

**SEMROC**

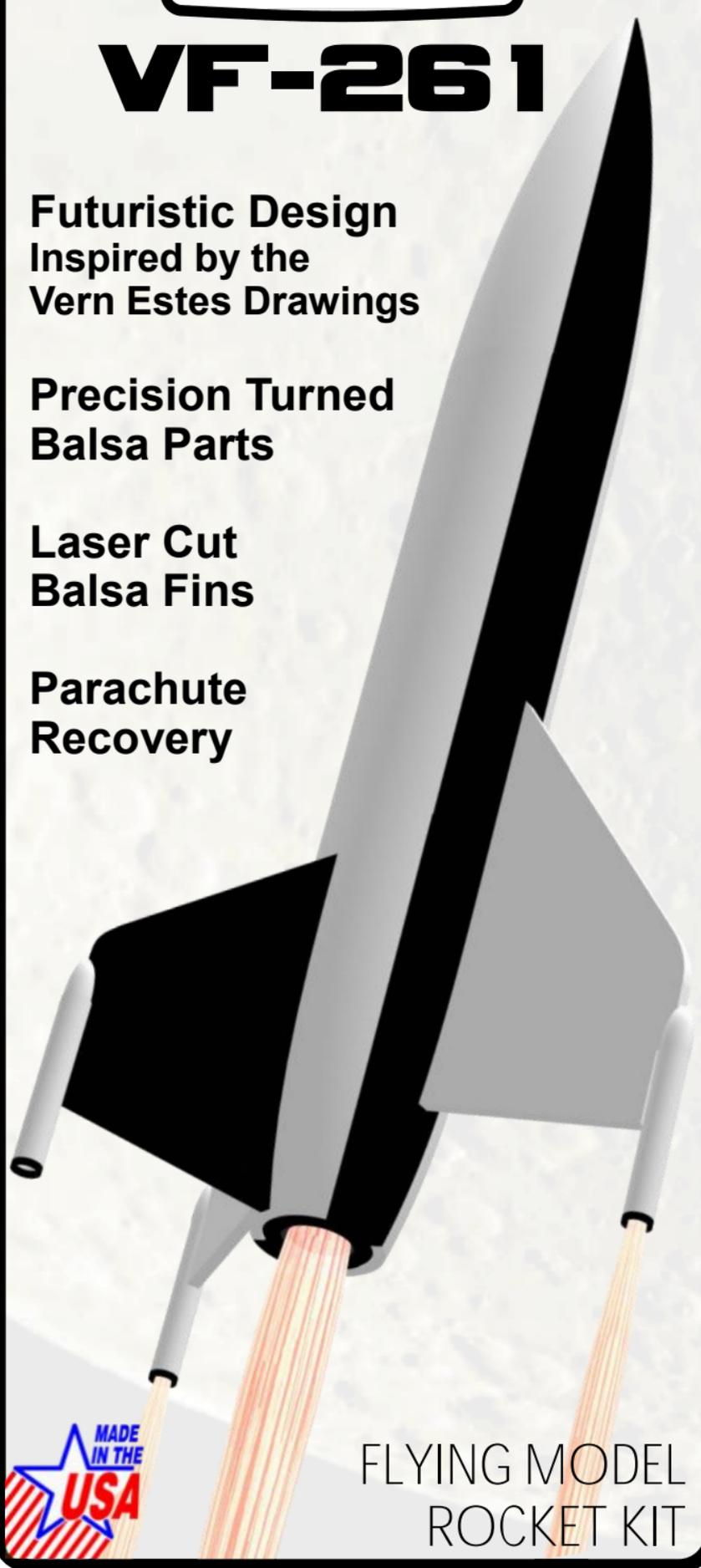
# VF-261

**Futuristic Design  
Inspired by the  
Vern Estes Drawings**

**Precision Turned  
Balsa Parts**

**Laser Cut  
Balsa Fins**

**Parachute  
Recovery**



**FLYING MODEL  
ROCKET KIT**

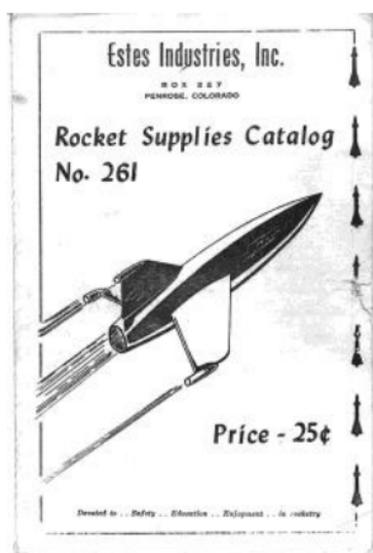
Made in the U.S.A by Semroc - Dayton, Ohio

**VF-261™  
Kit No. KA-10**

	<b>Specifications</b>	<b>Engine</b>	<b>Approx. Altitude</b>
Body Diameter	1.325" (3.4 cm)	A8-3	175'
Length	11.1" (28.2 cm)	B6-4	500'
Fin Span	5.5" (14.0 cm)	C6-7	1200'
Net Weight	1.6 oz. (45.4 g)		

**Skill Level 2**

Cover from the second 1961 Estes Industries, Inc. catalog (left) sported a whimsical vision of a vehicle for space flight. It in turn was probably inspired by the Luna 3 (right) from the *Destination Moon* Movie in 1950. The Luna 3 was based on elements from the German V-2. Since 1961, I always wanted one and wondered if it would really fly!



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## 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.

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May 29, 2007

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## About the VF-261™

The Semroc VF-261™ is the result of 46 years of seeing the rocket on the 1961 cover of an Estes Industries catalog and dreaming of trying it out someday. Since it is most like the German V-2, that became the starting point of the Semroc design. Using a 3D modeling program and RockSim, it came to life. The name came from "Vern's Fantasy" and catalog #261. Vern Estes probably based his drawing on the Luna 3 from a Destination Moon still, but for many early model rocketeers, the Estes drawing linked space travel and model rocketry together.

The VF-261™ uses a pre-drilled balsa boat tail and a pre-drilled balsa nose cone. Added clay is provided for stability. A 12" two-color chute is included along with Kevlar® cord for the shock cord mount. Laser cut balsa fins make the build easier even for beginning modelers.

### 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 is also required.

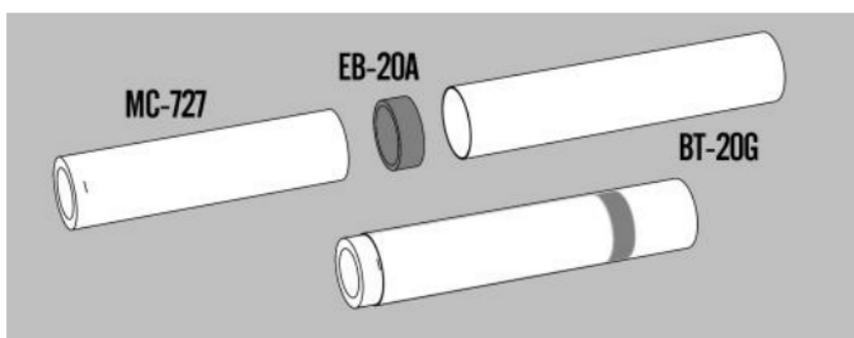


# ASSEMBLY

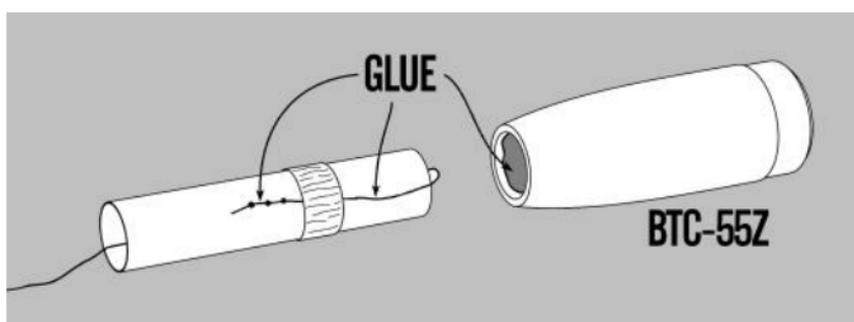
**1.** These instructions are presented in a logical order to help you put your VF-261™ together quickly and efficiently. Check off each step as you complete it and enjoy putting this kit together.

## ENGINE MOUNT

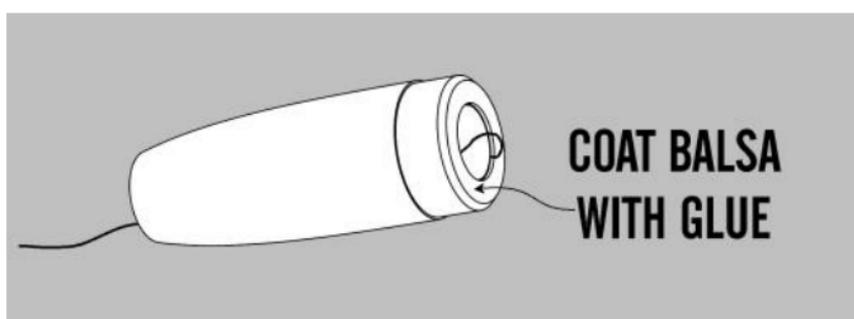
**2.** Mark the MC-727 engine spacing tube 1/8" from one end. From the top of the engine tube (BT-20G) apply a bead of glue inside it about 3/4" down. Insert the engine block (EB-20A) into the bottom of the engine tube and using the engine spacing tube, push it into the engine tube until the mark on the spacing tube is even with the bottom of the engine tube. **Remove the spacing tube immediately!**



**3.** Thread the yellow Kevlar thread (SCK-12) down through the top of the engine tube. Tie a series of three knots in the top end. Use a piece of masking tape to hold the Kevlar thread in place. Apply a bead of glue on the thread and inside the balsa boat tail (BTC-55Z) as shown. Push the engine tube into the tail cone until the bottom ends are even. Wipe off any excess glue.

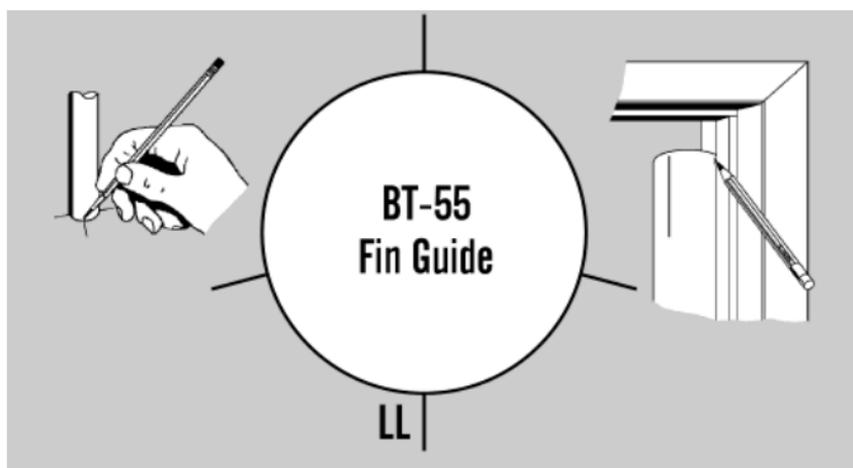


**4.** Coat the top end of the balsa tail cone with glue to help protect it from the hot ejection gases.

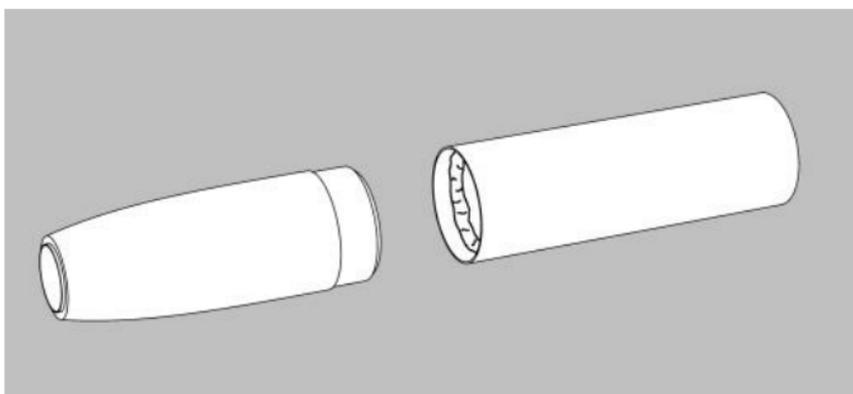


# MARK THE TUBE

- 5.** Stand the body tube on the fin guide below. Mark the three fin positions and one launch lug (LL) position on the side 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 length of the tube to provide lines for aligning the fins and launch lug. Mark the launch lug line with an "LL".

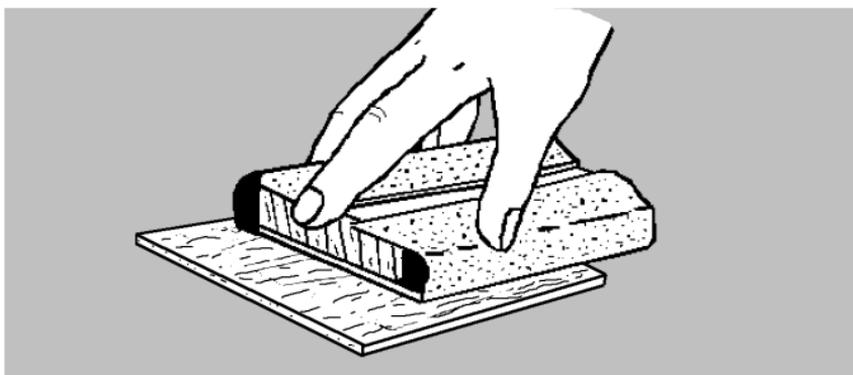


- 6.** Apply a bead of glue into one end of the Body tube (BT-55S). Insert the tail cone assembly into the body tube. Extend the three fin lines with a ruler and pencil to the end of the tail cone.

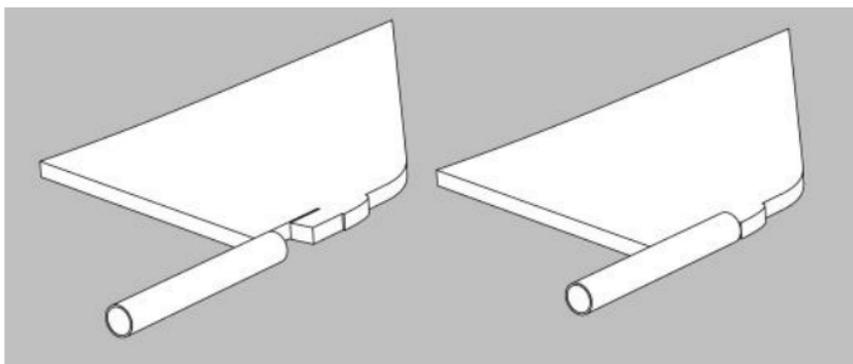


# PREPARE THE

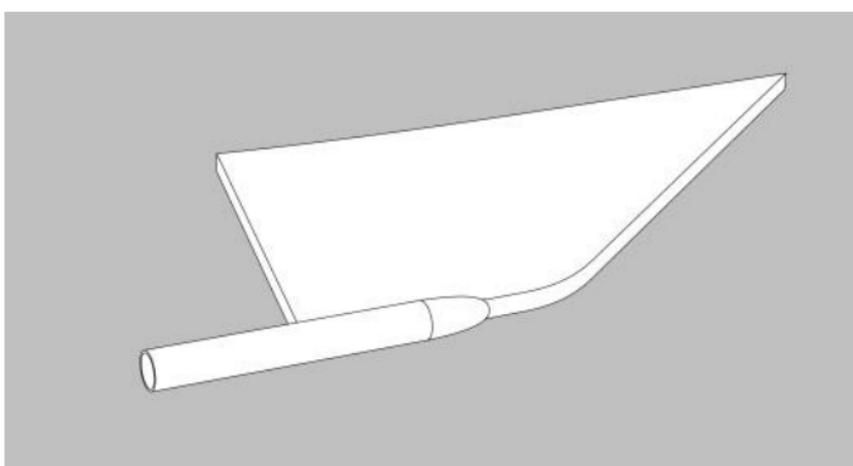
- 7.** Lightly sand each side of the laser-cut fins. Carefully push the laser-cut fins from their sheet. Start at one point on each fin and slowly and gently work around the fin. Be especially careful with the unsupported tips.



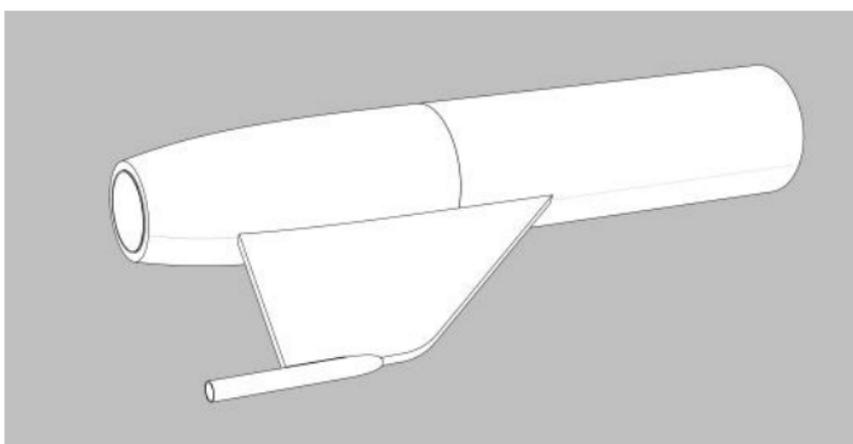
- ❑ **8.** Sand all three fins smooth and sand the hold-in tabs. Starting with one of the wings (two larger fins) apply a bead of glue in one end of a launch lug (LL-2A) and apply it over one of the tabs as shown. Repeat for the other wing and the rudder.



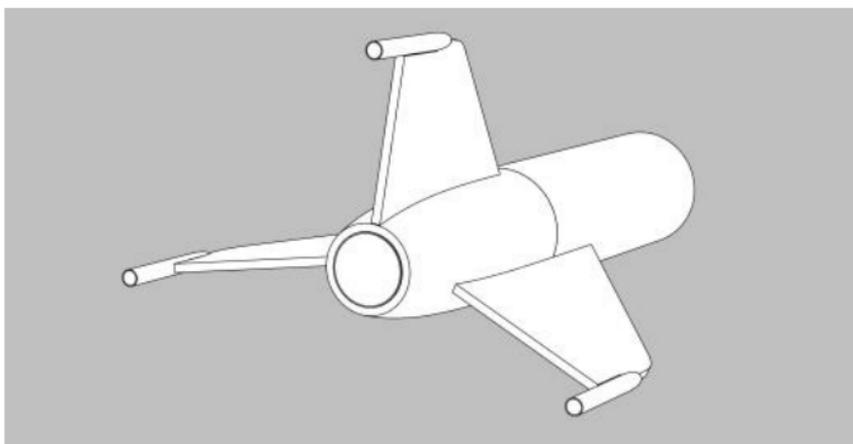
- ❑ **9.** Using a small amount of balsa dust or tissue, form a small aerodynamic shape on the tip of each fin. This should look like the cross section on the fin and rounded like a miniature nose cone. Small pieces of balsa may also be used to get the correct shape.



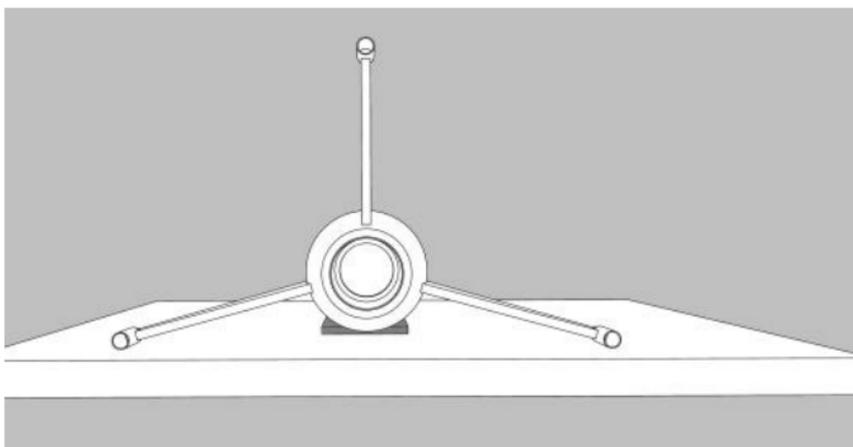
- ❑ **10.** Check one of the wings for fit. Each wing is applied to the left and right of the LL line. The wings should fit the boat tail  $3/4$ " from the bottom as shown. Once the fit is correct, apply a bead of glue to the root edge of the fin and apply it along the line. Remove it and allow it to almost dry, then reapply it. Repeat for the other wing.



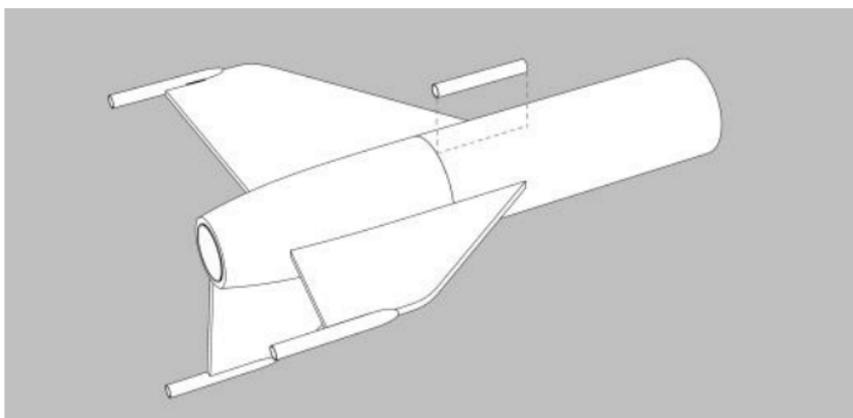
- ❑ **11.** Check the rudder (smaller fin) for fit. It should fit even with the bottom of the boat tail. Glue it the same way the wings were glued.



- ❑ **12.** Locate a small scrap of  $3/32$ " balsa from the laser-cut fin sheet. Place it on a flat surface and rest the body tube on it. Both wings should just touch the surface and the rudder should be vertical. Sight it from the end and make sure it dries in this configuration. Refer to the end view below. When all joints are dry, run a fillet along each joint for strength.

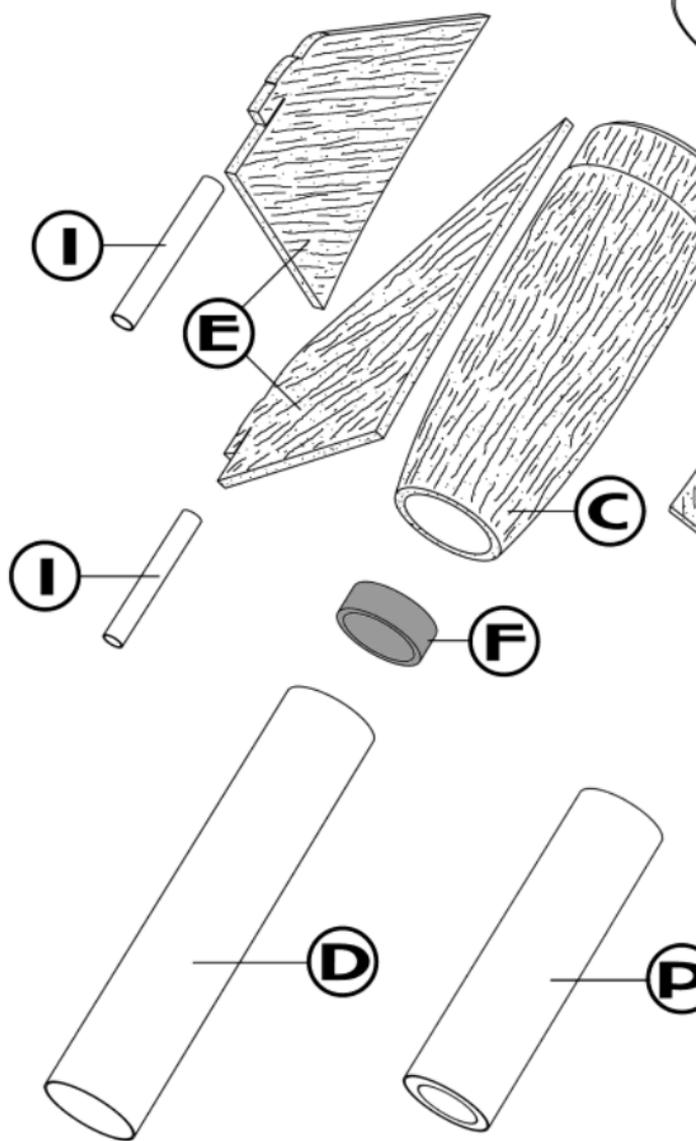


- ❑ **13.** Locate the LL line on the bottom of the rocket. Glue the remaining launch lug (LL-2A) on the line and even with the bottom of the body tube. Sight down the end and make sure it is aligned parallel with the body tube.

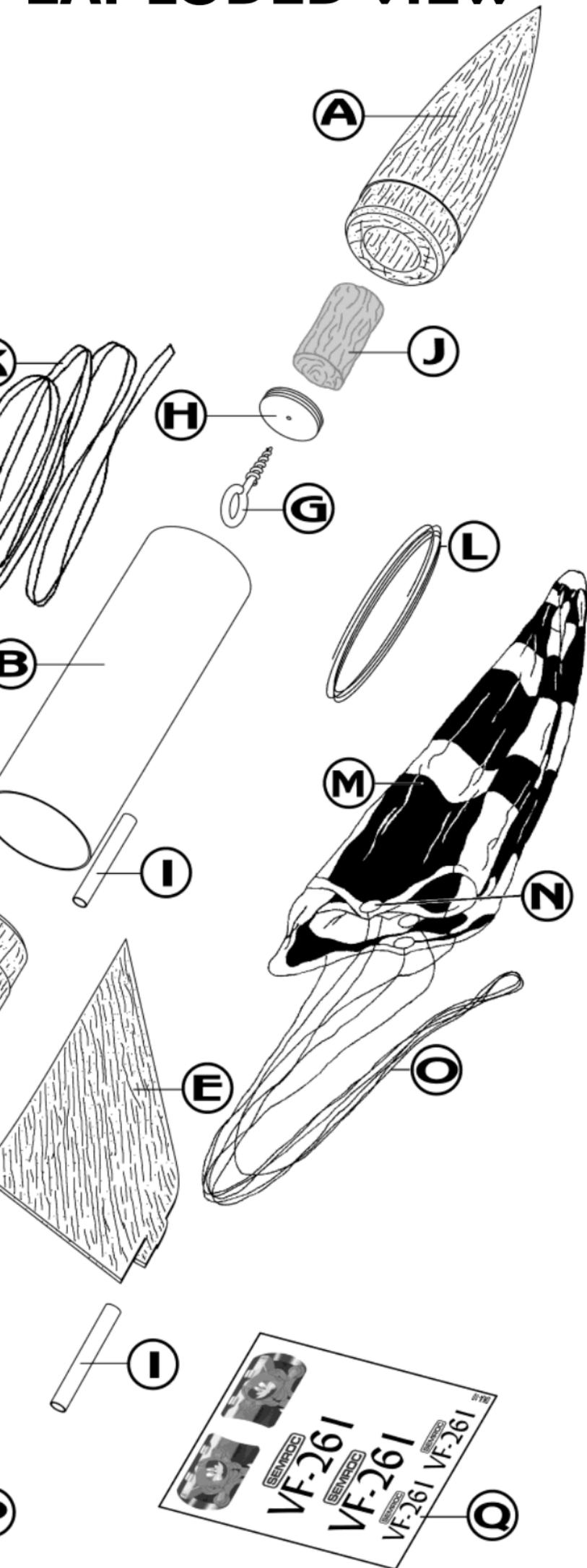


## Parts List

- |   |   |                         |          |
|---|---|-------------------------|----------|
| A | 1 | Nose Cone .....         | BNC-55FD |
| B | 1 | Body Tube .....         | BT-55S   |
| C | 1 | Balsa Tail Cone .....   | BTC-55Z  |
| D | 1 | Body Tube .....         | BT-20G   |
| E | 1 | Laser Cut Fins .....    | FA-10    |
| F | 1 | Engine Block .....      | EB-20A   |
| G | 1 | Screw Eye .....         | SE-12    |
| H | 1 | Plywood Block .....     | PB-75    |
| I | 4 | Launch Lugs .....       | LL-2A    |
| J | 1 | Clay Weight .....       | WC-5     |
| K | 1 | Elastic Cord .....      | EC-136   |
| L | 1 | Kevlar Cord .....       | SCK-12   |
| M | 1 | Plastic Parachute ..... | CB-12-24 |
| N | 1 | Tape Discs .....        | TD-6     |
| O | 1 | Shroud Line .....       | SLT-6    |
| P | 1 | Empty Casing .....      | MC-727   |
| Q | 1 | Decal .....             | DKA-10   |

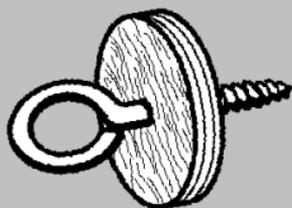


# EXPLODED VIEW

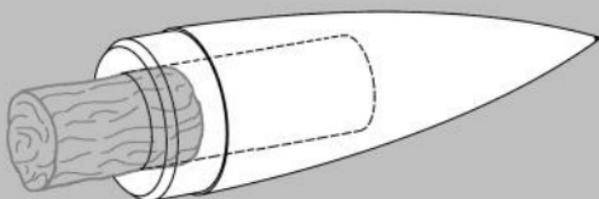


# PREPARE NOSE

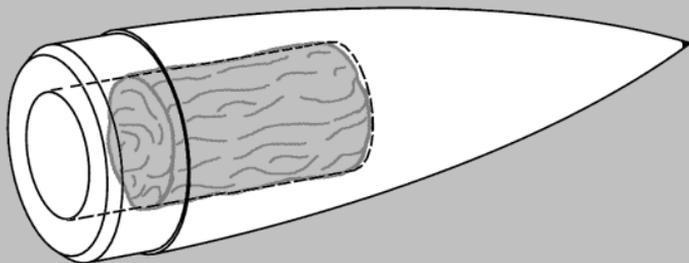
- 14.** Twist the screw eye into the center of the plywood disc. Only screw it in until the threads just disappear into the plywood. Apply glue to the thread side and set this assembly aside to dry.



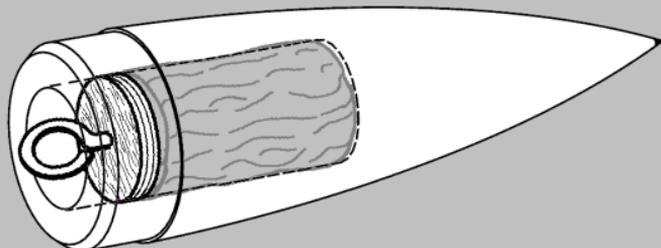
- 15.** Roll the Clay Weight into a cylinder about 5/8" in diameter. Insert into the drilled hole in the nose cone.



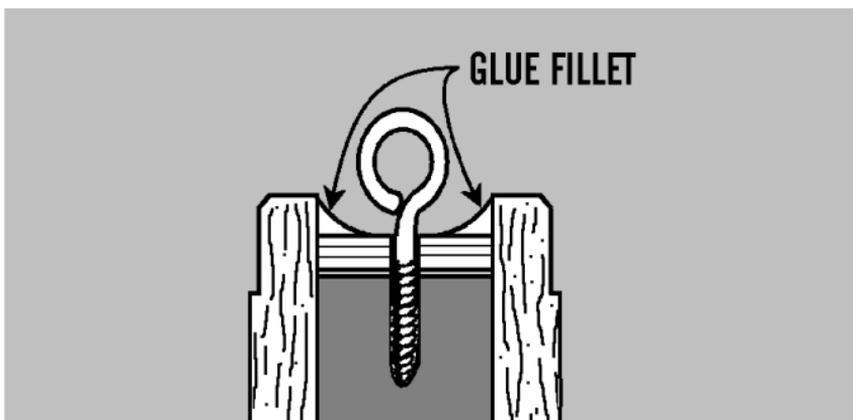
- 16.** Using a wood dowel, pencil eraser, or your finger, push the Clay Weight as far into the nose cone as possible.



- 17.** Insert the plywood disc and screw eye assembly into the hole in the nose cone and press it firmly against the Clay Weight.



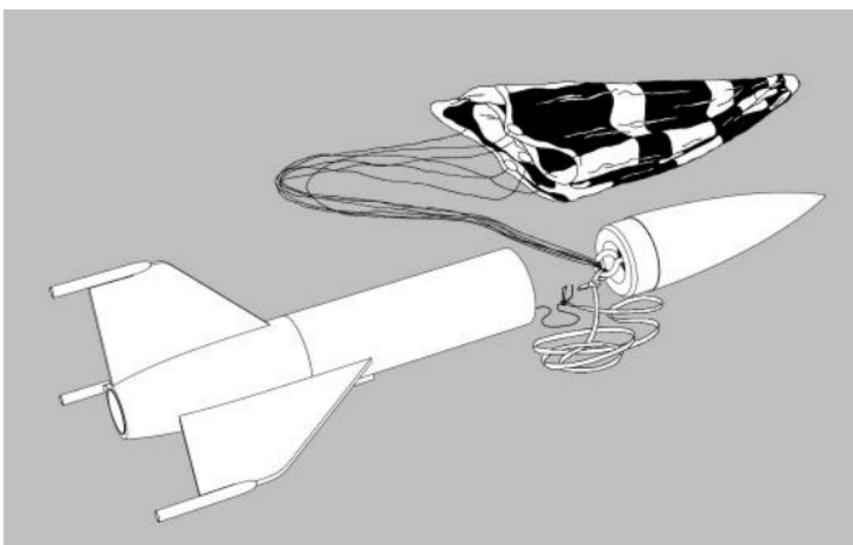
- ❑ **18.** Make sure there is no clay showing. The glue will not stick to the clay. Apply a glue fillet around the plywood disc-nose cone joint. Leave the nose cone in a vertical position with the screw eye facing upwards until the glue is completely dry.



## FINAL ASSEMBLY

- ❑ **19.** Assemble the parachute using the instructions printed on the canopy.

- ❑ **20.** Prepare the shock cord as follows. Shake the Kevlar® shock cord free and pull it out from the top of the main body tube. Line up one end of the elastic shock cord with the free end of the Kevlar cord extending from the top of the body tube. 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. Tie the loose end of the elastic to the screw eye on the payload section. Attach the parachute to the screw eye.



This completes the assembly of your

# VF-261

# FINISHING

- 21.** 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.



1st coat of fillercoat



2nd coat of fillercoat



After 1st sanding



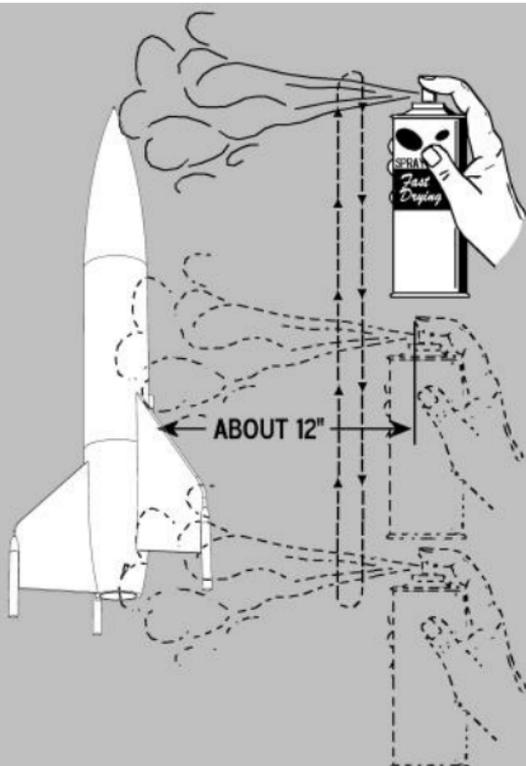
3rd coat of fillercoat



After 1st sanding

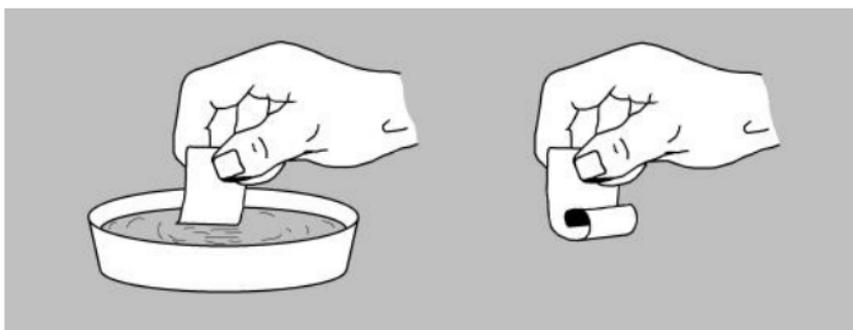
- 22.** After all balsa surfaces have been prepared, wipe off all balsa dust with a dry cloth. First spray the model with an enamel primer, then spray a base color of gloss white.

- 23.** 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.



❑ **24.** The VF-261™ can now be painted with its final colors. The rudder is black with a long strip of black along each side. Refer to the front photo for color placement. An alternative paint scheme is all silver like the rocket in Destination Moon.

❑ **25.** After the paint has dried, decals should be applied. The decals supplied with the VF-261™ are waterslide decals. Apply each decal before starting the next. Check for fit before wetting the decal. A drop of detergent in the water will allow for more movement before the decal sets.



## FLIGHT PREPPING

❑ **26.** Mounting the engine: Wrap a few turns of masking tape around the engine to get a snug fit in the engine mount. Make sure it is all the way in and against the engine block.

❑ **27.** 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. There is not much room left after sufficient wadding is applied.

❑ **28.** 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.

❑ **29.** 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.

❑ **30.** Carefully check all parts of your rocket before each flight as a part of your pre-flight checklist. Launch the VF-261™ from a 1/8" diameter by 36" long launch rod.

# NOTES

# 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**

[www.semroc.com](http://www.semroc.com)

# JOIN THE NAR!

Sign up online at [www.nar.org](http://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