



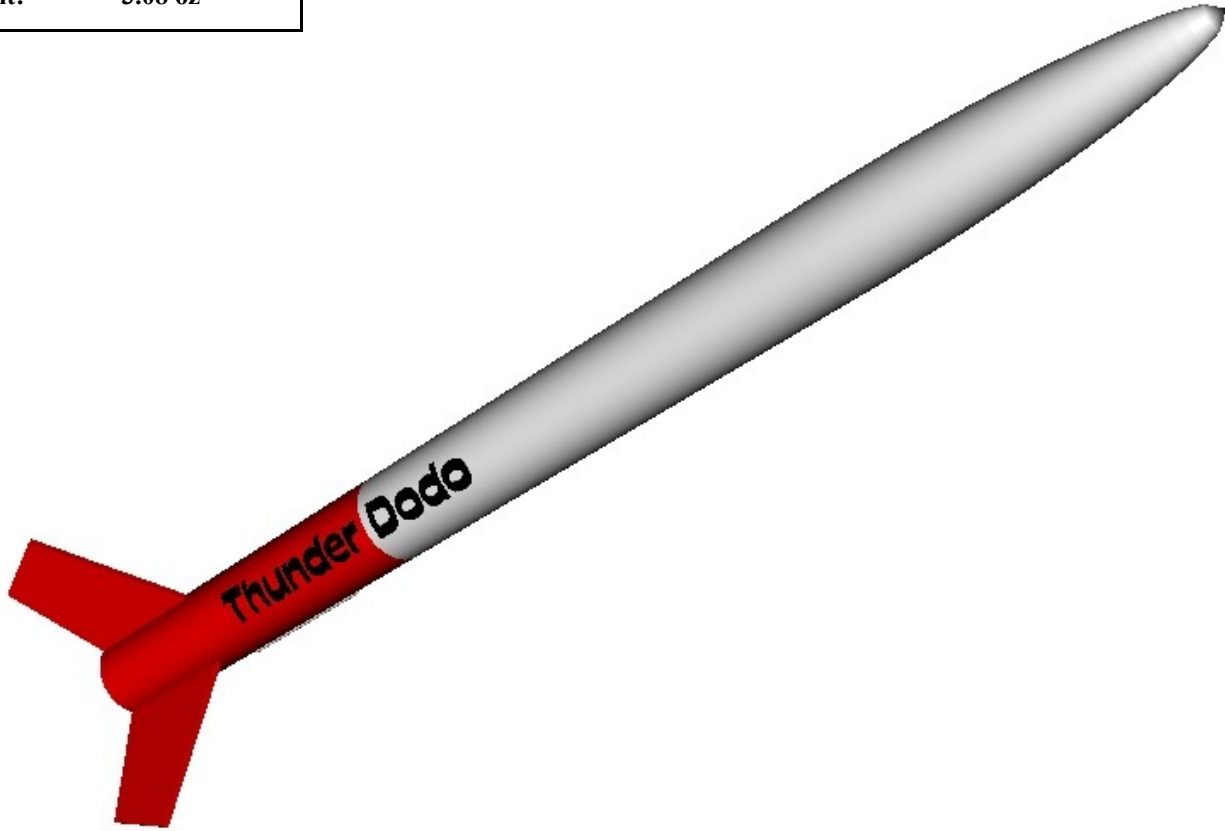
*Skill Level 1*

# ***Thunder Dodo***

*Designed By Jay Gommer  
Revision Date: January 3, 2006*

Length:	25.34"
Diameter:	1.64"
Fin Span:	7.05"
Weight:	3.08 oz

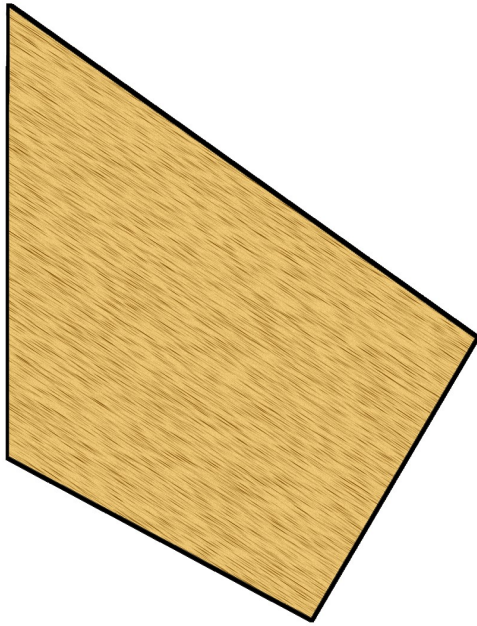
*Image created with RockSim 8 and Photoshop Elements*



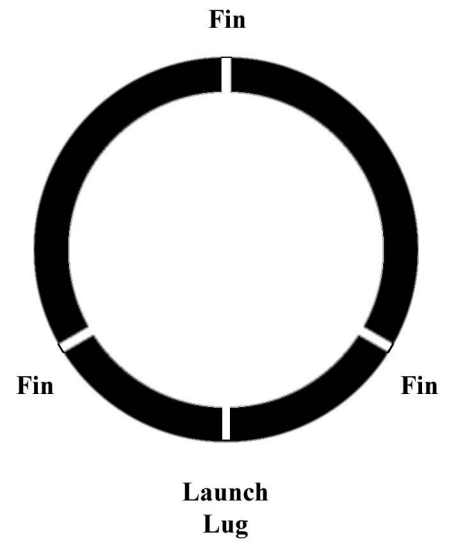
## ***Main Parts List***

Nose Cone.....	PNC-60AH	Launch Lug.....	LL-122
Body Tube.....	BT-60	Parachute.....	PK-18
Motor Tube.....	BT-50S	Shock Chord.....	SC-24
Centering Rings.....	(2) CR-5060	Shock Chord Mount.....	SCK-24
Thrust Block.....	CR-2050	Screw Eye.....	SE-1
Motor Hook.....	EH-375	Snap Links.....	(2) #12
Fin Stock.....	1/8" Sheet Balsa		

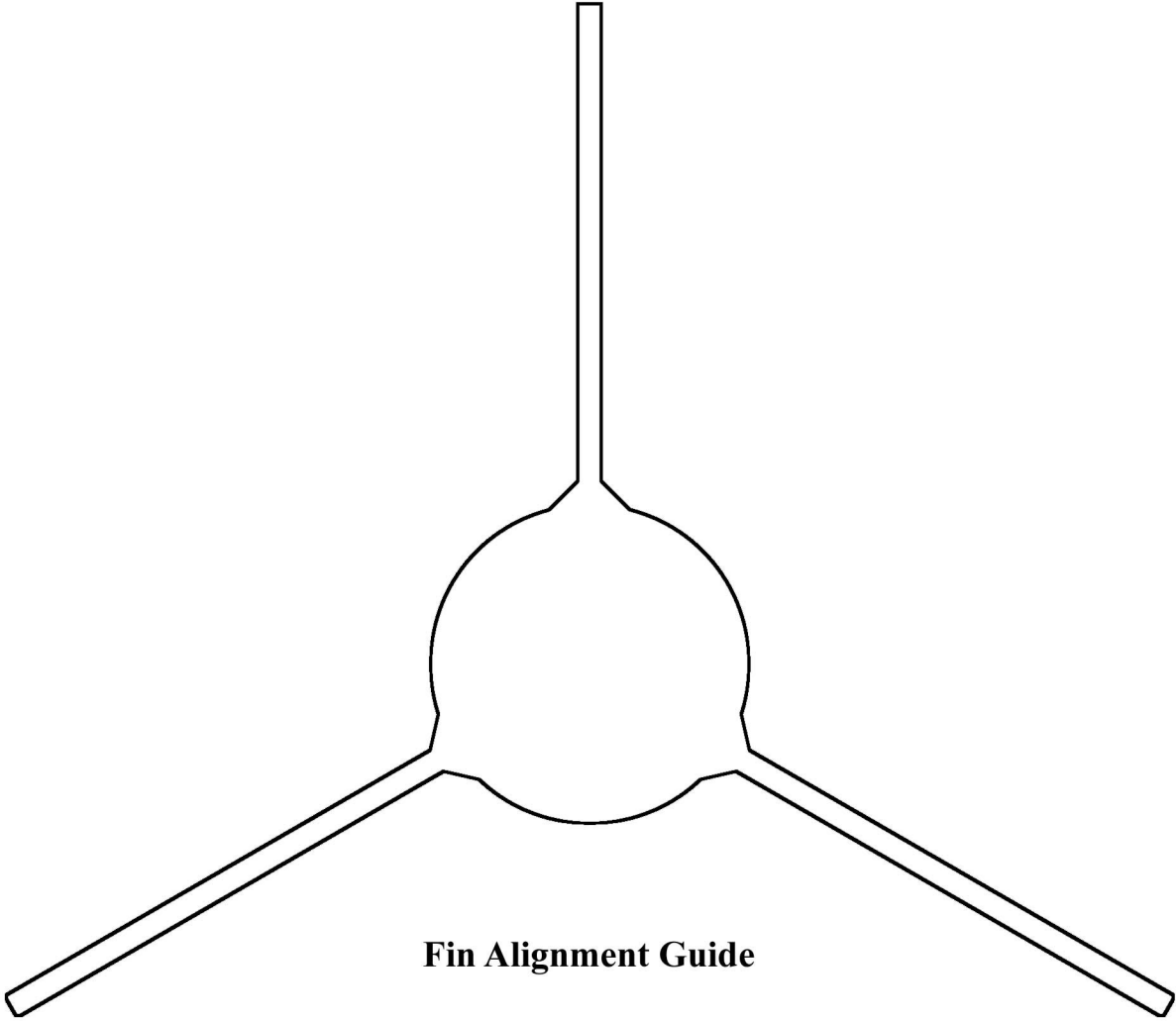
*Fin Template & Locater Guide*



**Fin Locater Guide**



*Fin Alignment Guide*



**Fin Alignment Guide**

## General Assembly Sequence

- **Step 1** Cut out the three fins using the template provided on page 2. If you are using the *Estes Screamin' Mimi* kit, use the kit fins as a starting point and remove the excess balsa. Sand the large faces of each fin with 220-grit paper to remove fuzzing. Round over only the leading edge, trailing edge, and tip edge. Square up the root edge.
- **Step 2** Stack and clamp the three fins together and apply thinned glue to the root edges. Set aside to dry, at least 30 minutes.
- **Step 3** Sand the surfaces of the BT-60 main body tube, and the BT-50S motor tube, to remove the shine and roughen up the finish.
- **Step 4** Slide the Fin Locator Guide onto the BT-60 and mark the tube for three fins and the launch lug. Remove the guide, then extend the lines lengthwise along the tube from the bottom edge to a distance of 3" for the fins, and 5" for the launch lug. Mark the launch lug line 2.5" up from the bottom edge of the tube.
- **Step 5** Apply a layer of thinned glue along the lengths of all three fin lines, and on the launch lug line between the marks at 2.5" and 5" from the bottom. Allow the glue to dry about 30 minutes.

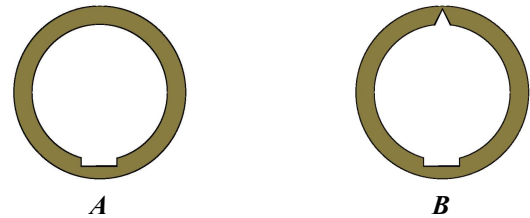


Figure 1

- **Step 6** Modify both of the two CR-5060 rings as shown in Fig. 1A above. Modify one of the two rings with a "V" notch, as shown in Fig. 1B.
- **Step 7** Mark the BT-50S 1", 2.75", and 3.5" from one end. Draw lines completely around the tube at these locations.

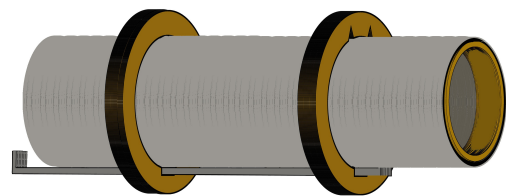
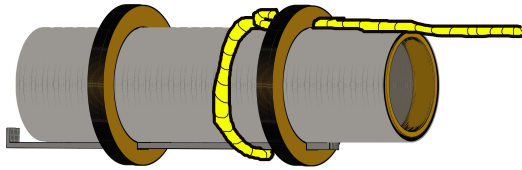


Figure 2  
(Not long mount shown)

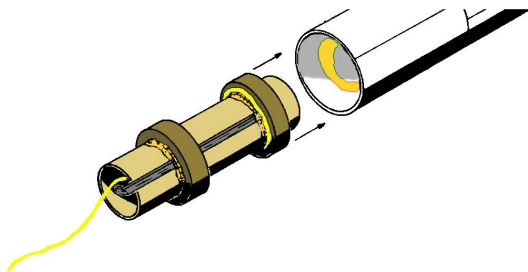
- **Step 8** Draw a line down the full length of the motor tube. At the intersection of this line with the line at 3.5" from the bottom, cut a slot in the tube wide enough for the tip of the engine hook to fit through. As illustrated in Fig. 2 above, slide the "A" ring up from the bottom with the flat notch over the hook, until it is touching the line at 1". Slide the "B" ring down from the top until the flat notch is just over the top end of the hook. You should just see the line at 3.5" on the front side of the ring. Apply a bead of glue around both sides of each ring where they contact the motor tube. Slide the CR-2050 ring down inside the motor tube from the top, until it bottoms out against

the tip of the hook. Apply a bead of glue to this ring from the top. Clean out any glue that has filled the “V” notch in the “B” ring before it has time to dry. This notch must be open in a later step. Set this subassembly aside for an hour to dry.



*Figure 3*

- **Step 9** Tie a slip knot loop at one end of the Kevlar thread, and slide the motor mount into the loop, as shown in Fig. 3 above. Pull the loop tight against the body tube, about mid-way between the two rings. Push the long, free end of the thread through the “V” notch from the back of the ring, and pull the thread until all of the excess is forward of the ring. Work the loop up against the back of the “B” ring, then secure it to the ring with a bead of glue. Allow this to dry about 30 minutes.

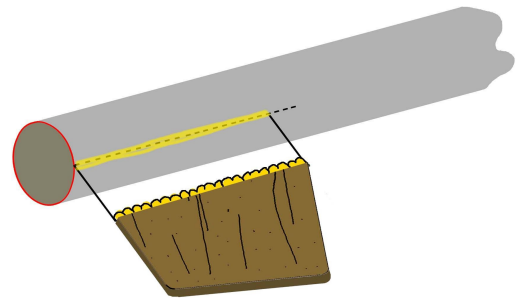


*Figure 4*

- **Step 10** Dry-fit the motor mount into the bottom of the main body tube and gently sand the outer edges of the rings until the mount fits easily. Apply a generous bead of glue up inside the bottom end of the body tube, about 3” from the edge, and

spread this around with a soft-bristle brush. Pull the Kevlar thread down through the center of the mount from the top, then insert the mount as shown in Fig. 4 above. Push the mount forward with one continuous motion until the bottom edge of the motor tube is even with the bottom edge of the body tube. Do not stop the movement until the edges are even, or the glue will grab the mount in the wrong place. Place the body tube in an upright position and allow the glue to dry completely.

- **Step 11** Using the brush, apply a bead of glue around the “A” ring where it contacts the main body tube. Turn the body tube upside down to keep the glue from running, and allow the glue to dry completely.



*Figure 5  
(Not this model shown)*

- **Step 12** Apply a narrow bead of full-strength glue to one of the fin locator lines, and to the root edge of one of the fins. As shown in Fig. 5 above, press the root edge of the fin onto the body tube on the locator line. Hold the fin in position for about 15 seconds before releasing. Using a 1/4” wide soft-bristle brush, moistened, wipe away the excess glue

that squeezes out from both sides of the joint. Slide the fin alignment guide down from the top of the tube and position one of the fin slots over this fin, gently adjusting the angle of the fin until it is straight with the slot. Allow the fin to dry with the tube in a horizontal position, and with the fin located TDC. Give this about 30 minutes before removing the guide. Repeat this sequence with the remaining fins, one at a time.

- **Step 13** Attach the launch lug to the main body tube, with the bottom of the lug touching the line at 2.5" from the bottom edge, and the top of the lug touching the line at 5" from the edge. Smooth out the glue with the 1/4" wide brush, moist, and allow to dry completely.

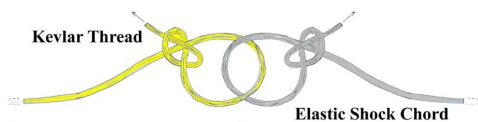


Figure 6

- **Step 14** Tie a slip knot loop in the free end of the Kevlar thread. As shown in Fig. 6 above, push one end of the elastic shock chord through the Kevlar loop, and tie a slip knot loop in it, trapping the Kevlar loop. Pull the two knots tightly against each other, then apply a droop of thinned glue to the knots to secure them. Allow to dry.
- **Step 15** Attach the barrel end of one of the snap links to the free end of the elastic thread with a slip knot, and secure this with a drop of thinned glue. Allow to dry.

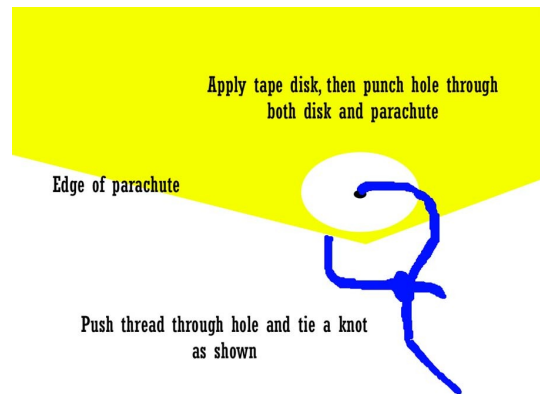


Figure 7

- **Step 16** Assemble the parachute according to the package instructions, but with the modification shown in Fig. 7 above. Attach the barrel end of the second snap link to the shroud lines and secure the knot with a drop of thinned glue. Allow to dry.
- **Step 17** Apply a fillet of glue along the base of each fin, both sides, and smooth this out with your finger. Allow these to dry in a horizontal position. Repeat this step with the launch lug.

### *Finishing Sequence*

- **Step 18** Apply thinned filler compound (cream soup consistency) to the raw balsa surfaces of the fins, and to the spiral seam of the body tube. Give this a full day to dry before sanding with 220-grit paper. Do not gouge the balsa, or sand through the outer layer of paper on the tube. Inspect the surfaces for deep scratches or other imperfections, then re-apply filler as needed to these areas and allow to dry. Sand again. Repeat this sequence until the unprimed surfaces are as blemish-free as possible.

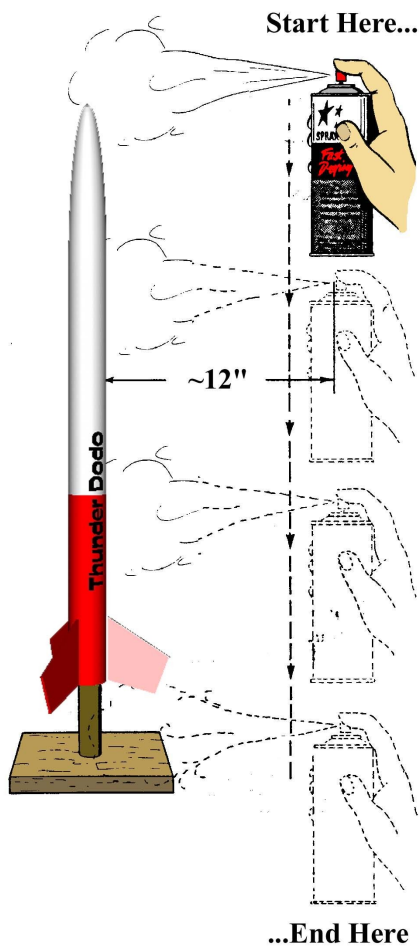


Figure 8

- **Step 19** Tack-rag the model to remove loose sanding dust. As shown in Fig. 8 above, use a top-to-bottom motion when applying primer, paint, and clear coats. This is to reduce the chances of runs, which can ruin the finish. Begin the spraying above the top of the model, and continue the spraying past the bottom of the model. This will reduce the chances of splatter. Allow at least a full day between coats for drying time. Apply at least two full coats of primer to the model before sanding the first time with 220-grit paper. Tack-rag the model after each sanding.
- **Step 20** We recommend the use of Rust-O-Leum's White Clean Bare

Metal Primer as the primer of choice. This is a spirit-based primer, and should be sprayed either outdoors or in a well-ventilated spray booth. Prime, sand with progressively finer grit papers, and tack-rag as needed until you are satisfied with the condition of the surface. Spray the model with one final prime coat, but do not sand.

- **Step 21** Use of a bright white primer may eliminate the need for a white color coat, but if a brighter white is desired, we recommend the use of an acrylic titanium white, such as that produced by Liquitex. Mix this artist's tube paint with matching airbrush medium and water to a viscosity that flows through an airbrush easily. Allow this to dry for two full days before masking off for the color coat. We also recommend using a bright red from Liquitex instead of an aerosol enamel. Allow another two days for the trim color to dry before moving to the next step.
- **Step 22** We recommend the use of Future Floor Finish as your protective clear coat. BARCLONE has been advised that the aerosol spray acrylics have an overly-aggressive solvent base that can damage waterslide decals beyond usability. Future is thinned with clean ammonia, but can also be thinned with Windex. Thin this product until it flows through your airbrush cleanly. Apply one full coat to the model and allow at least two days to cure before applying decals. This should reduce any chances of clouding when the decal is applied.

- **Step 23** Apply the name decal as shown in the cover illustration, using the instructions provided by the manufacturer of the paper. When fully dry, gently wipe away the adhesive residue with a soft tissue or cloth. Finally, give the model a second clear coat of Future to seal the decal and to protect the finish.

*Pre-Flight Sequence*

- **Step 24** Attach the snap links on the shock chord and the parachute to the attachment loop on the shoulder of the nose cone.

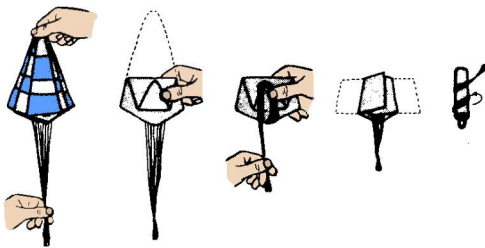


Figure 9

- **Step 25** Use the illustration in Fig. 9 above to fold the parachute. Wrap the shroud lines around the parachute in a loose manner.

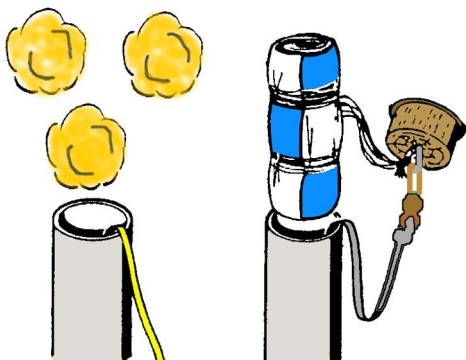


Figure 10

- **Step 26** Push about 3” of shredded cellulose insulation, or about 5 wadding sheets, crumpled, into the body tube. Do not pack either of these

tightly – the idea is to create a gas seal that will prevent hot, burning particles from coming into contact with the parachute when the ejection charge goes off. This wadding, or loose fill, must be blown completely out of the tube for the parachute to be deployed. Any restriction might prevent deployment.

Next, insert the shock chord and the Kevlar thread on top of the wadding, then push the parachute on top of the shock chord. The parachute needs to be located about 2” down from the edge of the tube to allow clearance of the nose cone shoulder.

- **Step 27** We recommend the C11-5 as the first motor for this model. Altitudes of over 500’ are possible with this motor. The chart below shows our other recommendations, and the altitudes and deployment velocities for each.

B4-2.....	175'	.....	24	FPS
C11-5.....	510'	.....	7	FPS
C6-5.....	550'	.....	20	FPS
D12-7.....	1100'	.....	28	FPS
E9-6.....	1720'	.....	26	FPS

- **Step 28** Review the safety code on the last page, then go fly!

**Developed for BARCLONE Rocketry  
by C. P. McGraw**

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by C. P. McGraw**

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# Model Rocket Safety Code

**Materials:** I will use only lightweight, non-metal parts for the nose cone, body, and fins of my rockets.

**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.

**Ignition System:** I will launch my rockets with an electrical launch system and electrical motor ignitors. 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.

**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.

**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 to a safe distance.

**Launcher:** I will launch my rockets 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 I will cap the end of the rod when it is not in use.

**Size:** My model rocket will not weigh more than 1,500 grams (53 oz) at liftoff, and will not contain more than 125 grams (4.4 oz) of propellant or 320 N-sec (71.9 lb-sec) of total impulse. If my model 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 (FAA) regulations before flying.

**Flight Safety:** I will not launch my rockets at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload into my rockets.

**Launch Site:** I will launch my rockets outdoors, in an open area at least as large as shown below, and in safe weather conditions with winds speeds no greater than 20 MPH. 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.

## LAUNCH SITE DIMENSIONS

Total Impulse (nSec)	Motor Size	Minimum Field Size
<i>0.00 – 1.25</i>	<i>1/4A – 1/2A</i>	<i>50'</i>
<i>1.26 – 2.50</i>	<i>A</i>	<i>100'</i>
<i>2.51 – 5.00</i>	<i>B</i>	<i>200'</i>
<i>5.01 – 10.00</i>	<i>C</i>	<i>400'</i>
<i>10.01 – 20.00</i>	<i>D</i>	<i>500'</i>
<i>20.01 – 160.00</i>	<i>E, F, G</i>	<i>1000'</i>
<i>160.01 – 320.00</i>	<i>2G</i>	<i>1500'</i>

**Recovery System:** I will use a recovery system, such as a streamer or parachute, in my rockets so that they return safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rockets.

**Recovery Safety:** I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

Model Rocket Safety Code  
developed by the  
National Association of Rocketry  
Revised Code November, 2004