





A DAMON COMPANY
ESTES INDUSTRIES
 1295 H Street
 Penrose, CO 81240

RASCALTM

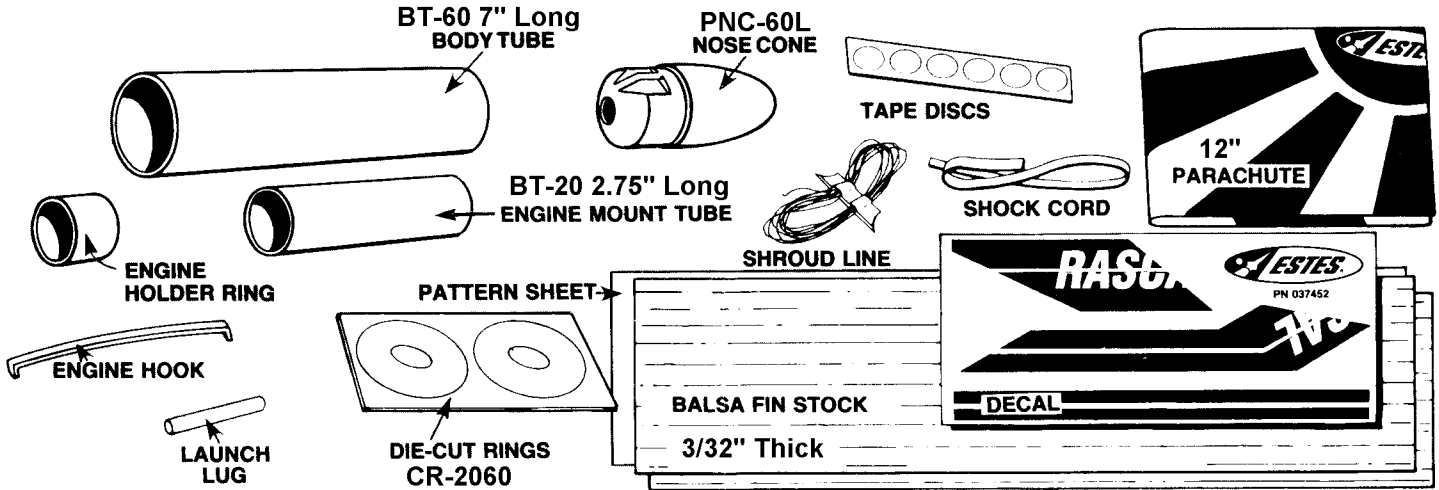
FLYING MODEL ROCKET KIT
 #2021

PARTS AND SUPPLIES

Locate the parts shown below and lay them out on the table in front of you.

ASSEMBLY TIP

Read all instructions before assembling your model.

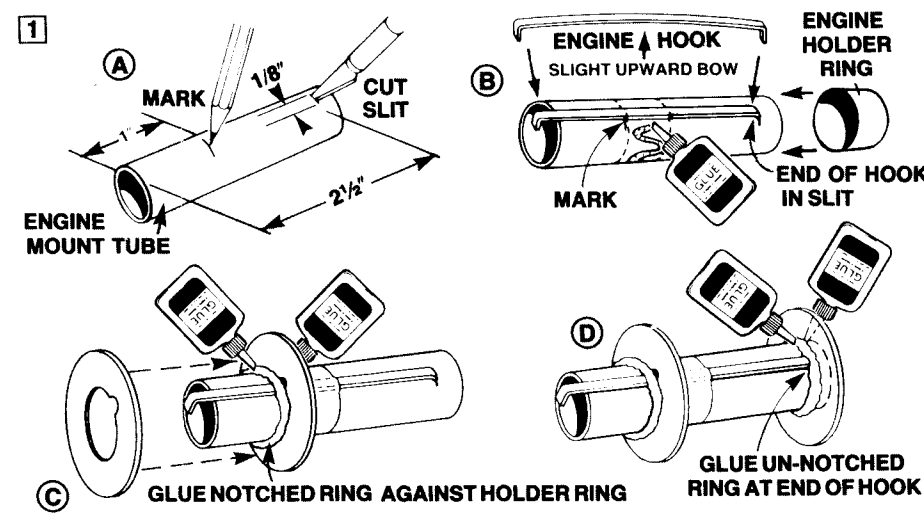


In addition to the parts included in the kit you will also need.

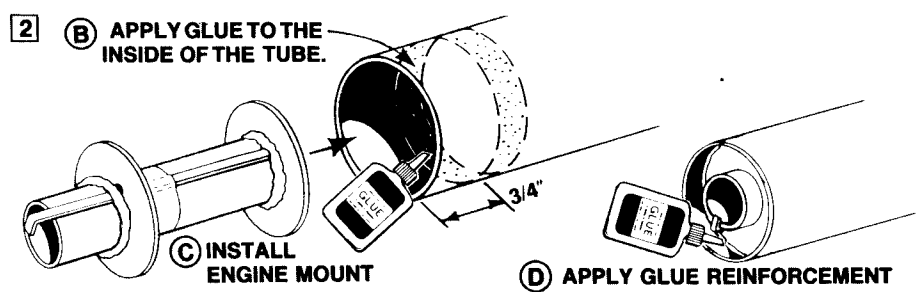


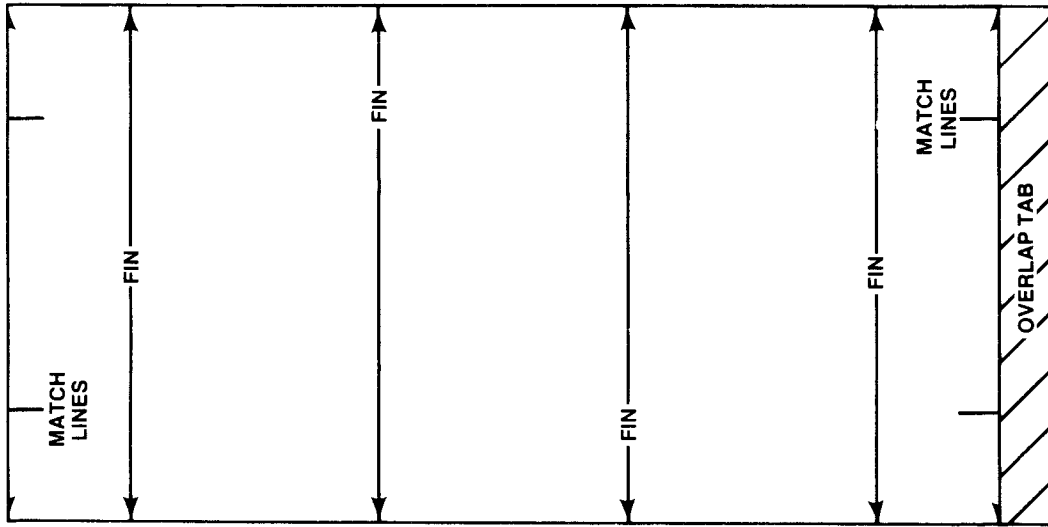
ROCKET ASSEMBLY

- Mark engine mount tube at 1 inch and 2½ inches from one end. Cut a 1/8 inch wide slit at the 2½ inch mark.
 - Apply glue around tube just in front of 1 inch mark. Push one end of engine hook into slit and lay straight on tube. Slide engine holder ring over hook and down to 1 inch mark.
 - Glue notched adapter ring against holder ring as shown.
 - Glue un-notched adapter ring against forward end of engine hook.

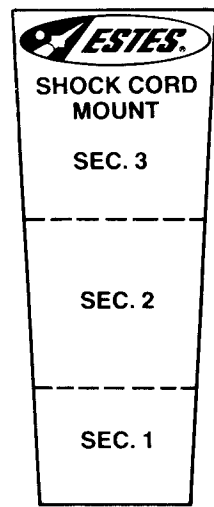


- Check fit of completed engine mount in body tube. Sand adapter ring edges if necessary.
 - Apply glue around inside of one end of body tube. Glue should be about ¾ inch from end of tube.
 - Push engine mount into body tube until tube ends are even.
 - Add glue reinforcement around rear ring and body tube joint as shown.



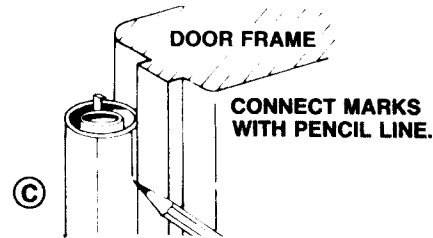
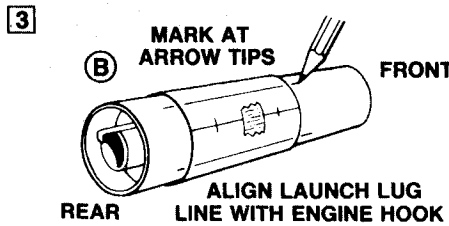


TUBE MARKING GUIDE



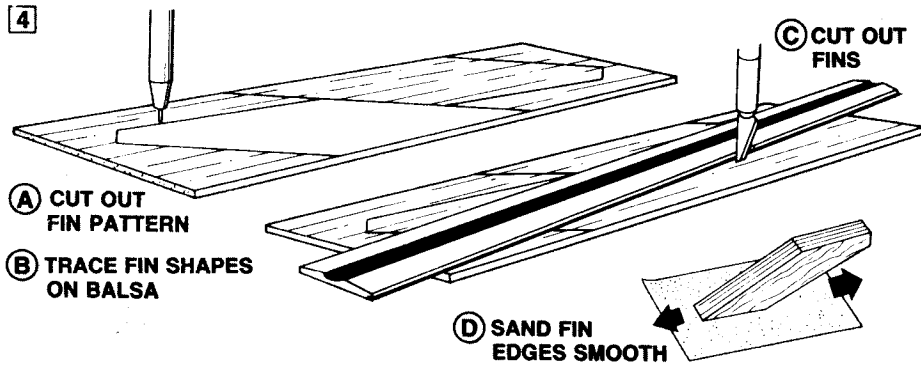
3.

- A. Cut out tube marking guide above.
- B. Wrap guide around the tube and tape. Mark tube at arrows. Remove guide.
- C. Draw straight lines connecting each pair of marks.



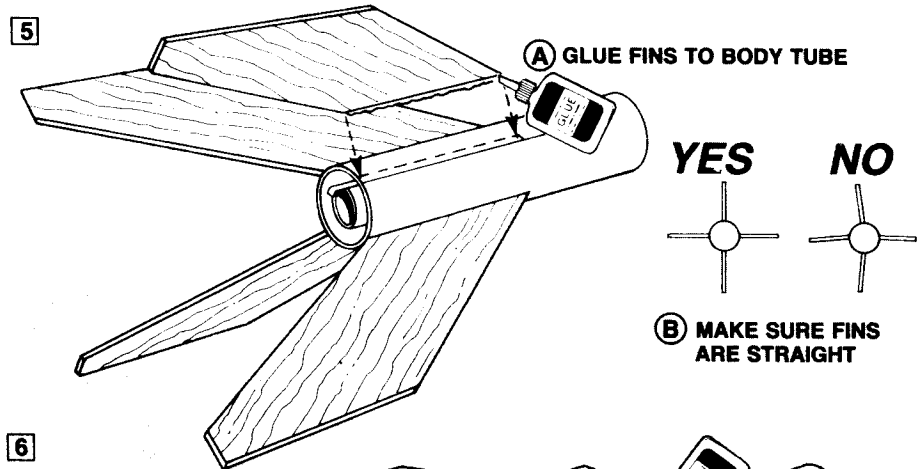
4.

- A. Cut out fin pattern from pattern sheet.
- B. Use ball point pen to trace 2 fins on each balsa sheet as shown on fin pattern.
- C. Cut out fins with hobby knife and metal-edged ruler.
- D. Stack fins together and sand all edges smooth. Lightly sand away any remaining pen lines.



5.

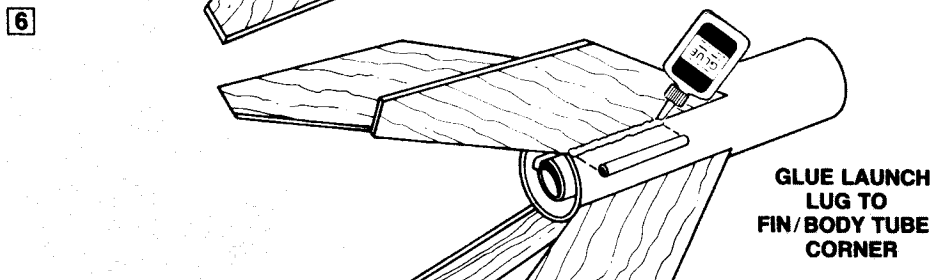
- A. Apply glue to the root edge of a fin. Glue fin next to alignment line. Repeat for other fins. Apply each fin on same side of its fin alignment line. Let each fin dry several minutes before applying the next fin.
- B. Looking at the rocket from the rear, the fins should be in the positions shown with the trailing edge of each fin even with the end of the tube.



FINS MUST BE ATTACHED CORRECTLY FOR STABLE FLIGHT

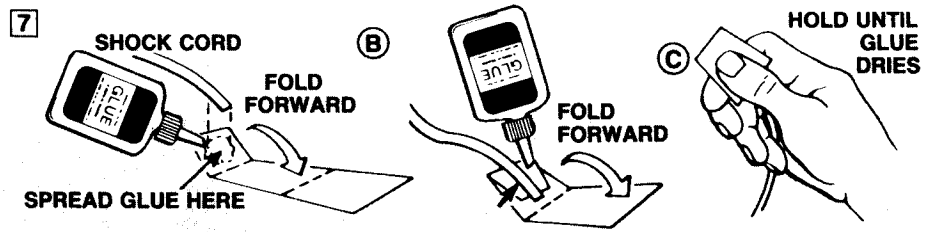
6.

- Glue launch lug to fin-body tube joint as shown.



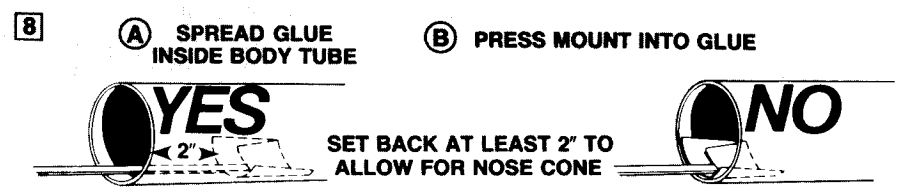
7.

- A. Cut shock cord mount from top of page 2.
- B. Crease on dotted lines by folding. Spread glue on section 1 and lay end of shock cord into glue. Fold over and apply glue to back of first section and exposed part of section 2. Lay shock cord as shown and fold mount over again.
- C. Clamp unit together with fingers until glue sets.



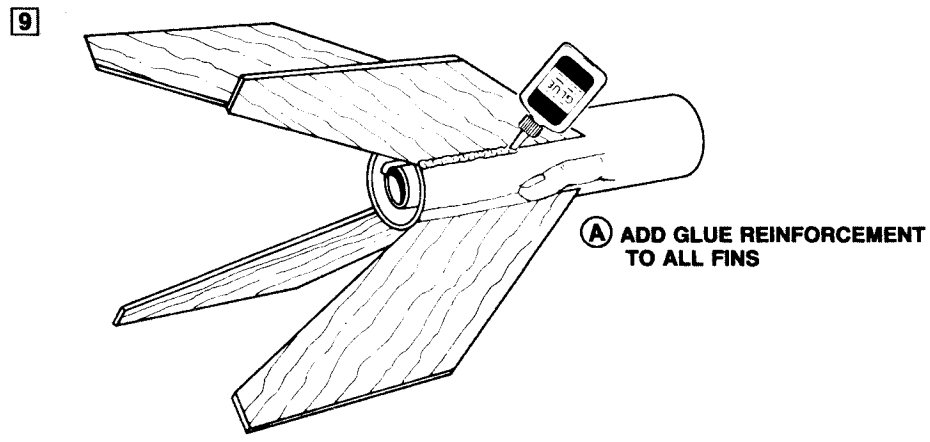
8.

- A. Apply glue to inside front of body tube to cover an area no less than 2 to 3 inches from end. The glued area should be same size as shock cord mount.
- B. Press mount firmly into glue as shown.
- C. Hold until glue sets.



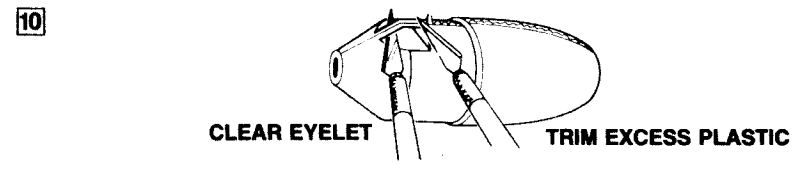
9.

- A. Apply a glue reinforcement to each fin/body tube joint.
- B. Allow glue to dry thoroughly.



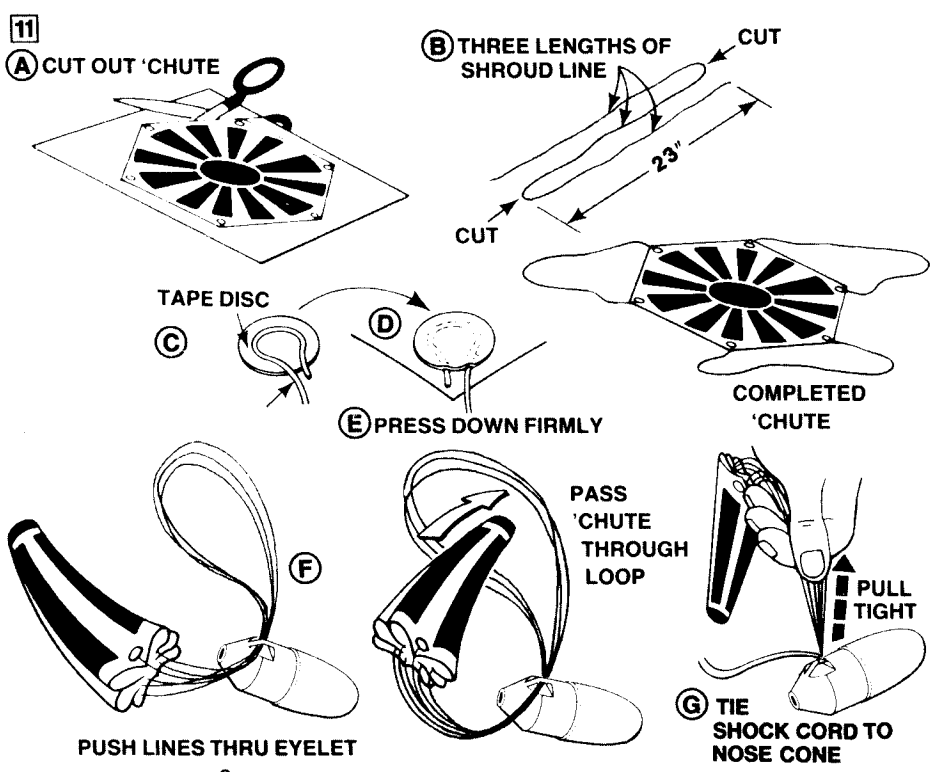
10.

Trim excess plastic from around sides of nose cone with a sharp knife. Also remove any excess plastic from inside molded eyelet. Wipe nose cone with damp cloth to remove oil and dirt.



11.

- A. Cut out parachute on edge lines.
- B. Cut three 23 inch lengths of shroud line.
- C. Form small loops with shroud line ends and press onto sticky side of tape discs.
- D. Attach tape discs with line ends to top of parachute as shown.
- E. Firmly press tape discs into place until both tape discs and parachute material are molded around shroud line loops.
- F. Pass shroud line loops through eyelet on nose cone. Pass parachute through loop ends and pull lines against the nose cone.
- G. Tie free end of shock cord to nose cone eyelet.

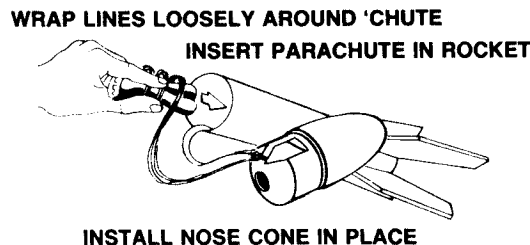
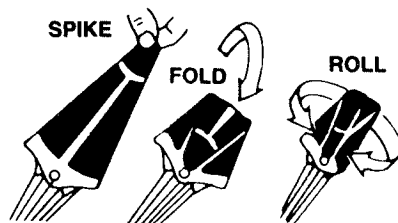
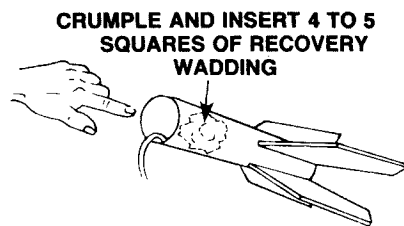


FINISHING YOUR ROCKET

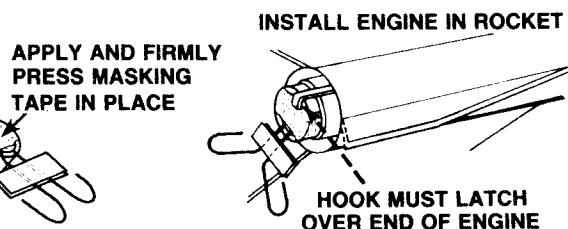
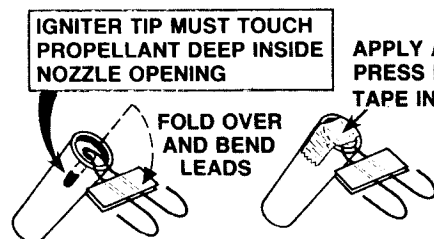
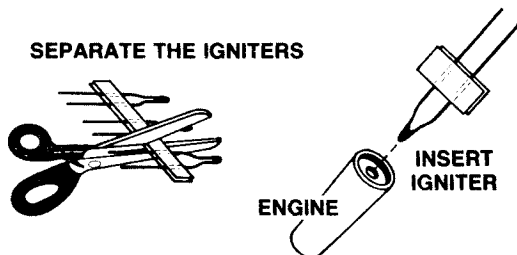
Apply sanding sealer to wood parts with small brush. When sealer is dry, lightly sand all sealed surfaces. Repeat sealing and sanding until balsa grain is filled and smooth. When sanding sealer and glue are completely dry, paint model with spray enamel. Follow instructions on spray can for best results. Let paint dry overnight before masking

to paint second color. To apply decals, cut each out, dip in lukewarm water about 30 seconds, and hold until it uncurls. Refer to photograph on front of color panel for decal placement. Slip decal off backing sheet and onto model. Blot away excess water. For best results, let decals dry overnight and apply a coat of clear spray paint to protect decals.

ROCKET PREFLIGHT



PREPARE ENGINE



LAUNCH SUPPLIES

To launch your rocket you will need the following items:
—Estes Electrical Launch System and Launch Pad
—Estes Recovery Wadding No. 2274
—Recommended Estes Engines: A8-3 (First Flight), B4-4, B6-4, or C6-5.
Use A8-3 for first flight to become familiar with your rocket's flight pattern.

Use only Estes products to launch this rocket.

FLYING YOUR ROCKET

Choose a large field away from power lines, tall trees, and low flying aircraft. Try to find a field at least 500 feet square. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great.

Launch area must be free of dry weeds and brown grass.

Launch only during calm weather with little or no wind and good visibility.

Don't leave parachute packed more than a minute or so before launch during cold weather. [Colder than 40° Fahrenheit (4° Celsius)].

Parachute may be dusted with talcum powder to avoid sticking.

MISFIRES

Failure of the model rocket engine to ignite is nearly always caused by incorrect igniter installation. An Estes igniter will function properly even if the coated tip is chipped. However, if the coated tip is not in direct contact with the engine propellant, it will only heat and not ignite the engine.

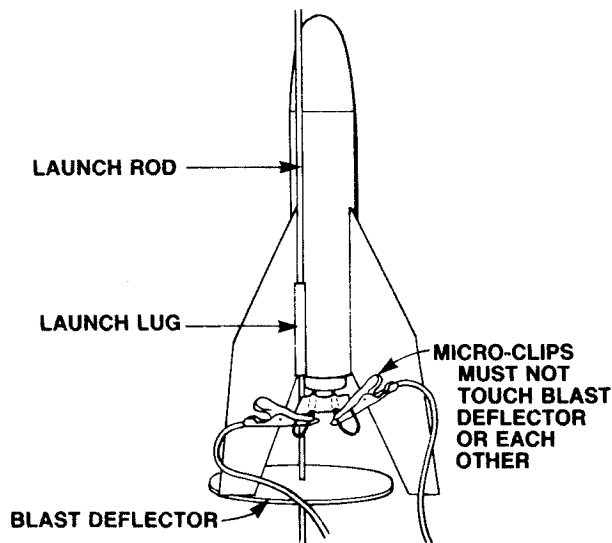
When an ignition failure occurs, remove the safety key from the launch control system and wait one minute before approaching the rocket. Remove the expended igniter from the engine and install a new one. Be certain the coated tip is in direct contact with the engine propellant, then tape the igniter leads firmly to base of engine as illustrated above. Repeat the countdown and launch procedure.

FOR YOUR SAFETY AND ENJOYMENT

Always follow the NAR-HIA* MODEL ROCKETRY SAFETY CODE while participating in any model rocketry activities.

*National Association of Rocketry-The Hobby Industry of America

COUNTDOWN AND LAUNCH



- ⑩ REMOVE SAFETY KEY to disarm the launch controller.
 - ⑨ Remove safety cap and slide launch lugs over launch rod to place rocket on launch pad. Make sure the rocket slides freely on the launch rod.
 - ⑧ Attach micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the metal blast deflector. Attach clips as close to protective tape on igniter as possible.
 - ⑦ Move back from your rocket as far as launch wire will permit (at least 15 feet).
 - ⑥ INSERT SAFETY KEY to arm the launch controller.
- Give audible countdown **5 ... 4 ... 3 ... 2 ... 1**

LAUNCH!!!
PUSH AND HOLD LAUNCH BUTTON UNTIL ENGINE IGNITES

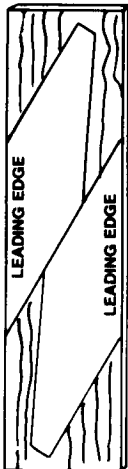
Remove safety key—Replace cap on rod.

1 Inch

LEADING EDGE

RASCAL FIN PATTERN

ROOT (GLUING) EDGE



**RASCAL KIT #2021
FIN PATTERN
PN 084202**

1. CUT OUT FIN PATTERN
2. TRACE 2 FINS ON EACH BALSA SHEET AS SHOWN
3. CUT OUT FINS WITH HOBBY KNIFE AND METAL EDGE RULER

PASCO



Estes Industries
PN 037452

Two



RASCAL™

SKILL LEVEL 1. Over one foot (30 cm) tall and brawny with flights to 800 feet (244 m), this model is sure to be a hit at rocket demonstrations. Kit features plastic nose cone, kit decal, 12 inch (30 cm) parachute, and 3/32" (2 mm) balsa fin stock.

Length: 13.6" (34.5 cm) **Dia.:** 1.637" (41.6 mm) **Wt.:** 1.5 oz. (42.5 g)

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, C6-5.

No. 2021

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Fly Like a Model Rocket



Model Rocketry
Fly Like a Model Rocket

Flying Model Rocket

RASCAL

FLYING MODEL ROCKET

Model Rocketry
Fly Like a Model Rocket

- 100% Beginner Friendly
- Includes everything you need to get started
- Ready-to-fly
- 100% Beginner Friendly
- Includes everything you need to get started

Length: 10.5 in. (26.7 cm)
Diameter: 1.5 in. (3.8 cm)
Weight: 1.2 oz. (34 g)

Maximum Altitude: 600 ft. (183 m)
Maximum Speed: 100 mph (161 km/h)



LAUNCH UP TO 600 FEET!



100% Beginner Friendly



For more information, visit www.aurorahobby.com
or call 1-800-888-8888