





A DAMON COMPANY

ESTES INDUSTRIES
1295 H STREET
PENROSE, CO 81240 USA

RAM JET™ #1994

FLYING MODEL ROCKET

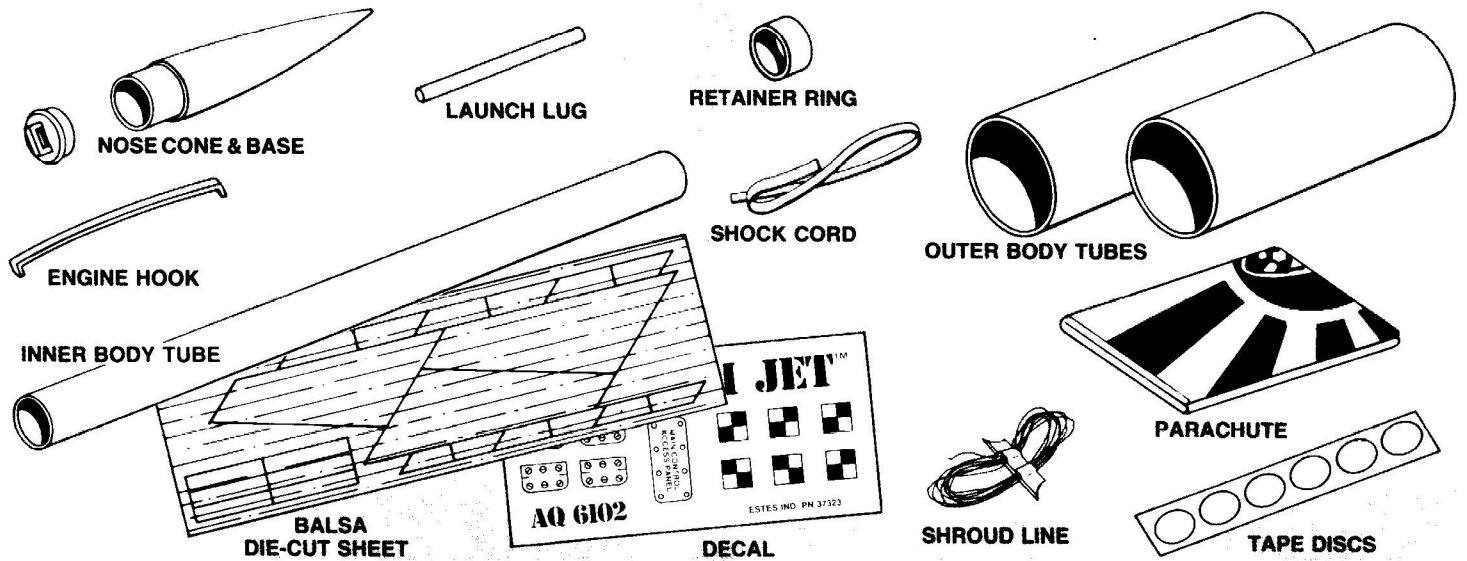


ASSEMBLY TIP

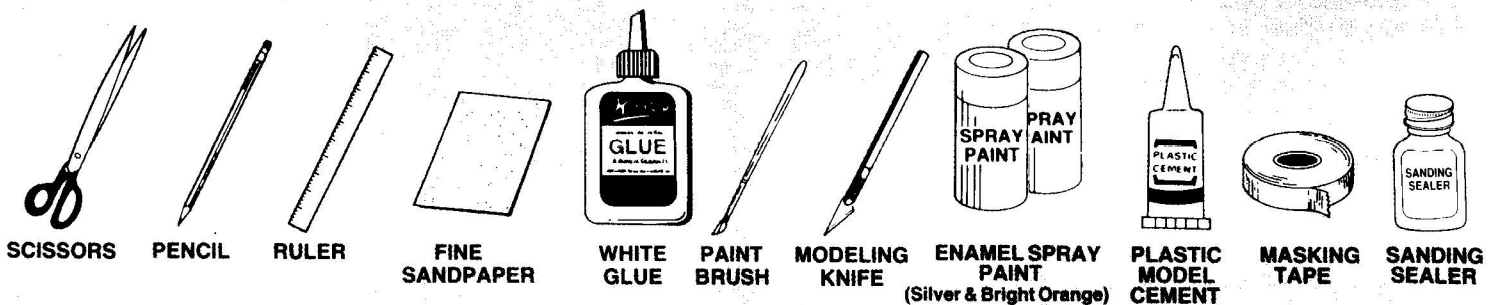
Read all instructions before beginning work on your model. Make sure you have all parts and supplies. Test-fit all parts together before applying any glue. If any parts don't fit properly, sand as required for precision assembly.

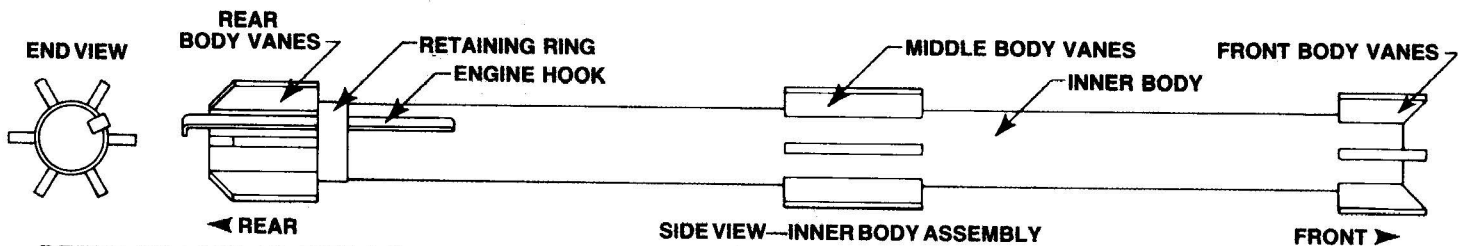
PARTS AND SUPPLIES

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



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



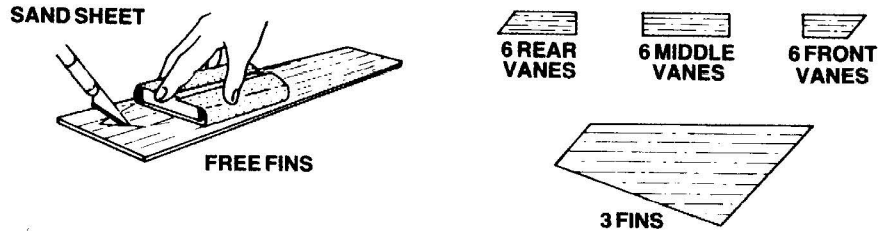


REFER TO THIS 1/2-SIZE DRAWING FOR CLARIFICATION DURING THE FOLLOWING ASSEMBLY STEPS.

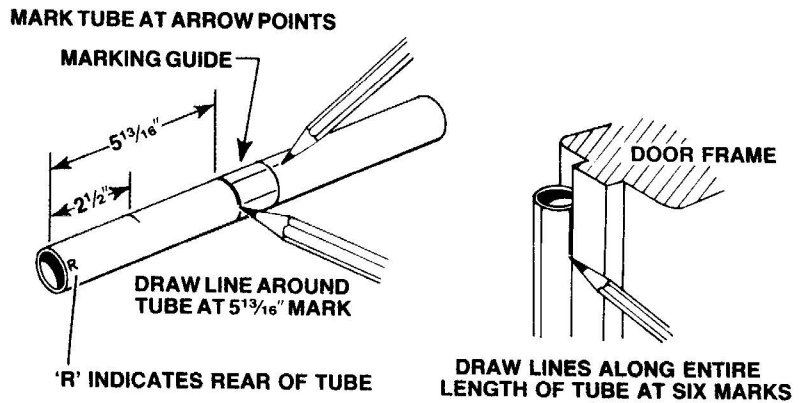
ROCKET ASSEMBLY

NOTE: Use white glue for all assembly steps except in Step 13.

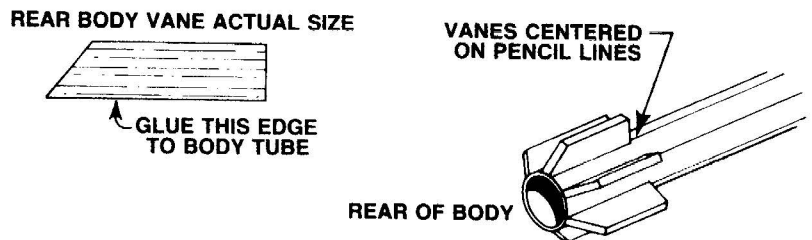
- 1 A. Lightly sand both sides of balsa sheet.
 B. Carefully free die-cut parts from sheet with a modeling knife. Do not punch parts from sheet.
 C. Sand edges of all parts and sort them into stacks as shown.



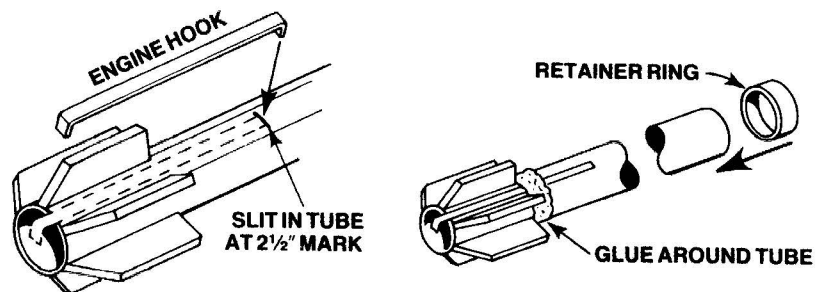
- 2 A. Cut the inner body marking guide from page 5 of these instructions.
 B. Locate the inner body tube (3/4 inch diameter by 12 inches long). Mark an 'R' at one end of tube to indicate it is the rear end of the tube. From this end of tube, measure forward 2 1/2 inches and place a mark. Place a second mark 5 13/16 inches from rear of tube.
 C. Wrap the marking guide around tube and tape ends together. Slide guide along tube until one end is on the 5 13/16 inch mark. Draw a line around tube at that point.
 D. Mark body tube at the arrow points, then remove guide.
 E. Using a door frame as a guide, draw lines the entire length of the tube on the six marks.



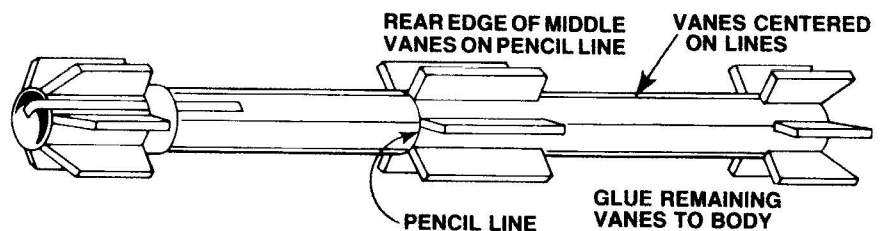
- 3 A. Locate the six rear body vanes (see template at right). The front body vanes are similar, but shorter. Make sure you have the right parts before proceeding.
 B. Glue these vanes to the rear of the body as shown. Allow glue on each vane to set for several minutes before attaching next vane.



- 4 A. Find the mark you made at 2 1/2 inches from rear of body in Step 2. Cut a 1/8 inch wide slit in the body, centered between two vanes, at the 2 1/2 inch mark.
 B. Insert one end of engine hook into slit. Other end of hook will be slightly beyond rear end of body.
 C. Apply glue around body just above vanes. Slide the retaining ring onto the front of the tube and push it down until it is against the vanes.



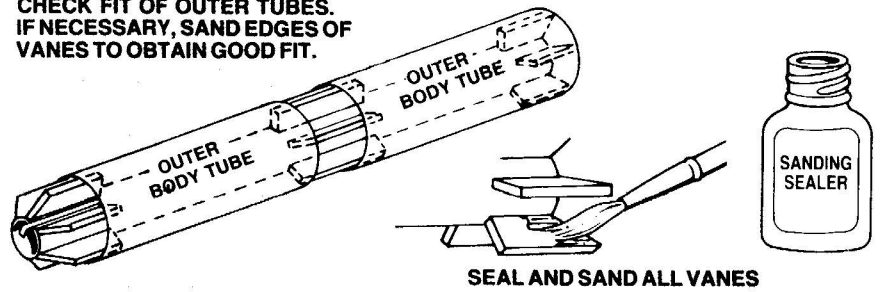
- 5 A. Glue the middle vanes to the body. The rear edges of these vanes are on the 5 13/16 inch line.
 B. Glue the front vanes to the body. Note that the angled portion of these vanes extend forward from the body tube.



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- Check the fit of the outer body tubes on the inner body assembly. If the tubes won't slide onto the assembly without distorting, lightly sand the outer edges of the vanes until a proper fit is obtained.
- Remove outer body tubes. Brush a coat of sanding sealer onto the vanes. Allow sealer to dry, then lightly sand all surfaces. Apply a second coat of sealer and sand again.

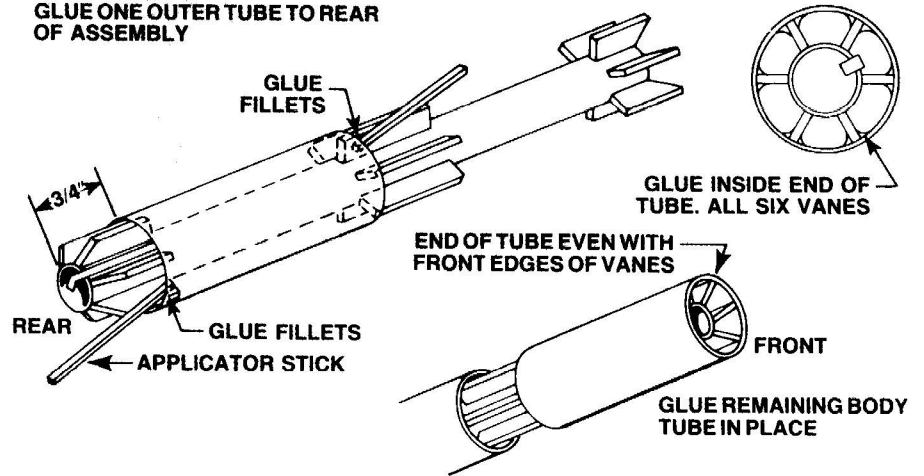
CHECK FIT OF OUTER TUBES. IF NECESSARY, SAND EDGES OF VANES TO OBTAIN GOOD FIT.



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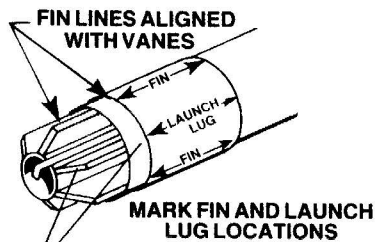
- Slide one of the outer body tubes onto the rear of the inner body assembly. Position so that rear edge of this tube is $3/4$ inch forward from the rear end of the inner body.
- Using a piece of scrap balsa (from fin sheet) as an applicator, apply a little glue to the inside of the joint between outer tube and one vane. Let the glue dry, then apply glue to the remainder of the joints. Turn the assembly around and apply glue to the joints at the opposite end of the tube.
- Glue the remaining body tube to the front of the assembly in the same manner.

GLUE ONE OUTER TUBE TO REAR OF ASSEMBLY

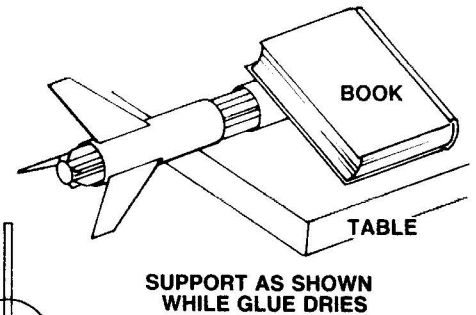
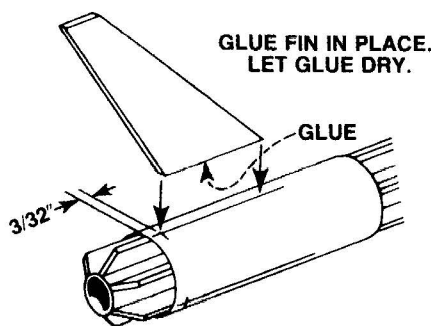
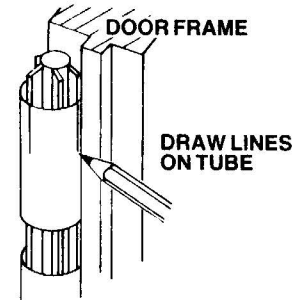


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- Cut the outer body marking guide from page 5. Wrap guide around lower portion of model and tape ends together. Rotate the guide so the fin and launch lug lines are lined up as shown.
- Mark fin and launch lug locations, remove guide and draw lines on outer body. Fin lines should extend from rear of body forward about $2\frac{1}{2}$ inches. Launch lug line should extend entire length of lower body.
- Place a mark across each fin line $3/32$ inch from rear edge of outer body tube.
- Apply glue to the root edge of a fin. Attach the fin to the body with the rear edge of the fin $3/32$ inch from the rear of the body and the fin centered on a fin line. Make sure the fin extends straight out from the body.
- Attach the remaining fins in the same manner. Be sure to allow glue to dry on one fin before attaching the next fin.



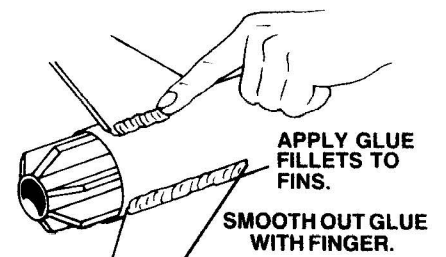
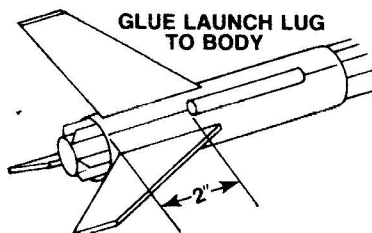
LAUNCH LUG LINE ALIGNED ON VANE NEXT TO ENGINE HOOK



FINS MUST EXTEND STRAIGHT FROM BODY

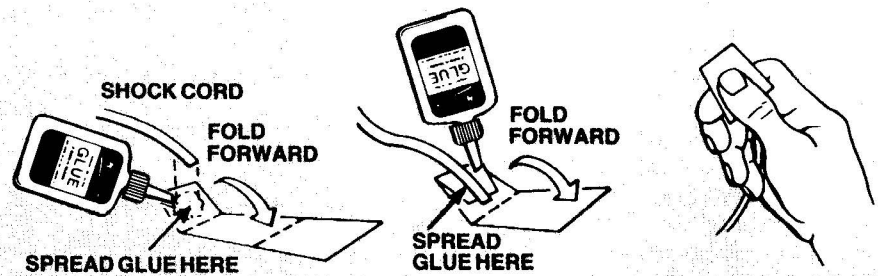
9

- Glue the launch lug to the body, centered on the pencil line, with the rear of the lug 2 inches from the rear of the body.
- Apply a light bead of glue to one side of a fin/body joint. Pull your finger down the joint to smooth the glue and to remove excess glue.
- Repeat this process on both sides of all fin/body joints. Apply small beads of glue to the launch lug/body joint. Support the rocket in a horizontal position until the glue dries.



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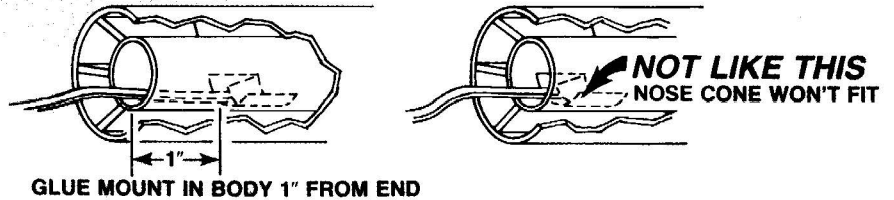
- Cut the shock cord mount from page 5.
- Crease on dotted lines by folding. Spread glue on section 1 and lay end of shock cord into the glue. Fold over and apply glue to back of first section and exposed part of section 2. Lay shock cord as shown and fold mount over again.
- Clamp unit together with fingers until glue sets.



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- Apply glue to inside front of inner body tube to cover an area no less than 1 inch to 2 inches from end. The glued area should be same size as shock cord mount.
- Press mount firmly into glue as shown.
- Hold until glue sets.

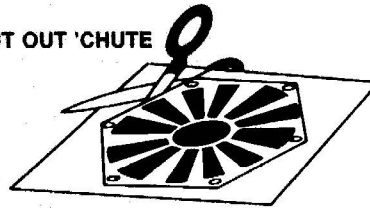
OUTER TUBE SHOWN CUT AWAY FOR CLARITY



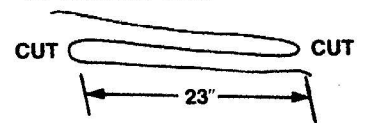
12

- Cut out parachute on edge lines.
- Cut three 23 inch lengths of shroud line.
- Form small loops with shroud line ends and press onto sticky side of tape discs. Attach tape discs with line ends to top of parachute as shown. Firmly press tape discs into place until both tape discs and parachute material are molded around shroud line loops.

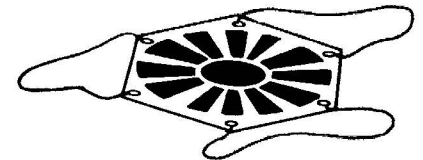
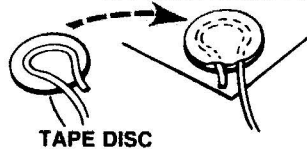
A. CUT OUT 'CHUTE



B. CUT THREE LENGTHS OF SHROUD LINE



C. PRESS DOWN FIRMLY



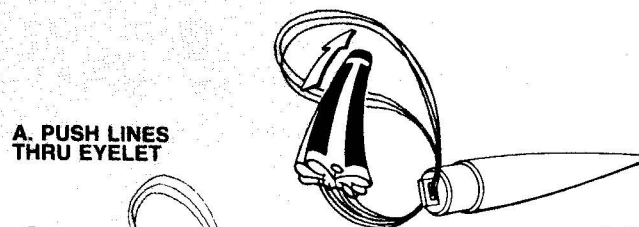
COMPLETED 'CHUTE

13

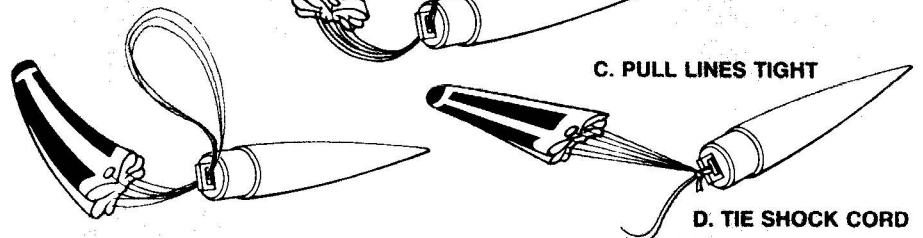
- NOTE:** Use plastic model cement in this step. Apply cement inside the bottom of the nose cone and socket base into cone.



B. PASS 'CHUTE THRU LINES



C. PULL LINES TIGHT

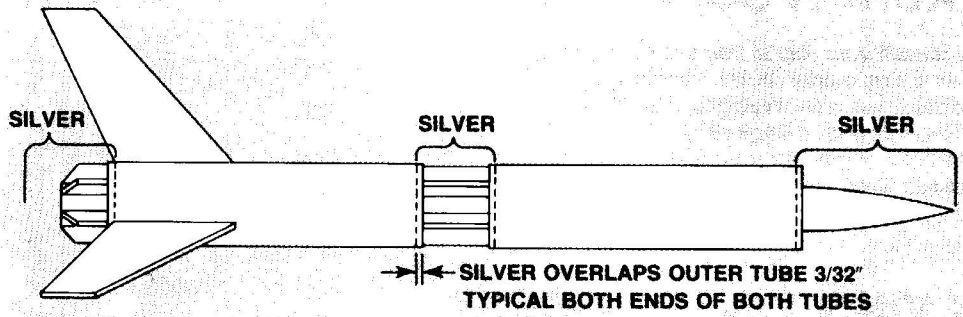


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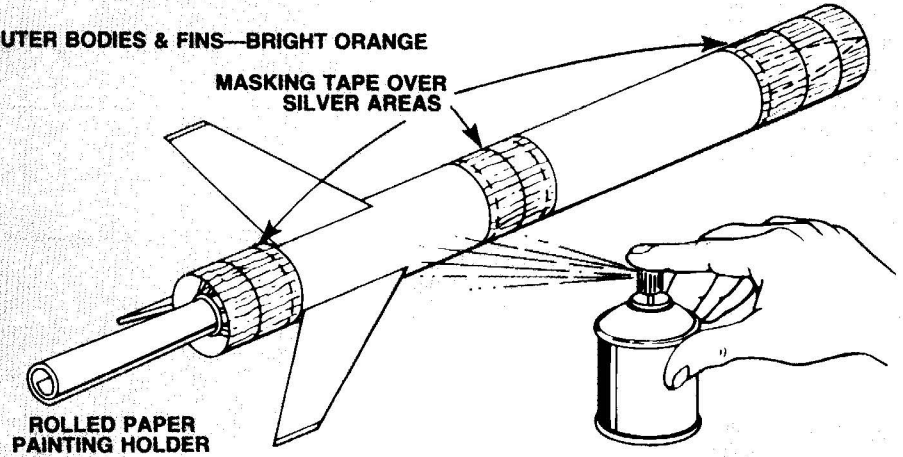
- Pass parachute shroud line loops through eyelet on nose cone.
- Pass 'chute through loops in shroud lines.
- Pull lines tight.
- Tie the end of the shock cord to the nose cone eyelet. Tie a double knot.

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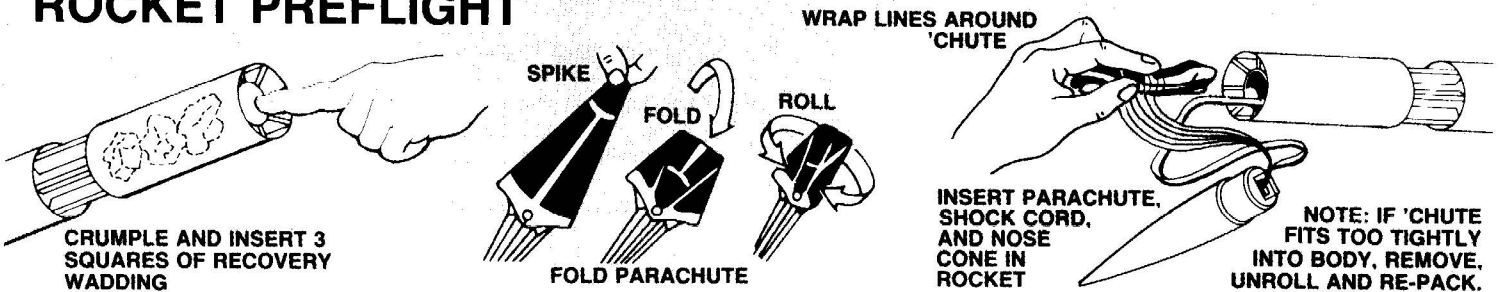
- A. Seal and sand the fins in the same manner as the vanes. The fins will probably require three or four coats of sealer to be completely filled.
- B. Push 'chute and shock cord into body and socket nose cone in place. Roll up a piece of paper and insert into bottom of rocket. This will serve as a holder for painting the model.
- C. Spray paint the nose cone and exposed vane areas silver. Hold the model at various angles while painting so the paint will cover all visible portions of the vanes and inner body. Allow paint to dry for at least 12 hours before proceeding to next step.
- D. Use masking tape to mask off the silver portions of the model. Note that the tape overlaps the outer tubes by about 3/32 inch. Make sure that all silver areas are completely covered with tape.
- E. Spray the exposed portion of the model bright orange. Allow the paint to dry for a couple of hours, then carefully remove tape.
- F. For decal placement, refer to the photo on the front of the instructions. To apply decals, cut each out, dip in water for 20 - 30 seconds, and hold until it uncurls. Slip decal off backing material and onto model. Blot away excess water.



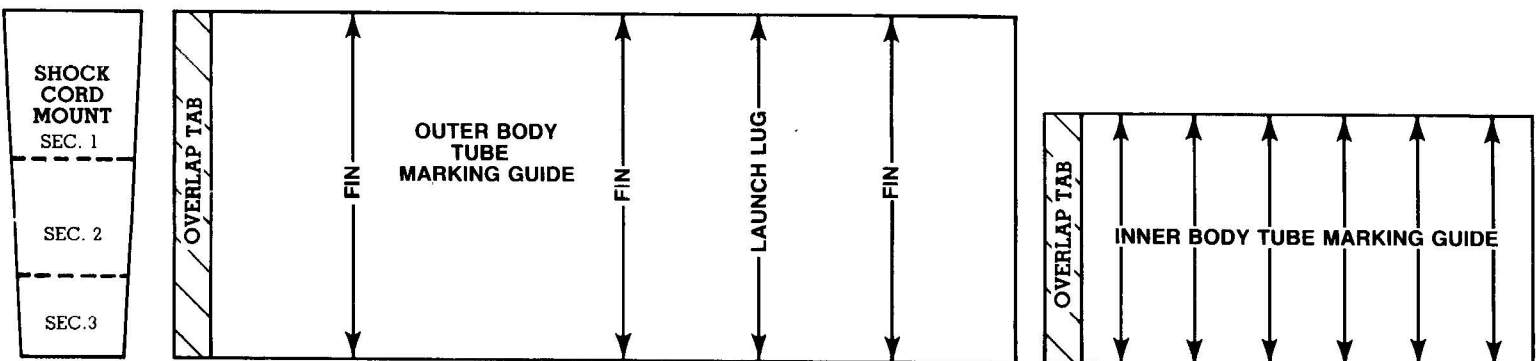
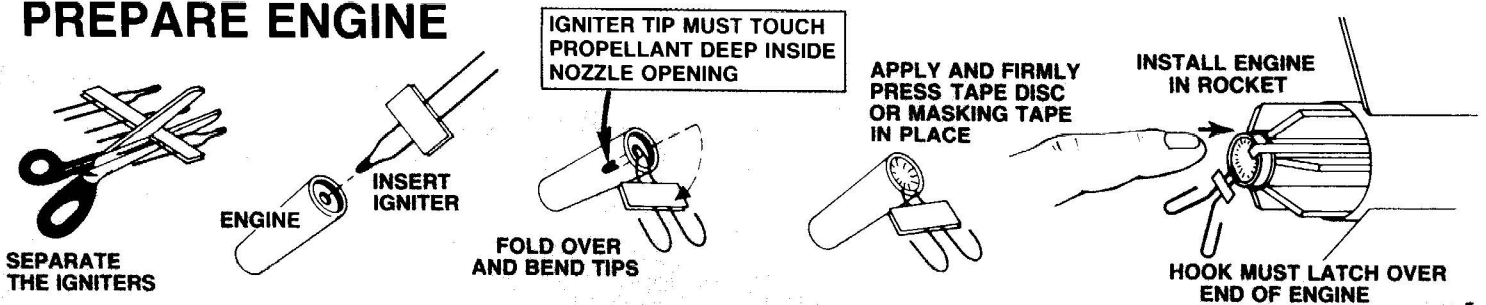
OUTER BODIES & FINS—BRIGHT ORANGE



ROCKET PREFLIGHT



PREPARE ENGINE



LAUNCH SUPPLIES

To launch your rocket you will need the following items:
—An Estes model rocket launching system
—Estes Recovery Wadding (No. 2274)
—Recommended Engines: A8-3, B4-4, B6-4, B8-5, or C6-5
Use A8-3 engine for your first flight to become familiar with your rocket's flight pattern.

FLYING YOUR ROCKET

Choose a large field away from power lines, tall trees, and low flying aircraft. Try to find a field at least 250 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

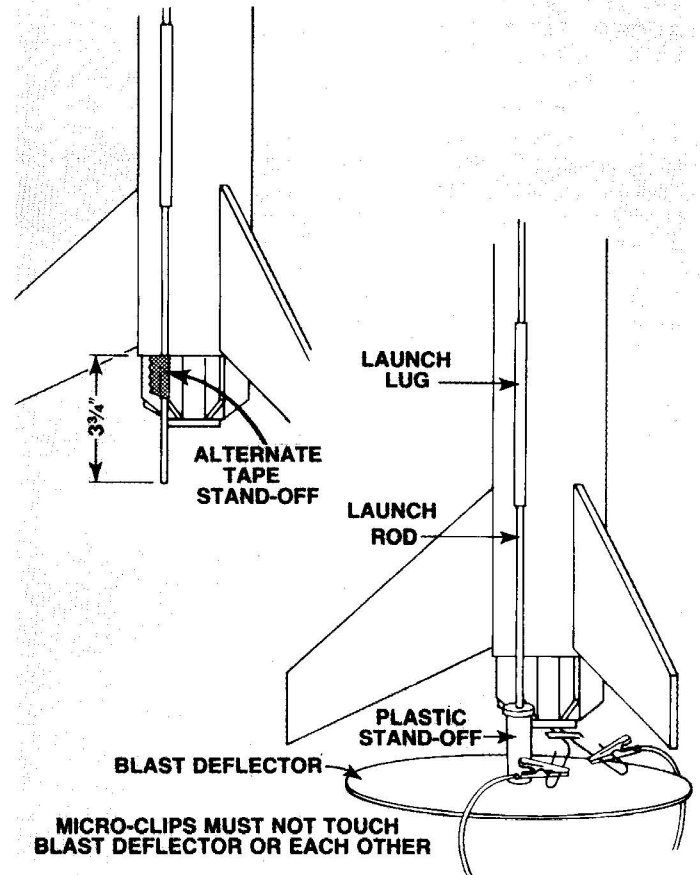
Failure of the rocket engine to function properly is nearly always caused by a failure to install the igniter correctly. This failure permits the igniter to heat and burn into two pieces without igniting the engine.

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



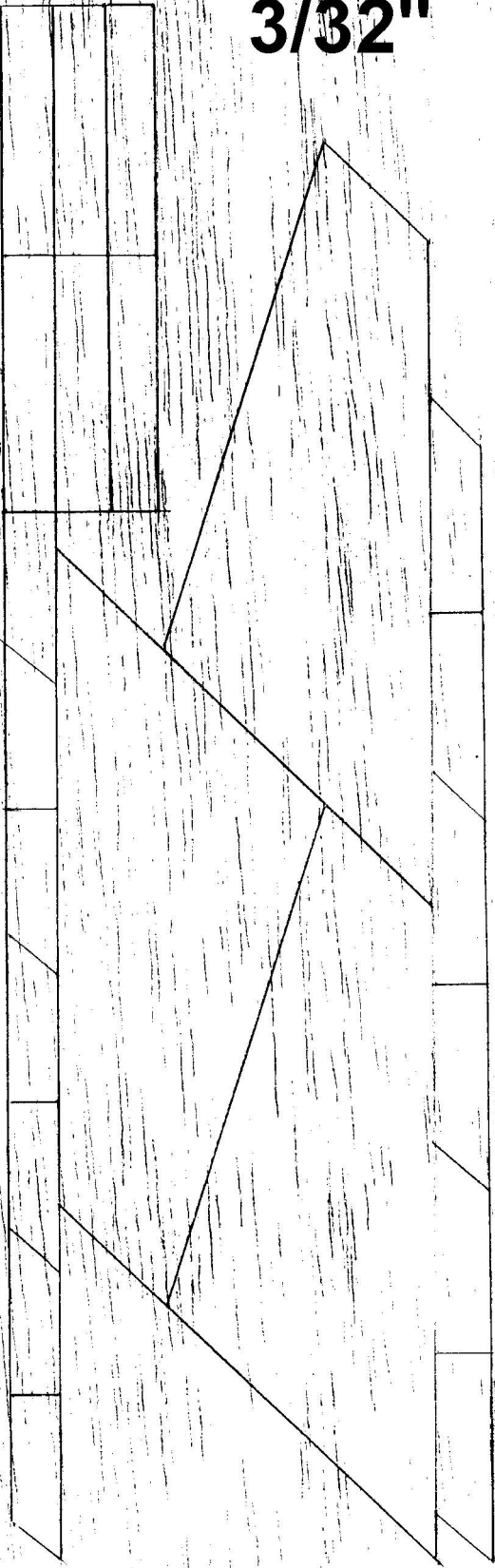
- ⑩ REMOVE SAFETY KEY to disarm the launch controller.
- ⑨ Remove safety cap and slide launch lug over launch rod to place rocket on launch pad. Make sure the rocket slides freely on the launch rod.
- ⑧ Attach micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the 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.

3/32"



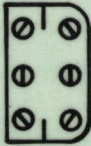
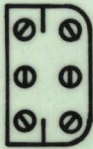
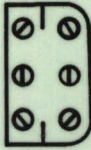
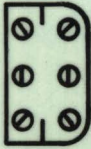
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No. C303SR

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RAM JET™



AQ 6102

ESTES IND. PN 37323



Estes Ram-Jet #1994

| Q | Desc | Stk Num | Size | Other |
|---|-------------------|---------|-------------------|-----------------|
| 1 | Nose Cone | NC-20 | 2.9" | comes in 303161 |
| 1 | Launch Lug | | 1 3/8" Length | |
| 1 | Retainer Ring | | | |
| 1 | Engine Hook | | | |
| 1 | Body Tube (Inner) | BT-20 | 12" Length | |
| 1 | Balsa Stock | BFS-30 | 3" x 9" x 3/32" | Pattern Scanned |
| 1 | Shock Cord | | 1/8" x 20" Length | |
| 2 | Body Tube (Outer) | BT-55 | 5.3" Length | |
| 6 | Tape Disk | | 1/2" | |
| 1 | Parachute | PK-12 | 12" | Red/Wht/Blk |
| 1 | Shroud Line | | 72" | |
| 1 | Decal | 37323 | 3" x 6" | Black |

RAM JET™

FLYING MODEL ROCKET

SKILL LEVEL 3
Intermediate to Advanced

■ DUCTED JET ROCKET

- 12" Ducted Recovery
- Dual-Parachute Ejection
Motor
- Die-Cut Balsa Fins

**LIFTS OFF
TO 1000 FEET!**

RAM JET™ is a ducted jet rocket that flies to 1000 feet and returns safely to earth. It features a dual-parachute ejection motor and die-cut balsa fins. The rocket is easy to assemble and fly.

For more information, visit us at
www.estes.com

#1094



Estes Industries, Inc.
10000 W. 10th Street, Denver, CO 80231

