

## About Centuri Engineering

Centuri Engineering Company was started in 1961 by Leroy (Lee) Piester in his garage while he was still in college in Phoenix, Arizona. With his wife, Betty, they built Centuri into one of the largest model rocket companies ever.

Centuri was known for its unusual and innovative designs, producing over 140 different kits with something for every model rocketeer. They also produced model rocket engines and pioneered the modern composite high powered engines with their Enerjet line.

Centuri Engineering was sold to Damon in the late 1960's and shared the same parent corporation with Estes Industries, the largest model rocket company in the world. The Centuri product line was kept separate from the Estes line until 1983. A few of the old kits have been reissued by Estes since then, but for the most part, Centuri Engineering Company lives today only in the dreams of the senior members of the model rocket community.

## About the Vector-V™

The Vector-V was released in the 1972 Centuri Catalog with an availability date of February 1, 1972. Since it used fiber fins, they could be glued on in many different ways to make it one of the earliest customizable kits. The same fins would be used in the future Akela and Viking kits. It was introduced as Catalog No. KB-2 and retailed for \$1.50.

The Semroc Retro-Repro™ Vector-V™ is very close to the original version. The original plastic nose cone has been replaced by a balsa equivalent for a more retro look and feel. The shock mount has been replaced with a newer Kevlar mount. The original die cut fiber fins are replaced with laser-cut high quality mat board for crisper and easier to finish fins.

## 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.

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# VECTOR-V

**CUSTOMIZABLE  
DESIGN**

**EASY TO BUILD**

**SINGLE STAGE**

**FIBER FINS &  
BALSA  
NOSE CONE**

**FLYING MODEL  
ROCKET KIT**



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

## Vector-V™ Kit No. KV-44

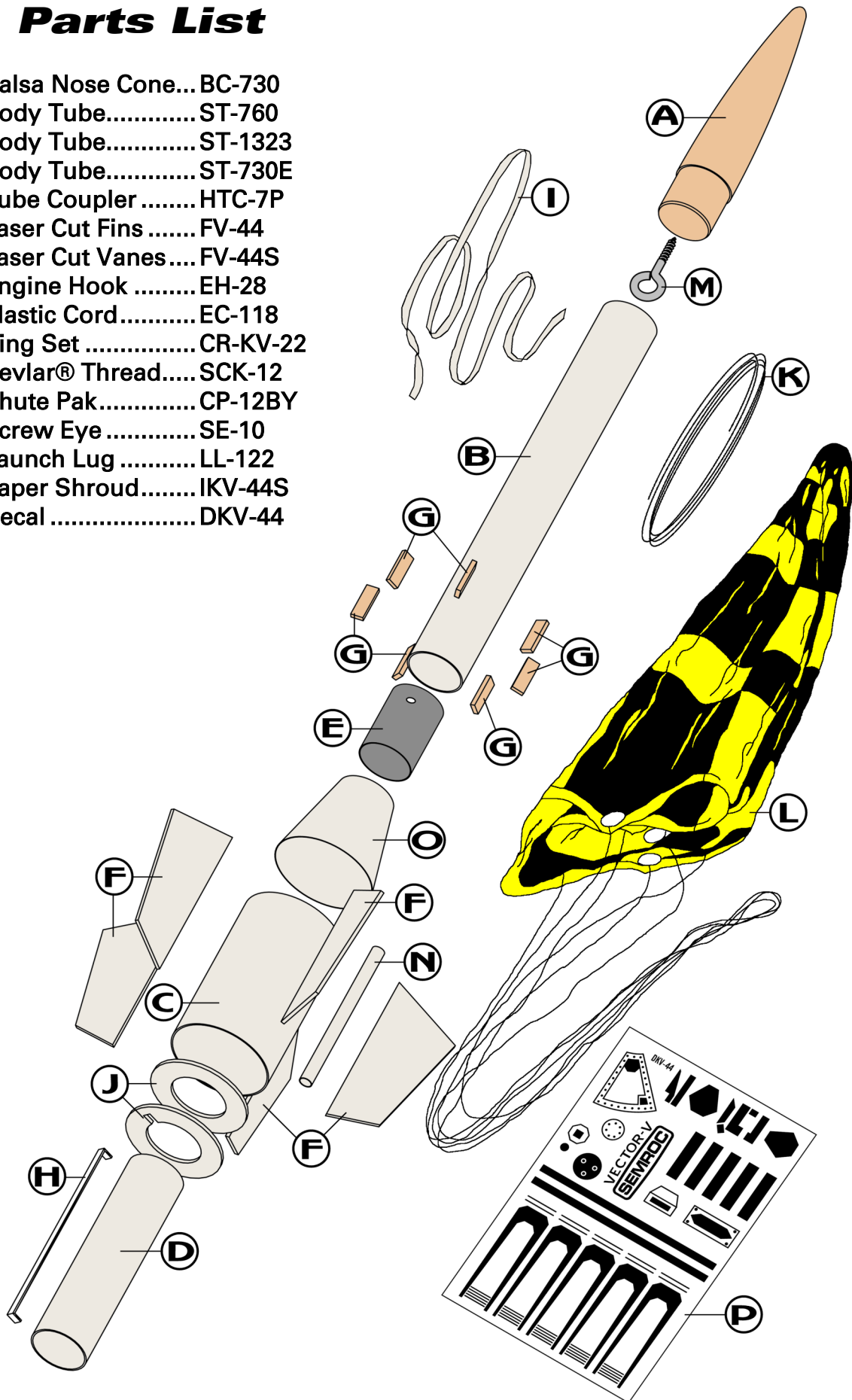
Specifications	Engine	Approx. Altitude
Body Diameter 1.34" (3.4 cm)	A8-3	300'
Length 12.6" (32.0 cm)	B6-4	650'
Fin Span 3.3" (8.4 cm)	C6-5	1250'
Net Weight 0.9 oz. (25.5 g)		

**PARACHUTE RECOVERY**

# EXPLODED VIEW

## Parts List

- A 1 Balsa Nose Cone... BC-730
- B 1 Body Tube..... ST-760
- C 1 Body Tube..... ST-1323
- D 1 Body Tube..... ST-730E
- E 1 Tube Coupler ..... HTC-7P
- F 1 Laser Cut Fins ..... FV-44
- G 1 Laser Cut Vanes .... FV-44S
- H 1 Engine Hook ..... EH-28
- I 1 Elastic Cord..... EC-118
- J 1 Ring Set ..... CR-KV-22
- K 1 Kevlar® Thread..... SCK-12
- L 1 Chute Pak..... CP-12BY
- M 1 Screw Eye ..... SE-10
- N 1 Launch Lug ..... LL-122
- O 1 Paper Shroud..... IKV-44S
- P 1 Decal ..... DKV-44



## BEFORE YOU START!

Make sure you have all the parts included in this kit that are listed in the Parts List to the left. 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 to the left. 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 is also needed. Masking tape and wax paper are also needed.

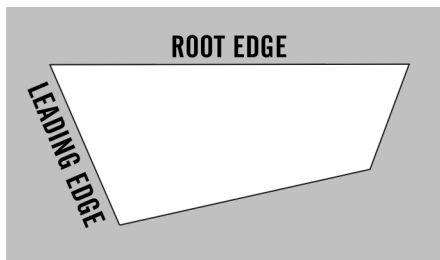


## ASSEMBLY

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

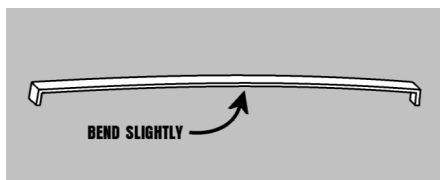
## FIN PREPARATION

2. Carefully remove the five laser-cut fiber fins from the fin sheet (FV-44). For best results, lightly sand each edge and apply a thin coat of cyanoacrylate (CA) glue along each edge to seal the laminations. Identify the root edge from the drawing below for the traditional look. Since the fins are fiber, any edge except the shortest one can be used as a root edge.

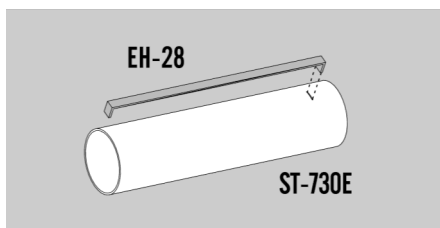


## ENGINE MOUNT

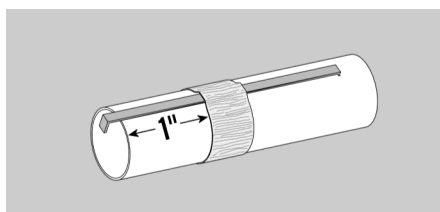
3. Bend the engine hook (EH-28) slightly so it forms a slight bow in the direction shown.



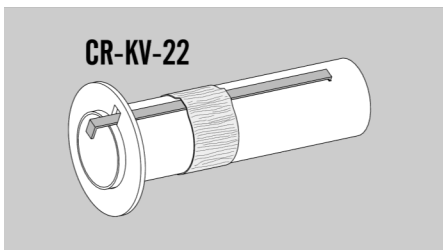
4. Insert one end of the engine hook into the pre-punched engine tube (ST-730E).



5. Wrap a few turns of masking tape around the engine tube and engine hook about 1" from the bottom of the engine tube. Apply glue to the engine hook at the end that is inserted into the engine tube. Strengthen the tape by smearing a film of glue over the tape.

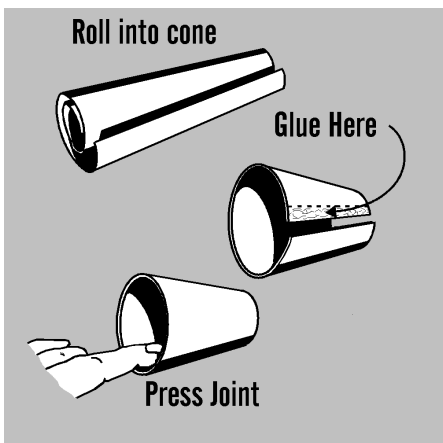


6. Carefully punch out both centering rings from the fiber set (CR-KV-22). Slide fit the slotted centering ring over the bottom of the engine tube leaving about 1/16" of the engine tube exposed. Apply a bead of glue around each side of the ring, keeping glue off the engine hook and the slot.

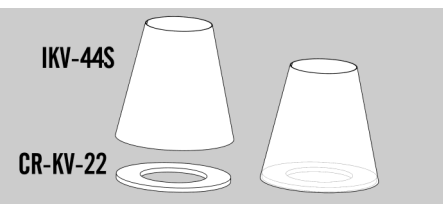


## SHROUD

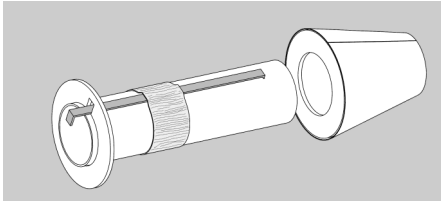
7. Carefully cut out the paper shroud (IKV-44S). Roll the shroud carefully forming it into a cone, being careful to avoid creasing the paper. Apply a thin layer of white glue on the indicated section inside the dotted line. Line up the opposite edge with the dotted line and press together on a flat surface. Hold it in place until the glue sets.



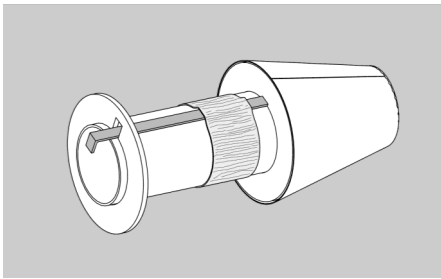
8. Set the remaining ring (CR-KV-22) on a flat surface covered by a small piece of wax paper or plastic film. Place a bead of glue around the inside edge of the larger end of the shroud. Carefully set the shroud over the ring until it seats over the ring. Wait for it to dry completely.



- ❑ **9.** Apply a bead of glue just inside the small end of the shroud assembly (opposite the ring). Insert the engine mount assembly into the shroud assembly until the engine tube is even with the small (top) end of the shroud.

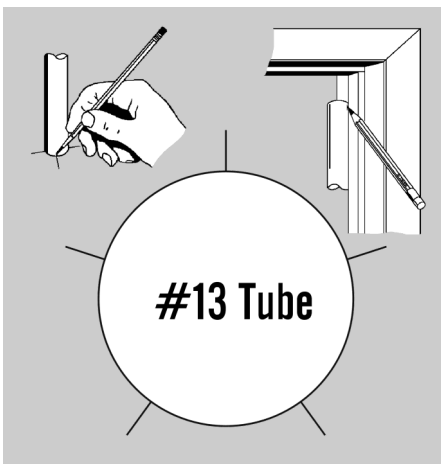


- ❑ **10.** Run a fillet of glue around the bottom of the ring on the shroud to secure it to the engine tube. Allow to dry.



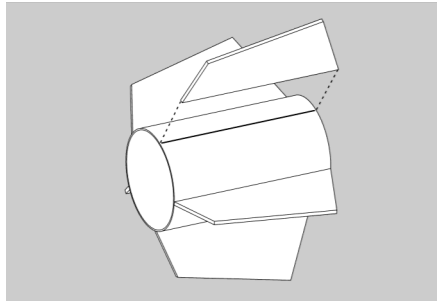
## MARK TUBE

- ❑ **11.** Stand the largest body tube (ST-1323) on the fin guide below and make the fin position marks on the sides of each 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.



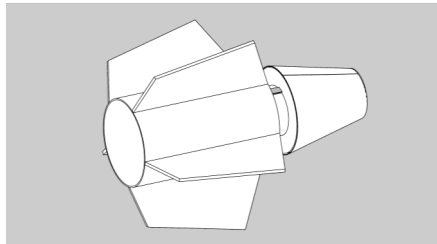
## ATTACH FINS

- ❑ **12.** Apply glue to the root edge of one of the fins and position it along one of the lines drawn for the fins on the side of the large body tube (ST-1323). Remove the fin, set it aside and allow it to almost dry, apply additional glue, and reposition. Repeat for the other four fins. If you follow these instructions, the fins will not require much additional work to keep them aligned. Allow the fins to completely dry, checking carefully to make sure they are aligned properly.

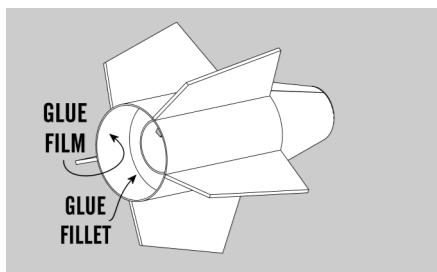


## ATTACH MOUNT

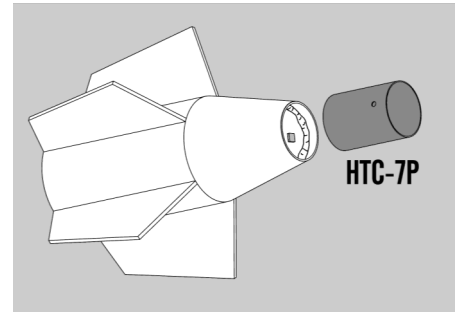
- ❑ **13.** Apply a bead of glue around the inside lip of the paper shroud and another bead about half way down the inside of the fin-body tube assembly. Slide the fin-body tube assembly over the engine mount. Carefully align the shroud and the large body tube. Hold in position until the glue sets.



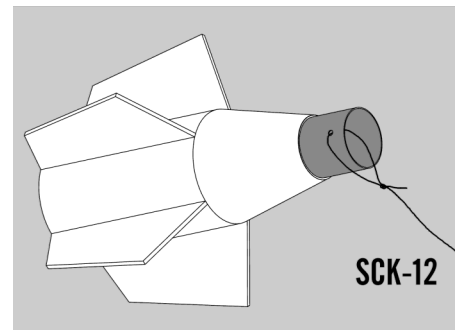
- ❑ **14.** Apply a fillet of glue around the bottom centering ring. Coat the inside of the exposed part of the large body tube and ring with glue to protect them from exhaust gases.



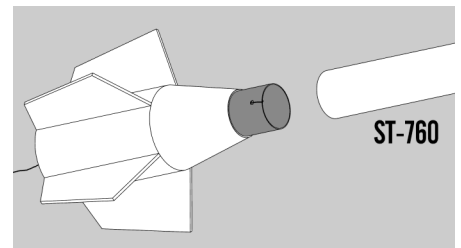
- ❑ **15.** Apply a bead of glue just inside the top of the engine tube no lower than the top of the engine hook. Insert the tube coupler (HTC-7P) with the punched end to the top.



- ❑ **16.** Thread one end of the Kevlar® cord (SCK-12) into the punched hole in the coupler and securely tie it using an overhand knot.

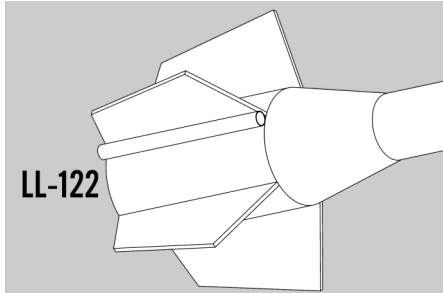


- ❑ **17.** Pull the free end of the Kevlar® cord back through the engine tube tightly. Depress the coupler slightly where the cord is exposed on the outside of the coupler. This will prevent a bulge where the cord is. Apply a bead of glue just inside one end of the long body tube (ST-760) and insert the tube over the coupler. Sight the assembly from the end to make sure the engine tube and the long body tube are aligned. Allow to dry in a horizontal position to prevent glue from running into the engine tube. Turn often to prevent pooling of the glue.



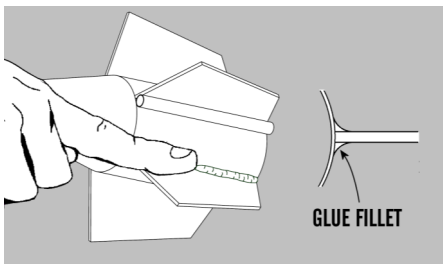
## LAUNCH LUG

- 18. Apply a bead of glue to one of the fin joints on the large body tube (ST-1323) for the length of the tube (the length of the launch lug.) Apply the launch lug (LL-122) to the glue and make sure it is in contact with the fin and even with the bottom of the main body tube.



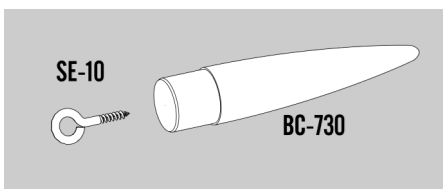
## APPLY FILLETS

- 19. 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. Apply a fillet of glue on each side of the launch lug. Allow this assembly to dry in a vertical position.



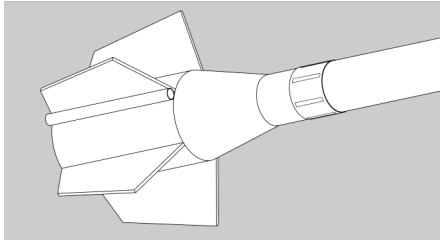
## NOSE CONE

- 20. Insert the nose cone (BC-730) in the main 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. Turn the screw eye (SE-10) into the center of the nose cone. Unscrew it and squirt glue into the hole. Reinstall the screw eye and wipe off any excess glue.

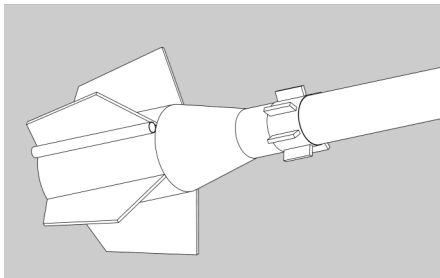


## VANES

- 21. Cut out the vane spacing guide from the shroud sheet. Apply a thin film of white glue to the back of the guide. Wrap it around the main body tube as shown below. Make sure the edges are aligned.

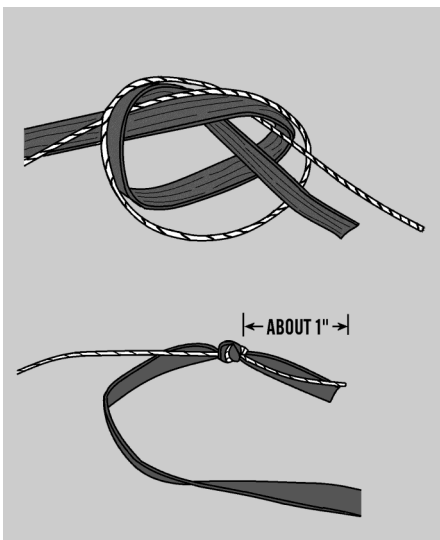


- 22. Carefully remove the seven basswood vanes from the laser-cut sheet (FV-44S). Leave one long edge flat and slightly round the other edges. Apply all seven vanes on the pattern sheet in the designated areas.

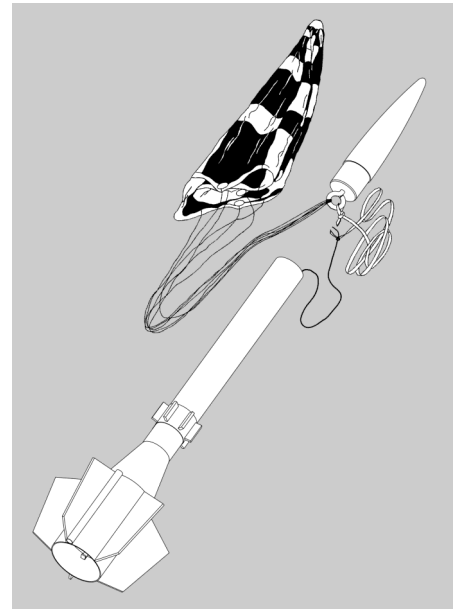


## FINAL ASSEMBLY

- 23. Using a pencil or dowel, push the Kevlar® cord out through the top of the main body tube. Tie the free end of the Kevlar® cord to one end of the elastic cord (EC-118) using an overhand knot.



- 24. Assemble the chute using the instructions printed on the canopy. Pull the lines tight on the chute and make sure they are all of equal length. Attach the chute by tying them to the screw eye. Put a drop of glue on the joint to keep the lines from moving. Attach the free end of the elastic cord to the screw eye. Put a drop of glue on that joint as well.

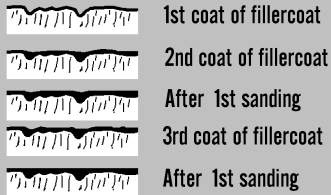


This completes the  
assembly of your

# VECTOR-V

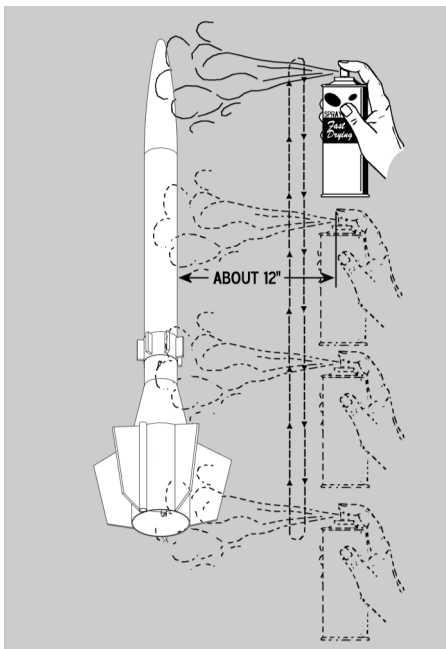
## FINISHING

- 25. When the fillets have dried, prepare balsa 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.

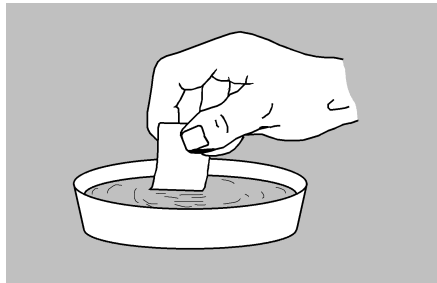


- 26. After all balsa surfaces have been prepared, wipe off all balsa dust with a dry cloth. First spray the model with an enamel primer. Choose a high visibility color like white and blue for the final color.

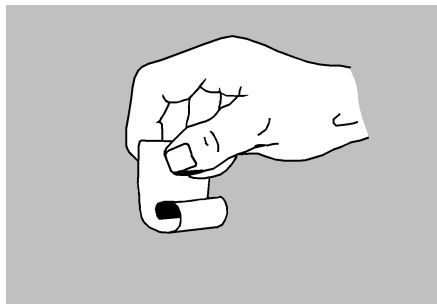
- 27. Spray painting your model with a fast-drying enamel will produce the best results. PATIENCE...is the most important ingredient. Use several thin coats, allowing each coat to completely dry before the next coat. Start each spray a few inches above the model and end a few inches below the model. 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.



- 28. After the paint has dried, decals should be applied. The decals supplied with the Vector-V™ are waterslide decals. Each decal should be cut separately from the sheet. Think about where you want to apply each decal and check for fit before wetting the decal. Use the cover photo for suggested placement. Dip each decal in a small dish of water that has a drop of detergent. It will take about 30 seconds before the decal is loose enough to apply.



- 29. Slide the decal in place and use the paper backing to work the bubble out. Repeat for all the decals.



- 32. 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.

- 33. Carefully check all parts of your rocket before each flight as a part of your pre-flight checklist. Launch the Vector-V™ from a 1/8" diameter by 36" long launch rod.

- 34. After each flight, promptly remove the spent engine casing and dispose of properly.

## FLIGHT PREPPING

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

- 31. Apply a few sheets of recovery wadding in the top of the main body tube. 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.