

SEMROC

vega

**1969 Retro
Reproduction**

**Precision Turned
Balsa Nose Cone**

**Laser Cut
Balsa Fins**

**Ideal First
Large Rocket**

**Parachute
Recovery**

*Designed by:
Carl McLawhorn*



**FLYING MODEL
ROCKET KIT**

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

**VEGA™
Kit No. KV-25**

Specifications	Engine	Approx. Altitude
Body Diameter	B6-4	300'
Length	C6-5	700'
Fin Span		
Net Weight		

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.

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.

July 20, 2005, August 15, 2015

About the Vega™

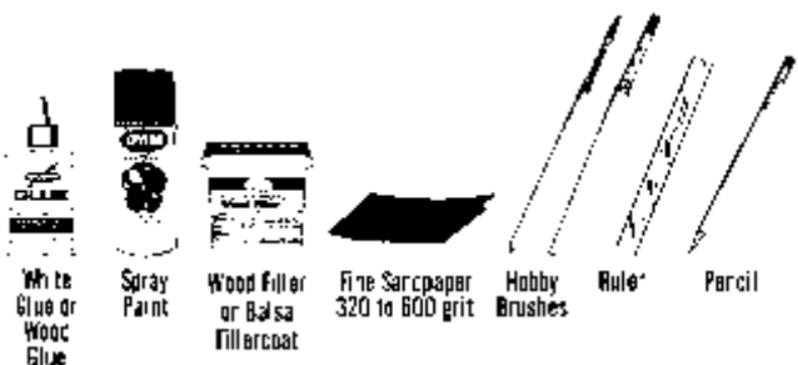
The Semroc Vega™ was released in 1969 as the fifth Semroc-Kit. Designed to be a large rocket for beginners, the Vega™ was inspired by the early Estes Big Bertha plans. Since the Vega™ was Semroc's fifth kit, it was named after the fifth brightest star (not counting the sun.) The Vega™ also was the forerunner to the Semroc Goliath™. To cut down on inventory, the Vega™ was redesigned with slightly larger fins, the body tube was cut to provide a payload section and released as the Goliath™. Since it was possible to build and fly the Goliath™ with a single engine, the Vega™ was only sold for one year. The Vega™ was part number KB-5 and retailed for \$2.49 when it was first introduced.

The Retro-Repro™ Vega™ is updated by using laser-cut balsa fins and a Kevlar® shock cord attachment. The original balsa nose cone and body tubes are used. An engine hook was added to make engine mounting more convenient. A single 12" parachute is provided.

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.

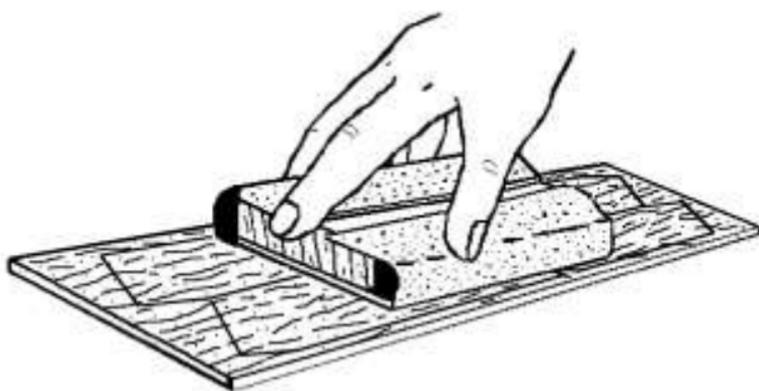


ASSEMBLY

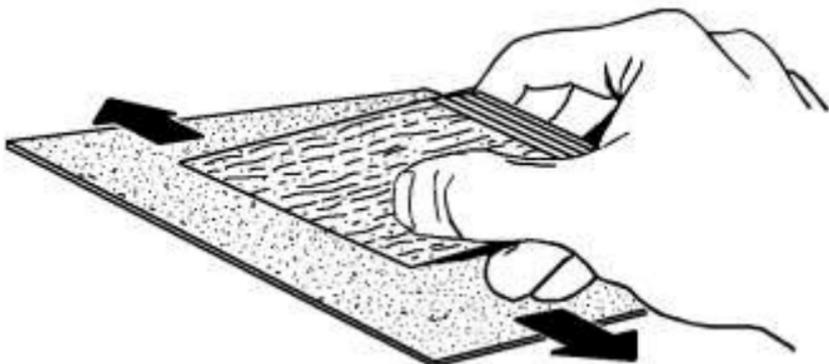
- ❑ 1. These instructions are presented in a logical order to help you put your Vega™ together quickly and efficiently. Check off each step as you complete it and we hope you enjoy putting this kit together and flying it.

FIN PREPARATION

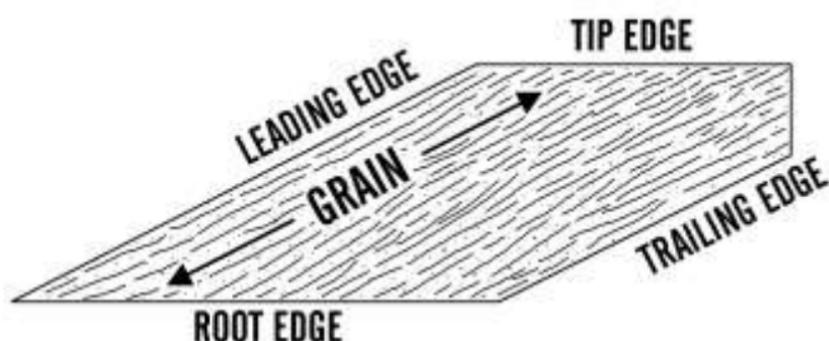
- ❑ 2. Lightly sand each side of the sheet of laser-cut fins. Carefully push the laser-cut fins from the sheet. Start at one point on each fin and slowly and gently work around the fin.



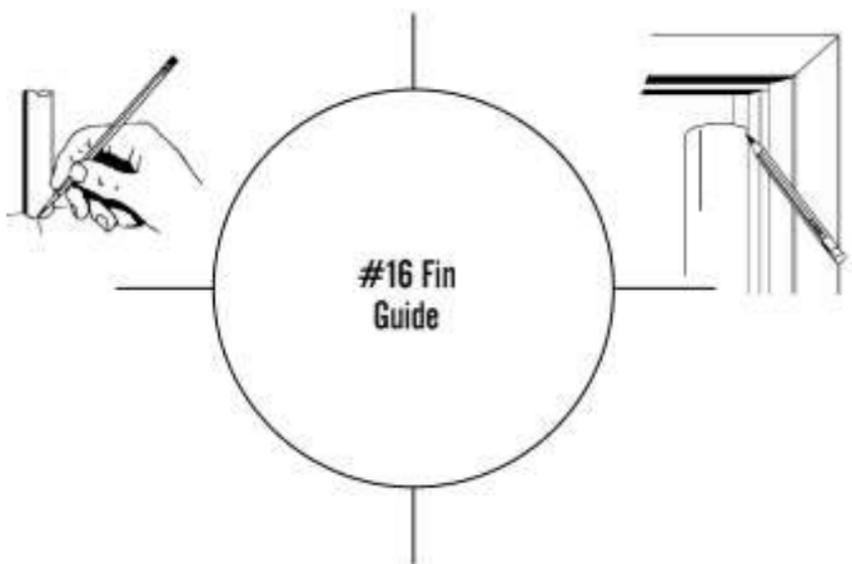
- ❑ 3. Stack all four fins together. Line them up squarely and sand the fins back and forth over some fine sandpaper to get rid of the hold-in tabs as shown below.



- ❑ 4. Round all leading edges. Round or taper all trailing and tip edges. Leave the root edges flat. Use the diagram below to aid in identifying the different edges.



- ❑ 5. Stand the largest body tube on the fin guide and make the fin position marks on the sides of the tube. Find a convenient channel or groove such as a partially open drawer, a door jamb (as shown,) or a piece of molding. Using the channel, extend the marks the full length of the tube to provide lines for aligning the fins.

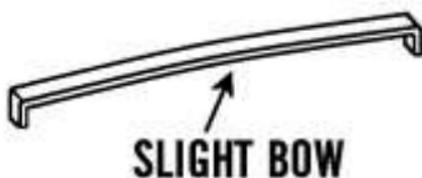


ENGINE MOUNT

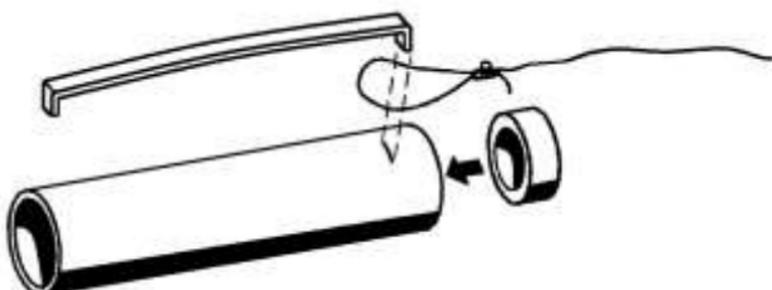
- ❑ 6. Tie a loop in one end of the yellow Kevlar® cord using an overhand knot.



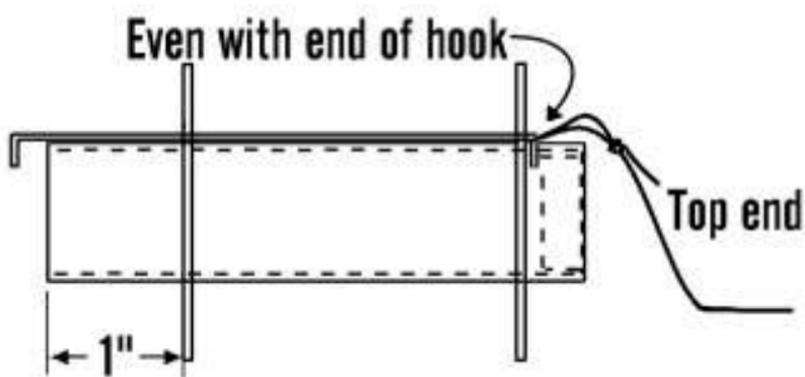
- ❑ 7. Bend the engine hook slightly so it forms a slight bow in the direction shown.



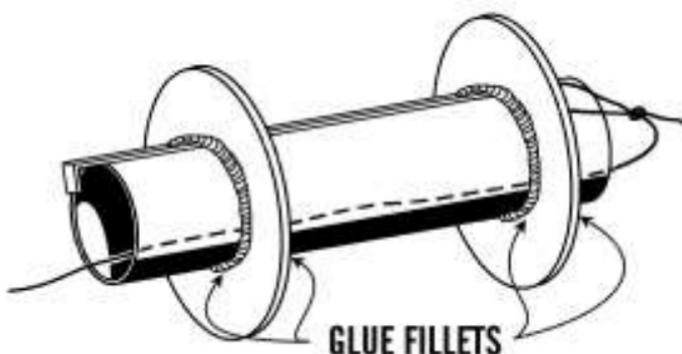
- ❑ 8. Insert one end of the engine hook through the loop in the yellow Kevlar® cord and into the pre-punched engine tube slot. Glue the thrust ring in place on top of the engine hook as shown.



- ❑ 9. Glue the two centering rings on the engine mount tube as follows. Slide the first ring from the bottom until it is even with the end of the engine hook. Make sure the yellow Kevlar® cord is free and comes out from the top of the tube as shown below. **Mark 1" from the bottom of the engine mount tube** and slide the other centering ring from the bottom until it is even with the mark.



- ❑ 10. When the centering rings are positioned properly, apply glue fillets around the engine mount tube at all four joints as shown. Pull the cord back through the engine tube.



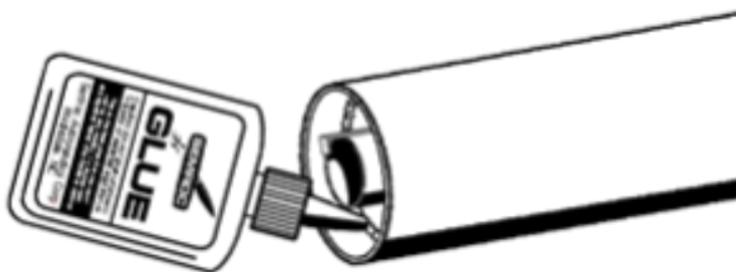
- ❑ 11. Apply a bead of glue about 1/4" inside the large body tube. Insert the engine mount assembly until it is flush with the bottom of the tube. Stand the tube on end with the engine mount pointed downward and allow to dry thoroughly.



- ❑ 12. Feed the yellow Kevlar® cord back through the engine mount tube until it comes out the opposite end. Make sure it is pulled all the way through the engine mount. It may be necessary to shake the tube or pull the cord through with a coat hanger or long, thin wood dowel.

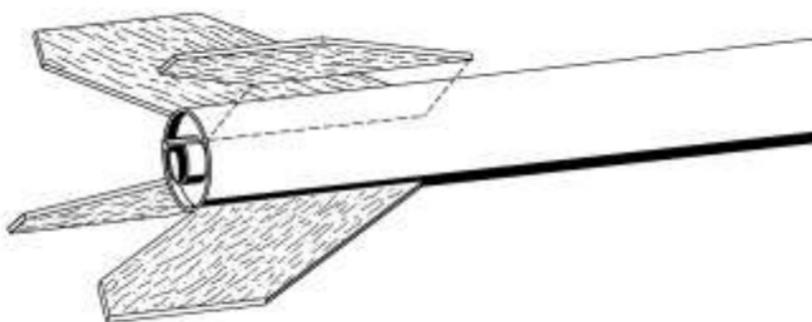


- ❑ 13. Apply a bead of glue around the bottom centering ring. Stand the assembly on end with the engine mount upward and allow to dry thoroughly.



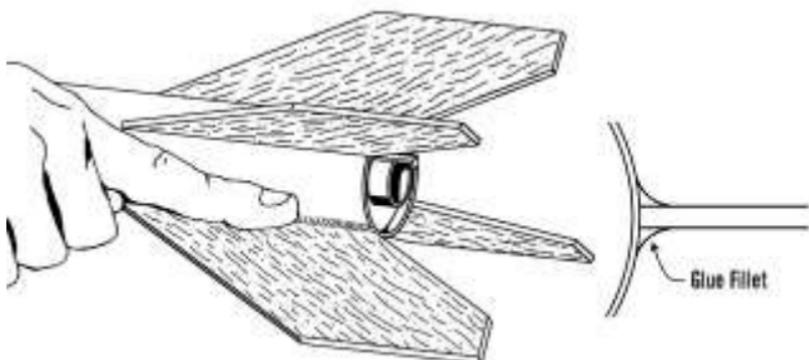
FIN ASSEMBLY

- ❑ 14. Apply glue to the root edge of a fin and position it along one of the lines drawn on the side of the body tube. Remove, allow to almost dry, apply additional glue, and reposition. Repeat for the other three fins.



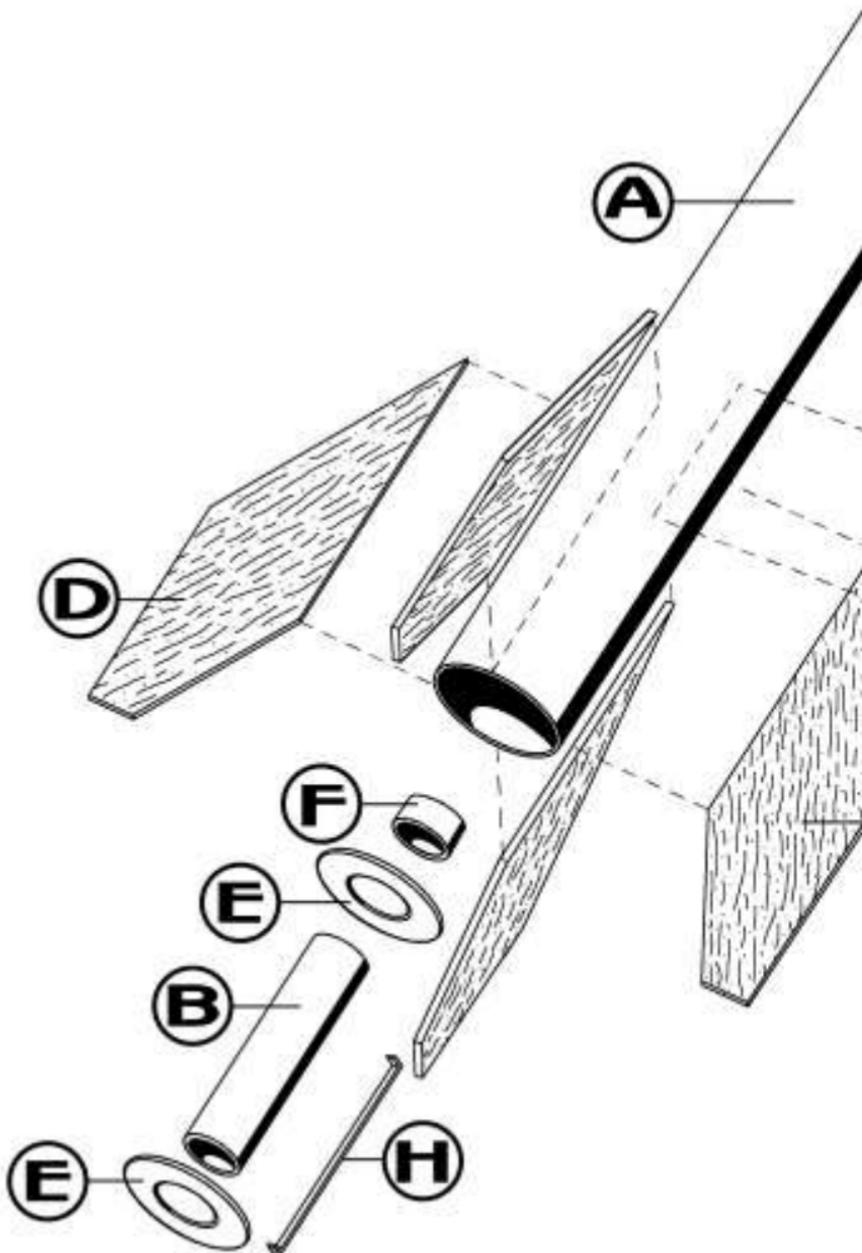
- ❑ 15. Allow to dry standing vertically, checking for alignment visually while the assembly dries. Stuff the shock cord and Kevlar® cord into the body tube so it will remain vertical.

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

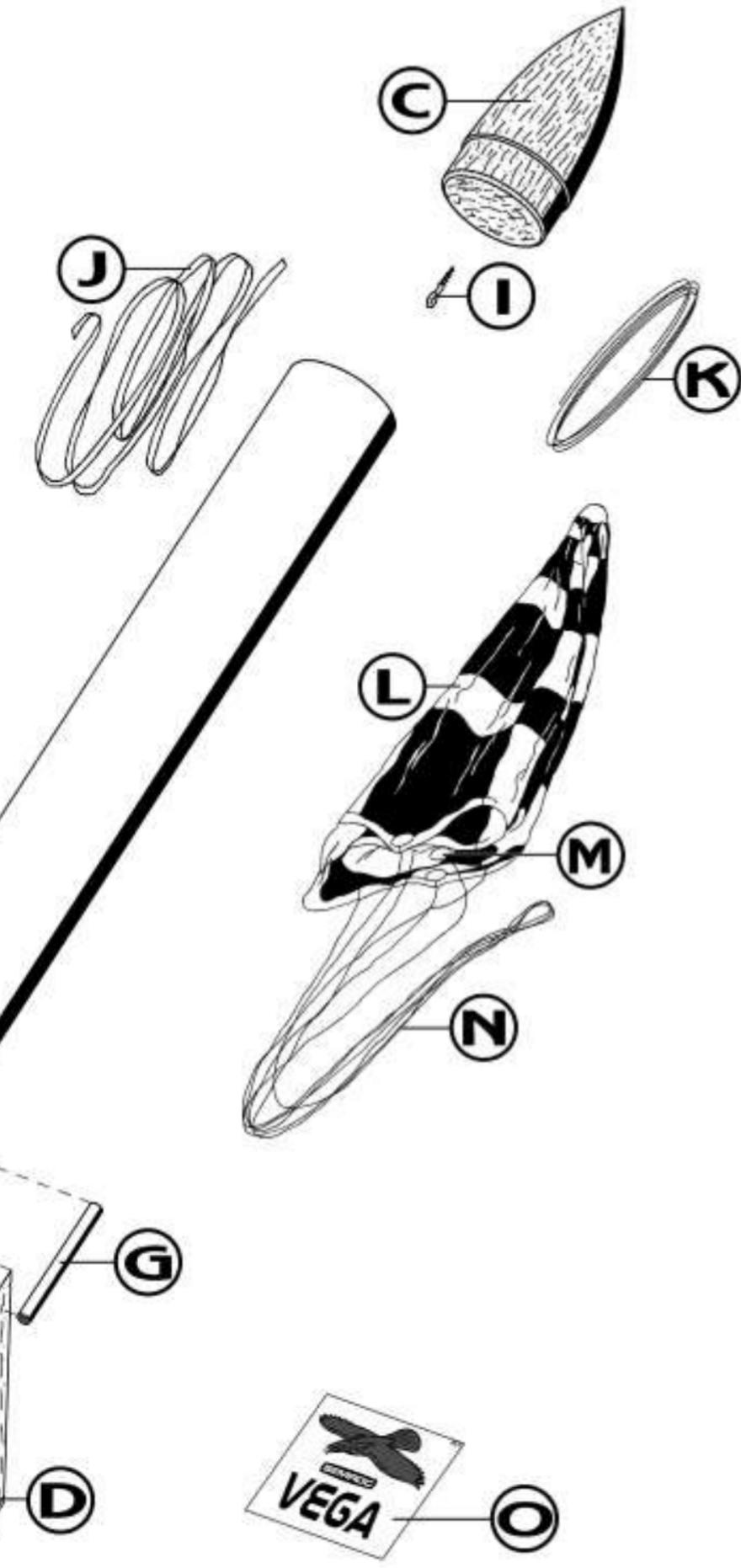


Parts List

A	1	Body Tube	ST-16180
B	1	Body Tubes	ST-730E
C	1	Balsa Nose Cone	BC-1631
D	1	Laser Cut Fin Set	FV-25
E	1	Centering Ring Set	CR-KV-25
F	1	Thrust Ring	TR-7
G	1	Launch Lug	LL-122
H	1	Engine Hook	EH-28
I	1	Screw Eye	SE-10
J	1	Elastic Cord	EC-124
K	1	Kevlar Thread	SCK-24
L	1	Plastic Parachute	CP-12-24
M	1	Tape Disc	TD-6
N	1	Shroud Lines	SLT-6
O	1	Decal	DKV-25

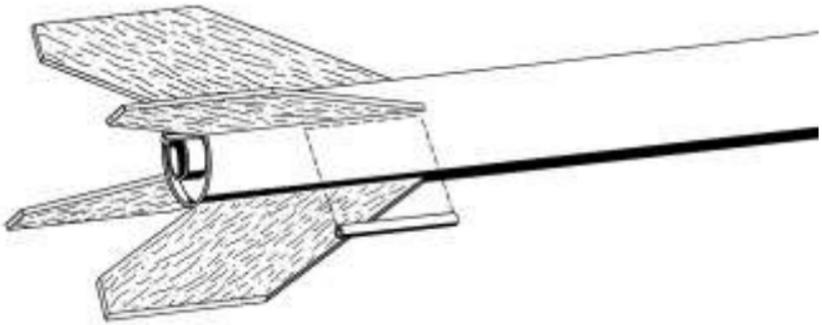


EXPLODED VIEW



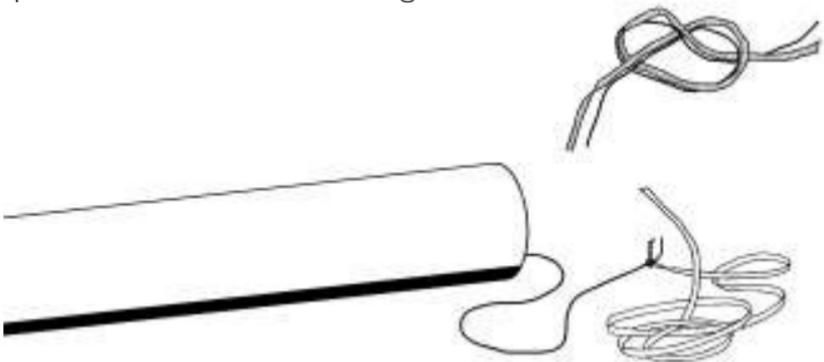
LAUNCH LUG

- ❑ 17. Glue the launch lug onto the body against one of the fin joints and even with the top edge of the fin as shown. Stand the assembly vertically again and wait for the fin fillets to completely dry. Watch for runs in the glue and wipe any before they run down the tube.



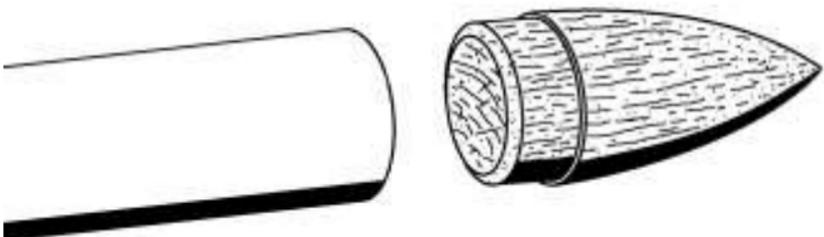
ATTACH SHOCK

- ❑ 18. Prepare the main shock cord as follows. Line up one end of the elastic shock cord with the free end of the Kevlar cord and tie an overhand knot at the end of the two cords. Pull the knot tight and place a small drop of white glue on the knot to prevent it from loosening.

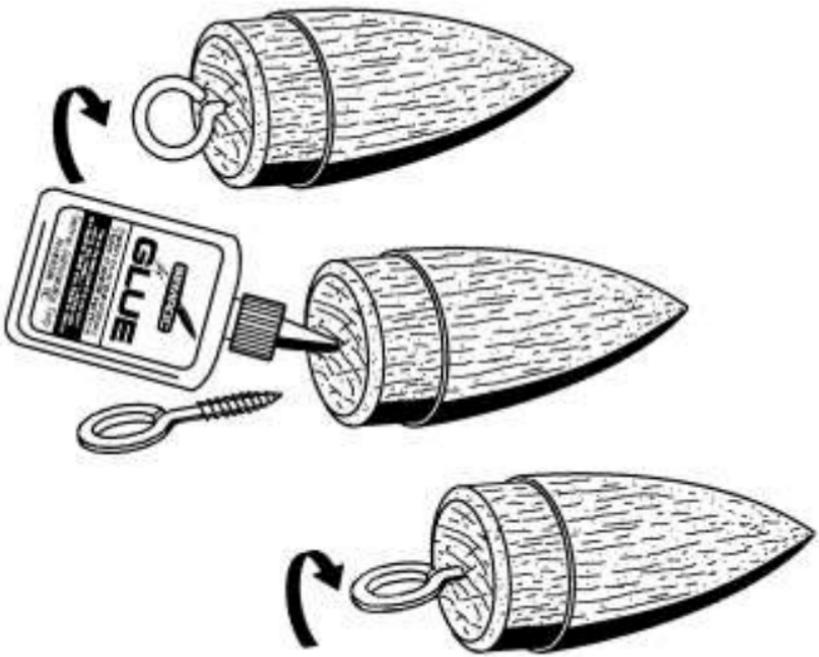


NOSE CONE

- ❑ 19. 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. Do not glue the nose cone into the body tube!

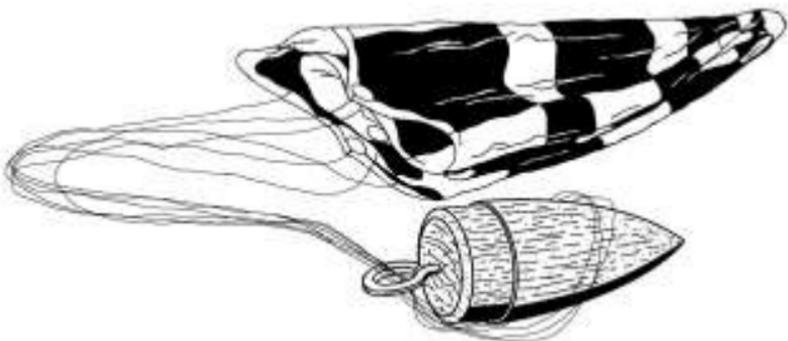


- ❑ 20. Turn the screw eye into the center of the base of the nose cone. Unscrew it and squirt glue into the hole. Reinstall the screw eye and wipe off any excess glue.

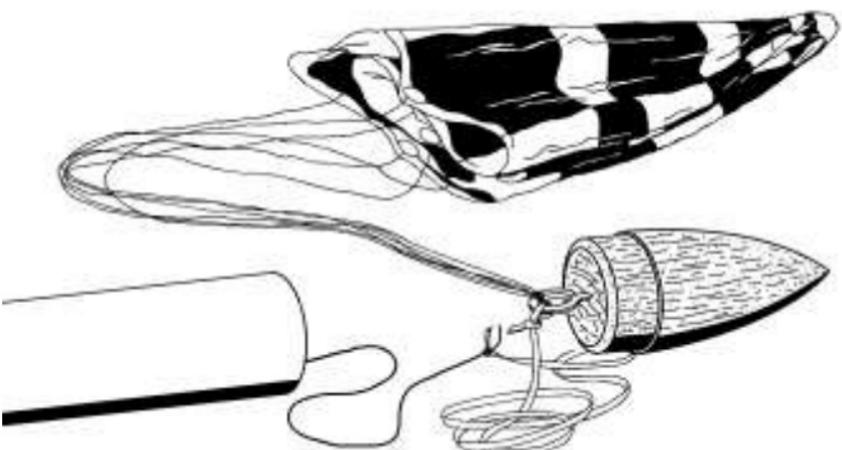


PARACHUTE AS-

- ❑ 21. Assemble the chute using instructions printed on canopy. Attach the chute to the nose cone by passing the lines through the screw eye and then passing the nose cone through the lines as shown.



- ❑ 22. Tie the free end of the elastic cord to the screw eye using an overhand knot. Put a drop of glue on the knot to keep it from untying.



- ❑ 23. This completes the final assembly of your Vega™. It may be flown as it is, but continue with the finishing for a better looking rocket!



This completes the assembly of your

VEGA

FINISHING

- ❑ 24. When the fillets have dried, prepare balsa surfaces for a smooth professional looking finish. **Fill the wood grain with Fill'n'Finish diluted about half and half with water**, When dry, sand with fine sandpaper. Repeat until smooth.



1st coat of fillercoat



2nd coat of fillercoat



After 1st sanding



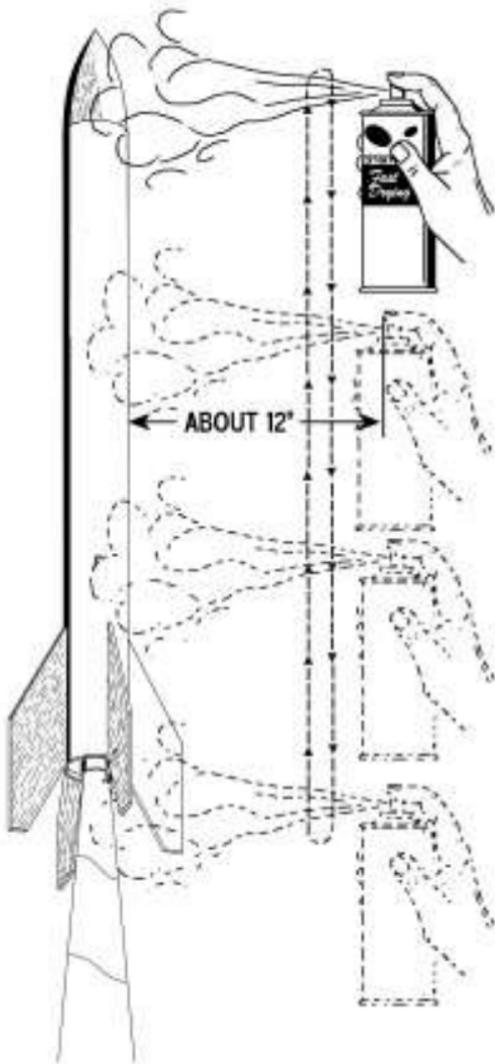
3rd coat of fillercoat



After final sanding

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

❑ 26. Spray painting your model with a fast-drying enamel will produce the best results. **PA-TIENCE...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.

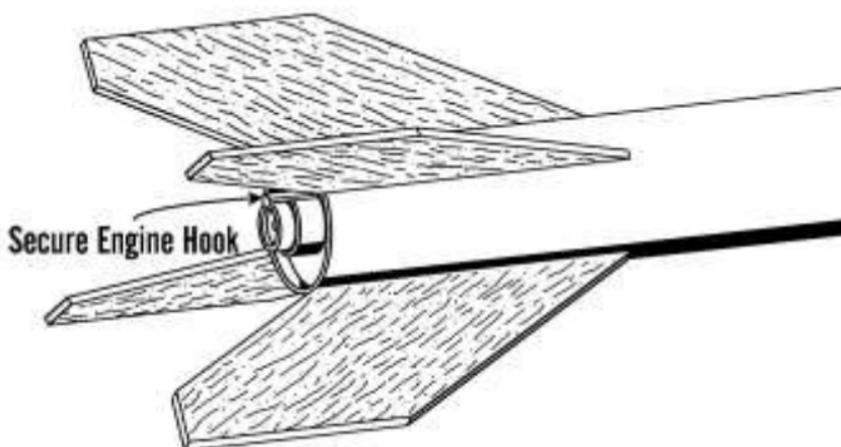


❑ 27. After the paint has dried, the decal may be applied. The decal supplied with the Vega™ is a waterslide decal. Cut around the decal and place it in a dish of water. When it is loose on the paper backing, slide it onto the main tube.



LAUNCH PREPARA-

- ❑ 28. Mounting the engine: Insert the engine hook keeps the engine in snugly. The hook may be slightly bent to make sure the engine is retained.



- ❑ 29. 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. For best results, only push the recovery wadding down far enough to allow room for the chute and cords.

- ❑ 30. Fold the parachute and pack it and the shock cord on top of the recovery wadding. Slide the nose cone into place, making sure it does not pinch the shock cord or parachute.



- ❑ 31. Carefully check all parts of your rocket before each flight as a part of your pre-flight checklist. Launch the Vega™ from a 1/8" diameter by 36" long launch rod. A longer rod will result in better flight control and stability.



Why the eagle? The constellation that the star Vega is located is also known as the "soaring eagle." Since all of us at Semroc are Boy Scout oriented, the eagle has a special place for us.

LIMITATION OF LIA-

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% SATISFAC- TION

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 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