RCV AG Connecting Tube.....BT-5BJ

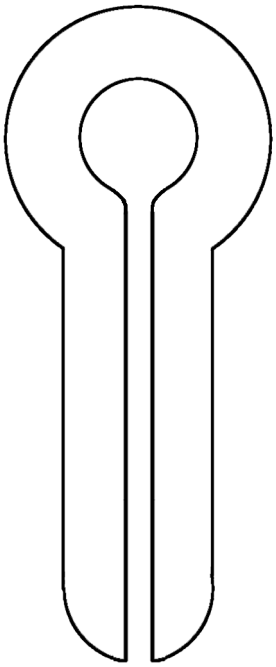


Reactor Cooling Vane Alignment Guide
(Make 2 from 0.05" fiberboard)



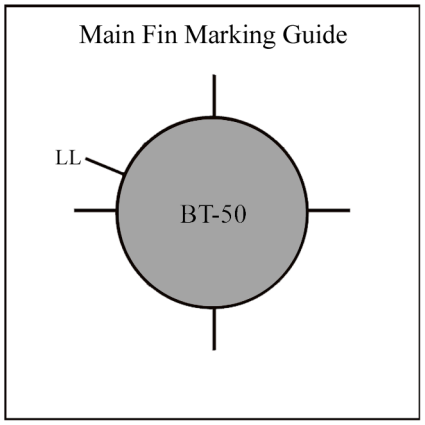
(Make 1 from 0.05" fiberboard)

Fin Tip Pod Alignment Tool



(Make 2 from 0.05" fiberboard)

Main Fin Marking Guide

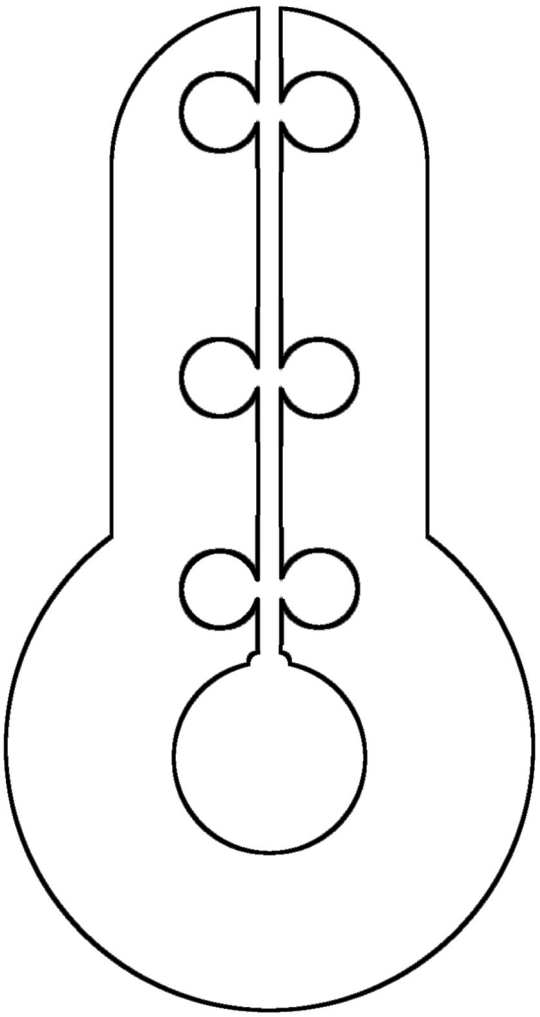


(Make 1 from 0.05" fiberboard)

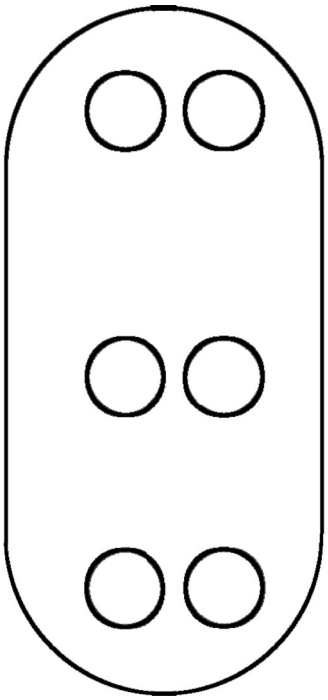
Alignment Guides

Main Fin
Alignment Tool Parts List

Guide Supports.....(2) 0.05″ Fiberboard
Sliding Tube Holders.....(3) 0.05″ Fiberboard
Clamping Tubes.....(6) BT-3, 9″

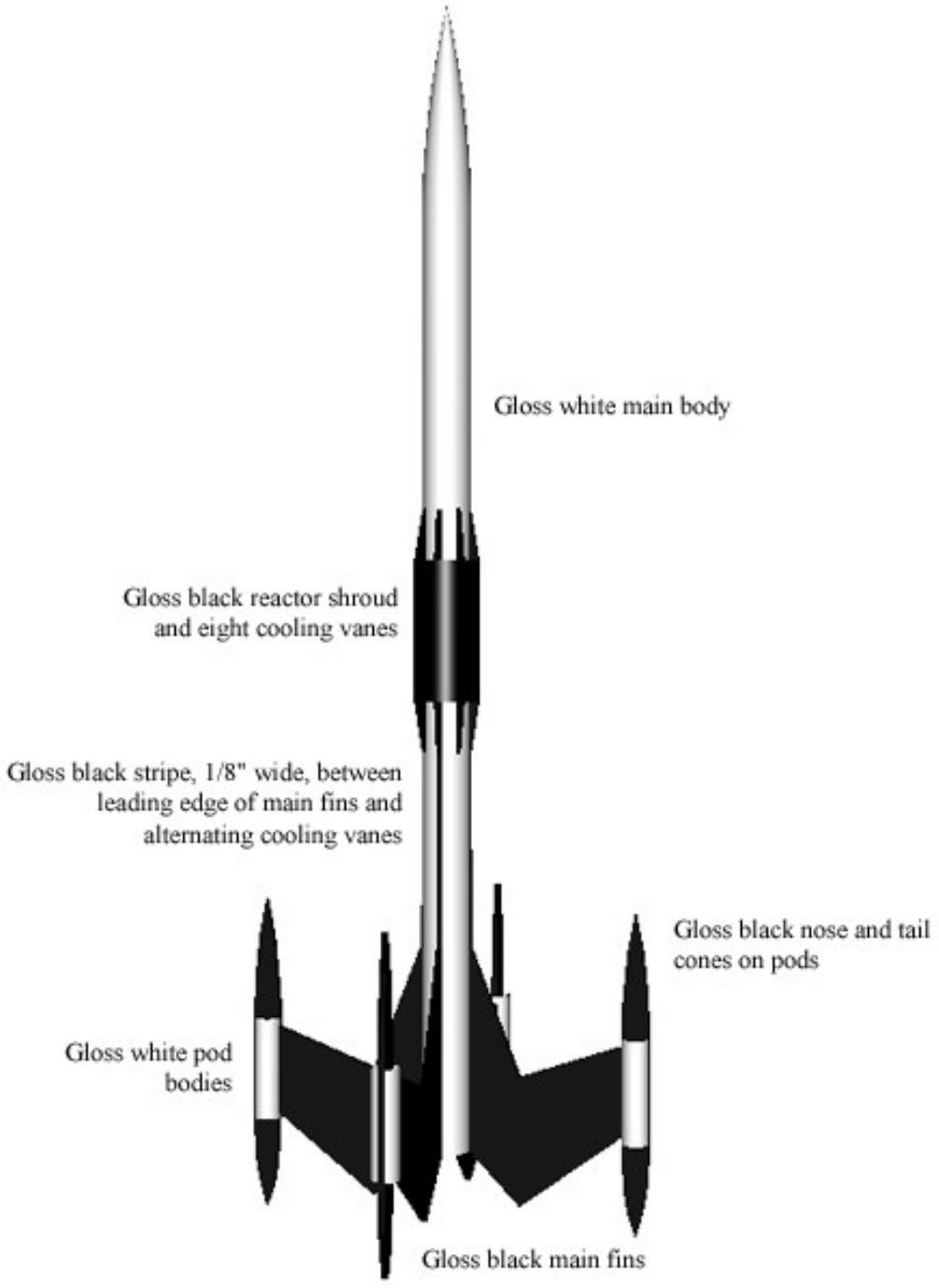


Main Fin Front Support Piece
(Make 2 from 0.05" fiberboard)



Main Fin Rear Support Piece
-- Sliding Tube Holder --
(Make 3 from 0.05" fiberboard)

Painting Guide



General Assembly Sequence

Read this instruction guide carefully several times before starting the actual construction of the model. You need to familiarize yourself with the overall flow of the process, since there will be many starting and stopping points for various subassemblies. There are many opportunities for overlapping the construction of one subassembly while another is drying, even if the instruction guide doesn't explicitly show this. Reading these instructions ahead of time will allow you to understand what needs to be done and when, and it allows you to schedule your building time more productively.

Main Fin Alignment Tool

- **Step 1** Test-fit the pieces together and make minor adjustments as required for the pieces to fit friction-tight, but not so tight that the pieces are damaged, not so loose that the pieces fall apart.

- **Step 2** The two large end pieces should be spaced about 2" apart, with the tubes holding them together. One of the end pieces should be about 1/16" from the edge of the tubes, and the other end piece about 2" inward from there. Insert a 1/8" balsa spacer between the tubes at each end piece to keep them properly aligned. Slide all three of the movable small end pieces onto the tubes at the far end and space them about 1" apart.

- **Step 3** Insert a scrap piece of BT-50 tubing through the large holes of the two end pieces. Inspect the alignment and make adjustments to ensure that the BT-3 tubes are parallel to each other and to the scrap BT-50, but perpendicular to all of the end pieces.

- **Step 4** Apply glue to the joints between the BT-3 tubes and the large end pieces. Do not glue the BT-50 tube in place. Do not glue the smaller end pieces in place. Set this aside for about 20 minutes to dry.

Reactor Vane Alignment Tool

- **Step 5** Test-fit the pieces together and make minor adjustments as required for the pieces to fit friction-tight, but not so tight that the pieces are damaged, not so loose that the pieces fall apart.

- **Step 6** Slide the two end pieces onto the 3" BT-5CJ tube, and position them 1/4" from each end. Make an adjustment to align the slots with each other. Place scrap pieces of 1/16" balsa strips into the slots and carefully rotate one of the end pieces until the strips are parallel to the tube.

- **Step 7** Apply thinned glue to the joints of the end pieces with the tube. Do not glue any of the strips in place. Allow about 20 minutes for the glue to dry.

Fin Tip Pod Construction

- **Step 8** Draw a line down the full length of all four of the 2" long BT-5BJ fin pod tubes. Mark each tube 0.125" from each end. Draw a line completely around the tubes at these locations.

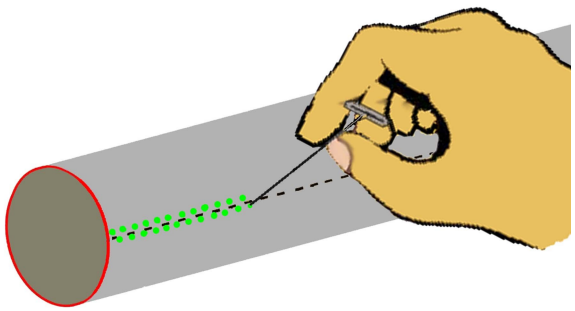


Figure 1

- **Step 9** Using a large modeler's "T" pin, punch a series of holes about 1/32" on either side of the long axis line, in a zig-zag pattern, between the circumferential lines at either end of the tube. Refer to Fig. 1 to understand the idea.

- **Step 10** Glue one BNC-5AX in one end of each pod tube, and one BNC-5E cone into the opposite end. Set aside to dry.

- **Step 11** Sand the pod with 220-grit paper to remove fuzziness from the balsa pieces, and to remove the shine from the tube surface,

- **Step 12** Cut four strips of masking tape 1/8" wide and 1.75" long. Place one strip over the long attachment line between the two circumferential lines on each pod. This will protect the line of holes punched in step 9.

- **Step 13** Apply thinned lightweight filler compound to the entire pod and allow to dry. BARCLONE recommends ***Elmer's Fill-N-Finish*** for this. Sand with 220-grit paper, tack-rag the pod, and inspect for scratches, voids, and gouges. Repeat this step until you are satisfied with the surface finish.

Engine Mount Construction

- **Step 14** Mark the motor tube at 0.75", 2.25", and 2.5" from one end. Draw lines completely around the tube at these locations. Draw a single line lengthwise the full length of the tube.

- **Step 15** At the intersection of the 2.5" line and the lengthwise line, cut a slot in the tube about 1/8" wide.

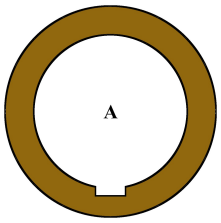


Figure 2

- **Step 16** Modify the two CR-2050 rings by cutting or sanding flat notches in the inside diameter, as shown in Fig. 2 above. A sanding twig is an excellent tool for this job.

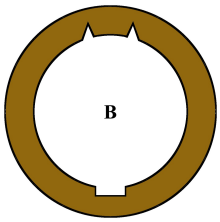


Figure 3

- **Step 17** Modify one of the two CR-2050 rings with two "V" notches, as shown in Fig. 3 above.

- **Step 18** Insert the tip of the engine hook into the slot in the tube, then slide the CR-2050 "B" ring with the "V" notches down from the top until it touches the line at 2.25" from the bottom edge, aligning the flat notch over the hook. Keep the hook aligned parallel to the tube.

- **Step 19** Slide the CR-2050 "A" ring up from the bottom of the tube, with the flat notch over the hook, until it touches the line at 0.75" from the bottom edge. Apply glue to the base of each ring, front and rear, where it contacts the tube. Allow at least 20 minutes to dry.

- **Step 20** Apply a layer of glue with a soft-bristle brush around the inside of the top end of the tube. Push the CR-520 ring into this end and push with an expended engine casing until it bottoms out against the tip of the engine hook. Allow to dry.

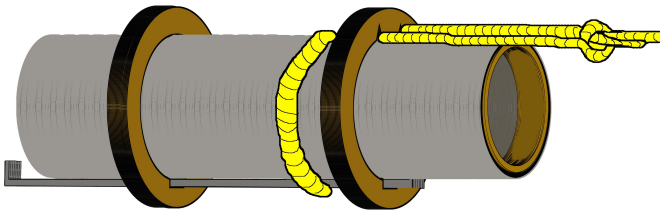


Figure 4

- **Step 21** Tie a knot about 5" from one end of the SCK-24 Kevlar thread. As shown in Fig. 4 above, run the short end of the Kevlar thread through one of the "V" notches from the front, loop it around the body tube, then run it out through the other "V" notch. Tie a slip knot around the long end of the knot,

then pull the slip knot down tight with the first knot. Even out the two legs of the thread, then apply a layer of glue around the back side of the forward "B" ring to secure the Kevlar thread in place. Apply a drop of thinned glue to the two knots, then set aside to dry.

Reactor Shroud Construction

- **Step 22** Using the Reactor Vane Alignment Tool you completed in step 7, mark the ***inside*** diameter of the BT-55J tube for the edges of the eight cooling vanes. Draw lines down the full length of the inside of the tube at each location. Cut eight strips of masking tape, 1/16" wide and 3" long. Apply these strips of tape directly between each 1/16"-wide pair of lines. This will protect the inside of the shroud from filler and primer while completing the next few steps.

- **Step 23** Fill the inner and outer spiral seams on the BT-55J shroud with thinned lightweight filler compound. Apply filler to the sides, leading, and trailing edges of the eight cooling vanes. Do not apply filler to the top or root edges of the vanes. Allow a full day to dry. Sand all of the pieces smooth with 220-grit paper, but do not damage or lift the masking tape from the shroud. A 1/2" dowel wrapped with the sanding sheet may be helpful in sanding the inside of the shroud. Tack-rag the dust.

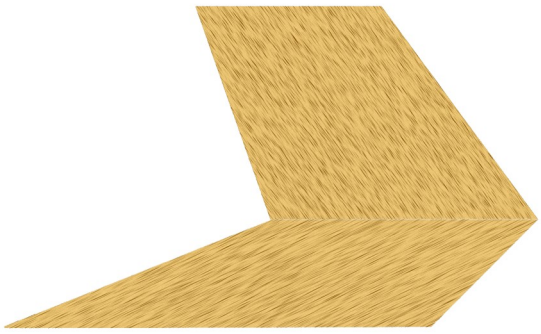
- **Step 24** Cut eight strips of masking tape, 1/16" wide and 2.75" long. Apply these to the top edges of the vanes. Cut eight more strips, 1/16" wide and 4.75" long, and apply these to the root edges of the vanes. Prime the inside surface of the shroud and the sides of the vanes with one coat of white or gray primer, and allow a day to dry. You may sand the primer at this stage, but it is not really necessary as it will not easily be seen.

- **Step 25** Remove all of the tape strips from the shroud pieces and discard these. Insert into the slots of the Reactor Vane Alignment Tool all eight of the primed balsa vanes, with the wide root edges pointing ***inward,*** and the short edges pointing ***outward.*** Position the loaded tool inside the shroud so that each of the vanes is aligned over one of the uncovered strips. Apply a small drop of thinned ***white*** glue to both sides of each vane at the center where it contacts the shroud. This is only meant to tack the vane in place. Do not get glue on the tool, nor add any additional glue to the joint at this time. Allow the glue about 20 minutes before removing the tool. Now, using a keen pointed artists brush, or a fine-tipped pipette, apply thinned white glue to all of these joints, making sure the full length of the joint has been glued. Allow another 20 minutes to dry before handling.

- **Step 26** Cut eight more strips of masking tape, 1/16" wide and 5" long. Apply these strips of tape directly on top of the root edge of each vane. This will protect these edges from paint.

- **Step 27** Spray the inside and outside surfaces of the shroud, and the fins, with gloss or flat black, and allow a day to dry. Now, remove the strips of tape from the bottom edges of the vanes.

Main Fin Assembly



Fin Placement Guide

Figure 5

- **Step 28** Cut four pieces each of the main fin upper and lower sections using the patterns on page 2. Square and true up the

edges of all eight pieces. Glue the fin halves together as shown in Fig. 5 above. Use pins, clamps, or weights to hold the pieces in alignment while the glue dries.

- **Step 29** Round over only the leading and trailing edges of the main fins with 320-grit paper. Do not reshape the fin. Apply a thin layer of glue to the root edges of all four main fins, and set aside to dry.

- **Step 30** Apply thinned filler compound to the edges and flat surfaces of the fins, and allow a day to dry. Sand with 220-grit paper, tack-rag the dust, and inspect the fins for gouges, voids, or other visible blemishes. Repeat this step until you are satisfied with the surface finish.

Main Body Tube Preparation

- **Step 31** Sand the 18" BT-50 tube with 220-grit paper to remove the glassine "shine" from the surface.

- **Step 32** Draw a continuous line down the length of the main body tube. Mark the tube at locations 1", 2.25", 4", 7.75", 9.5", 10.75" and 12.5" from the bottom edge. Draw lines completely around the tube at these locations.

- **Step 33** Draw lines parallel to the long line, 1/16" to either side, between the lines at 1" and 2.25", and between the lines at 9.5" and 10.75". These areas represent the locations for the two launch lugs. Cut strips of masking tape to fit these two areas, and apply them to the tube to protect these areas from filler and primer.

- **Step 34** Slide the Main Fin Marking Guide onto the body tube from the rear, and align the "LL" mark with the long line drawn in step 28. Mark the body tube for the four fin alignment lines, then remove the guide. Extend these lines from the rear edge of the tube up to the line drawn at 4" from the edge.

- **Step 35** Cut four strips of masking tape 1/8" wide and 4" long. Carefully apply these to the body tube directly over the fin alignment lines.

- **Step 36** Slide the Reactor Vane Marking Guide down from the front of the body tube until it is touching the line at 12.5". Align the "LL" mark with the long line drawn in step 28. Mark the body tube at each of the eight locations, then remove the guide. Extend these eight lines from the line at 12.5" back to the line at 7.75".

- **Step 37** Cut eight strips of masking tape 1/16" wide and 4.75" long. Carefully apply these to the body tube directly over the eight reactor vane alignment lines.

- **Step 38** Apply thinned filler compound to the spiral seam on the body tube, and allow a day to dry. Sand with 220-grit paper, tack-rag the dust, and inspect the tube for gouges, voids, or other visible blemishes. Repeat this step until you are satisfied with the surface finish.

Main Body Tube Assembly

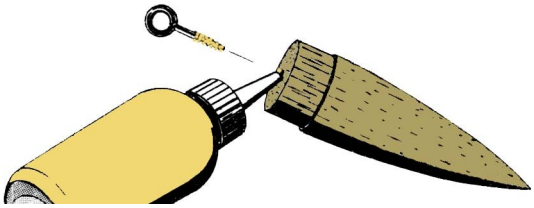


Figure 6

- **Step 39** Using the threads of the screw eye, cut a hole through the center of the BNC-50Y shoulder. As shown in Fig. 6 above, reverse the screw eye back out, then force full-strength glue into the hole. Coat the threads with glue, then re-thread the screw eye into the hole. Do not wipe away the excess glue. Let this dry in an inverted position (screw eye up) while the glue dries.

- **Step 40** Apply thinned filler compound to the surface of the nose cone. Do not get any filler on the shoulder area. Allow this to dry a full day, then sand with 220-grit paper.

Tack-rag the dust and inspect for scratches, gouges, or voids. Repeat this sequence as needed to achieve a smooth, unblemished surface.

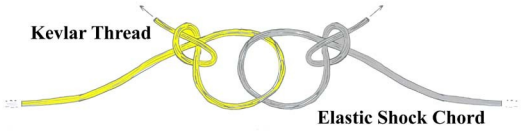


Figure 7

- **Step 41** Tie a slip knot with about a 1" loop at the free end of the Kevlar thread. Run the elastic shock chord through this loop, and tie a slip knot in the elastic as shown in Fig. 7 above, trapping the Kevlar loop. Pull both knots tightly against each other, then apply a drop of thinned glue to the two knots to secure them. Allow to dry.

- **Step 42** Remove the four pieces of tape protecting the fin attachment areas from the body tube, and discard.

- **Step 43** Referring back to Fig. 1, in the same manner as you did for the fin tip pod tubes, use a large "T" pin to punch a series of holes along the fin alignment lines between the rear edge of the tube and the line drawn at 4", about 3/32" apart. This will actually help strengthen the attachment of the fin later. Apply a thin layer of glue to the four main fin alignment lines, forcing some glue into the pin holes. Allow these to dry about 20 minutes. This forms the foundation layers for what is known as a "double-glue joint".

- **Step 44** Remove the two pieces of tape protecting the launch lug attachment areas from the body tube, and discard. Apply a thin layer of glue to these areas and allow to dry. Apply a thin layer of glue to the two launch lugs as well, and allow to dry.

- **Step 45** Remove the eight pieces of tape protecting the reactor vane attachment areas from the body tube, and discard. Apply a thin layer of glue to these areas and allow to dry. Cut eight more pieces of masking tape, 1/16" wide and 4.75" long, and reapply over these areas to protect the glue layer for a later step.

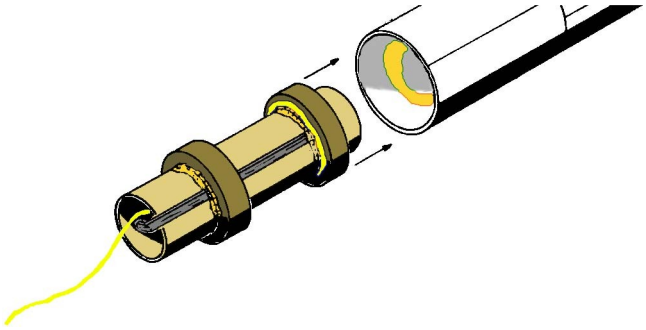


Figure 8

- **Step 46** Pull the Kevlar thread down through the center of the motor mount from the top. As shown in Fig. 8 above, apply a generous bead of glue around the inside of the main body tube, about 2" up from the rear edge. Spread this around with a brush. With one continuous motion, not stopping during the process, insert the motor mount into the main body tube and push forward through the glue until the rear edge of the motor tube is even with the rear edge of the body tube. Do not stop the push during this step as it will allow the glue to "freeze" the mount in the wrong place. Set the body tube in an upright position for about an hour while the glue dries.

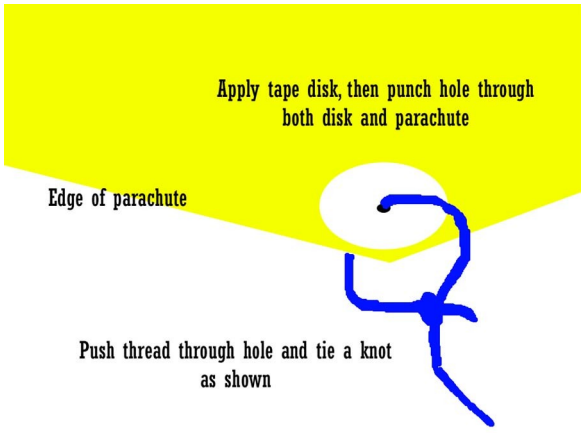


Figure 9

- **Step 47** If you are using a pre-assembled parachute, skip to the next step. Assemble the parachute as shown in its included instructions, but modify the shroud attachment method as shown in Fig. 9 above.

- **Step 48** Gather the shroud lines together and attach them to the swivel end of one of the snap links. Attach the swivel end of the remaining snap link to the free end of the elastic shock chord. Apply a drop of thinned glue to these knots to secure them, and allow to dry. Do not attach the parachute to the nose cone, or store it in the body tube at this time.

- **Step 49** Pull the elastic shock chord and the excess length of the Kevlar thread back through the motor tube and out the front end of the main body tube.

- **Step 50** Attach the snap link of the shock chord to the screw eye in the base of the nose cone. Push the shock chord back into the body tube, and insert the nose cone into the tube.

Main Fins and Fin Tip Pods

- **Step 51** Remove the small end pieces from the rear of the fin alignment tool. Remove the scrap piece of BT-50 from the front end pieces. Slide the alignment tool down from the top of the main body tube, such that the six BT-3 tubes are pointed toward the rear of the model. Rotate the tool so that the gap between the tubes is aligned directly over the fin attachment areas.

- **Step 52** Apply a second layer of glue to the one fin attachment area directly below the tool, and to the root edge of one main fin. Slide the fin into the gap between the guide tubes, and press the fin against the body tube with the trailing edge touching the rear edge of the body tube, and the leading edge touching the line at 4". Slide the short end pieces onto the six guide tubes to firmly clamp the fin in place. Make any adjustments to the position of the fin while the glue is still wet. Use a moist brush to remove the excess glue from the joint, and to smooth out the remaining glue into a fillet. Allow about 20 minutes to dry. Remove the short end pieces, then slide the guide forward just enough to clear the leading edges of the fin. Rotate the guide, and repeat this sequence for each of the remaining three main fins.

- **Step 53** Remove the strip of tape from one of the pods. Mix up a small quantity of 20-minute epoxy. Apply a very thin layer of epoxy to the tip edge of one main fin, and to the exposed area on the pod. Force some of the epoxy into the holes. Attach the pod to the fin tip, with the longer cone pointing toward the front. Slide one of the pod alignment guides from the rear over the pod, with the fin in the slot. Do the same with a second guide from the front. Wipe away any excess epoxy that squeezes out from the joint, but do not get any epoxy on the guides. Allow at least two hours for the epoxy to cure before removing the guides. Repeat this sequence for the remaining three pods.

Finishing

- **Step 54** Inspect the main body, fins, and pods for glue ridges or other imperfections that might show through the primer. Sand, apply filler, let dry, and sand again as needed to achieve a level of surface finish you are satisfied with.

- **Step 55** Apply glue to the two launch lug attachment areas, and to the two launch lugs, then attach the lugs to the body tube. Sight down the two lugs and adjust them as needed until they are parallel to the tube and in-line with each other. Wipe away the excess glue with a moist brush, being careful not to disturb the position of the lugs. Allow to dry.

- **Step 56** When all of the glue joints have dried completely, apply a second fillet of glue to all of the non-epoxy joints, and smooth this into a fillet with your finger. This will reinforce the joint against flight stresses. Allow to dry.

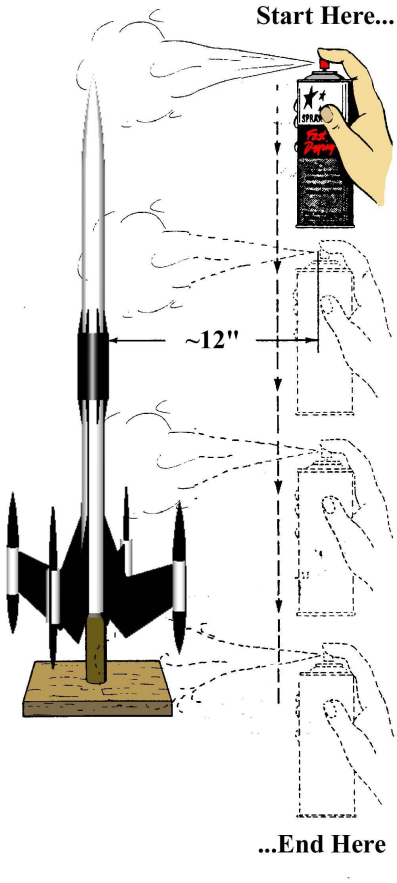


Figure 10

- **Step 57** The illustration in Fig. 10 above shows the best method for spraying the model, for primers, paints, or gloss coats. It is also the best method regardless of the type of spray used, aerosol or airbrush. Always spray the model in a top-down fashion, with the spray starting above the model and ending below the model, to reduce the chances for splattering.

  BARCLONE suggests using either ***Rust-O-Leum White Clean Bare Metal Primer***, or ***Krylon White H2O Primer***, as these both sand well. Spray at least two complete coats of primer before sanding the first time, allowing two days of drying time after each coat. If using a solvent-based primer, there should be no odor remaining. Sand the first coat with 220-grit paper until the all the surfaces appear sealed. Tack-rag the model and inspect the surfaces for voids and scratches. Repeat this sequence, one coat at a time, until all of these imperfections have been rendered unnoticeable.

- **Step 58** The BARCLONE suggested color scheme is an overall white, with black main fins, fin tip pod cones, reactor shroud, and cooling fins. Refer to the painting guide on page 5. If you use a bright white primer, you only need to mask off for the trim color. With a flat white primer, we recommend the use of acrylic artists paint thinned with airbrush medium and water. This paint will dry flat, and there are no solvent fumes to deal with. You should allow at least two full days before masking over the white, to prevent the tape from lifting the white when it is removed.

Installing Reactor Shroud

- **Step 59** Remove and discard the eight pieces of tape protecting the reactor vane attachment areas on the main body. You may need to use the tip of a #11 knife to assist in lifting a corner of the tape.

- **Step 60** Remove and discard the eight pieces of masking tape protecting the root edges of the reactor vanes.

- **Step 61** Slide the reactor shroud down from the front of the model carefully so as not to scar the finish. Position and align the root edges of the cooling vanes directly over the exposed bare surface areas. Make adjustments in the root edges as needed to eliminate binding, but be careful not to remove too much material and cause the vanes to be loose. When the vanes are correctly positioned, apply thinned white glue with a pipette or a keen-pointed brush to both sides of the vane-to-body-tube joints. Allow to dry. The white glue will dry clear, and will be nearly invisible.

- **Step 62** When there are no more solvent fumes, or when the paint has dried for a full two or three days, spray the model with a clear gloss coat. BARCLONE recommends ***Future Floor Finish***, as this product does not use harsh solvents which can destroy an otherwise great paint job. Allow at least two days for the gloss coat to dry.

Preflight Sequence

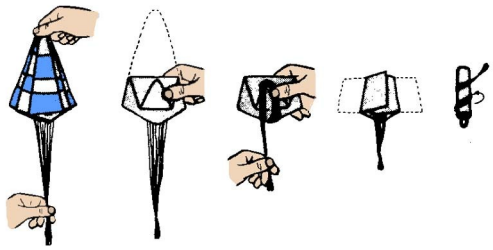


Figure 11

- **Step 63** Fold or roll the parachute in a manner similar to the illustration in Fig. 11 above. You may find that a light dusting of talcum powder will help the parachute open easier, especially in cold weather, or cold climates. Do not make the parachute bundle too tight.

- **Step 64** Remove the nose cone from the body tube. Attach the snap links of the parachute and the shock chord to the screw eye.

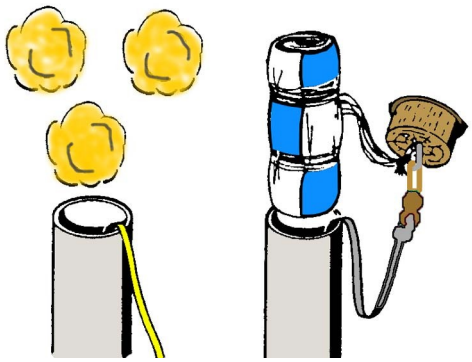


Figure 12

- **Step 65** As shown in Fig. 12 above, push at least 3" of flame-resistant recovery wadding, either crumpled sheets or loose cellulose fill, into the body tube and down to the motor using a 3/4" dowel. Do not pack this material tightly! The wadding must be blown out of the model to recover successfully. You are only trying to create a gas seal and a particulate block to protect the parachute with this material. Next, push the shock chord and the Kevlar thread down on top of the wadding. Insert the rolled or folded parachute on top of the shock chord, making sure the parachute is at least 2" below the edge of the tube. Finally, insert the nose cone.

- **Step 66** The BARCLONE Antares is not a high-performance model, therefore you will not achieve the same altitudes with this design that you might otherwise reach with lower-drag model. We have selected a set of two motors that provide nice, visible flights and which allow for safe same-field recovery. We do not recommend any other motor(s) at this time.

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B6-4......285'......16.3 FPS Dv
C6-5......700'......11.3 FPS Dv
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- **Step 67** Review the Model Rocket Safety Guide at the end of this guide, then go fly!

Developed for BARCLONE Rocketry by C. P. McGraw

Model Rocket Safety Code

Materials: I will use only lightweight, non-metal parts for the nose cone, body, and fins of my rockets.

Motors: I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

Ignition System: I will launch my rockets with an electrical launch system and electrical motor ignitors. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

Misfires: If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock, or disconnect it's battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

Launch Safety: I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 15 feet away when I launch rockets with "D" motors or smaller, and 30 feet when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them to a safe distance.

Launcher: I will launch my rockets from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or I will cap the end of the rod when it is not in use.

Size: My model rocket will not weigh more than 1,500 grams (53 oz) at liftoff, and will not contain more than 125 grams (4.4 oz) of propellant or 320 N-sec (71.9 lb-sec) of total impulse. If my model weighs more than one pound (453 grams) at liftoff, or has more than four ounces (113 grams) of propellant, I will check and comply with Federal Aviation Administration (FAA) regulations before flying.

Flight Safety: I will not launch my rockets at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload into my rockets.

Launch Site: I will launch my rockets outdoors, in an open area at least as large as shown below, and in safe weather conditions with winds speeds no greater than 20 MPH. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

LAUNCH SITE DIMENSIONS

Total Impulse (nSec)	Motor Size	Minimum Field Size
0.00 – 1.25	*1/4A – 1/2A*	*50'*
1.26 – 2.50	*A*	*100'*
2.51 – 5.00	*B*	*200'*
5.01 – 10.00	*C*	*400'*
10.01 – 20.00	*D*	*500'*
20.01 – 160.00	*E, F, G*	*1000'*
160.01 – 320.00	*2G*	*1500'*

Recovery System: I will use a recovery system, such as a streamer or parachute, in my rockets so that they return safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rockets.

Recovery Safety: I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

Model Rocket Safety Code
developed by the
National Association of Rocketry
Revised Code November, 2004