



ESTES INDUSTRIES (11-96) 82117
1295 H Street
Penrose, CO 81240 EST 2136

EXPLORER
SERIES
SKILL LEVEL 2

GEMINI DC™

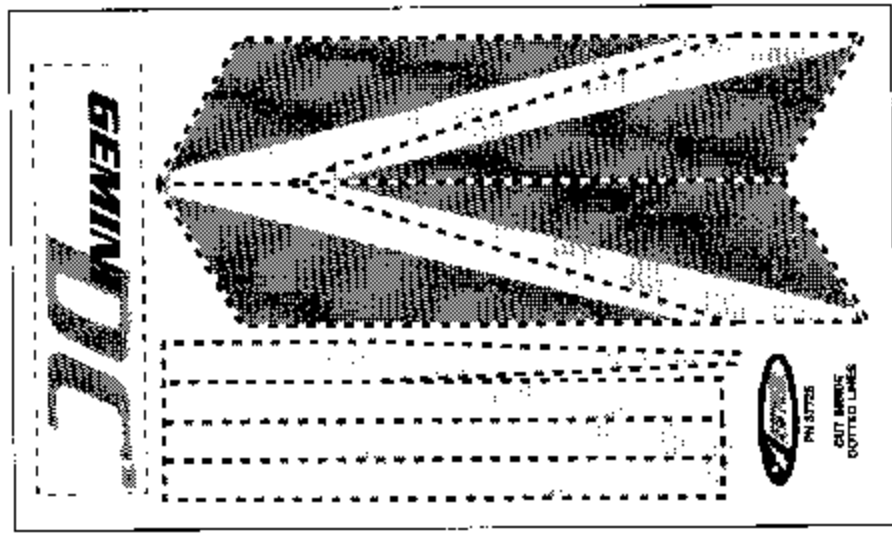
FLYING MODEL ROCKET KIT INSTRUCTIONS

TOOLS REQUIRED:

PENCIL, HOBBY KNIFE, WOOD GLUE, SCISSORS, SANDPAPER, DOWEL ROD, TUBE-TYPE PLASTIC CEMENT, SANDING SEALER, SPRAY PAINT (WHITE AND BLUE), AUTOMOTIVE PRIMER (OPTIONAL) AND THE ESTES® ROCKET BUILDER'S MARKING GUIDE (EST 302227) (OPTIONAL)

ALL GLUED AREAS ARE SHADED IN GRAY

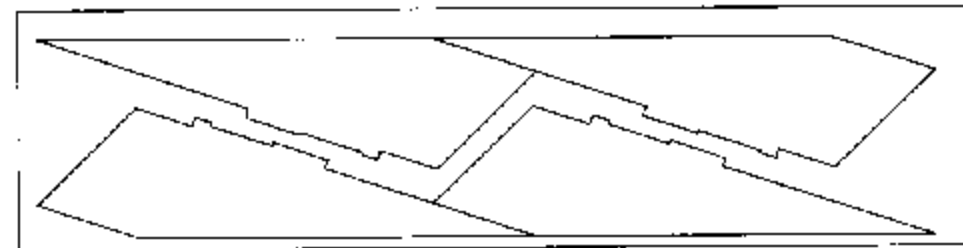
PARTS LAYOUT



DECAL (1)
37725

LARGE NOSE CONE
PNC #50YR (1)
72604

NOSE CONE
ADAPTER (1)
50YR
72605



DIE CUT BALSA FIN SHEET
32253

SMALL NOSE
CONES PNC 20A (2)
72602

BODY TUBE SLOTTED
#BT-50WH (1)
31177

VENT TUBE 1/4 x 1 (1)
30289

SIDE TUBES
BT20 (2)
30330

LAUNCH LUG
LL2A (1)
38175

SHOCK CORD
#1/8 x 18 (2)
38374

ADAPTER RING
#2050 (1)
30164-2

SHROUD LINE BUNDLES #72 (2)
38237

ENGINE MOUNT
TUBE #BT-20J (1)
30326-1

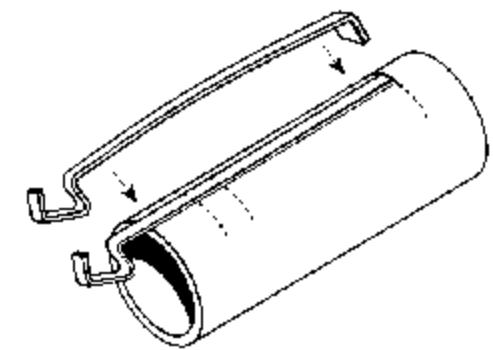
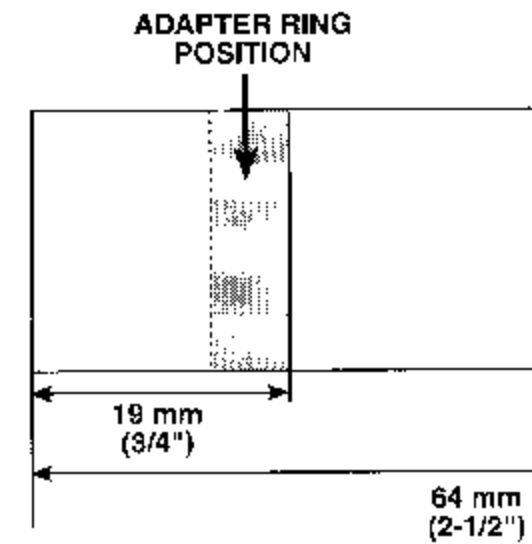
TAPE RING SETS (2)
38407

ENGINE HOOK EH-2A (1)
35021

PARACHUTE PK 12 (2)
35820

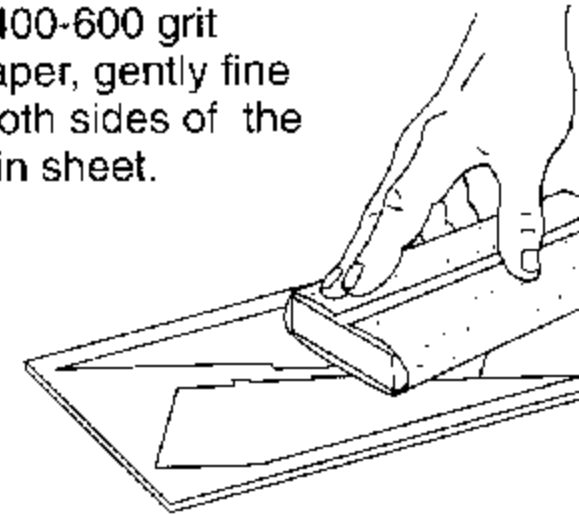
ADAPTER RING #2050 (1)
30164-2

1. ENGINE MOUNT TEMPLATE

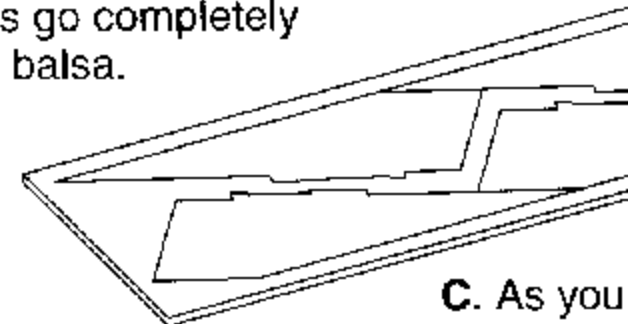


C. Insert the engine hook into the slit as shown. The hook will extend out over the REAR of the engine mount.

2. A. Using 400-600 grit sandpaper, gently fine sand both sides of the balsa fin sheet.

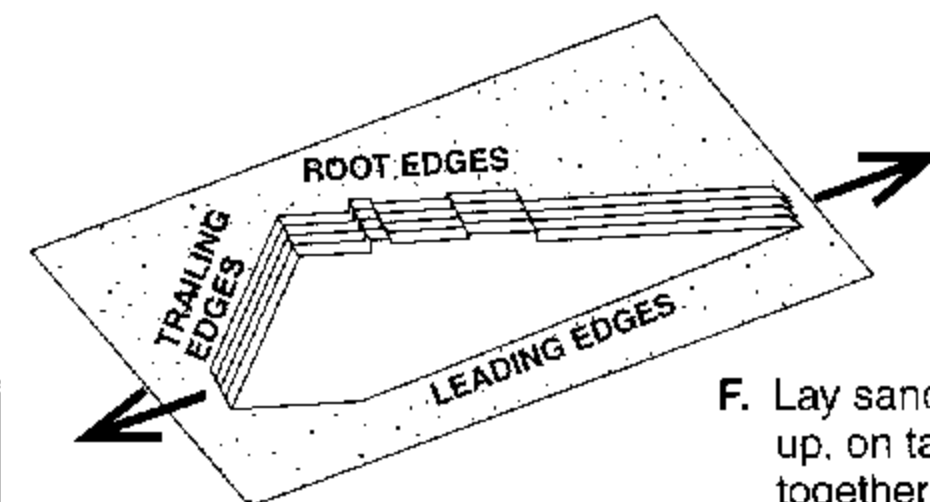


B. Use a hobby knife to carefully cut fins out of balsa sheet. Be sure cuts go completely through the balsa.



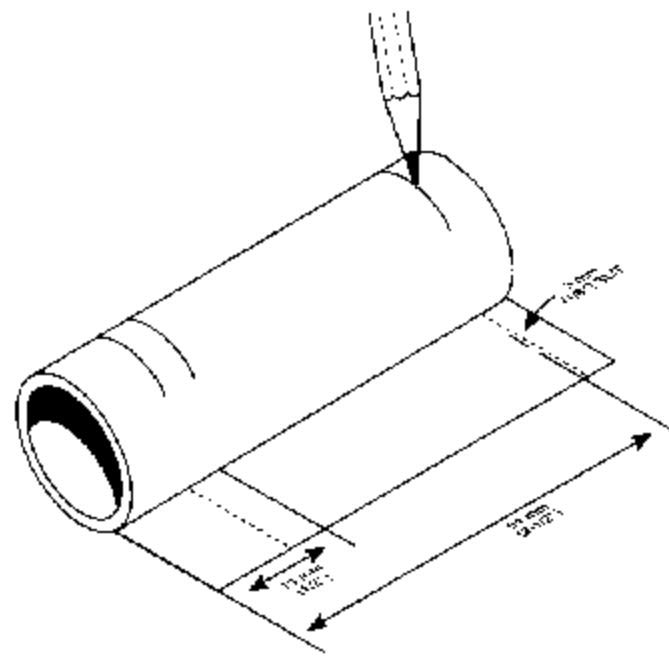
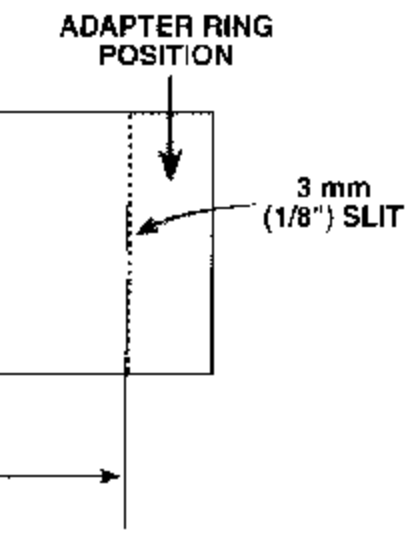
C. As you move the fin sheet away from the balsa sheet, you will see the fins.
D. Carefully separate the fin sheet.

E. Keep a stick of balsa wood to use as a glue applicator.

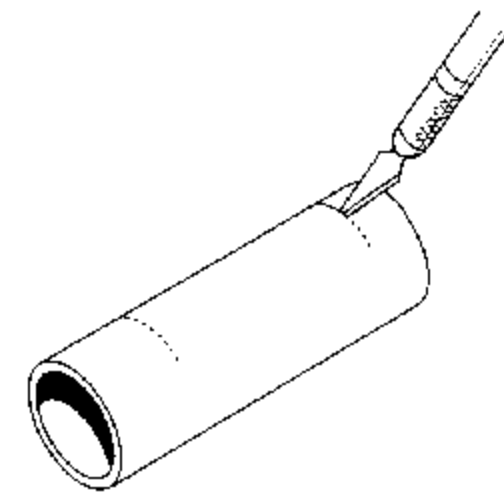


F. Lay sandpaper up on top of the fins and together the edges of the fins.

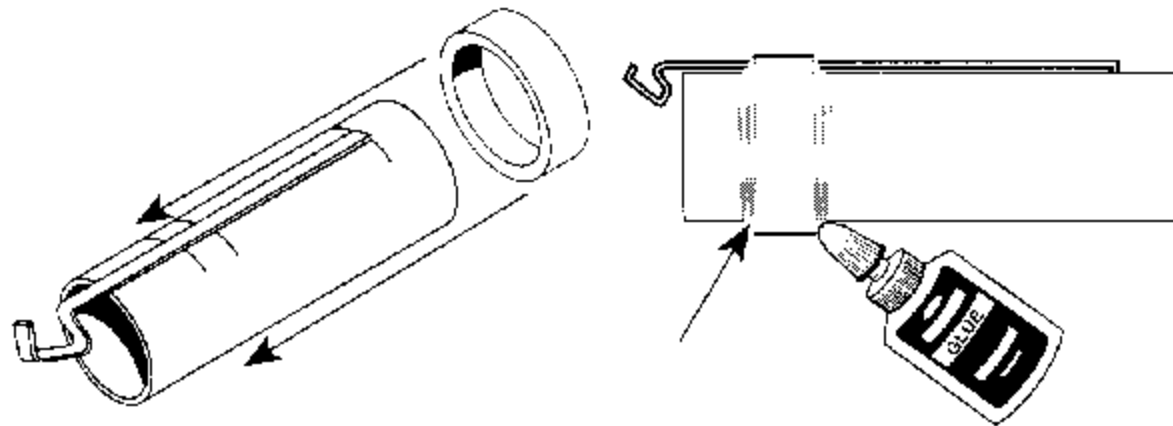
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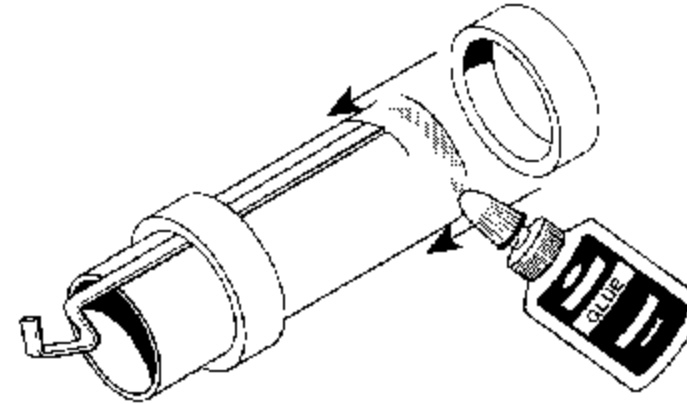
A. Lay blue engine mount tube on the template provided and mark the tube with a pencil as indicated.



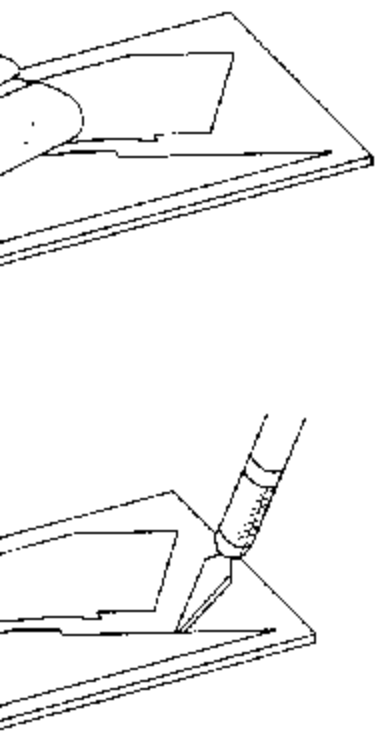
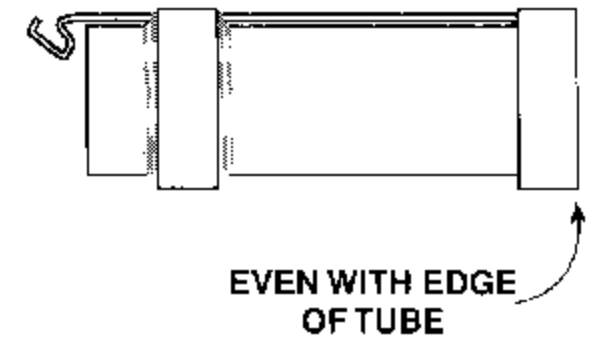
B. Cut a 3 mm (1/8") wide slit with your hobby knife at the front of the tube at the 64 mm (2-1/2") mark ONLY.



D. Slide one adapter ring from the front end of the engine tube past the 19 mm (3/4") mark and apply a band of glue to both sides of the ring.



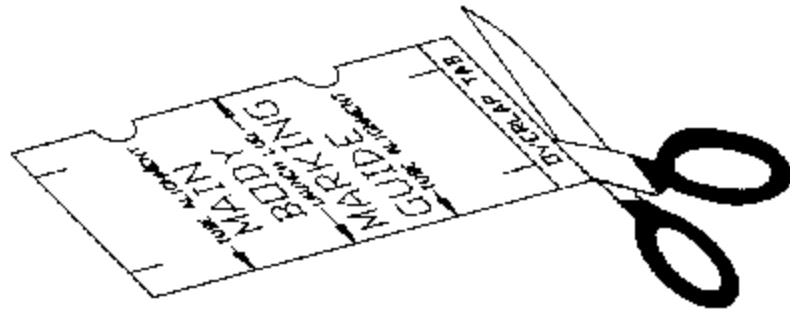
E. Apply a band of glue to the FRONT outside edge of the engine mount tube. Slide the remaining adapter ring into the glue at the front of the engine mount tube until the edge of the ring is even with the end of tube.



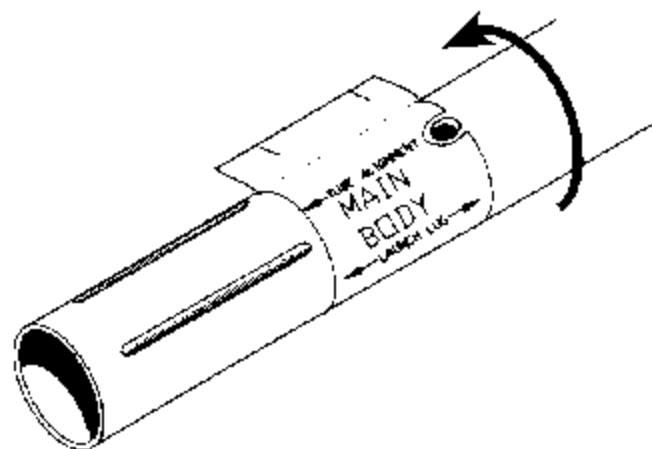
cut each fin, cut from adjacent fins so don't damage them. Fully remove fins from

paper, rough side visible. Stack fins and lightly sand the smooth and flat.

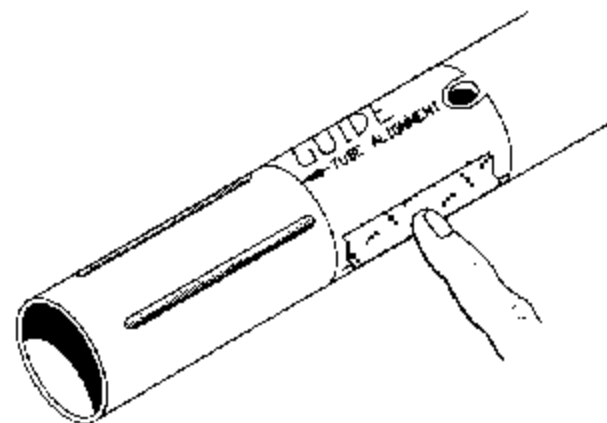
3.



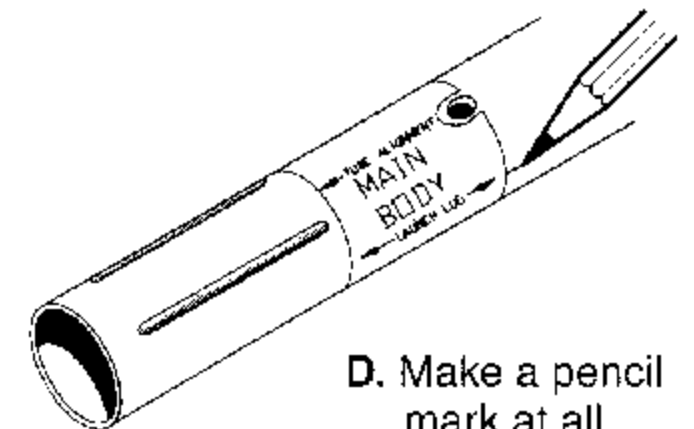
A. Use a pair of scissors or a hobby knife to cut out both tube marking guides from page 3.



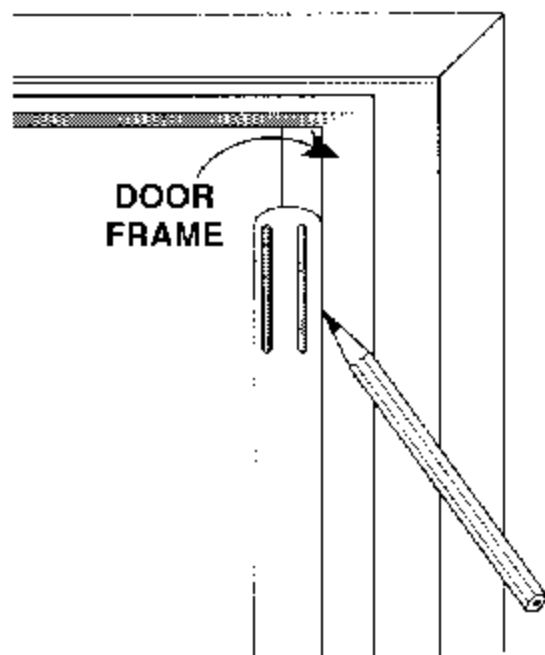
B. Wrap the main body guide around the slotted body tube, aligning the holes on the tube with the notches on the template.



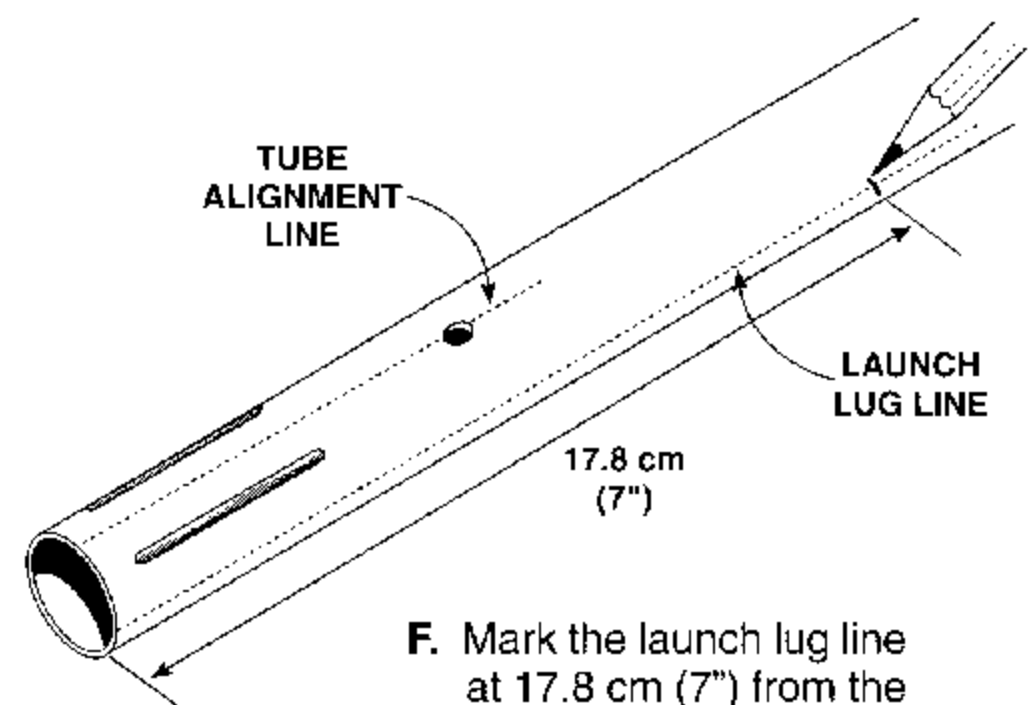
C. Use a piece of masking tape to tightly secure the template.



D. Make a pencil mark at all arrows.

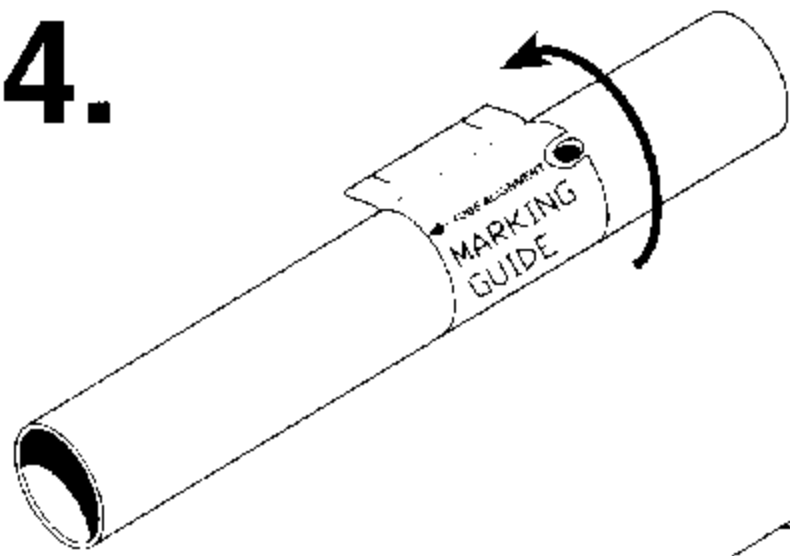


E. Remove the template and use a door frame or the Estes Rocket Builder's Marking Guide (EST 302227) to draw straight lines connecting the marks. Save the template to identify the launch lug line. **Extend the launch lug line the full length of the tube.**



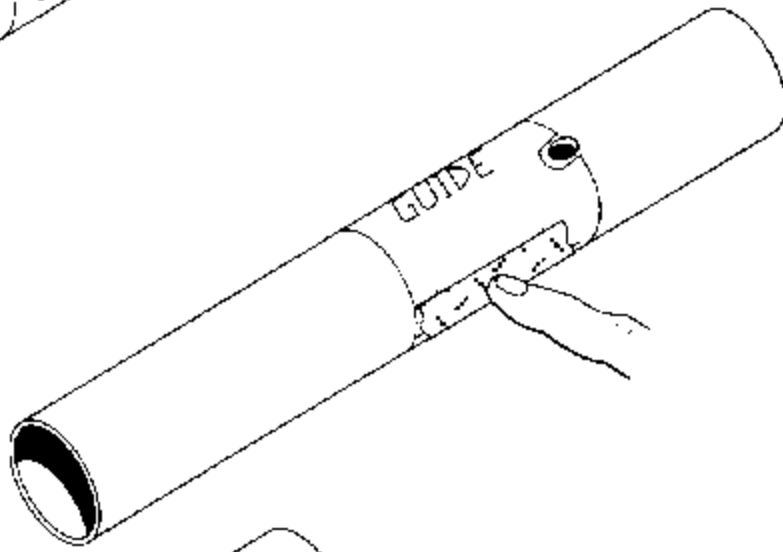
F. Mark the launch lug line at 17.8 cm (7") from the rear of the tube.

4.

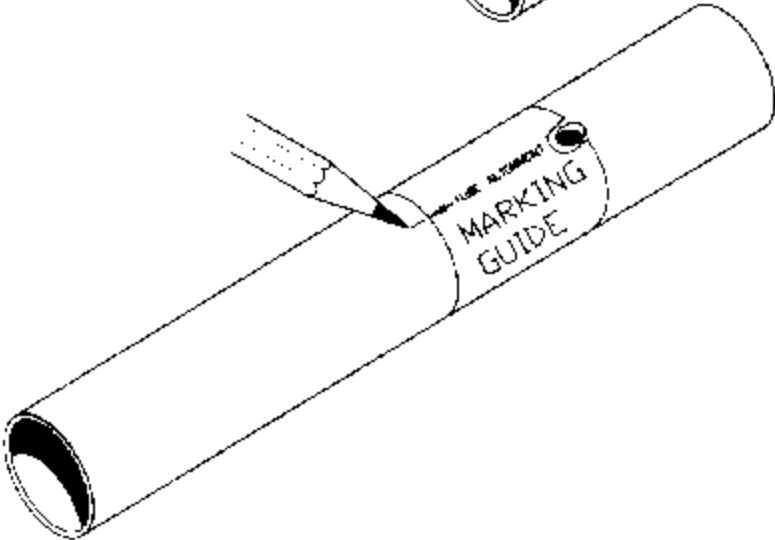


A. Align the single notch on the side tube marking template with the hole on one of the side tubes.

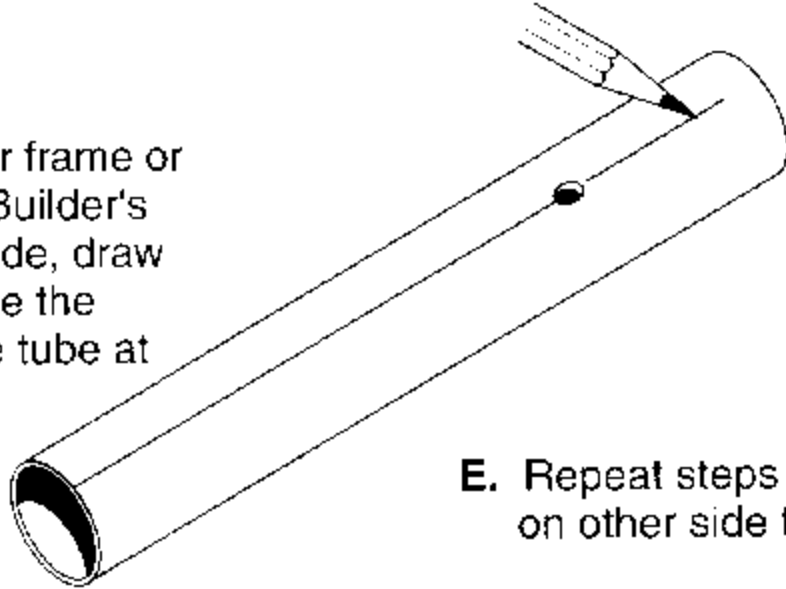
B. Secure the template tightly with a piece of masking tape.



C. Mark tube at arrows and carefully slide the marking template off the tube. **You will need it for the other tube so be careful not to tear it.**



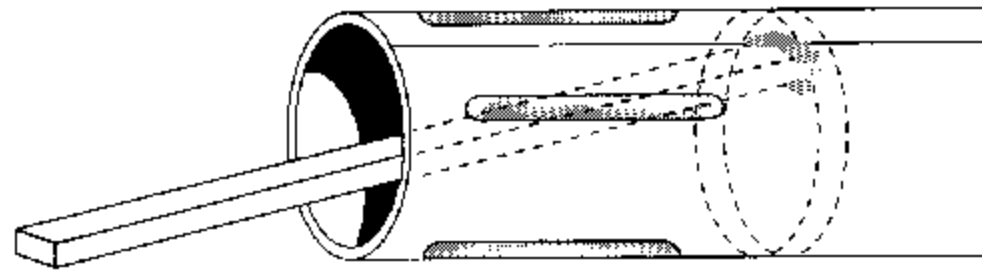
D. Using a door frame or the Rocket Builder's Marking Guide, draw a straight line the length of the tube at the marks.



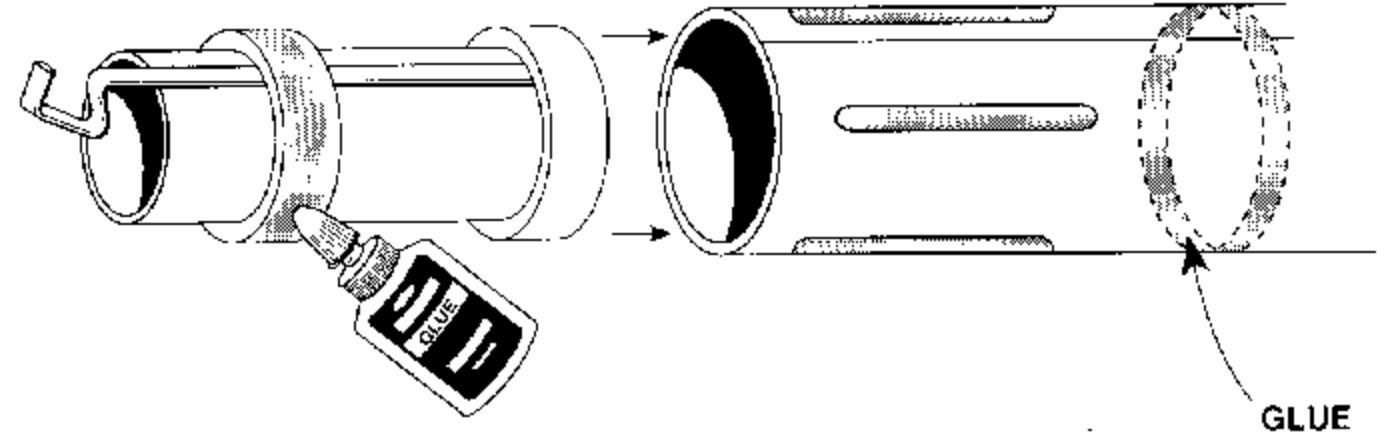
E. Repeat steps 4A-4C on other side tube.

5.

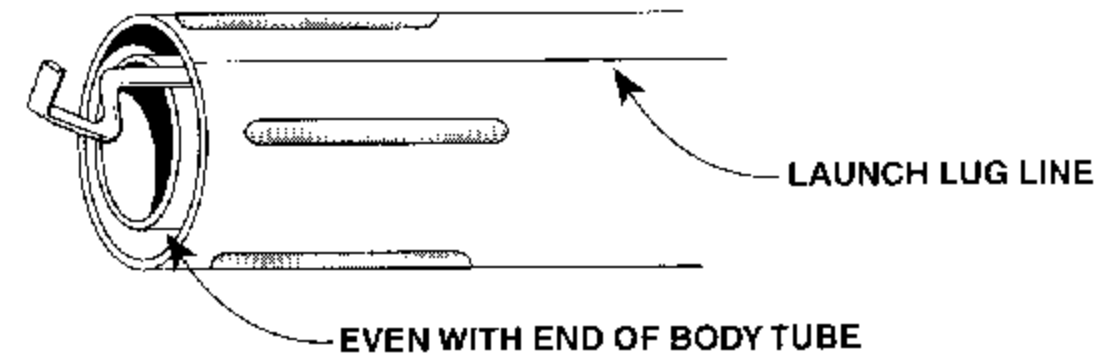
A. Now that the engine mount is dry, you need to test fit your fins. Insert the tab on the fin between the green adapter rings as shown. Sand tabs as necessary. **DO NOT GLUE YET!**



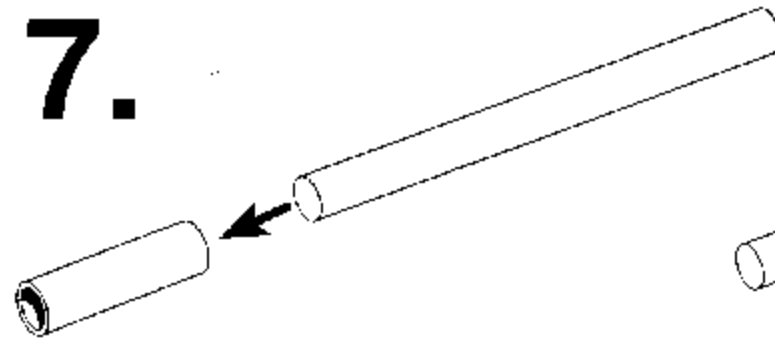
B. Using the balsa stick, a glue inside the rear of the slotted body tube just inside of the slots.



C. Apply glue to rear adapter ring (ring over engine hook).
D. Slide engine mount into body tube so that the slots are centered between adapter rings and engine hook is aligned with the launch lug line. (This will insure that fins will fit into slots.)

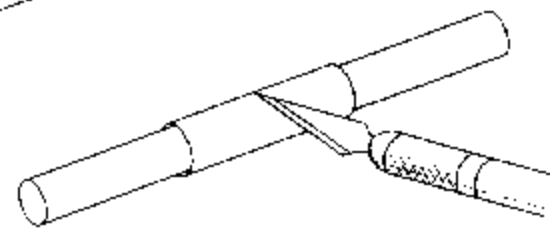


7.

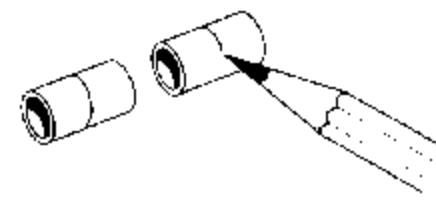


A. Locate the vent tube (the vent tube is 6 mm [1/4"] in diameter.)

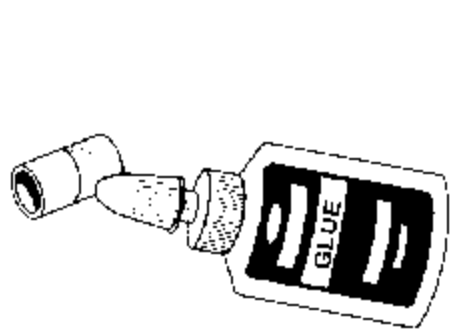
B. Insert a dowel rod or stick (not included) for support to prevent crushing the tube while cutting.



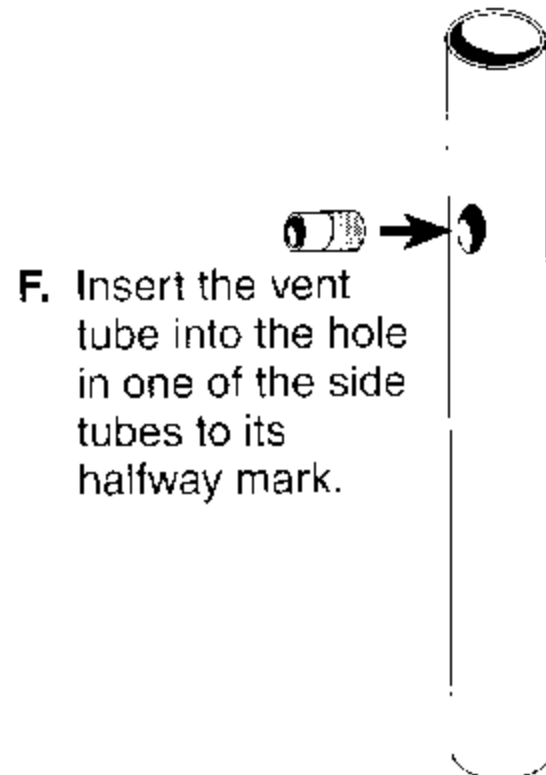
C. Use a hobby knife to cut the vent tube into two equal lengths. Remove the dowel.



D. Measure each vent tube portion and make a pencil mark at half its length.



E. Apply a band of glue around the outside of one half of the vent tube portions. Do not get glue **inside** vent tube.



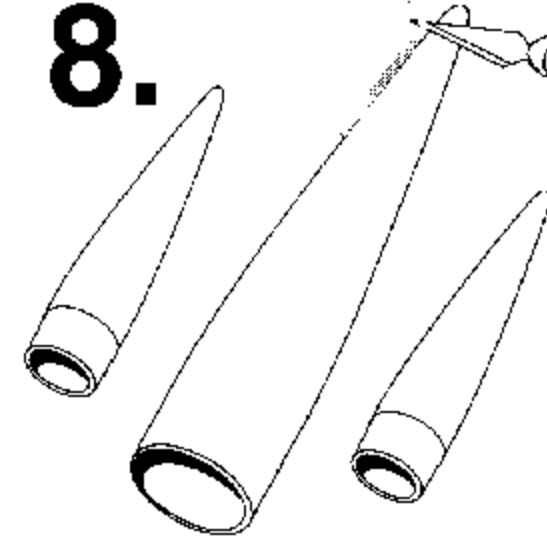
F. Insert the vent tube into the hole in one of the side tubes to its halfway mark.

G. Repeat steps 7E and 7F with the other vent tube portion and the other side tube.

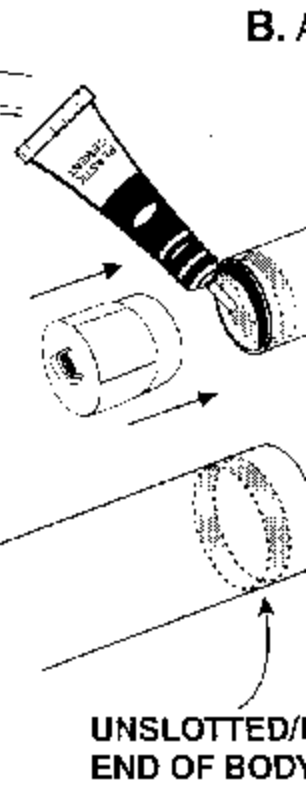
H. This end is now the front of the side tube. Be sure no glue blocks vent tube.

I. Set assemblies aside to dry.

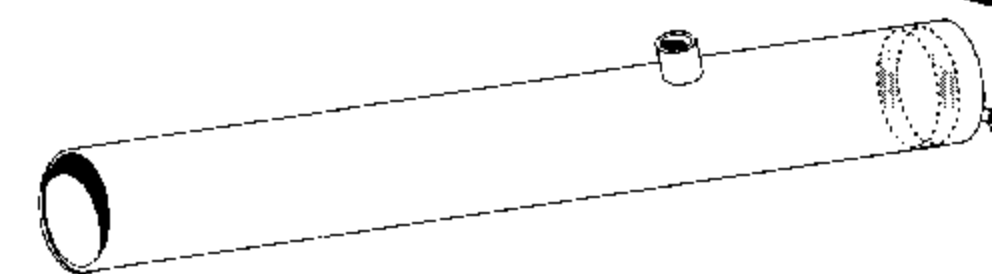
8.



A. Use a hobby knife to trim any excess plastic (flash) from all three nose cones.



C. Apply a ring of plastic cement (to vent tube) of one of the small nose cones.
D. Insert the large nose cone into the main body tube.



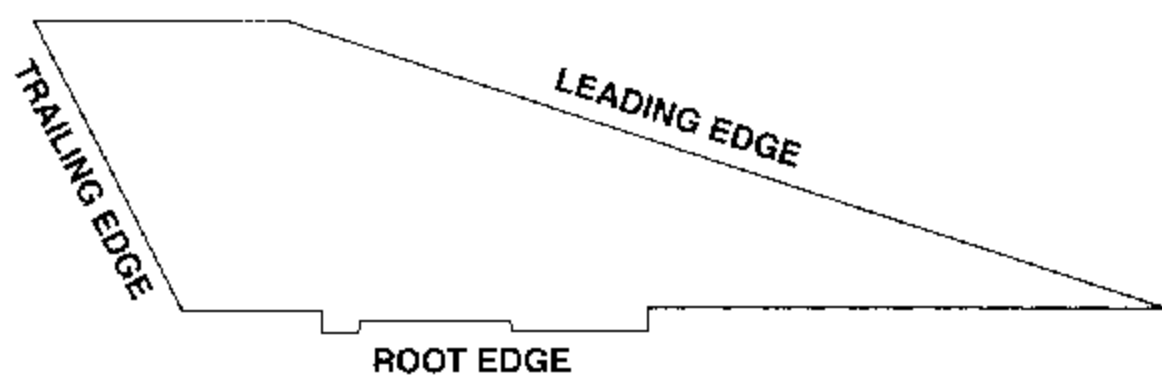
D. Apply plastic cement to vent tube) of one of the small nose cones.
E. Repeat step 8D with other nose cone.

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just in front

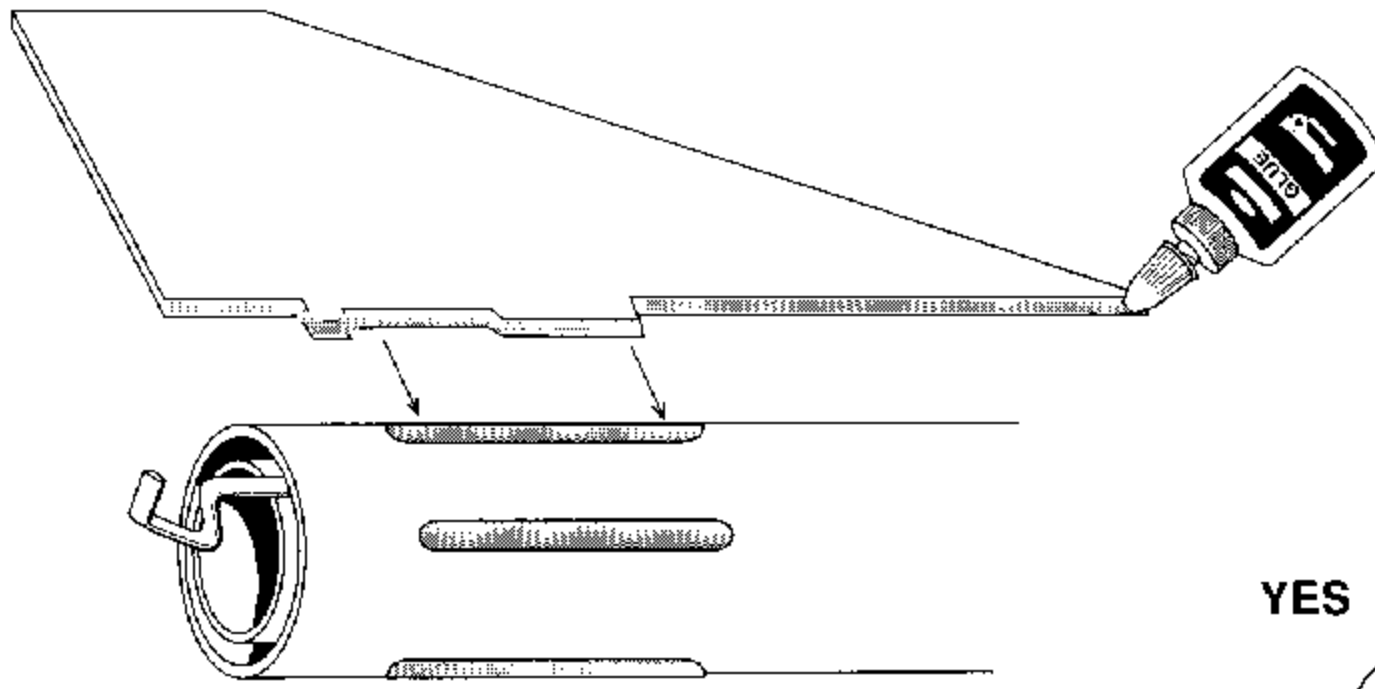
E

INE

6.

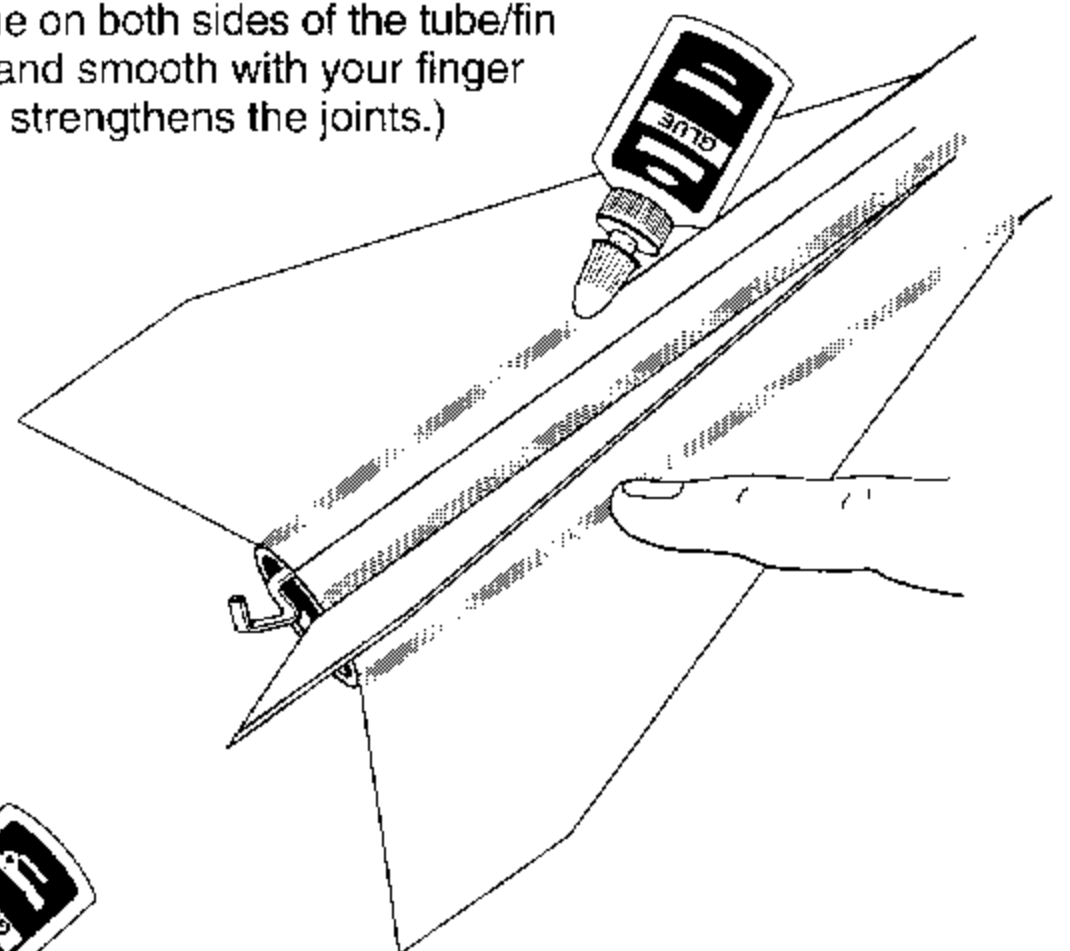


A. Before gluing your fins, identify the root, leading and trailing edges. Remember: Fins must be attached correctly for stable flight.



B. Apply glue to the tab on the fins and along the fin root as shown. Insert the fins into slots, checking alignment to make sure fins are straight.

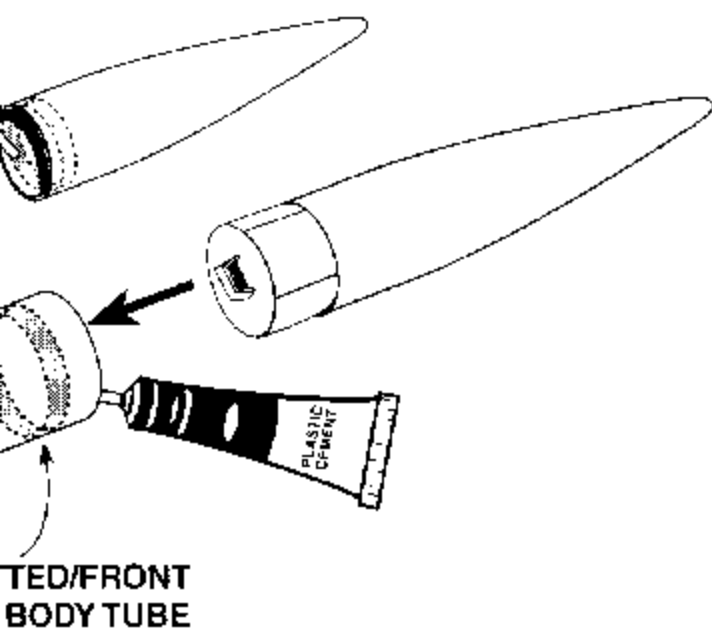
C. Once the fins are positioned correctly, apply a thin bead (fillet) of glue on both sides of the tube/fin joint and smooth with your finger (This strengthens the joints.)



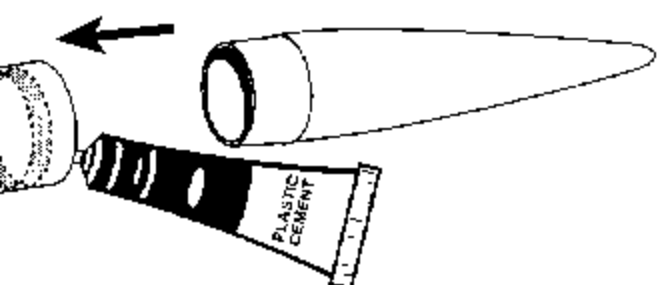
YES

NO

B. Apply a ring of plastic cement just inside large nose cone and insert nose cone adapter.

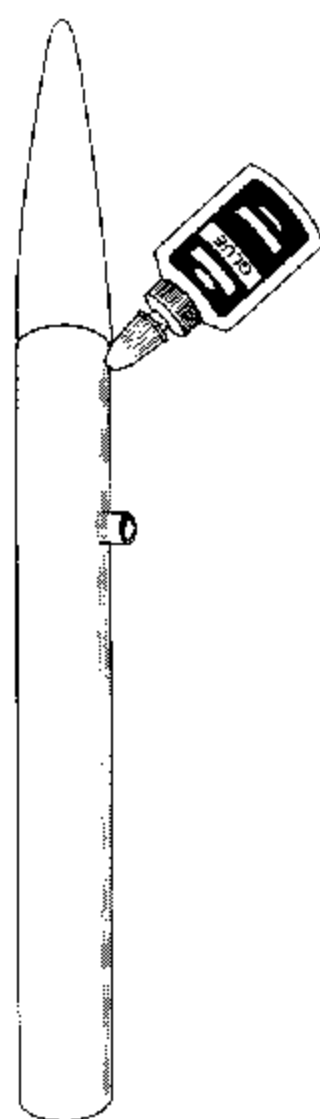


Apply a ring of plastic cement to the inside front of the body tube. Insert the large nose cone into main body tube.

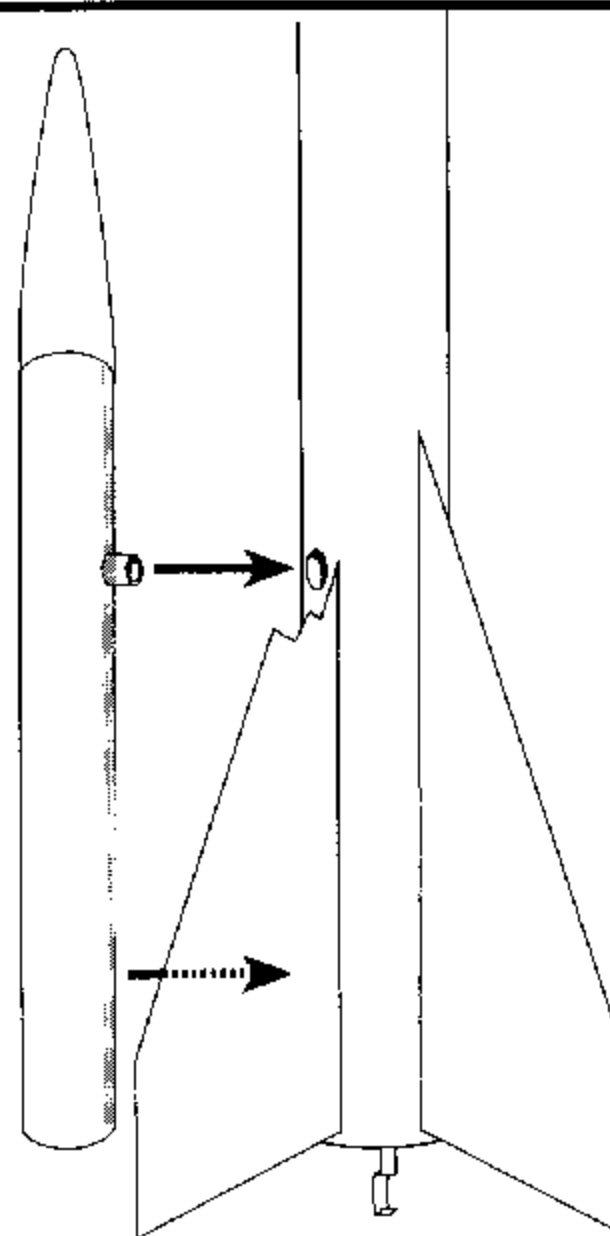


Apply plastic cement to the inside front (end with the side tubes) and insert one nose cone. Repeat with other side tube and small

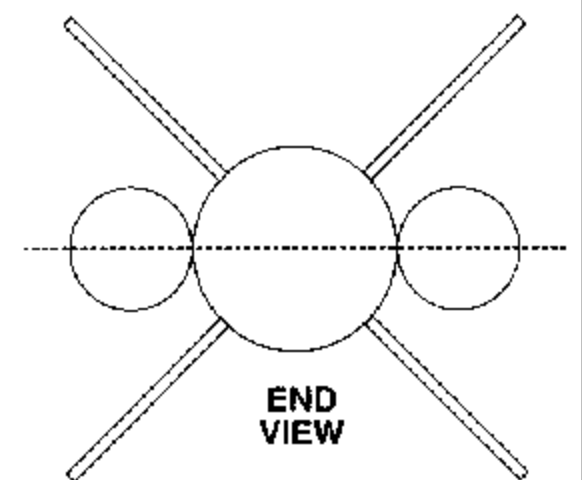
9.



A. Apply glue to alignment line on one side tube and around the vent tube/side tube joint.

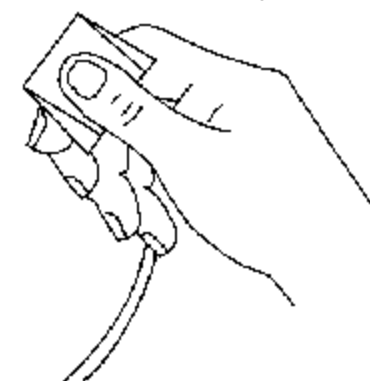
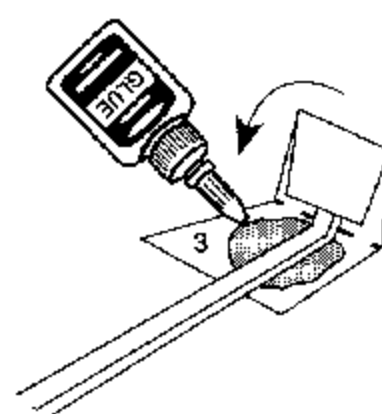
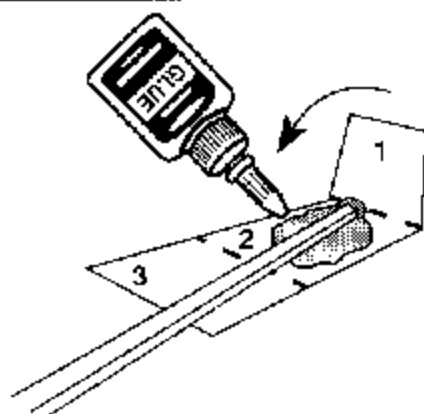
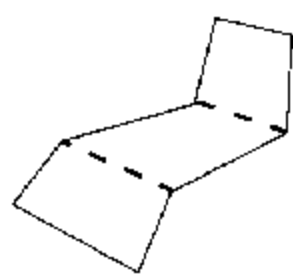
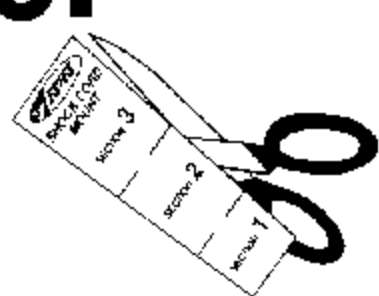


B. Slide the vent tube into one of the holes in the body tube. BE SURE THE SIDE TUBE IS ALIGNED WITH THE CORRESPONDING LINE ON BODY TUBE.



C. Repeat steps 10A and 10B with the other side tube. BE SURE ALIGNMENT IS CORRECT.

10.

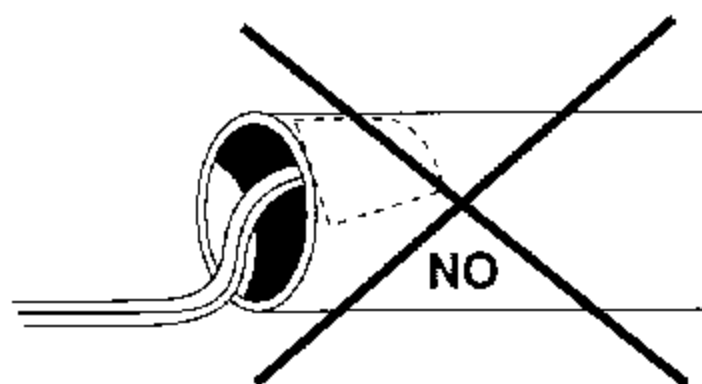
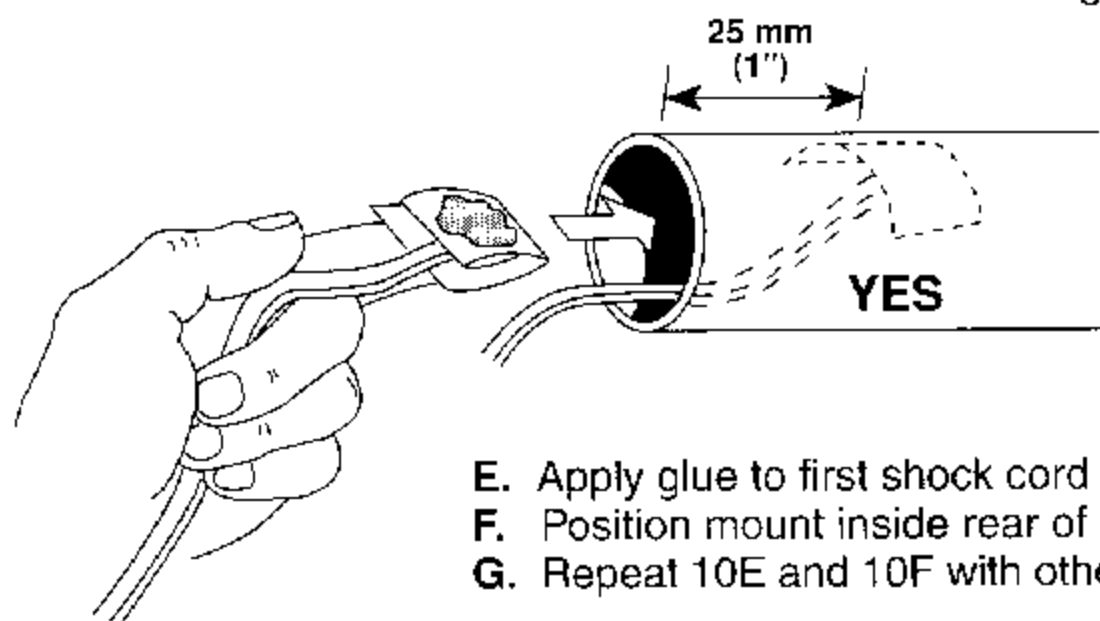


A. Cut out both shock cord mounts on the lower right side of this page. Crease the mounts on the dotted lines by folding them.

B. Spread glue on section 2 of one mount and lay one end of shock cord into glue at a slight angle as shown.

C. Apply glue to section 3. Fold forward again. Clamp firmly until glue sets.

D. Repeat steps 10B and 10C with other mount and shock cord.



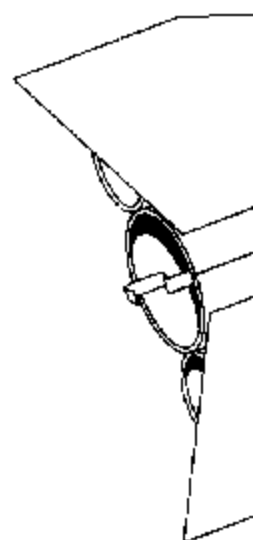
E. Apply glue to first shock cord mount.

F. Position mount inside rear of one side tube no less than 25 mm (1") from end.

G. Repeat 10E and 10F with other mount and side tube. Set assembly aside to set.

11.

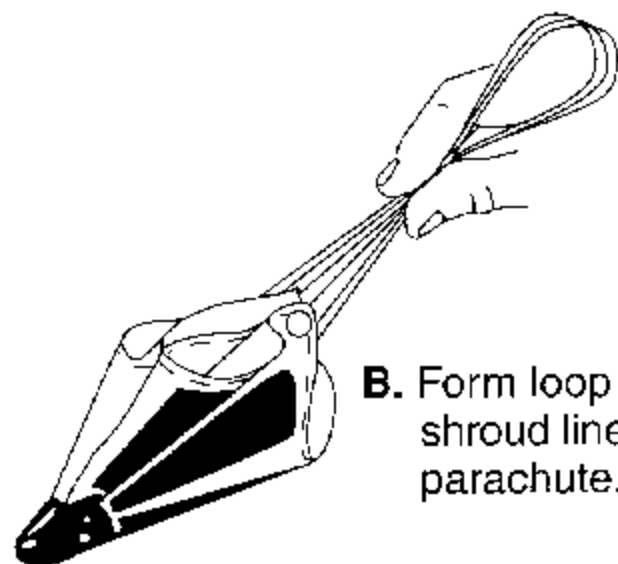
A.
B.



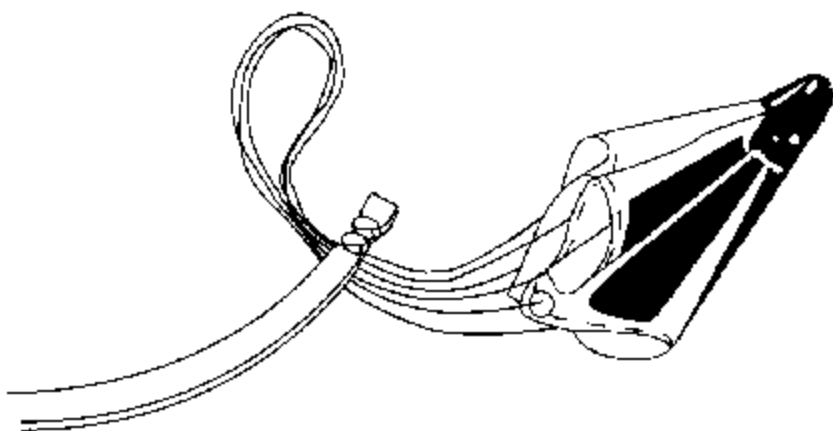
13.



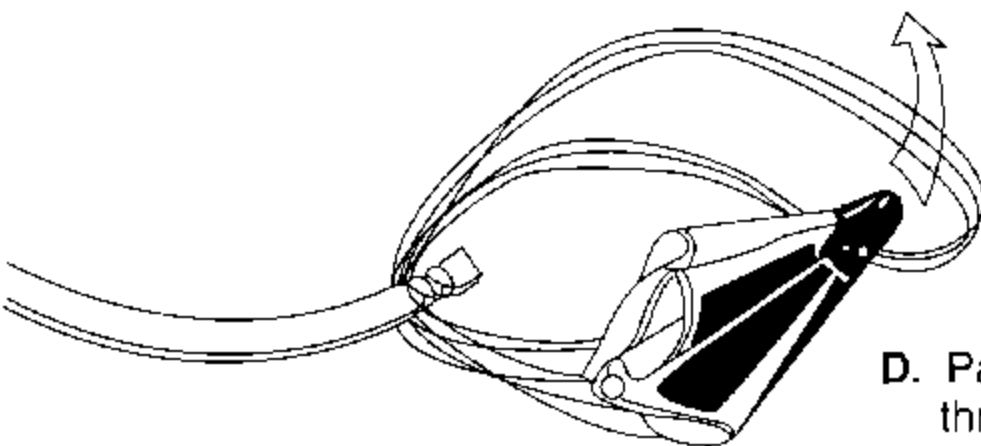
A. Tie a double knot at the free end of one shock cord.



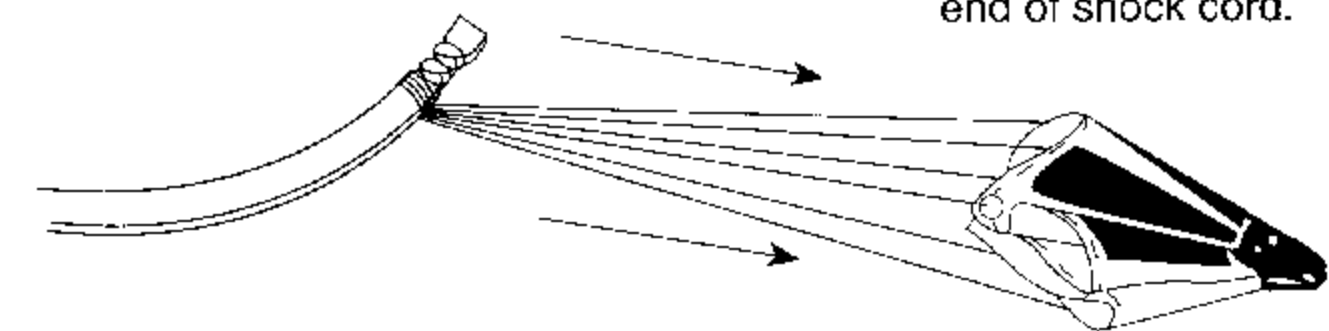
B. Form loop with the shroud lines of one parachute.



C. Lay knotted end of shock cord on shroud lines.



D. Pass parachute through loop, capturing the knot at end of shock cord.

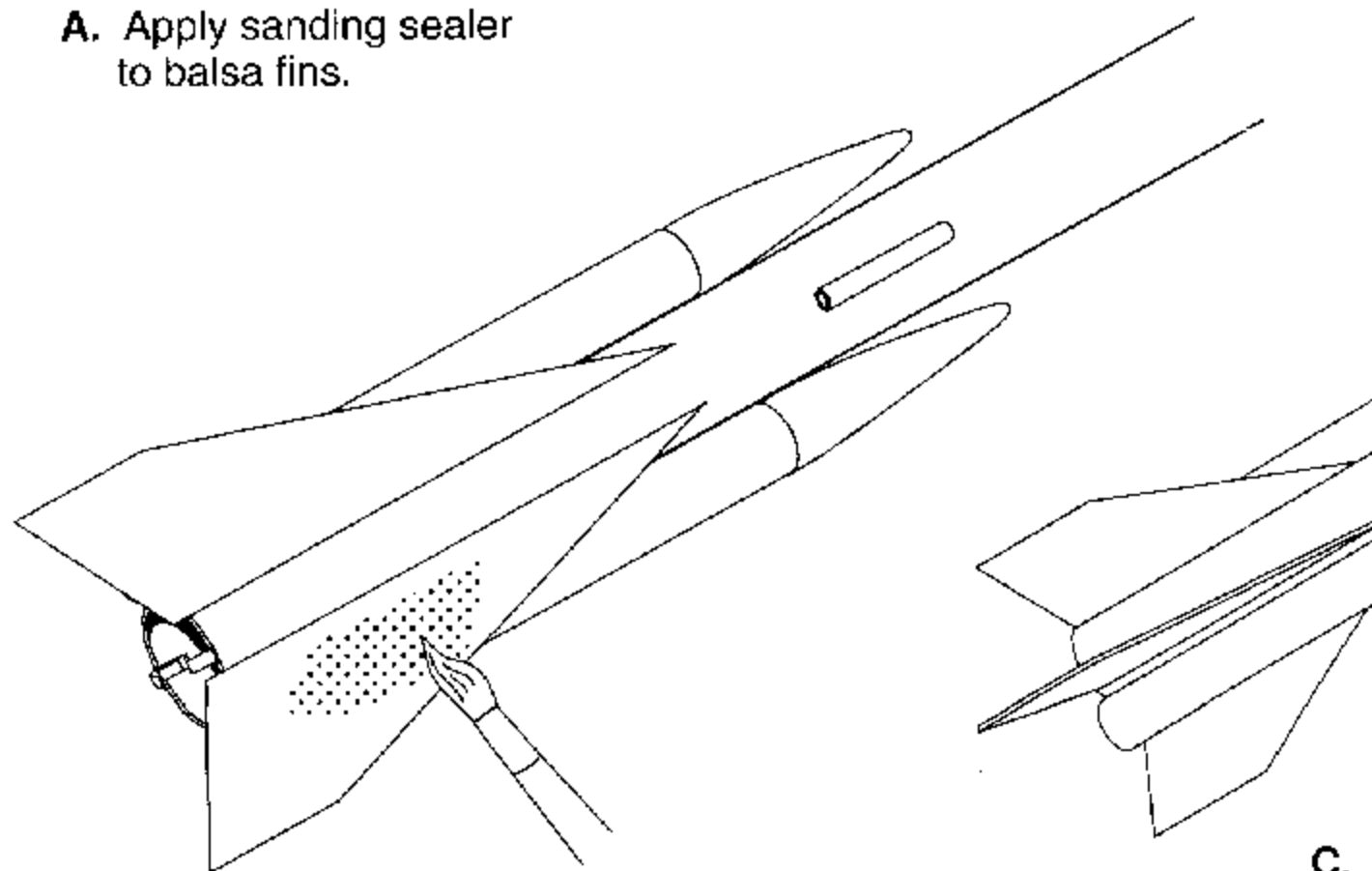


E. Pull down to tighten.

F. Repeat steps 13A-13E with second shock cord and second parachute for the other side tube. Then use step 15 to fold parachutes and slide parachutes into side tubes.

14. FINISHING YOUR ROCKET

A. Apply sanding sealer to balsa fins.



B. Fine sand with 400-600 grain sanding paper. Alternate sanding and sealing until you are satisfied with finish.

C.
D.
E.

GU



1.

A. Apply glue to launch lug.
 B. Place lug in front of the 17.8 cm (7") mark you made on the straight line down the body tube.

C. Be sure lug is perfectly aligned.

12.

A. Cut out both parachutes on dotted lines.

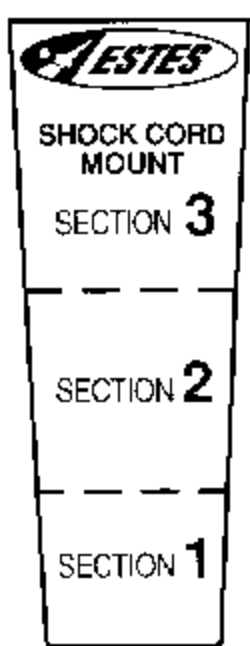
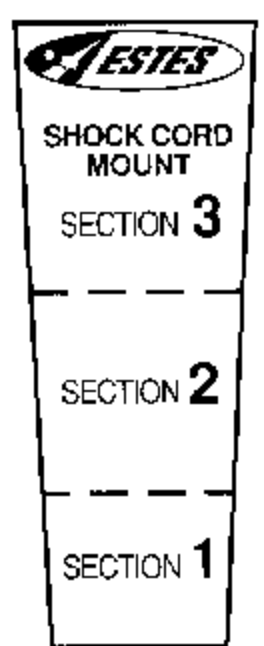
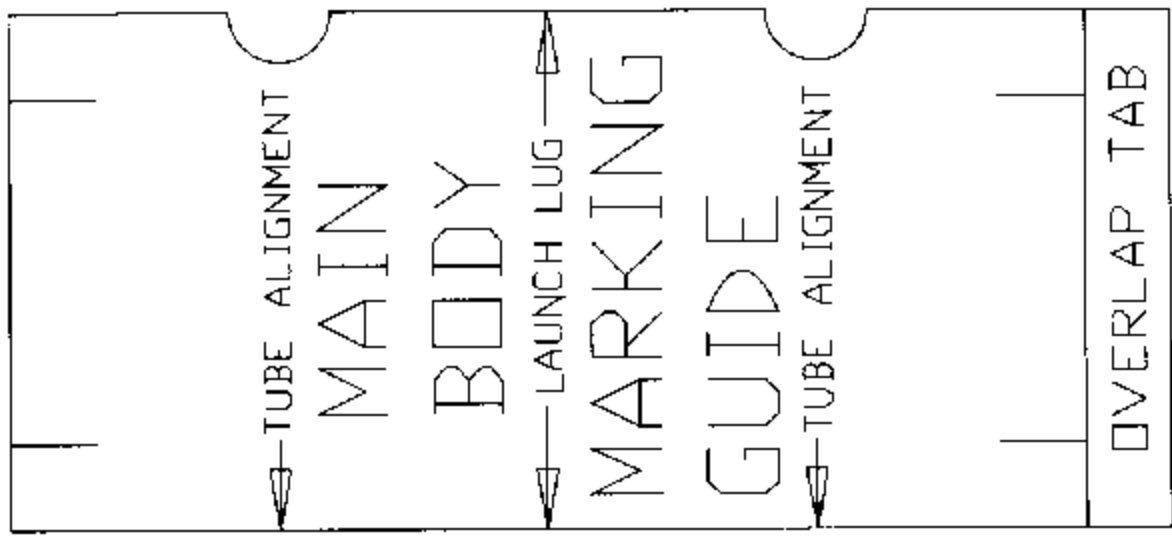
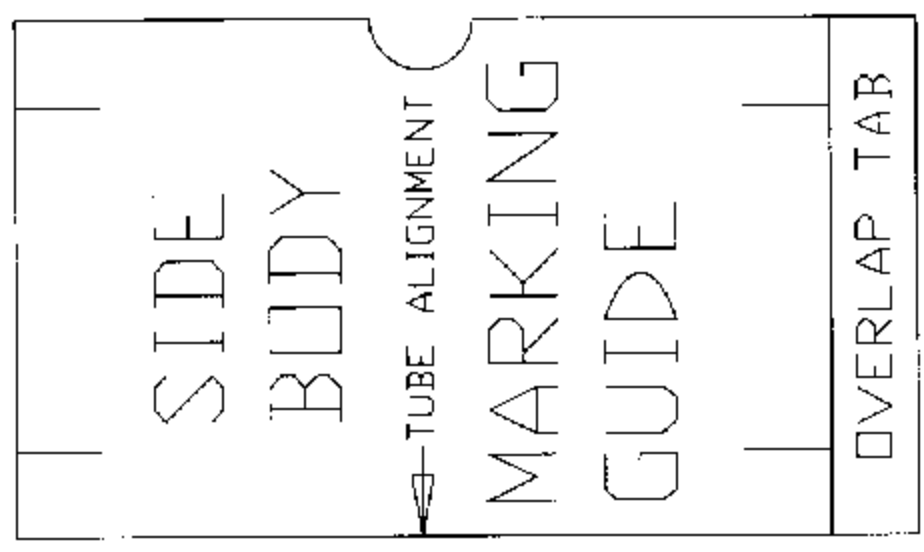
B. For each parachute, find shroud line bundle. Remove tape. Fold and cut the entire length of the shroud line into three equal lengths.

C. Press tape rings onto marks on corners.
 D. Punch holes with sharp pencil.
 E. Tie lines off.

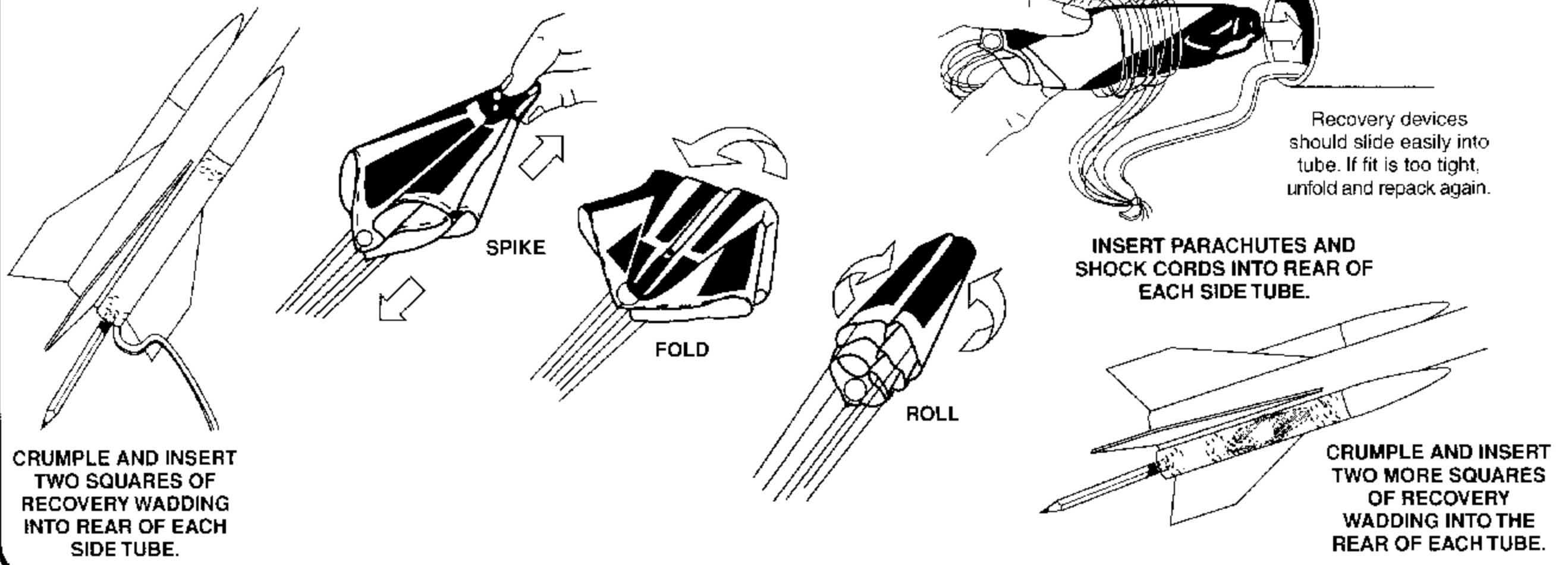
C. (Optional) Apply a thin coat of automotive primer for a great looking finished rocket.
 D. Spray paint entire rocket enamel white. Let dry completely.
 E. For final coat, spray paint entire rocket blue. Let dry completely.

F. Once your rocket is completely dry, carefully cut decals out just inside the dotted lines.
 G. Carefully remove one decal at a time and position on rocket. (Use photo of rocket for decal placement.)
 H. Once decal is in position, rub with finger to remove air bubbles and to secure decal to rocket.

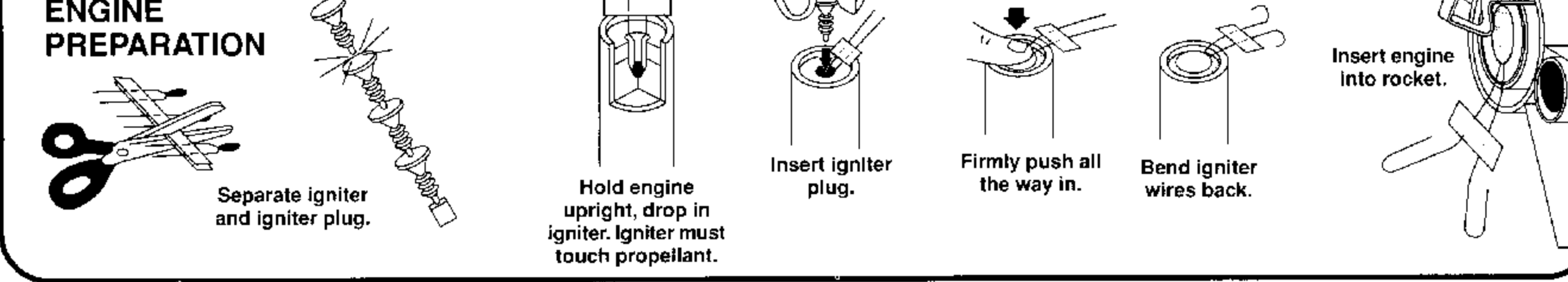
GUIDES AND MOUNTS



15. PACKING PARACHUTES



16. FLYING YOUR ROCKET



LAUNCH SUPPLIES

- To launch your rocket, you will need the following:
- Launch Pad (Estes Porta-Pad® II)
 - Launch Controller (Estes Electron Beam®)
 - Recommended Estes Engines: B4-2, B4-4, B6-2, B6-4 or C6-5. Use a B6-2 engine for your first flight to become familiar with your rocket's flight pattern.
 - Recovery Wadding (EST 302274)
 - Igniters and Igniter Plugs (included with Estes engines)
- Use only Estes products to launch this rocket.

ENGINE	PROJECTED ALTITUDE	
	Feet	Meters
B4-2, B4-4	175	54
B6-2, B6-4	200	61
C6-5	600	183

Igniter Plugs - U.S. Patent Nr. 5,509,354

TIPS FOR FLYING YOUR ROCKET

- Choose a large field away from power lines, buildings, tall trees, and low flying aircraft. Try to find a field at least 76 meters (250 feet) square. The larger the launch area, the better your chance of recovering your rocket.
- 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 4° Celsius [40° Fahrenheit]). Parachute may be dusted with talcum or baby powder to avoid sticking.
- Always follow the National Association of Rocketry (NAR) MODEL ROCKETRY SAFETY CODE while participating in any model rocketry activities. The safety code is enclosed with this kit.

ROCKET PROFILE

Your Gemini DC is boosted into the air with one of the recommended engines. At apogee (the highest point of flight) the two parachutes eject from the side tubes and open to allow the rocket to return to Earth ready to be flown again and again.