



SEMROC SKY HOOK

Semroc Large Series

**Precision Turned Balsa
Nose Cone**

**Laser Cut Basswood
Fins**

**Laser-Slotted Thick
Walled Body Tube**

**Colorful Water
Slide Decal**

**Rip-Stop
Nylon Chute**

**24/29mm
Engines**



FLYING
MODEL
ROCKET KIT

Made in the U.S.A by Semroc - Dayton, Ohio

SLS SKY HOOK™

Kit No. KLV-9

Specifications	Engine	Approx. Altitude
Body Diameter	C11-5	500'
Length	D12-7	1100'
Fin Span	E9-8	2000'
Net Weight	F25-9	4000'

Skill Level 1

What is a Retro-Repro™?

A Retro-Repro™ is a retro reproduction of an out-of-production model rocket kit. It is a close approximation of a full scale model of an early historically significant model rocket kit from one of the many companies that pioneered the hobby over the past half century. A Retro-Repro™ is not a true clone or identical copy of the original. It incorporates improvements using modern technology, while keeping the flavor and build appeal of the early kits.

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 Estes Industries, Inc.

In July 1958, G. Harry Stine of Model Missiles, Inc. in Denver, Colorado approached Vern Estes about making model rocket engines for them. On January 15, 1959, his automated model rocket engine fabricating machine, "Mabel", produced the first of many millions of Estes model rocket engines. In 1960, Estes was producing more engines than Model Missiles could sell. Vern and his wife Gleda opened a mail order rocket company and introduced the Astron Scout and Astron Mark.

In 1961, a catalog was mimeographed and hand stitched on Gleda's sewing machine. Later that year, Estes Industries had outgrown the confined space in Denver. In December 1961, the entire operation was moved to an old farm in Penrose, Colorado quickly establishing the small town as the "Model Rocket Capital of the World."

Estes Industries was sold to Damon in September 1969. The name Estes is synonymous with model rocketry. Almost everyone remembers growing up firing Estes rockets or knowing someone that did. Estes Industries has introduced millions of youngsters of all ages to model rocketry for almost half a century.

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About the SLS Sky Hook™

The Estes Sky Hook was designed by Bill Simon and introduced in the August 1963 issue of Model Rocket News. The plans were included, but a complete kit was offered in the new products section. The Sky Hook was a durable sport rocket, using the BT-30 that had thicker walls than the later BT-20. The Sky Hook was Estes #K-8 and the original kit sold for \$1.35. Semroc introduced a full scale Retro-Repro™ Sky Hook™ in 2003.

The SLS™ Sky Hook™ is a 175% upscale of the original Estes kit. Using the SLS™ parts a precise upscale is possible using much more rugged parts than the original-sized Sky Hook. The SLS™ Sky Hook™ uses precision laser-cut basswood fins instead of balsa for additional strength. An 18" Nylon chute is used instead of the original poly plastic. The body tube is laser-slotted to match the through-the-wall fins. The original Sky Hook had a rubber shock cord and is replaced with Kevlar® cord and elastic cord for greater strength and reliability. A 24 mm engine mount adapter is included to increase the selection of engines that can be used.

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.

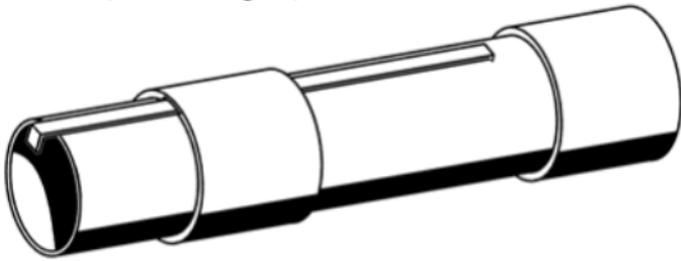
TOOLS: In addition to the parts supplied, you will need the following tools to assemble and finish this kit.



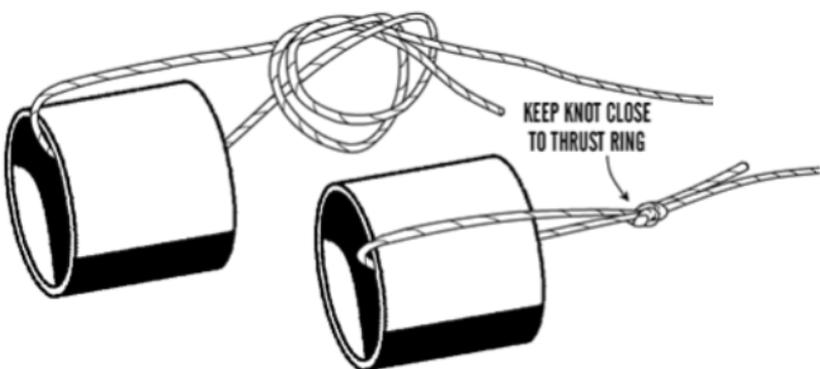
ASSEMBLY

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

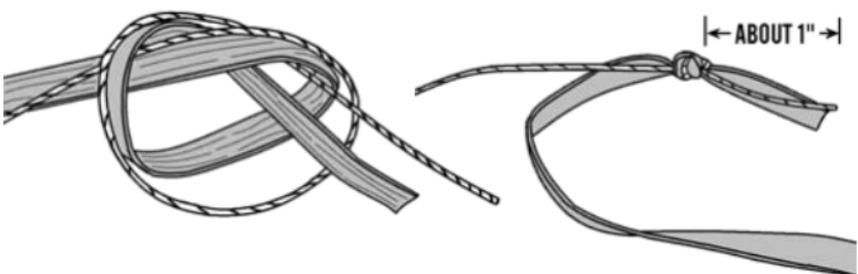
❑ **2.** Follow the instructions included with the EM-9115 Engine Mount kit to build the adapter. Allow it to dry thoroughly.



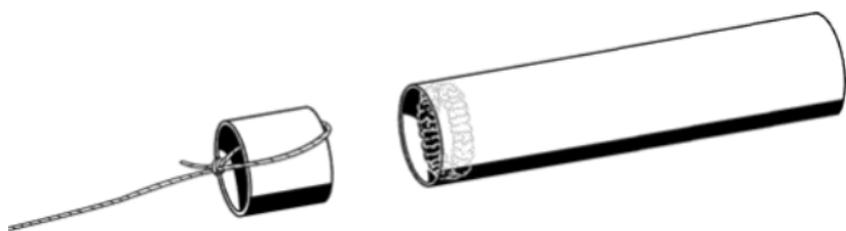
❑ **3.** Loop the yellow Kevlar® thread through the thrust ring as shown. Tie both ends of the Kevlar® thread in an overhand knot leaving one end short and the other end as long as possible. Keep the knot and one end of the thread as close to the ring as possible as shown. Put a drop of glue on the knot to keep it from coming untied.



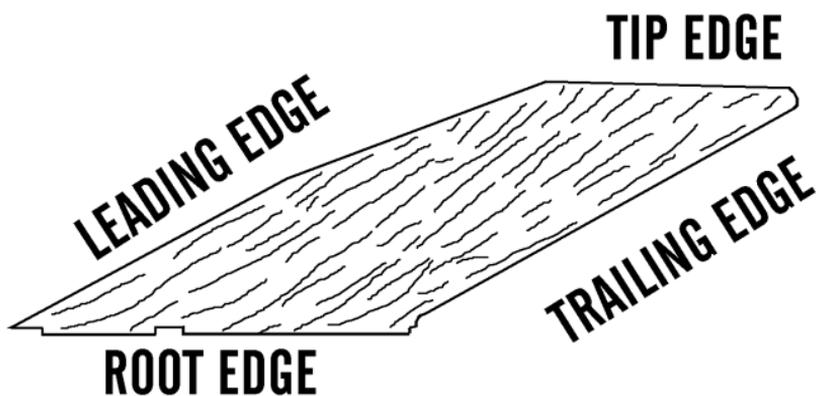
❑ **4.** Using the long free end of the Kevlar® thread and one end of the elastic shock cord, tie an overhand knot joining the elastic shock cord to the Kevlar® thread. Pull the thread and cord tight leaving about 1" of excess after the knot. Put a drop of glue on the knot to keep it from coming untied.



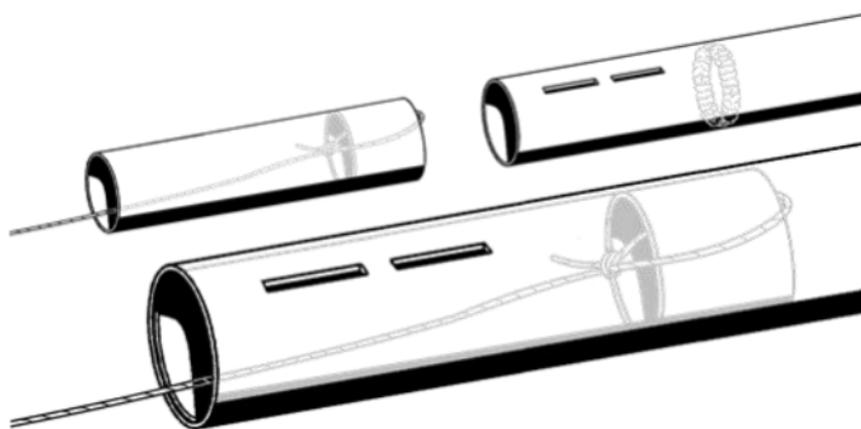
❑ **5.** Apply a bead of glue inside one end of the small body tube (LT-11555.) Insert the thrust ring into the body tube until the ends are even. Clean up any excess glue pushed inside the tube or the engine will not fit properly. When the assembly is dry, push the shock cord back through the body tube so it comes out the bottom away from the thrust ring.



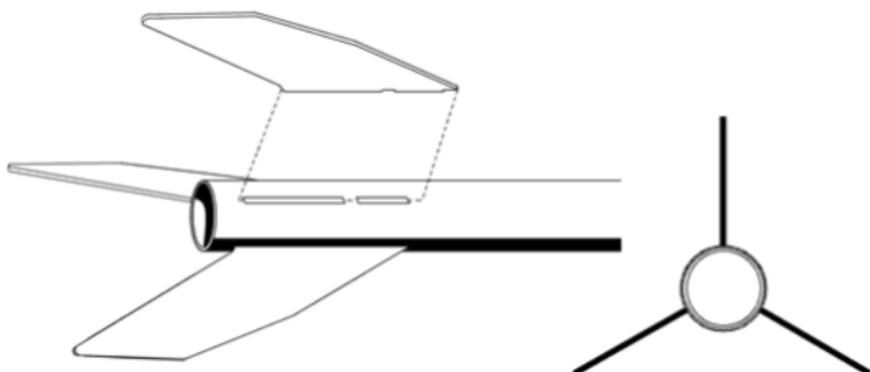
- ❑ **6.** Lightly sand each side of the three fins. Round all edges except the root edges (which will be glued to the body tube). The tip edges and trailing edges may be tapered for better aerodynamic cross section. Check all fins for fit in the slots in the body tube and sand if necessary.



- ❑ **7.** Apply a generous bead of glue inside the slotted end of the main body tube just above the slots. Push the engine mount assembly with the thrust ring end first into the main body tube until both ends are even. Proceed to the next step without waiting for the glue to completely dry.

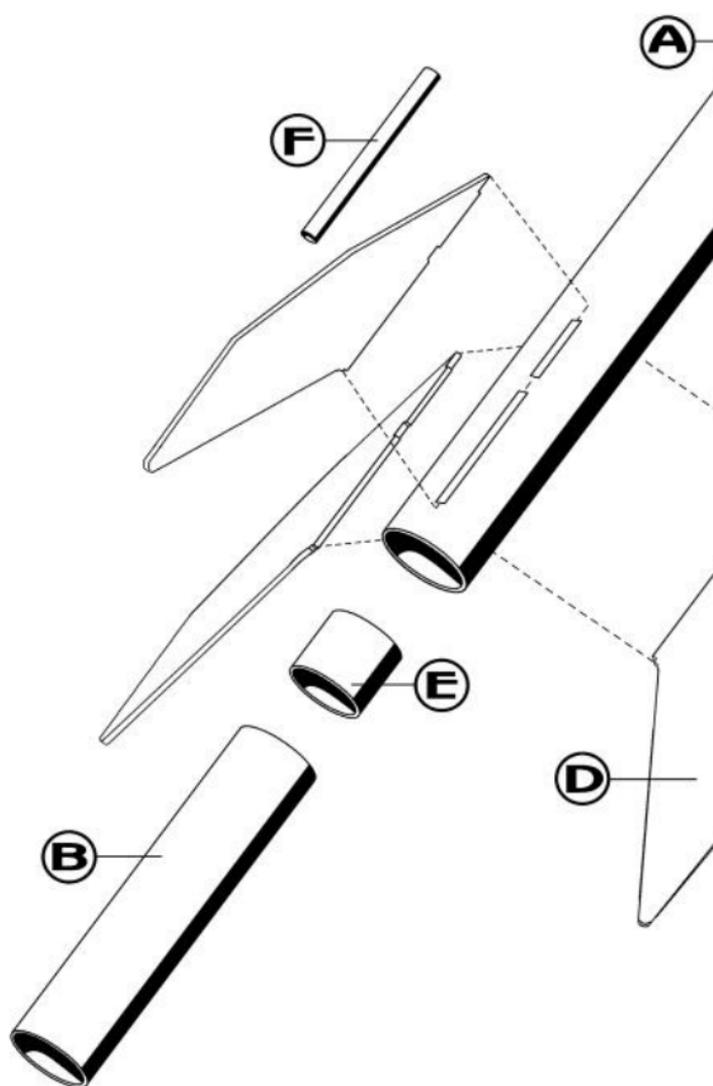


- ❑ **8.** Run a thin bead of glue along the root edge of one of the fins. Attach it to the body tube in one of the sets of slots on the main body tube. Repeat for the other two fins. Refer to the end view.

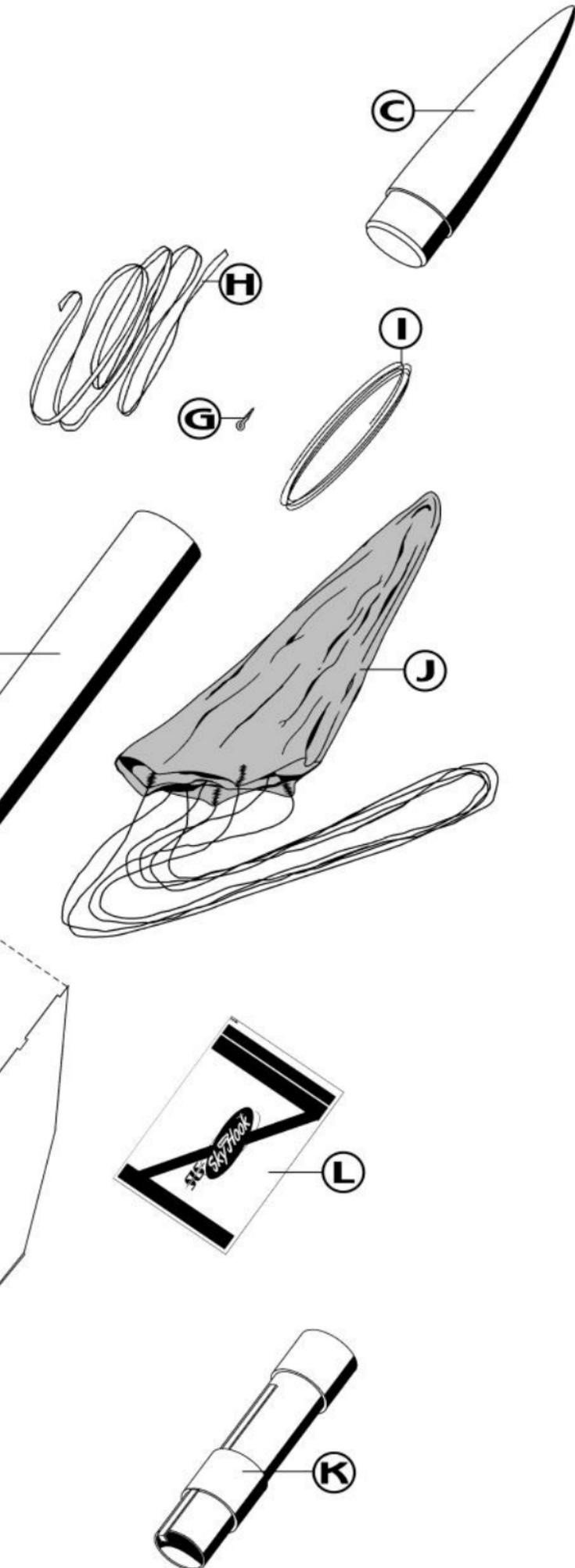


Parts List

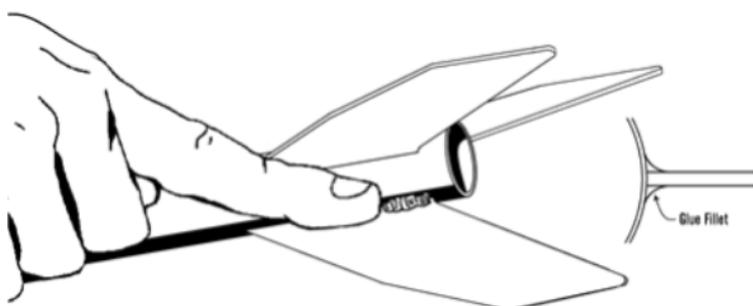
A	1	Body Tube	.....	LT-125122
B	1	Body Tube	.....	LT-11555
C	1	Balsa Nose Cone	.....	BC-12548
D	1	Laser Cut Fins	.....	FLV-9
E	1	Thrust Ring	.....	TR-115
F	1	Launch Lug	.....	LL-330
G	1	Screw Eye	.....	SE-10
H	1	Elastic Cord	.....	EC-236
I	1	Kevlar Braided Cord	.....	SCK-24
J	1	Nylon Parachute	.....	PAR-18
K	1	24mm Engine Mount	.....	EC-9115
L	1	Decal	.....	DKLV-9



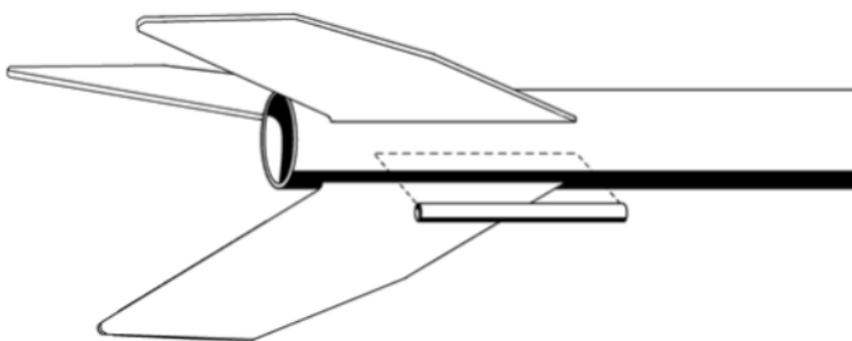
EXPLODED VIEW



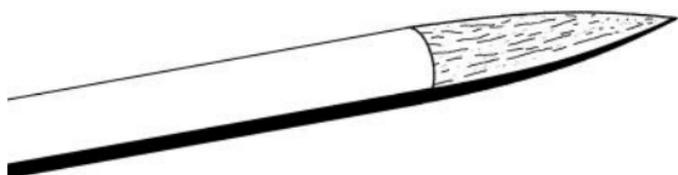
- ❑ **9.** After the fin assembly is completely dry, run a small bead of glue along both sides of each fin-body tube joint. Using your index finger, smooth the glue into fillets.



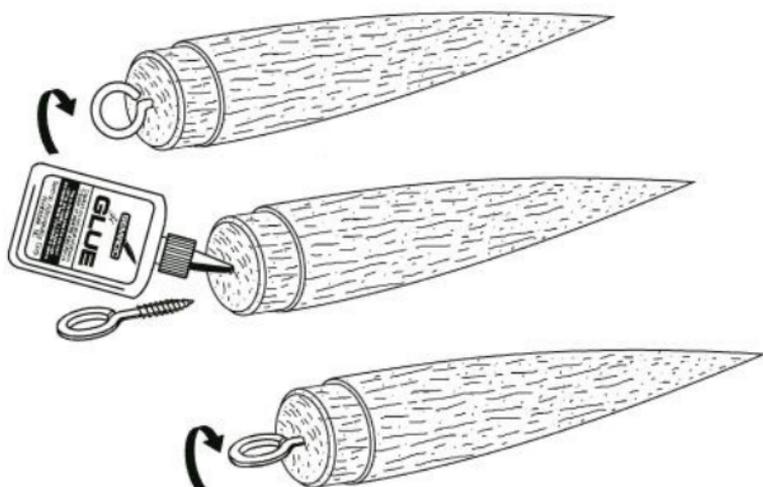
- ❑ **10.** Glue the launch lug along the side of the body tube, centered between two of the fins and about 1" from the bottom of the body tube.



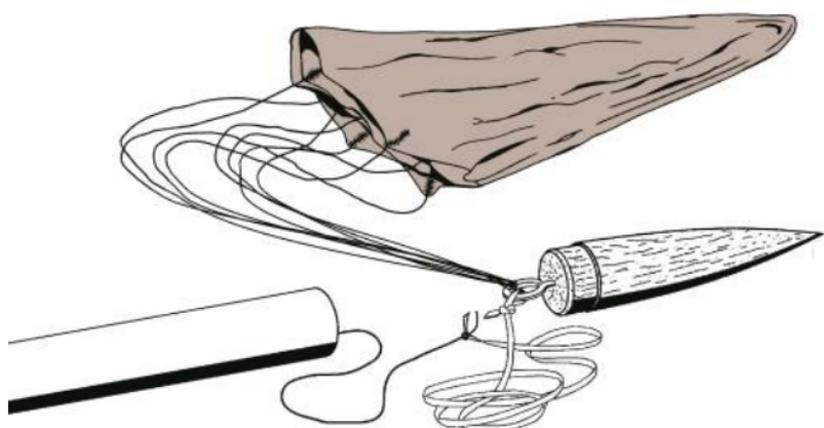
- ❑ **11.** Insert the nose cone in the body tube and check for proper fit. The nose cone should be snug to hold itself in alignment. If it is too loose, add masking tape. If it is too tight, sand the shoulder slightly.



- ❑ **12.** Twist the screw eye into the center of the base of the nose cone. Unscrew it and squirt glue into the hole. Reinstall the screw eye and wipe off any excess glue.

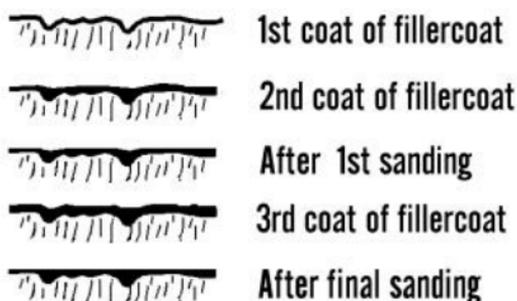


- ❑ **13.** Attach chute by passing the lines through the screw eye and looping them over the tip of the nose cone. Pull the lines tight and make sure they are all of equal length. Put a drop of glue on the joint to keep the lines from moving. Tie the loose end of the elastic cord to the screw eye. Put a drop of glue on the knot to keep it from untying.



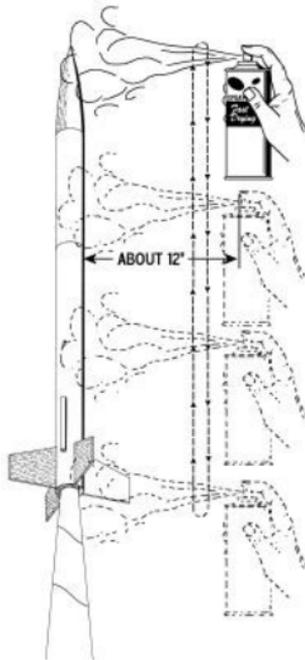
FINISHING

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

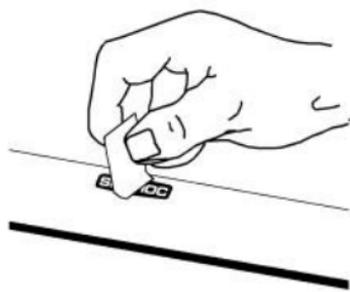


- ❑ **15.** After all balsa and basswood surfaces have been prepared, wipe off all dust with a dry cloth. First spray the model with an enamel primer. Choose a high visibility color combination like red, white, and black for the final color.

- ❑ **16.** 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. Use rolled newspaper to hold the rocket while you spray it.



- ❑ **17.** After the paint has dried, decals should be applied. The decals supplied with the SLS™ Sky Hook™ are waterslide decals. Each decal should be cut separately from the sheet. Completely apply one of the decals before starting the next. Think about where you want to apply each decal and check for fit before wetting the decal. Make sure the ends are aligned with the roll pattern.



FLIGHT PREPPING

- ❑ **18.** Pack the recovery wadding from the top of the body tube. Use a sufficient quantity to protect the parachute, but not too much that it will interfere with the proper deployment of the parachute.
- ❑ **19.** 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.
- ❑ **20.** 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.
- ❑ **21.** Carefully check all parts of your rocket before each flight as a part of your pre-flight checklist. Launch the SLS™ Sky Hook™ from a 3/16" diameter by 36" long launch rod.

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 motors, 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.

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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 100,000 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.





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