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.

Join the National Association of Rocketry at http://www.nar.org.

Astron™

GREAT BEGINNER KIT

EASY & FAST TO BUILD

BALSA NOSE CONE & FINS

SLOTTED TUBE

FLYING MODEL ROCKET KIT

LASER-CUT FINS

MADE IN THE USA

SEMROC

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

ASTRON™
Kit No. KA-23

Specifications		Engine	Approx. Altitude
Body Diameter	0.908" (2.3 cm)	A8-3	300'
Length	14.8" (37.6 cm)	B6-6	750'
Fin Span	4.1" (10.4 cm)	C6-7	1400'
Net Weight	0.9 oz. (25.6 g)		

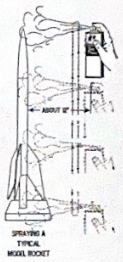
STREAMER RECOVERY

Finishing your Astron™

The Astron™ is ready to fly as soon as all the glue has dried! It does not have to be painted, but as you become more proficient in your finishing skills, you will want to follow these steps for the best-looking model!

When the glue has dried, all the balsa surfaces should be sealed for a smooth professional looking finish. Fill the wood grain with balsa fillercoat or sanding sealer. When dry, sand fins and nose cone with fine sandpaper. Repeat until smooth.

Wipe off all balsa dust with a dry cloth. Choose a high visibility color like white or yellow for the final color. 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.



After the paint has dried, decals can be applied. The decals supplied with the Astron™ are water-slide 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.

Your Astron™ is ready for flight!

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.

Preparing for Launch

Follow these steps to prepare your Astron for its first flight.

PREFLIGHT:

12. Select a model rocket engine. Use an A6-4 engine for the first flight. Later flights may be made with a B6-6 or C6-7 if your field is large enough.

11. Mount the engine by inserting it in the engine mount tube and making sure the hook keeps the engine in snugly. Install an electrical igniter in the engine using the instructions that were supplied with the engine.

10. Pack the flameproof recovery wadding from the top of the body tube. Fill the tube with about 1-1/2" of wadding making sure it seals along the sides of the tube.

9. Roll the streamer into a small cylinder around the shock cord. Insert the streamer on top of the wadding. Insert the nose cone, making sure it does not pinch the streamer or shock cord.

8. Place your Astron™ on the launcher. Make sure the launch controller is not armed. Attach the micro-clips to the igniter leads, checking to make sure they are not touching.

7. Clear the flight area, check for low-flying aircraft, and alert all the other participants of your pending flight.

6. Arm your launch controller and start your countdown...

5 4 3 2 1

Launch!

POSTFLIGHT:

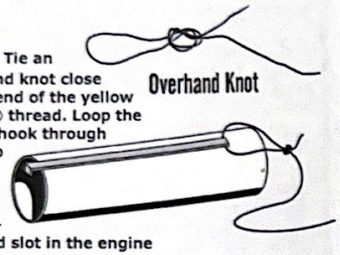
Safely recover your Astron™. Some parts, particularly the engine hook may still be warm. Remove the spent engine casing and dispose of properly. Clean your Astron™ before its next flight.

Building your Astron™

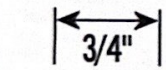
Assembly

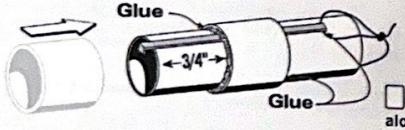
Make sure you have all the parts in the diagram below. In addition to the parts included in this kit, you will also need white or yellow glue to assemble it. Sandpaper and paint are required if you want to finish your Astron™. Read the entire instructions before beginning to assemble your rocket. When 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 below. It is important that you always ensure that you have adequate glue joints.

☐ **1.** Tie an overhand knot close to one end of the yellow Kevlar® thread. Loop the engine hook through the loop and insert it into the pre-punched slot in the engine tube.

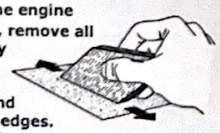


☐ **2.** Slide the centering ring over the end of the engine tube opposite the looped thread. Push it forward 3/4" from the end of the engine tube. Glue around the joints and around the looped thread. Keep glue from the outside of the centering ring.

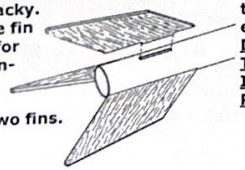




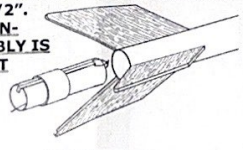
☐ **3.** While the engine mount is drying, remove all the fins carefully from the laser-cut balsa sheet. Stack the fins and lightly sand the edges. Round all the edges except the root edges that have a small tab that will fit into the body tube.



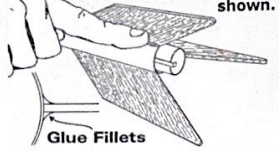
☐ **4.** Run a THIN bead of glue along the root edge of one of the fins. Attach the fin in one of the slots on the body tube. Remove the fin and wait a few minutes until the glue gets tacky. Reapply the fin and check for proper alignment. Repeat for the other two fins.



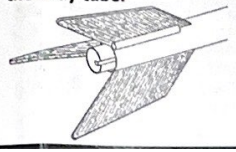
☐ **5.** Apply a bead of glue inside the body tube in the end with the fins. Push the yellow Kevlar® thread back through the engine mount. Slide the engine mount into the body tube until the centering ring stops against the fin tabs. The end of the engine tube will extend about 1/2". <u>DO NOT STOP UNTIL THE ASSEMBLY IS IN THE CORRECT PLACE!</u>



☐ **6.** After the fin assembly is 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 as shown.



☐ **7.** Using the same technique you used on the fins, glue the launch lug against the root edge of one of the fins and even with the bottom of the body tube.



☐ **8.** Test the nose cone for fit. Sand it slightly if it is too tight. Turn the screw eye into the base of the nose cone. Unscrew it and squirt some glue into the hole. Reinstall the screw eye and wipe off any excess glue.

☐ **9.** Feed the yellow Kevlar® cord back through the engine mount and out of the top of the body tube. Tie it to one end of the elastic cord. Tie the other end of the elastic cord to the screw eye as shown in the drawing to the left. Put a drop of glue on each knot.

☐ **10.** Tie the streamer to the middle of the elastic cord, leaving about the same amount of streamer on each side of the knot. Apply a bead of glue to the joint.