Model Rocket Safety Code

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

2. 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.

3. Ignition System. I will launch my rockets with an electrical launch system and electrical motor igniters. 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.

4. 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 its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

5. 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 away to a safe distance.

6. Launcher. I will launch my rocket 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 will cap the end of the rod when it is not in use.

7. Size. My model rocket will not weigh more than 1,500 grams (53 ounces) at liftoff and will not contain more than 125 grams (4.4 ounces) of propellant or 320 N-sec (71.9 pound-seconds) of total impulse. If my model rocket 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 regulations before flying.

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

9. Launch Site. I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 20 miles per hour. 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.

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

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

LAUNCH SITE DIMENSIONS

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00 — 1.25	1/4A	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 — 40.00	E	1000
40.01 — 80.00	F	1000
80.01 — 160.00	G	1000
160.01 — 320.00	2 Gs	1500

Made in the U.S.A by Semroc Astronautics Corporation - Knightdale, N.C. 27545

SLS Brighton™

Kit No. KA-9

Specifications	
Body Diameter	2.64" (6.7 cm)
Length	39.6" (100.6 cm)
Fin Span	9.7" (24.6 cm)
Net Weight	11.6 oz. (329.2g)

Engine	Approx. Altitude
Four C6-5	650'
Three D12-5	1000'
E15W-4	850'
H97J-M	2800'

Nylon Parachute Recovery

What is SLS™?

SLS™ is short for Semroc Large-Scale Rocketry. Based on the original Centuri Large Scale Line using larger, thicker-walled body tubes, Semroc is introducing several models in the Mid-Power range. Most of the models will fly on 24mm and 29mm engines in the C through G (and small H) impulse levels. Featured in the family are laser-cut basswood fins, Nylon chutes, and laser-slotted tubes allowing much more robust construction designed to last for years of flying.

About Semroc Astronautics Corporation

Semroc Astronautics Corporation was started by Carl McLawhorn in his college dorm at North Carolina State University in November, 1967. Convincing a small group of investors in his home town of Ayden, North Carolina to invest in a small corporation, the company was re-incorporated as Semroc Astronautics Corporation on December 31, 1969.

Semroc produced a full line of model rocket kits and engines. At its peak, Semroc had twenty-five full time employees working at two facilities. One was for research and development, printing, shipping, and administration. The other was outside town and handled all production and model rocket engine manufacturing. For several years, Semroc was successful selling model rocket kits, supplies, and engines by mail-order and in hobby shops. In early 1971, Semroc became insolvent and had to close its doors.

After 31 years of dreams and preparations, Semroc Astronautics Corporation was reincorporated on April 2, 2002 with a strong commitment to helping put the fun back into model rocketry.

October 9, 2008
July 1, 2009 Re-release

LIMITATION OF LIABILITY

Model rockets are not toys, but are functional rockets made of lightweight materials and are launched with NAR or Tripoli safety certified model rocket engines, electrically ignited and flown in accordance with the NAR Model Rocket Safety Code. If misused, model rockets can cause serious injury and property damage. Semroc certifies that it has exercised reasonable diligence in the design and manufacture of its products. Semroc cannot assume any liability for the storage, transportation, or usage of its products. Semroc shall not be held responsible for any personal injury or property damage whatsoever arising out of the handling, storage, use, or misuse of our products. The buyer assumes all risks and liabilities therefrom and accepts and uses Semroc products on these conditions.

Your purchase and use of any Semroc products is construed as your agreement to and acceptance of these terms. If you do not agree to these terms and conditions, you must return the product, unused, for refund or credit.

100% SATISFACTION GUARANTEE

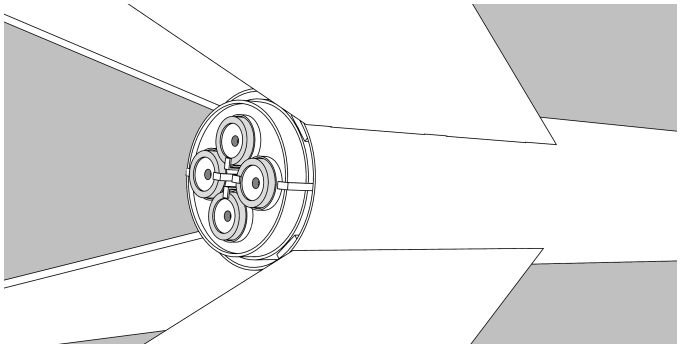
If you are not 100% satisfied with your Semroc product, we will make it right by providing whatever you consider fair, from refund to replacement.

Contact us at:

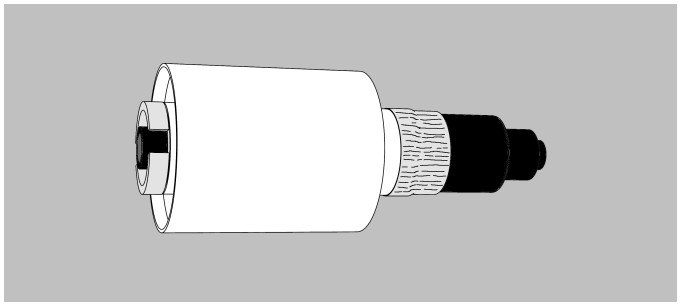
Semroc Astronautics Corporation
Customer Service Department
P.O. Box 1271
Knightdale, North Carolina 27545

JOIN THE NAR!

Sign up online at www.nar.org to join the premier model rocketry organization. Semroc fully supports the National Association of Rocketry and recognizes it as the sport's official voice. The NAR is the oldest and largest sport rocketry organization in the world. Since 1957 over 80,000 serious sport rocket modelers have joined the NAR to take advantage of the fun and excitement of organized rocketry. It is always more fun if you fly with friends. The *Sport Rocketry* magazine is one of the best ways to keep informed of new developments in the hobby. Check online at www.semroc.com/nar for promotions just for NAR members.



❑ **56.** When using the 29mm casings, apply a band of tape around the top of the engine before installing the engine mount in the rocket..



❑ **57.** Pack the recovery wadding from the top of the body tube. Use a sufficient quantity to protect the parachute, but not too much that there is no room left for the recovery system.

❑ **58.** Fold the parachute and pack it and the shock cord on top of the recovery wadding. Slide the payload section into place, making sure it does not pinch the shock cord or parachute.

❑ **59.** Refer to the model rocket engine manufacturer's instructions to complete the engine prepping. Different engines have different igniters and methods of hooking them up to the launch controllers.

❑ **60.** Carefully check all parts of your rocket before each flight as a part of your pre-flight checklist. Launch the SLS Brighton™ from a 1/4" diameter by 48" long or longer launch rod.

❑ **61.** After each flight, remove the engine mount and clean it thoroughly for many hours of fun flying with your SLS Brighton™!

About the SLS Brighton™

The Estes Ranger was the first commercial cluster payload model rocket kit. The Ranger was designed by Vern Estes using a cluster of three BT-20 engine tubes in the new BT-60 body tube. Using a fin shape similar to the upper stage of the previously released Apogee, the Ranger become one of the most recognized designs from the early years. The Ranger was released in 1962 as Estes Cat. # K-6 and sold for $3.75.

The Semroc SLS Brighton™ is an approximate 161% upscale of the Ranger with many added features. It uses precision laser-cut basswood fins in a pre-slotted heavy-duty body tube. An internal structure provides for strong fin mounting and a holder for three included interchangeable engine mounts. The mounts will accommodate four 18 mm engines, three 24 mm engines, or a single 24 mm or 29 mm engine. An internal ejection baffle protects the 24" nylon chute that is attached with a long durable elastic cord. A large payload section is provided with a precision turned balsa nose cone.

BEFORE YOU START!

Make sure you have all the parts included in this kit that are listed in the Parts List in the center of these instructions. In addition to the parts included in this kit, you will also need the tools and materials listed below. Read the entire instructions before beginning to assemble your rocket. When you are thoroughly familiar with these instructions, begin construction. Read each step and study the accompanying drawings. Check off each step as it is completed. In each step, test-fit the parts together before applying any glue. It is sometimes necessary to sand lightly or build-up some parts to obtain a precision fit. If you are uncertain of the location of some parts, refer to the exploded view in the center of these instructions. It is important that you always ensure that you have adequate glue joints.

TOOLS: In addition to the parts supplied, you will need the following tools to assemble and finish this kit. Masking tape will also be needed.

ASSEMBLY

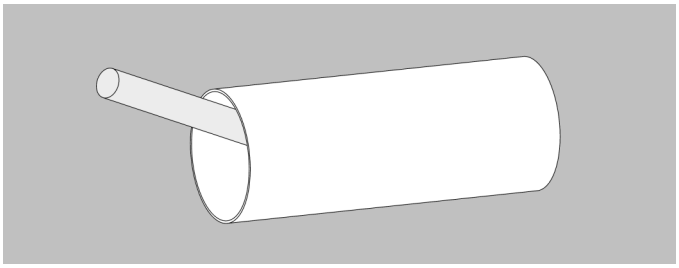
❑ **1.** These instructions are presented in a logical order to help you put your SLS Brighton™ together quickly and efficiently. Check off each step as you complete it and we hope you enjoy putting this kit together and flying it.

HIGH POWER?

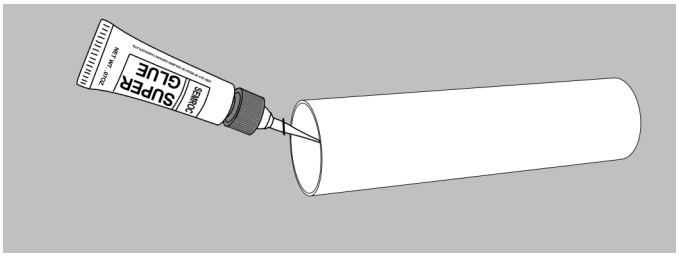
Note: This kit can be built to fly low power, mid -power, or high power. That does not mean it is built the same for all three. If you plan on launching it on engines with less than 70 Newtons of average thrust, it can be built with yellow glue. If it will be flown using higher thrust engines, it should be built with epoxy and all the joints should be well-filleted. Fiberglass should be used on internal rings for maximum strength.

TUBE PREPARATION

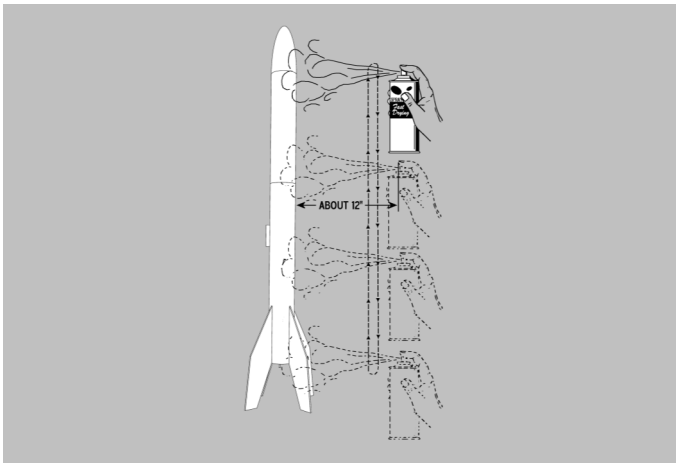
❑ **2.** Using a smooth hard object, like a piece of plastic tubing or large pen, slightly flare the inside of all the large tubes. Do not flare them so much that the outside edge is larger than the rest of the tube.



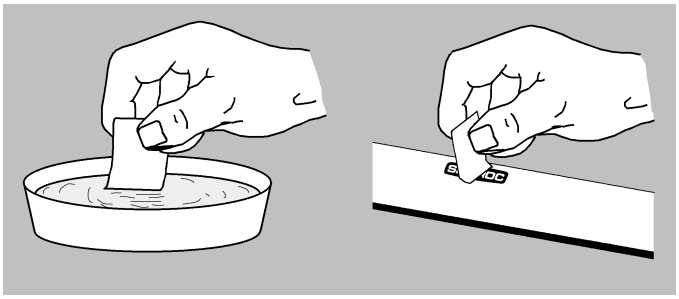
❑ **3.** The ends of all the tubes should be "hardened" with very thin Cyanoacrylate glue (CA). Start at one point along the edge of each tube and slowly and evenly wick the CA into the end layers of the tube. Wipe off any CA that runs on the outside or inside of the tube. Allow to completely dry.



❑ **53.** Spray painting your model with a fast-drying enamel will produce the best results. PATIENCE…is the most important ingredient. Use several thin coats, allowing each coat to completely dry before the next coat. Start each spray a few inches above the model and end a few inches below the model. Keep the can about 12" away and use quick light coats. The final coat can be a little heavier to give the model a glossy wet-looking finish.



❑ **54.** After the paint has dried, decals should be applied. The decals supplied with the SLS Brighton™ are waterslide decals. Add a drop of detergent to the water to make the decals easier to slide into place. Each decal should be cut separately from the sheet.

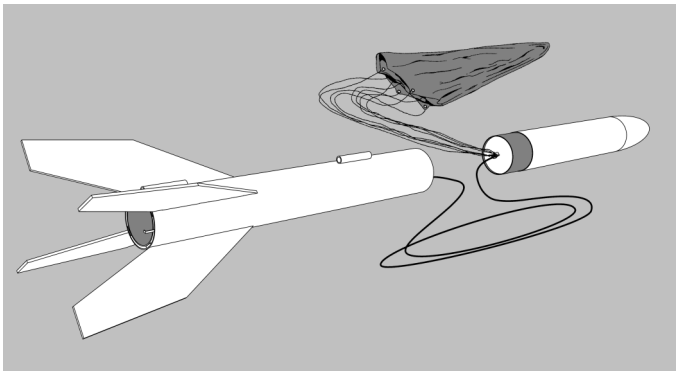


FLIGHT PREPPING

❑ **55.** Three interchangeable mounts and the 24 mm adapter provide the choice of a large range of engines to be used in the SLS Brighton™. From four C6-5's up to a single H-impulse are possible. When using clusters, make sure they are all the same type engine and the tops of the engines are stuffed with flameproof wadding to prevent "top-lighting." Make sure all engines are secure and the engine mount is securely clipped in the rocket. Wrap tape around the base of the mount to hold the clips firmly against the engine mount.

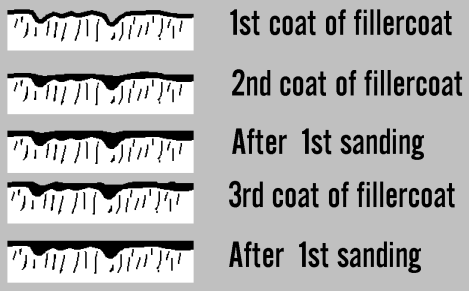
ATTACH PARACHUTE

❑ **50.** Tie the free end of the elastic cord securely to the screw eye in the payload section. Attach the pre-assembled Nylon chute to the screw eye. Make sure all the lines are the same length. When using a payload, the included chute is not large enough to handle any extra weight. Add an additional chute (not supplied) to the payload section and tie the shock cord directly to the supplied 24" Nylon chute. Depending on the weight of the payload, the additional chute should be from about 14" for a two ounce payload to 24" for an eight ounce payload.



FINISHING

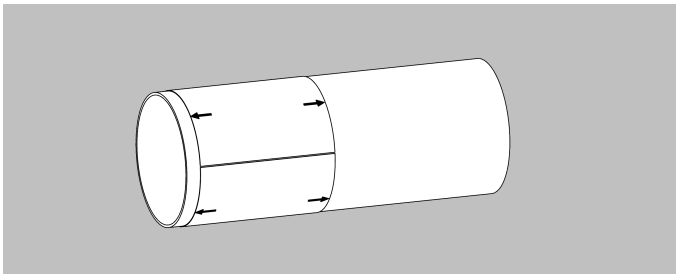
❑ **51.** When the fillets have dried, prepare balsa and basswood surfaces for a smooth professional looking finish. Fill the wood grain with diluted Fill n' Finish or sanding sealer. When dry, sand with fine sandpaper. Repeat until smooth.



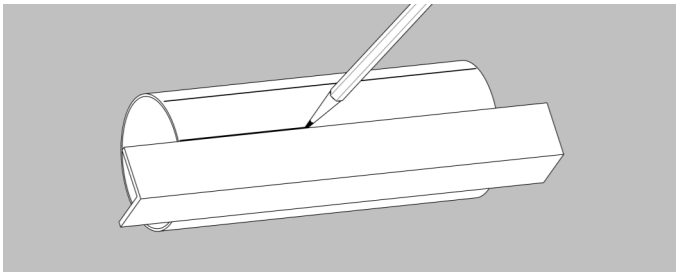
❑ **52.** After all balsa and basswood surfaces have been prepared, wipe off all dust with a dry cloth. First spray the model with an enamel primer. Choose a high visibility color combination like white and yellow for the final color. One of the original Rangers was painted fluorescent magenta as depicted on the front cover.

MOUNT HOLDER

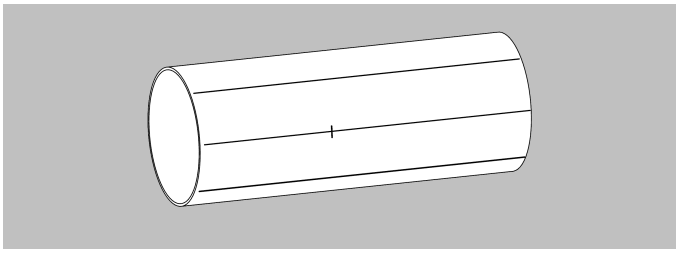
❑ **4.** Cut out the marking guide and wrap it around one end of the engine mount holder tube (LT-22560). Use a piece of tape to hold it in place. Place a mark at each of the arrows. Mark the engine hook lines with EH.



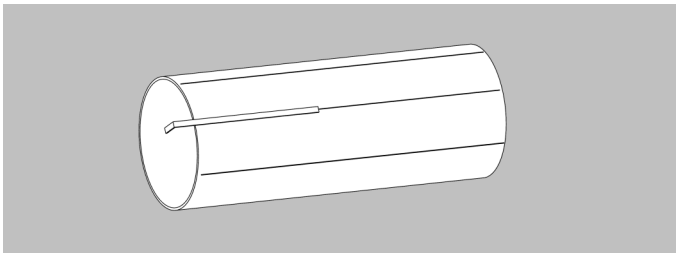
❑ **5.** Use a drawer or piece of molding to connect the marks. Extend the lines for the length of the tube.



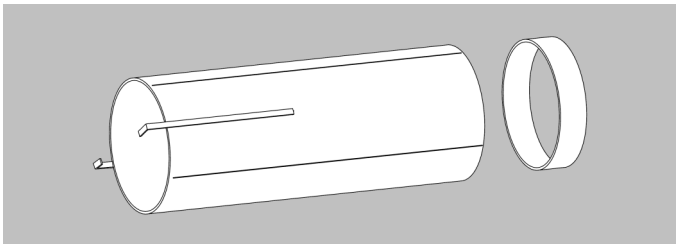
❑ **6.** Place a mark 2-1/2" from one end of the tube on both of the EH lines. This will be the bottom of the mount holder.



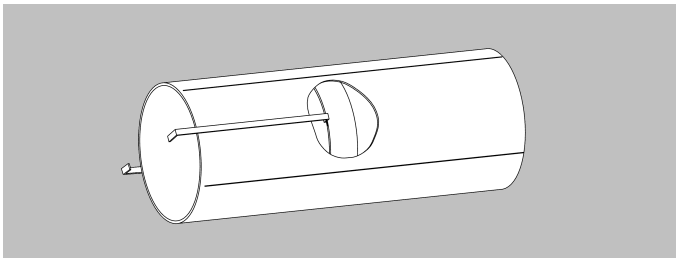
❑ **7.** Using a hobby knife, slot the tube on one of the marks about 1/8" long. Locate the two special engine hooks (EH-28L) that have different length hooks. Insert the end with the shortest hook in the slot and hold in place with a piece of tape. Do not glue at this time. Repeat on the opposite side with the second special engine hook.



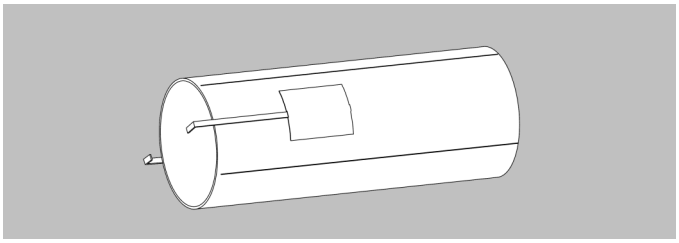
❑ **8.** From the top end (opposite the engine hooks, insert the engine mount thrust ring (BTN-70-05).



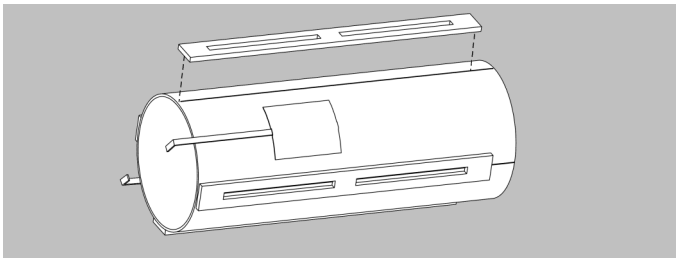
❑ **9.** Slide the ring into place until it just touches the top of the engine hooks as shown in the cutaway view below. Use the engine mount tubes (BTH-70-28) to help push the ring into place, then remove them. Apply a bead of glue around the top edge of the thrust ring. Coat the inside of the engine mount holder with a generous coat of glue to help protect it from the ejection gasses.



❑ **10.** Cut out the engine hook covers from the pattern sheet. Apply a generous bead of glue to one side of a cover and apply over the top section of one of the engine hooks. Press it tightly against the hook. When it is dry, apply a coating of glue around the outside and edges. Allow to dry. Repeat on the other engine hook.

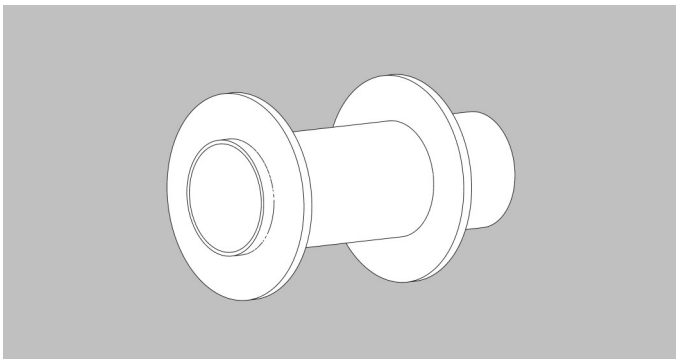


❑ **11.** Using CA, tack the fin strips (FA-9S) along the lines and even with the bottom of the tube. Make sure the cutout sections are exactly centered on the lines. **This is critical.**

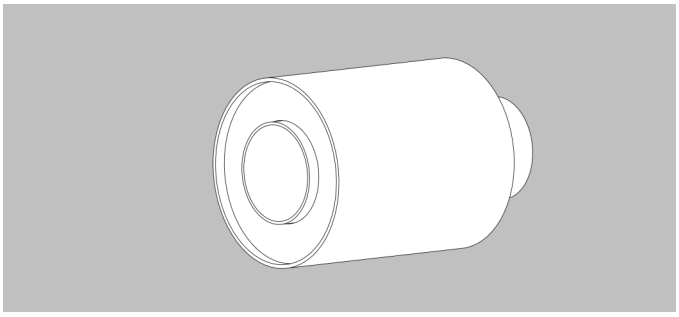


29 mm ENGINE MOUNT

❑ **47.** Slide the two remaining plywood rings over the 29mm engine tube. Place the bottom ring 1/8" from one end and the top ring 1" from the opposite end. Apply a fillet of glue around each ring-tube joint. Turn the assembly while the glue is drying to get a uniform fillet.

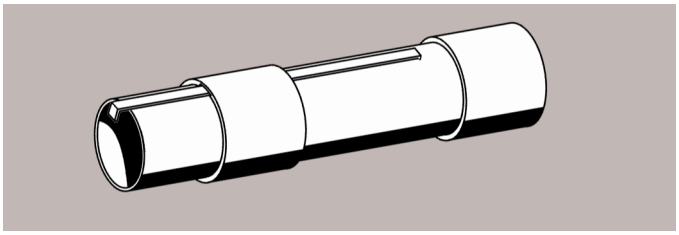


❑ **48.** Slide the last engine mount tube over the 29mm engine tube assembly until it is even with the bottom of the engine tube (the 1/8" end.) Apply a bead of glue around the joint formed by the engine holder tube and the plywood rings. Allow to dry.

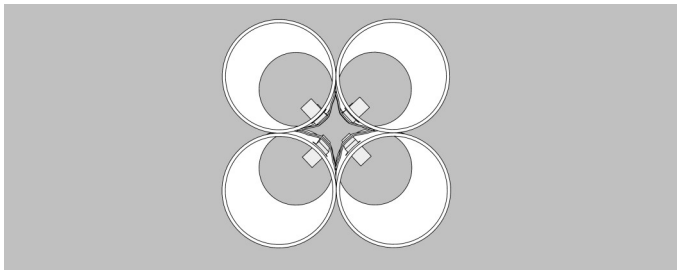


24 mm ENGINE MOUNT

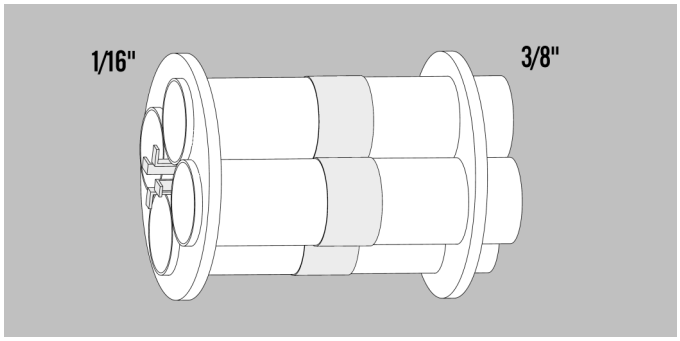
❑ **49.** Follow the instructions included with the EM-9115 Engine Mount kit to build the adapter. Allow it to dry thoroughly.



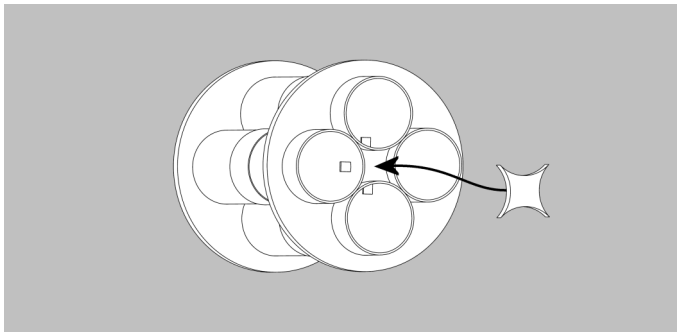
Watch for new engine mounts in the future!



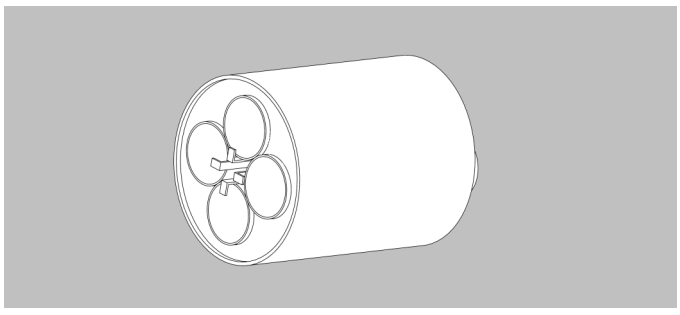
❑ **44.** Slide a plywood ring over each end of the assembly. Offset the ring nearest the bottom 1/16" and the top 3/8".



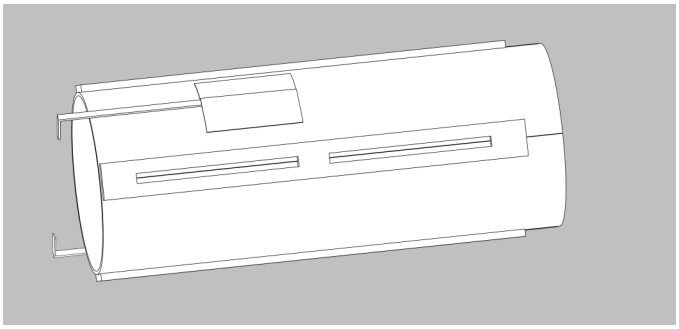
❑ **45.** Attach one of the small plywood "diamonds" on the top center section between the four tubes. Apply a bead of glue around all joints. **Keep glue off the outside of the plywood rings.**



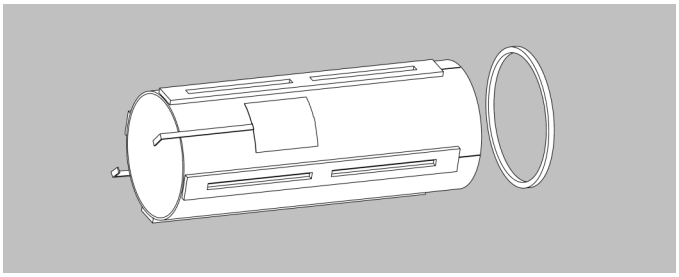
❑ **46.** Slide the engine mount tube over the quad engine tube assembly until it is even with the engine tubes. Apply glue to the joints of the tubes and the plywood ring, keeping glue away from the engine hooks and the outside of the engine mount tube. Apply a bead of glue around the joint formed by the engine holder tube and the plywood rings. Allow to dry.



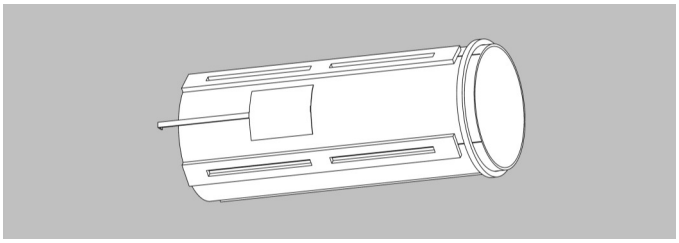
❑ **12.** Sand the edges of the strips to fit the contour of the main body tube (BTH-80-185S4). Check the assembly for fit and make sure the slots in the tube align with the slots in the basswood strips. If they do not align, break the strip loose and tack it into place and retry for correct fit. When a satisfactory fit is achieved, run a fillet of glue along each edge of each strip. Keep glue out of the slots.



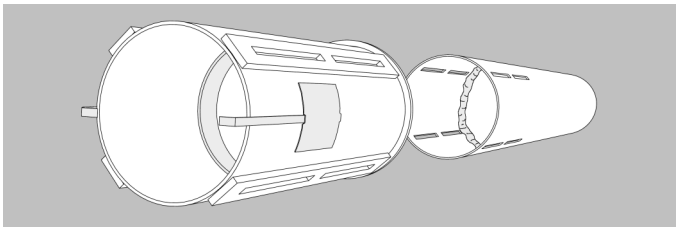
❑ **13.** Check the front seal ring for fit on the mount assembly and inside the main body tube. Sand if necessary to get a good fit.



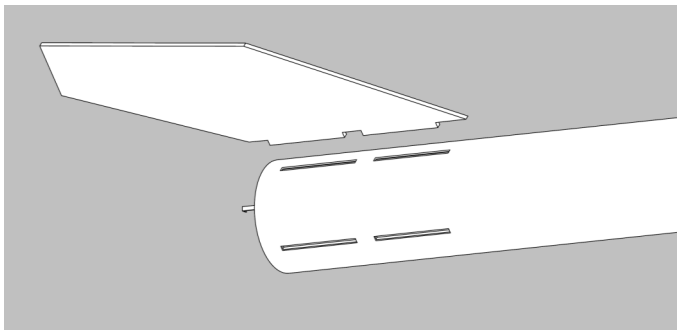
❑ **14.** Align the ring about 1/16" from the top of the mount assembly tube and apply a bead of glue around the edges. Keep glue off the outside of the ring and the surfaces of the basswood strips.



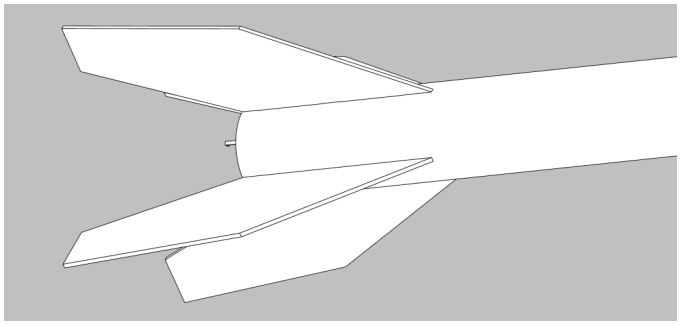
❑ **15.** Apply a bead of glue inside the main body tube just beyond the top of the slots. Insert the mount assembly and align the slots. Slide it in until the bottom of the mount assembly is even with the end of the main body tube..



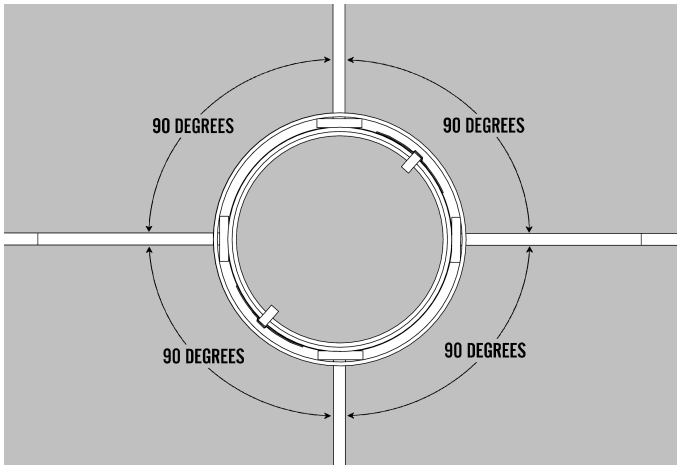
❑ **16.** Check all four fins for fit in the slots in the main body tube.. These are close tolerance so the fins will be supported well. It may be necessary to bevel the root edge slightly for easier insertion. A small piece of sandpaper or a nail file will help with the fit. The basswood slots must be trimmed if they interfere with the fit.

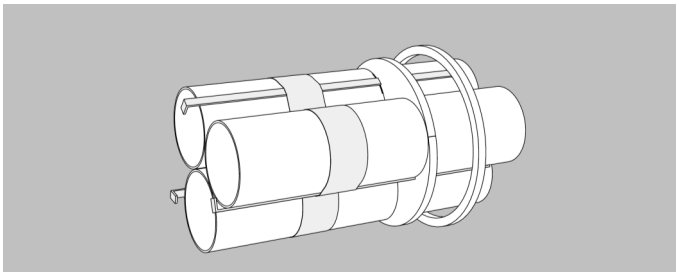


❑ **17.** Apply a bead of glue inside of one slot and on the root edge of a fin. Glue it in place making sure it is seated and is perpendicular to the main body tube. Repeat for the other three fins. Allow to dry in a vertical position.

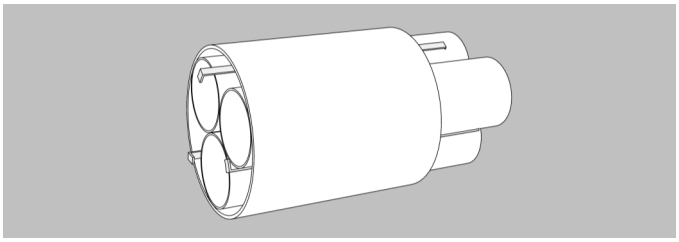


❑ **18.** Sight down the end of the tube and make sure all fins are at 90 degree (right) angles to adjacent fins.



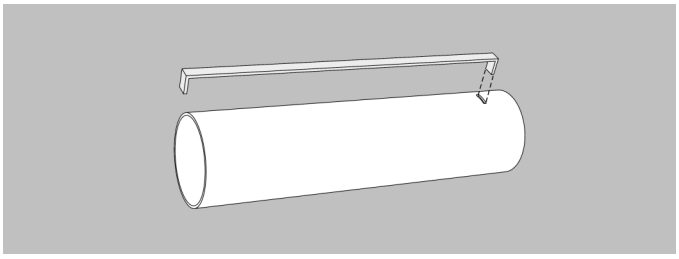


❑ **40.** Slide the engine mount tube over the engine tube assembly until it is even with the engine tubes. Apply glue to the joints and on top of the plywood ring, keeping glue away from the engine hooks and the outside of the engine mount tube.

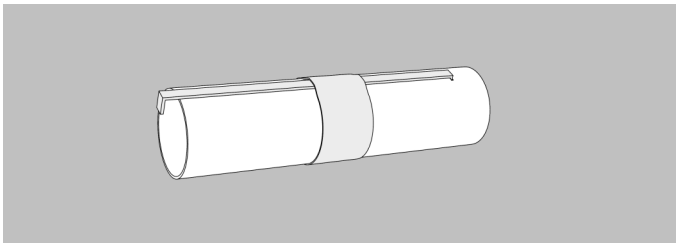


QUAD 18 mm ENGINE MOUNT

❑ **41.** Locate the four 18 mm engine tubes (ST-730E). These are 3″ long. Insert one end of a short engine hook (EH-28) into the pre-punched slit in the engine tube.

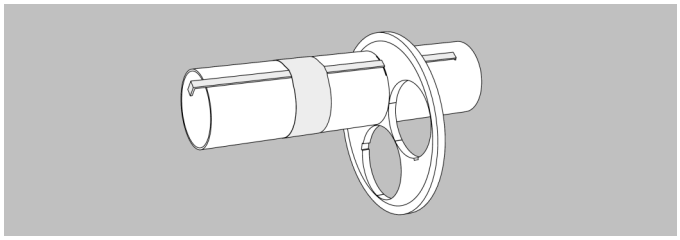


❑ **42.** Wrap a piece of masking tape around the tube about halfway between the slit and the opposite end of the engine tube. Apply a bead of glue between the slit and the masking tape. Prepare the other three engine tubes in a similar fashion.

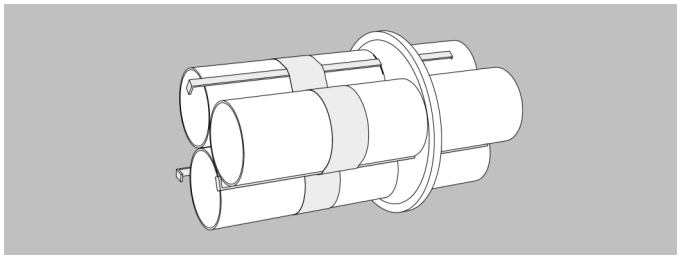


❑ **43.** Group the four engine mount tubes together as shown. All the engine hooks should be in the inside cavity. A small amount of glue should be used on the joints to hold the tubes together.

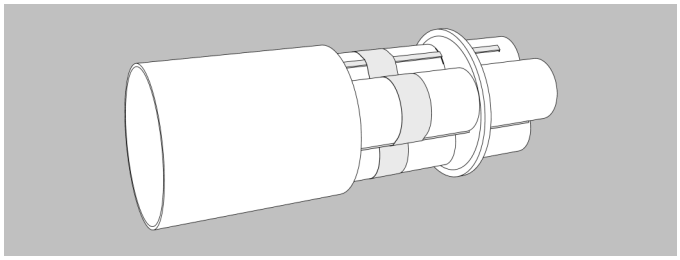
❑ **36.** Insert the top end of one of the engine tubes into the large plywood ring having three holes. Do not break off the outer ring yet! It will hold the assembly together during the next few steps, then it will be discarded. Align the engine hook in the slot. Position it so the mark just shows on the side closest to the masking tape.



❑ **37.** Repeat with the other two engine tubes. Each engine hook should be in their corresponding slot and ends of the tubes should be even. Do not glue anything yet.



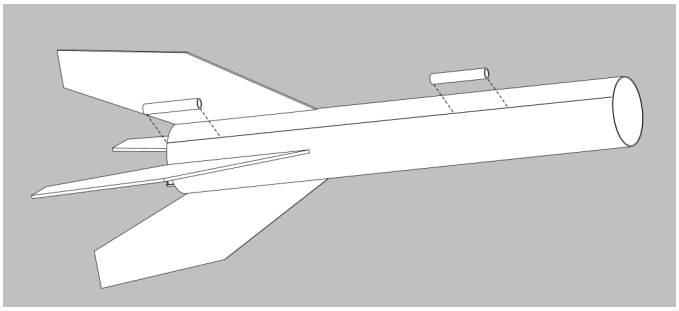
❑ **38.** Slide one of the engine mount tubes (BTH-70-28) over the bottom of the mount just enough to hold the engine tubes together. Apply fillets of glue around each joint formed by the engine tubes and the plywood ring. Keep glue away from the outer plywood ring and the engine mount tube. Apply a fillet between each pair of engine tubes. If the inside triangular piece falls out, reinsert it and glue it to the engine tubes. Allow to dry.



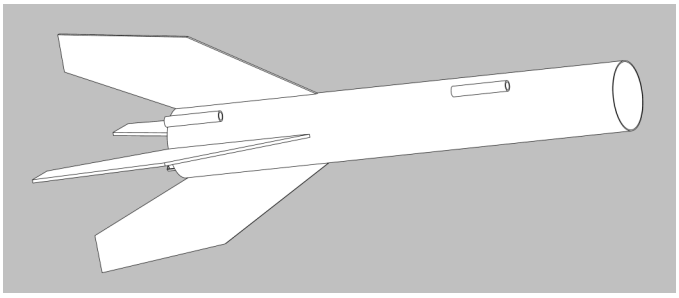
❑ **39.** When the assembly is dry, remove the engine mount tube and breakaway the temporary outer ring and discard. Sand the ring and check it for fit in the engine mount tube.

ATTACH LAUNCH LUGS

❑ **19.** Glue the bottom launch lug between two of the fins and even with the bottom of the main body tube. Glue the upper launch lug assembly in line with the bottom lug and about 3″ from the top of the tube. Sight down the tube to insure the launch lugs are parallel with the fins and in line with each other. Apply a bead of glue along the sides of both launch lugs.

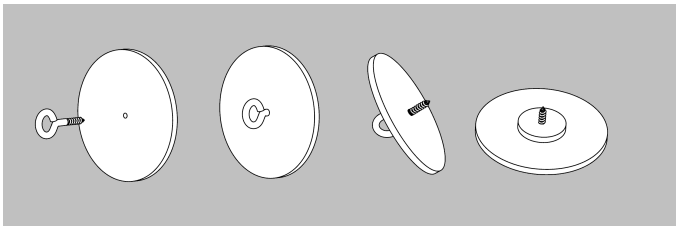


❑ **20.** Using your finger, apply fillets of glue along the fin-to-body tube joints and along each launch lug. Stand it on end, watching for runs. Allow the assembly to completely dry.

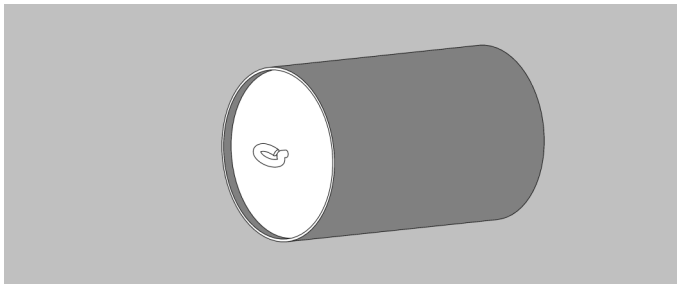


PAYLOAD ASSEMBLY

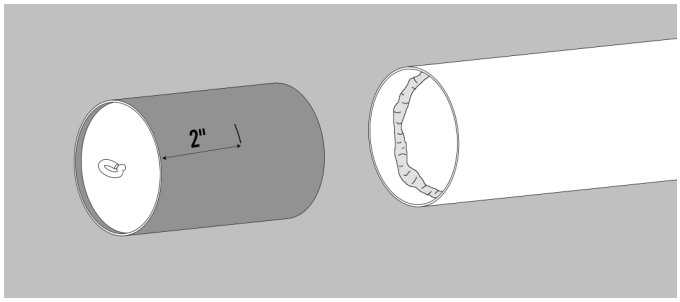
❑ **21.** Twist the screw eye into the center of the large plywood ring with one small hole until the threads just disappear. Locate the small 1″ diameter ring with the small hole in its center. Screw it onto the screw eye from the opposite side. Apply a generous bead of glue around the small ring and the threads of the screw eye. Allow to dry.



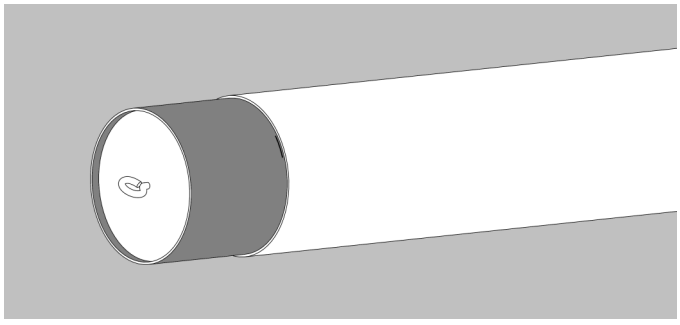
❑ **22.** Apply a bead of glue just inside one end of the large tube coupler (JT-80E). Insert the bulkhead assembly just completed into the coupler until it is about 1/8″ deep. Apply a bead of glue around the joint. Roll the assembly horizontally until the glue forms a fillet on both sides of the ring.



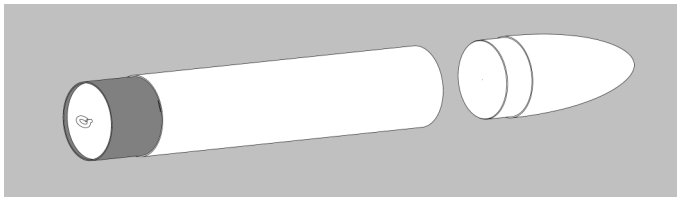
❑ **23.** Place a mark 2″ from the end of the tube coupler. Apply a bead of glue inside one end of the payload tube (BTH-80-115).



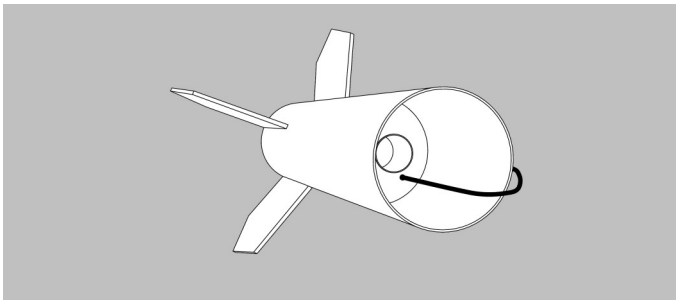
❑ **24.** Slide the tube coupler inside the payload tube until the mark is even with the end of the payload tube.



❑ **25.** Insert the nose cone (BNC-80HL) into the payload tube and check for fit. A small amount of sanding may be necessary. Make sure it is tightly fitted using masking tape if necessary. If a payload is added, screws or external tape may be required to secure the nose cone in flight.

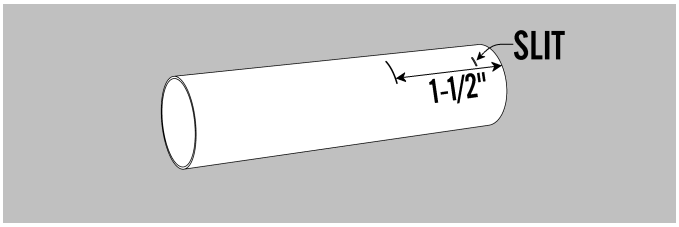


❑ **32.** Apply a generous bead of glue around the top ring of the ejection baffle.. Keep glue away from the elastic cord. Allow to dry.

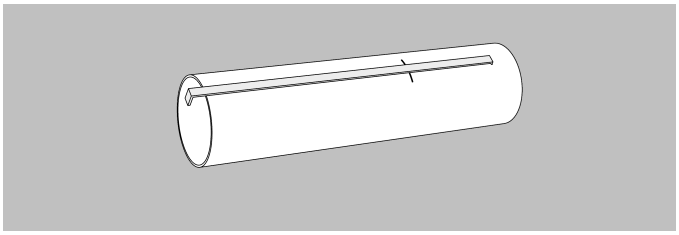


TRIPLE 24 mm ENGINE MOUNT

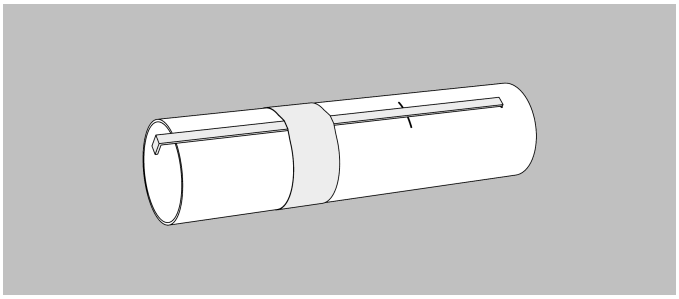
❑ **33.** Locate the three 24 mm engine tubes (ST-940E). These are 4″ long. Place a mark 1-1/2″ from the end of each tube near the pre-punched slit.



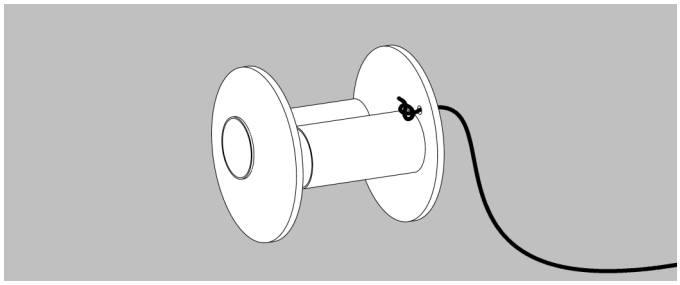
❑ **34.** Insert one end of a long engine hook (EH-38) into the pre-punched slit in the engine tube.



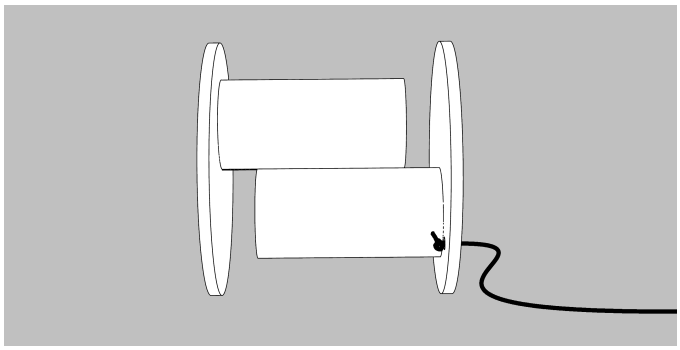
❑ **35.** Wrap a piece of masking tape around the tube about halfway between the mark and the opposite end of the engine tube. Apply a bead of glue between the slit and the masking tape. Prepare the other two engine tubes in a similar fashion.



❑ **29.** Tie a large knot in one end of the elastic cord. Thread it in the small hole in one of the baffle rings as shown. Slide the ring with the elastic cord over one end of the baffle tube leaving about 1/16" showing. **Do not glue yet!** Slide the second ring over the opposite end of the assembly leaving 1/16" overlap.

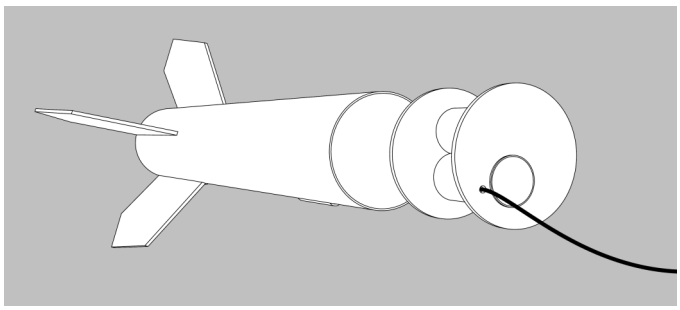


❑ **30.** Align the two rings so the assembly is symmetrical and rolls smoothly over a flat surface. When the assembly is aligned, apply fillets of glue over both sides of each ring along the tube joints. **Keep glue off the outside surface of each ring.** Set this assembly aside to dry.



ADD EJECTION BAFFLE

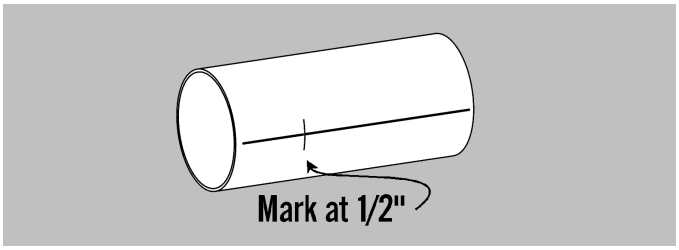
❑ **31.** Test fit the ejection baffle in the main tube. Sand the edges so it will slide freely in the main body tube. Apply a bead of glue about 6" inside the top of the main tube. Orient the baffle assembly so the elastic cord is at the top end. Slide the ejection baffle in the tube past the bead of glue until the top of the baffle is about 6" from the top of the tube. Rotate the main tube as the glue is drying so it does not pool in one place. Allow to dry completely.



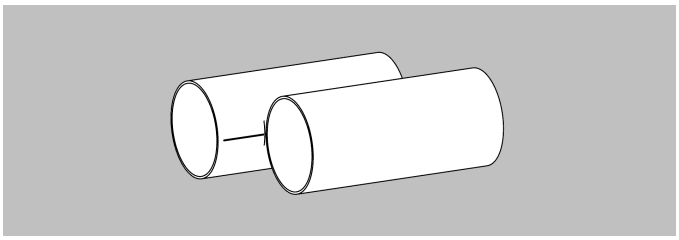
EJECTION BAFFLE

Note: An ejection baffle can be very convenient and helps protect the parachute, but it does add much constriction to the flow of the ejection gasses. If you do use the ejection baffle, you must ensure the engine mount is secured well or it will eject instead of the parachute and payload section. If you choose to not use the ejection baffle, you must secure the shock cord firmly to the side of the main body tube using epoxy.

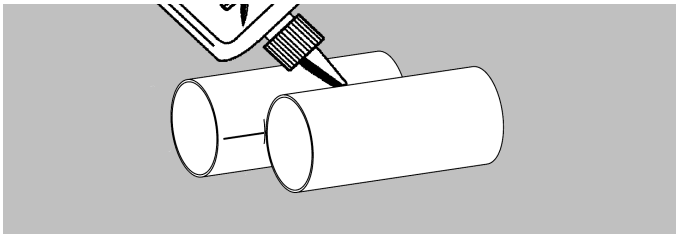
❑ **26.** Using a ruler, straight edge, or door jam, place a straight line on one of the two baffle tubes (ST-820). Place a mark on the line 1/2" from the end as shown.



❑ **27.** Apply a bead of glue along the marked line from the 1/2" mark to the far end. With both tubes on a flat surface, slide the second tube against the bead of glue and hold in place until the glue sets.



❑ **28.** After the glue is dry, apply additional fillets along both sides of the tube joints for strength. Since these tubes will absorb much of the heat of the ejection gases, apply a generous coating to the inside and outside of both tubes. Allow this assembly to dry.



Parts List

A	1	Balsa Nose Cone	BNC-80HL
B	1	Body Tube	BTH-80-115
C	1	Body Tube	BTH-80-185S4
D	1	Body Tube	LT-225-60
E	1	Laser Cut Fins (4)	FA-9
F	1	Laser Cut Strips (4)	FA-9S
G	1	Tubing Coupler	JT-80E
H	1	Body Tube	BTH-70-05
I	4	Engine Hooks	EH-28
J	3	Engine Hooks	EH-38
K	1	Screw Eye	SE-12
L	1	Elastic Cord	ECR-272
M	2	Launch Lugs	LL-423
N	1	Nylon Parachute	PN-24
O	3	Body Tubes	BTH-70-28
P	1	Body Tube	LT-115-35
Q	3	Body Tubes	ST-940E
R	4	Body Tubes	ST-730E
S	2	Body Tubes	ST-820
T	3	Tubing Couplers	HTC-9
U	1	Plywood Ring Set (8)	CR-KA-9
V	1	24mm Engine Mount	EM-9115
W	2	Engine Hooks	EH-28L
X	1	Decal (not shown)	DKA-9
Y	1	Pattern Sheet (not shown)	IKA-9P

EXPLODED VIEW