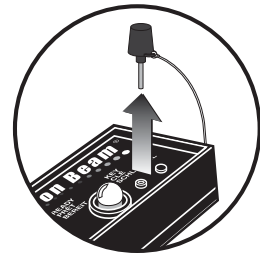
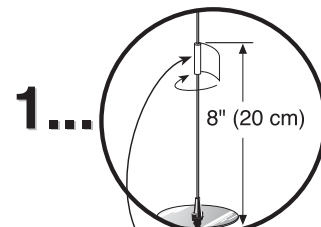


COUNTDOWN AND LAUNCH



KEY ALWAYS OUT UNTIL FINAL COUNTDOWN!



1...

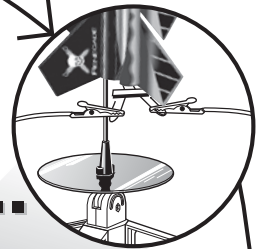
Masking Tape



2...



3...



4...

5...



INSERT KEY. PUSH DOWN AND HOLD.

HOLD KEY DOWN AND PRESS LAUNCH BUTTON UNTIL LIFT-OFF!

LAUNCH BUTTON

LAUNCH SUPPLIES (Sold Separately)

- Porta Pad® II Launch Pad
- Electron Beam® Launch Controller
- Recovery Wadding
- Igniters (with Engines)
- Igniter Plugs (with Engines)
- Recommended Estes® Engines:
Single Stage A8-3, B4-4, B6-4, C6-5
- Two Stage Flights: Booster Stage - B6-0, C6-0,
- Upper Stage - A8-5, B6-4, B6-6, C6-5, C6-7



www.estesrockets.com

ESTES INDUSTRIES
1295 H Street
Penrose, CO 81240
PRINTED IN CHINA



FLYING MODEL ROCKET KIT INSTRUCTIONS
KEEP FOR FUTURE REFERENCE.

EST 2109

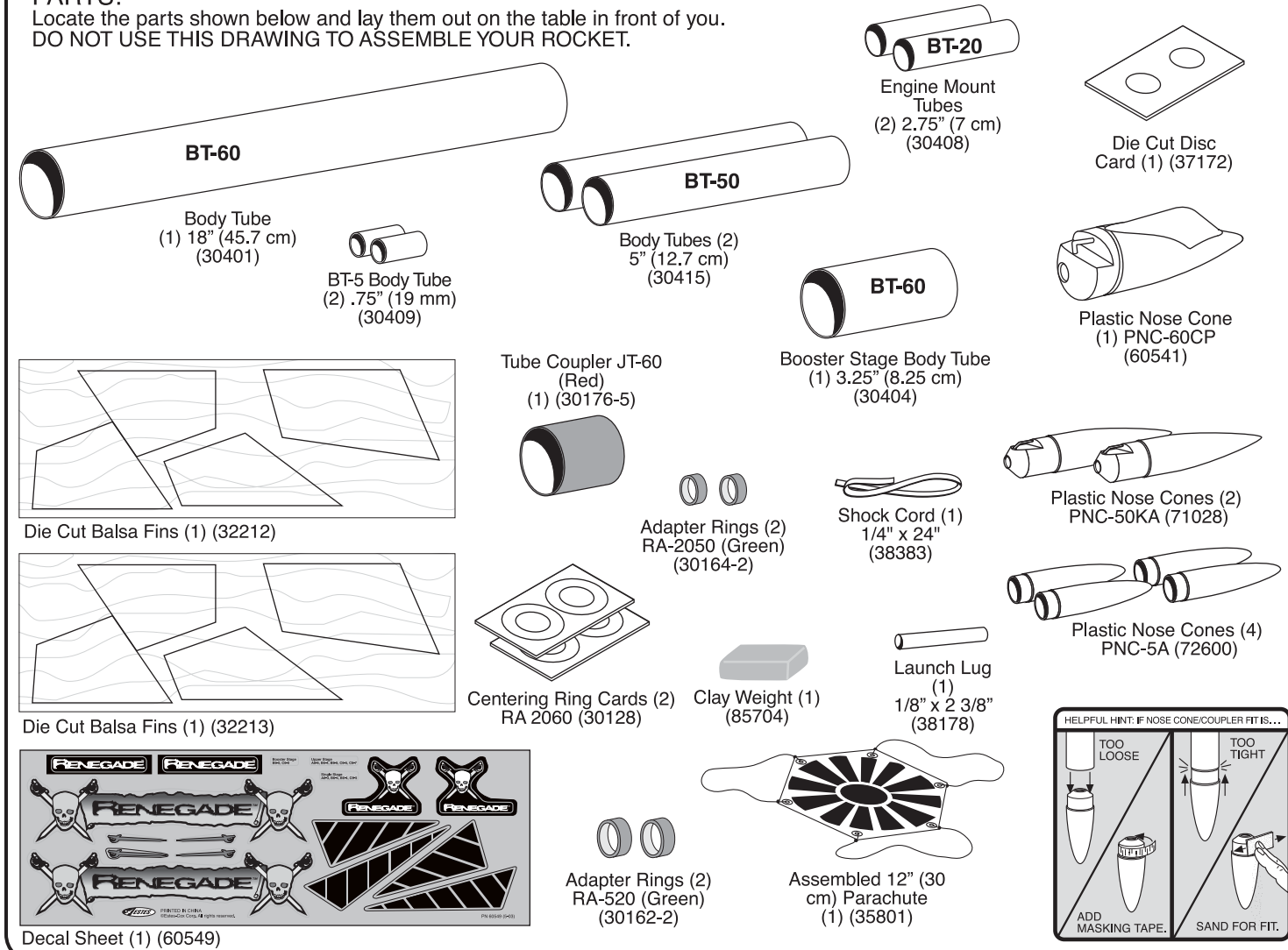


ASSEMBLY TIP: Read all instructions before beginning work on your model. Make sure you have all parts and supplies.

TEST-FIT ALL PARTS TOGETHER BEFORE APPLYING ANY GLUE! If any parts don't fit properly, sand as required for precision assembly.

PARTS:

Locate the parts shown below and lay them out on the table in front of you. DO NOT USE THIS DRAWING TO ASSEMBLE YOUR ROCKET.



PRECAUTIONS

NAR Safety Code



NO DRY GRASS OR WEEDS

FLYING YOUR ROCKET

Choose a large field (500 ft. [152 m] square) free of dry weeds and brown grass. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great. Launch only with little or no wind and good visibility.

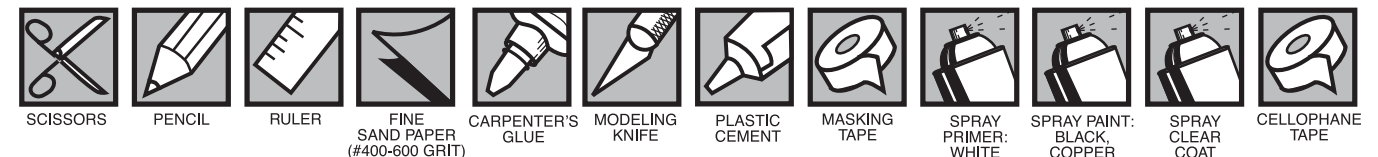
Always follow the National Association of Rocketry (NAR) Safety Code.

MISFIRES

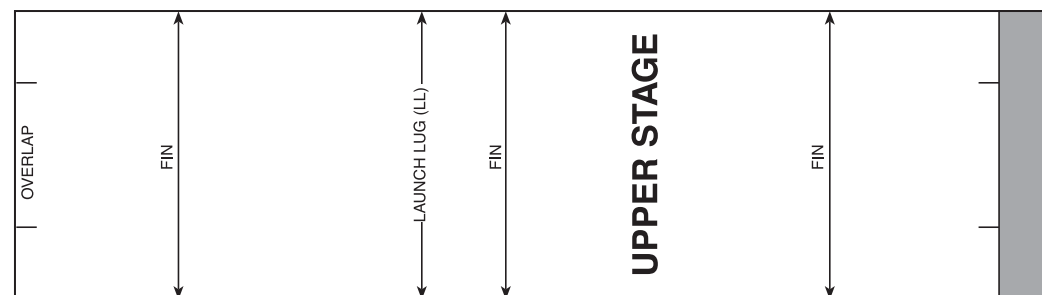
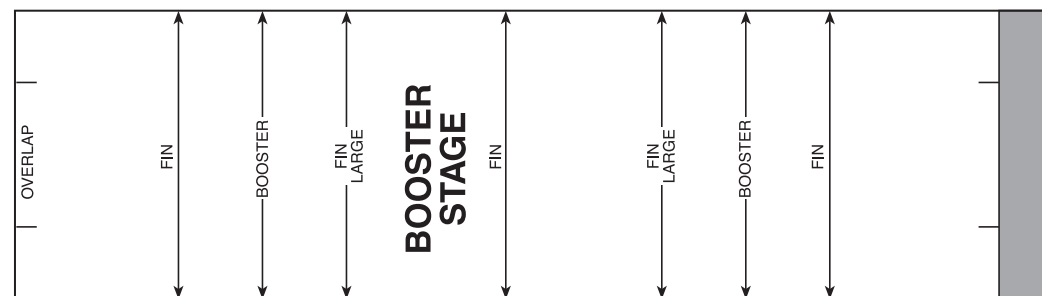
TAKE THE KEY OUT OF THE CONTROLLER. WAIT ONE MINUTE BEFORE GOING NEAR THE ROCKET! Disconnect the igniter clips and remove the engine. Take the plug and igniter out of the engine. If the igniter has burned, it worked but did not ignite the engine because it was not touching the propellant inside the engine. Put a new igniter all the way inside the engine without bending it. Push the plug in place. Repeat the steps under Countdown and Launch.

SUPPLIES

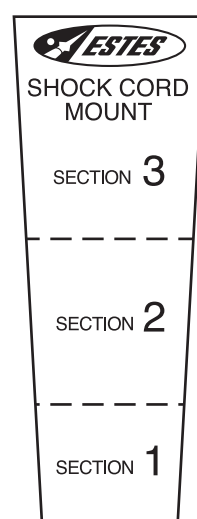
In addition to the parts included in the kit you will also need:



TUBE MARKING GUIDES



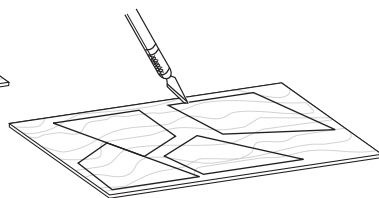
SHOCK CORD MOUNT



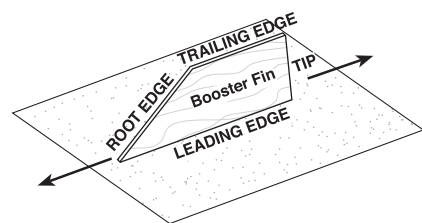
1. FIN PREPARATION



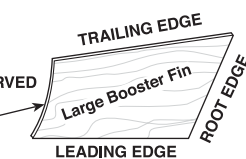
A. Fine sand balsa sheets, both sides.



B. Carefully free fins with modeling knife.

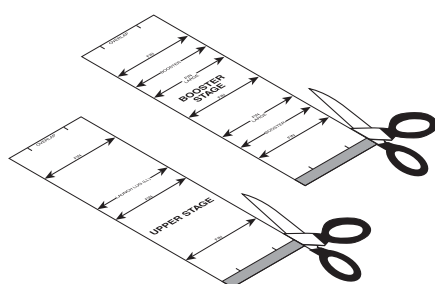


C. Sand all edges smooth except as noted.

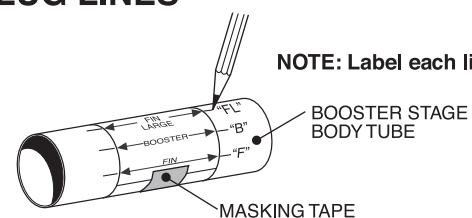


DO NOT SAND SMOOTH.

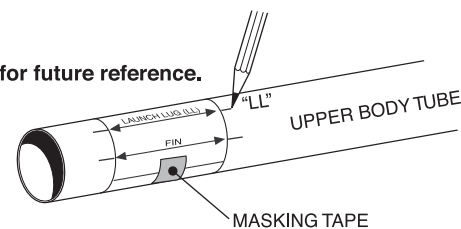
2. MARK FIN AND LAUNCH LUG LINES



A. Cut out tube marking guides from top of page.



B. Wrap BOOSTER STAGE Tube Marking Guide around Booster Stage Tube as shown. Mark at arrows, label fins "F", boosters "B" and large fins "FL". Remove guide.



C. Wrap UPPER BODY TUBE marking guide around Upper Body Tube as shown. Mark at arrows. Mark launch lug line "LL". Remove guide.

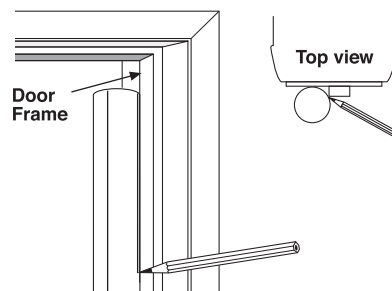
D. Extend lines.

BOOSTER STAGE BODY TUBES

Using a door frame, extend all lines entire length of tube.

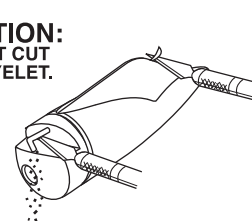
UPPER BODY TUBE

Using a door frame, extend fin lines 4" (10 cm), extend launch lug "LL" line 6" (15 cm).

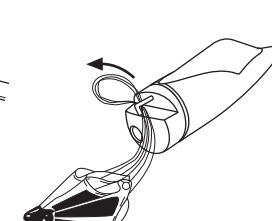


16. ATTACH NOSE CONE

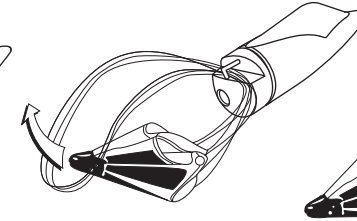
CAUTION:
DO NOT CUT OFF EYELET.



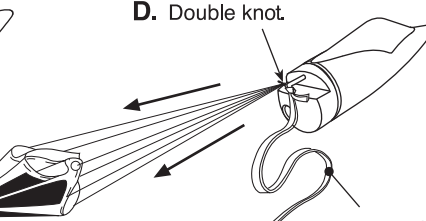
A. Remove excess flash and clean the eyelet of the nose cone.



B.



C.



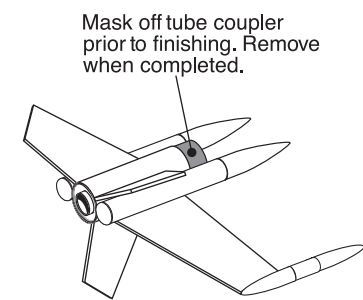
D. Double knot.

PULL TIGHT

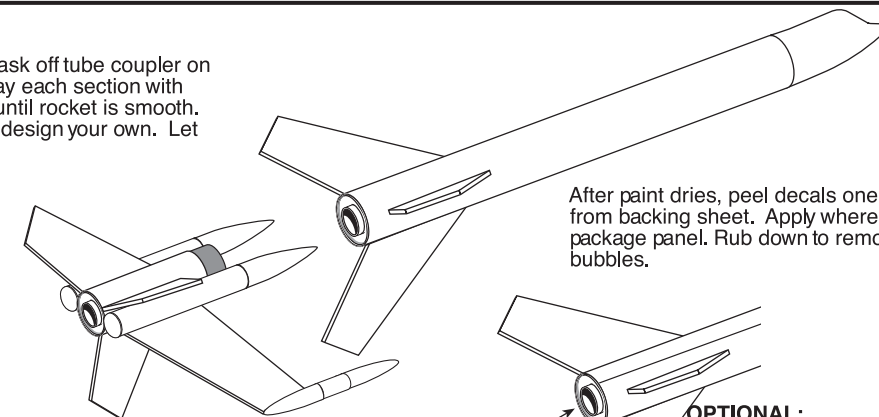
ATTACH SHOCK CORD

PAINT SCHEME

Finish booster and upper stage separately. Mask off tube coupler on booster and upper stage engine mount. Spray each section with spray white primer. Let dry. Sand and repeat until rocket is smooth. Follow the paint scheme on the front panel or design your own. Let dry.



Mask off tube coupler prior to finishing. Remove when completed.



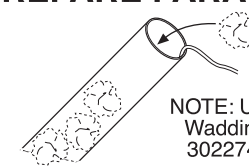
After paint dries, peel decals one at a time from backing sheet. Apply where shown on package panel. Rub down to remove bubbles.

Mask off engine compartment prior to painting. Remove when completed.

OPTIONAL:

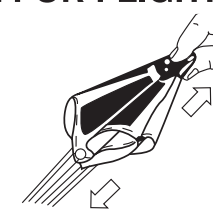
After decal placement mask off tube coupler and engine compartment. Spray entire rocket with clear coat. Let dry. Remove masking materials.

PREPARE PARACHUTE FOR FLIGHT

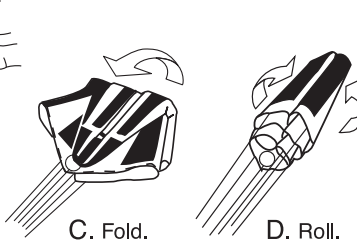


A. Insert 4-5 squares of loosely crumpled recovery wadding into rocket.

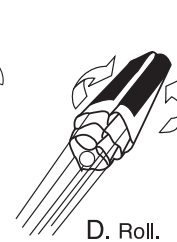
NOTE: Use Estes Wadding (EST 302274) Only.



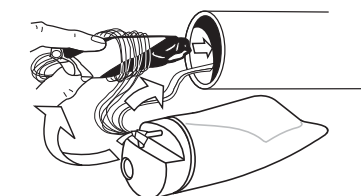
B. Spike Parachute.



C. Fold.



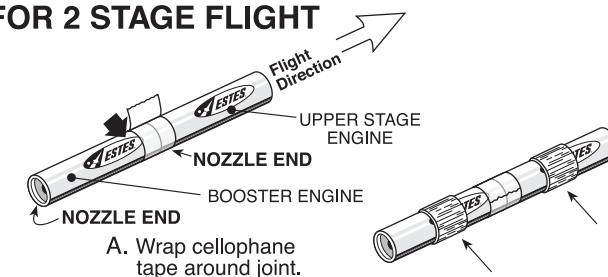
D. Roll.



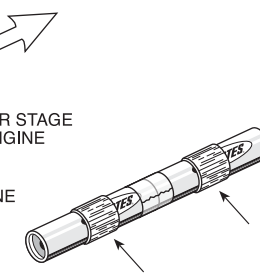
E. Wrap lines loosely. Insert 'Chute, Shock Cord and Nose Cone into Body Tube.

ENGINE PREP FOR 2 STAGE FLIGHT

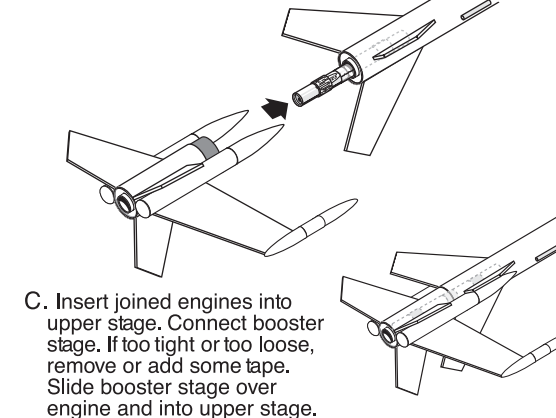
WARNING: FLAMMABLE
Before proceeding read instructions & NAR Safety Code included with engines.
PREPARE YOUR ENGINE ONLY WHEN YOU ARE OUTSIDE AT THE LAUNCH SITE PREPARING TO LAUNCH!
If you do not use your prepared engine, remove the igniter before storing your engine.



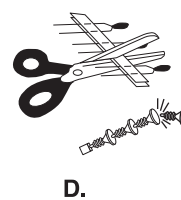
A. Wrap cellophane tape around joint.



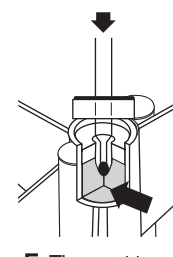
B. Wrap masking tape around middle of each engine to ensure tight fit in upper and booster stages.



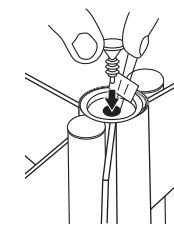
C. Insert joined engines into upper stage. Connect booster stage. If too tight or too loose, remove or add some tape. Slide booster stage over engine and into upper stage.



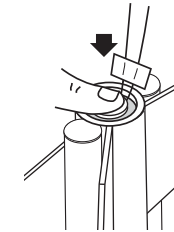
D.



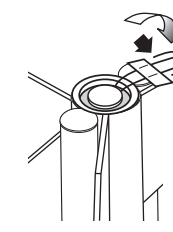
E. Tip must touch propellant.



F.



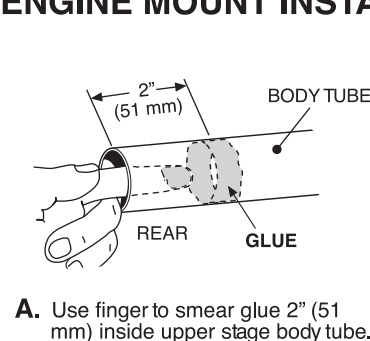
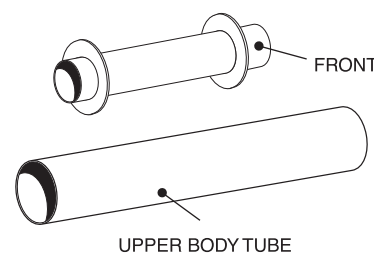
G.



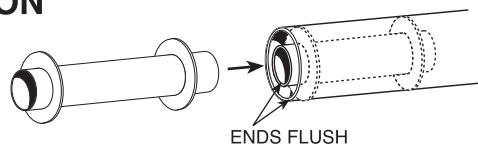
H.

11. UPPER STAGE ENGINE MOUNT INSTALLATION

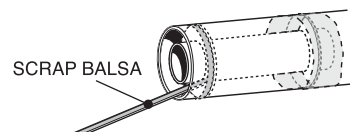
PARTS
ENGINE MOUNT ASSEMBLY



A. Use finger to smear glue 2" (51 mm) inside upper stage body tube.



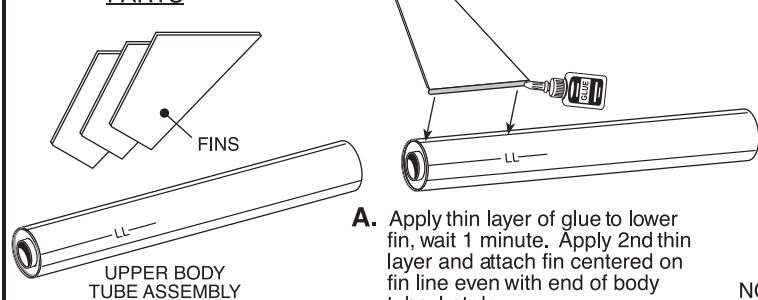
B. Insert engine mount until flush with end. Let dry.



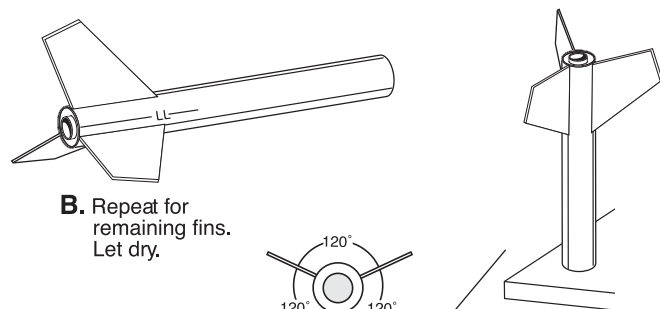
C. Use a scrap piece of balsa to apply a glue fillet between the centering ring and body tube joint. Let dry.

12. ATTACH UPPER STAGE FINS

PARTS

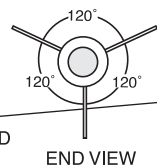


A. Apply thin layer of glue to lower fin, wait 1 minute. Apply 2nd thin layer and attach fin centered on fin line even with end of body tube. Let dry.



B. Repeat for remaining fins. Let dry.

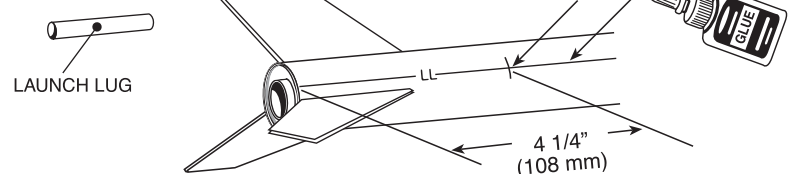
NOTE: FINS MUST BE ATTACHED CORRECTLY FOR A STABLE FLIGHT.



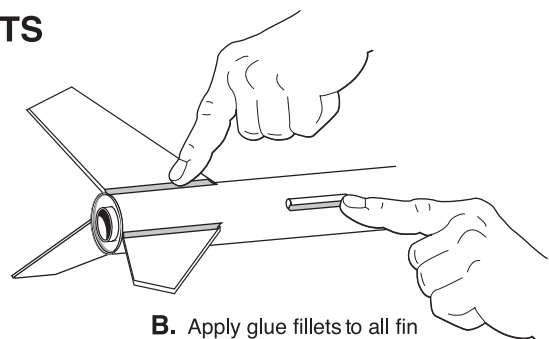
C. Stand rocket on flat table until glue dries completely.

13. ATTACH LAUNCH LUG AND APPLY GLUE FILLETS

PARTS



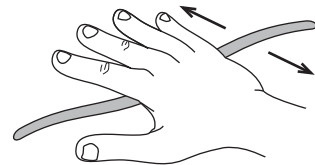
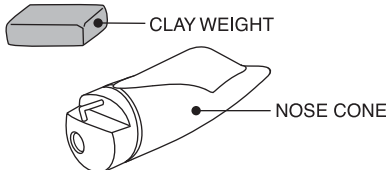
A. Mark Launch lug line at 4 1/4" (108 mm). Glue launch lug centered on "LL" line even with mark. Let dry.



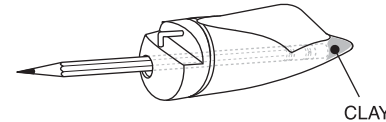
B. Apply glue fillets to all fin and launch lug/body tube joints. Let dry.

14. INSTALL NOSE WEIGHT

PARTS

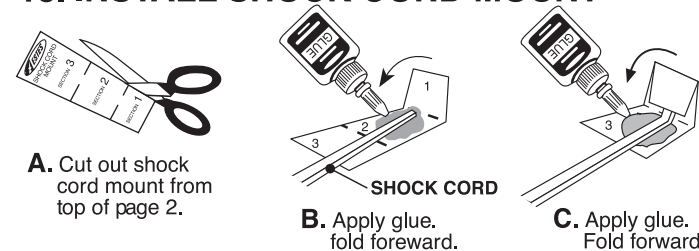


A. Form the clay weight into a thin snake.

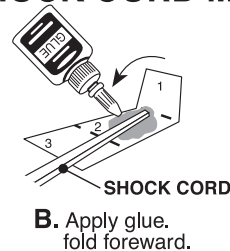


B. Use a long wooden pencil to tamp the clay into the front of the nose cone as far as possible. Use all of the clay.

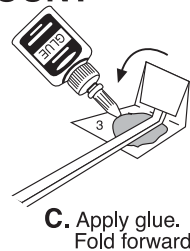
15. INSTALL SHOCK CORD MOUNT



A. Cut out shock cord mount from top of page 2.



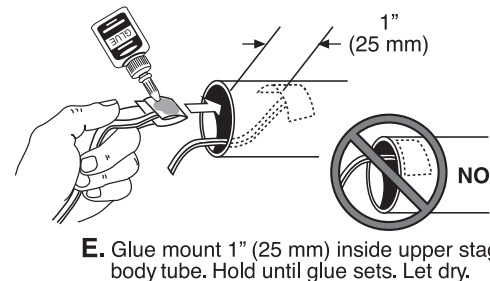
B. Apply glue. fold forward.



C. Apply glue. Fold forward.



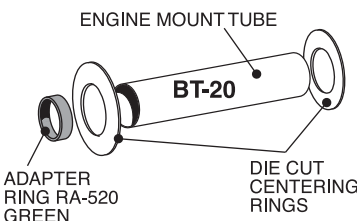
D. Squeeze tightly and hold for one minute.



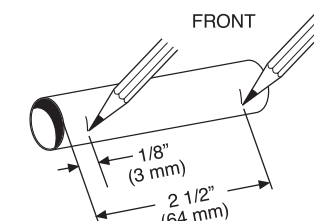
E. Glue mount 1" (25 mm) inside upper stage body tube. Hold until glue sets. Let dry.

3. BOOSTER STAGE ENGINE MOUNT ASSEMBLY

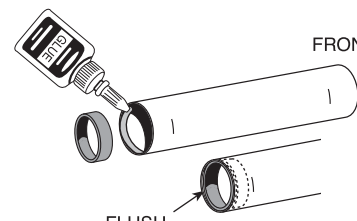
PARTS



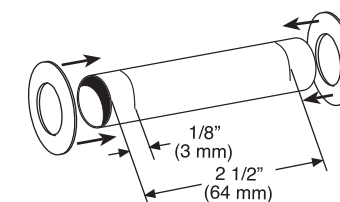
A. Carefully remove centering rings from card using a modeling knife.



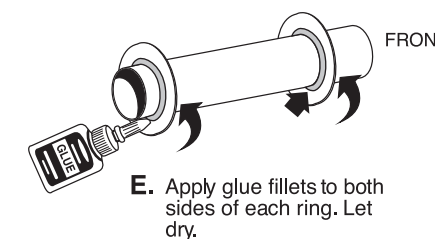
B. Mark tube at the 1/8" (3 mm) and 2 1/2" (64 mm) mark from end.



C. Apply a ring of glue just inside the end of the tube, insert the adapter ring until flush with end. Let dry.

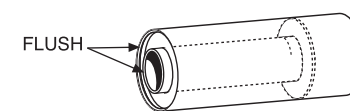


D. Push the centering rings onto the tube, at 1/8" (3 mm) and 2 1/2" (64 mm) marks.

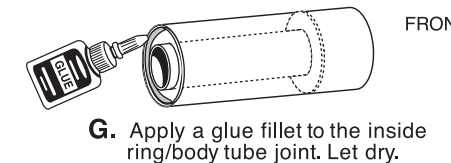


E. Apply glue fillets to both sides of each ring. Let dry.

PARTS



F. Insert engine mount until the motor tube is flush with the end.

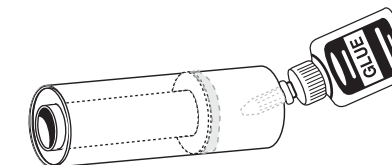


G. Apply a glue fillet to the inside ring/body tube joint. Let dry.

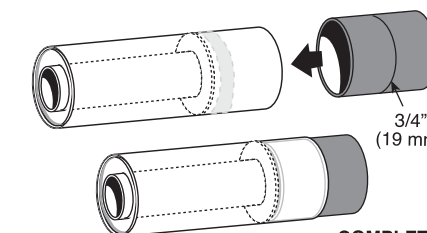
PARTS



H. Mark red tube coupler at 3/4" (19 mm).



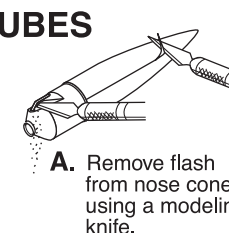
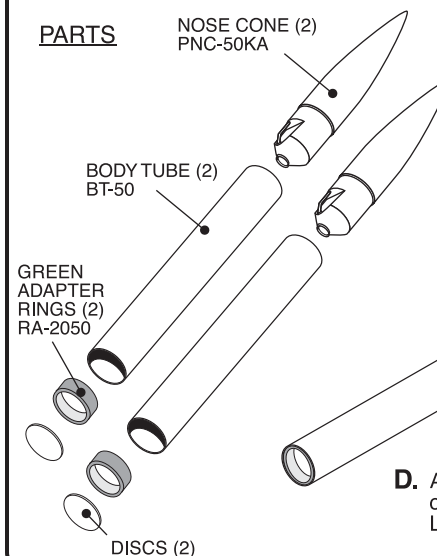
I. Apply a ring of glue inside the front of booster tube at the body tube/centering ring joint.



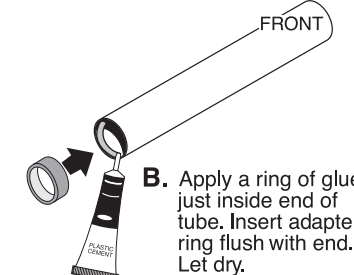
J. Insert red adapter into booster tube up to the 3/4" (19 mm) mark. Let dry.

4. PREPARE BOOSTER TUBES

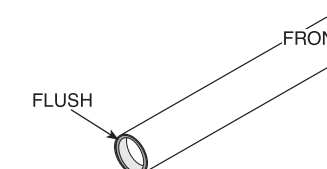
PARTS



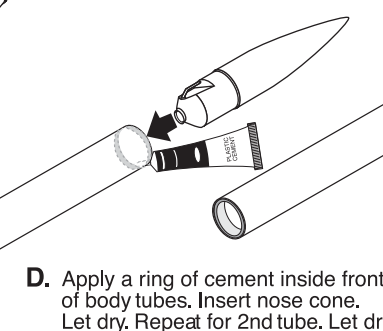
A. Remove flash from nose cones using a modeling knife.



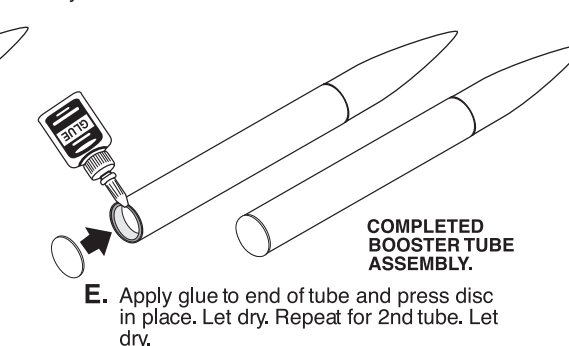
B. Apply a ring of glue just inside end of tube. Insert adapter ring flush with end. Let dry.



C. Repeat for 2nd tube. Let dry.



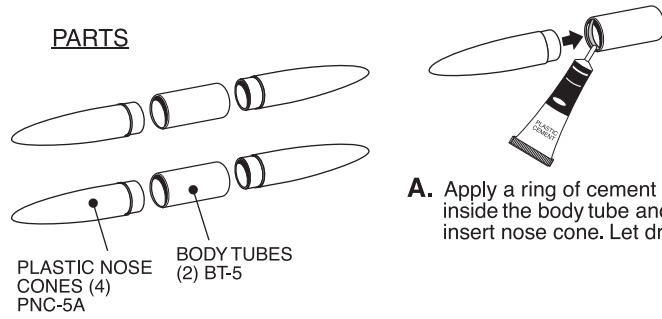
D. Apply a ring of cement inside front of body tubes. Insert nose cone. Let dry. Repeat for 2nd tube. Let dry.



E. Apply glue to end of tube and press disc in place. Let dry. Repeat for 2nd tube. Let dry.

5. PREPARE FIN POD TUBES

PARTS



A. Apply a ring of cement inside the body tube and insert nose cone. Let dry.

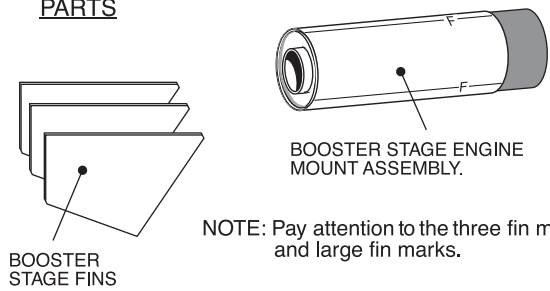
B. Repeat for 2nd tube. Let dry.

C. Apply a ring of cement inside the other end of the body tube and insert nose cone. Let dry. Repeat for 2nd tube. Let dry.

COMPLETED ASSEMBLY.

6. ATTACH BOOSTER STAGE FINS

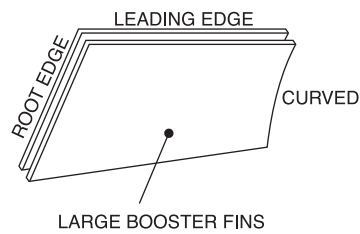
PARTS



NOTE: Pay attention to the three fin marks and large fin marks.

A. Apply thin layer of glue to fin, wait 1 minute, apply 2nd layer and attach fin to booster stage. Let dry.

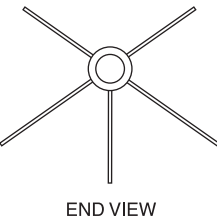
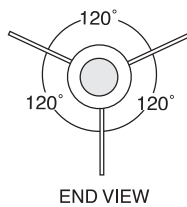
B. Repeat for remaining fins. Let dry.



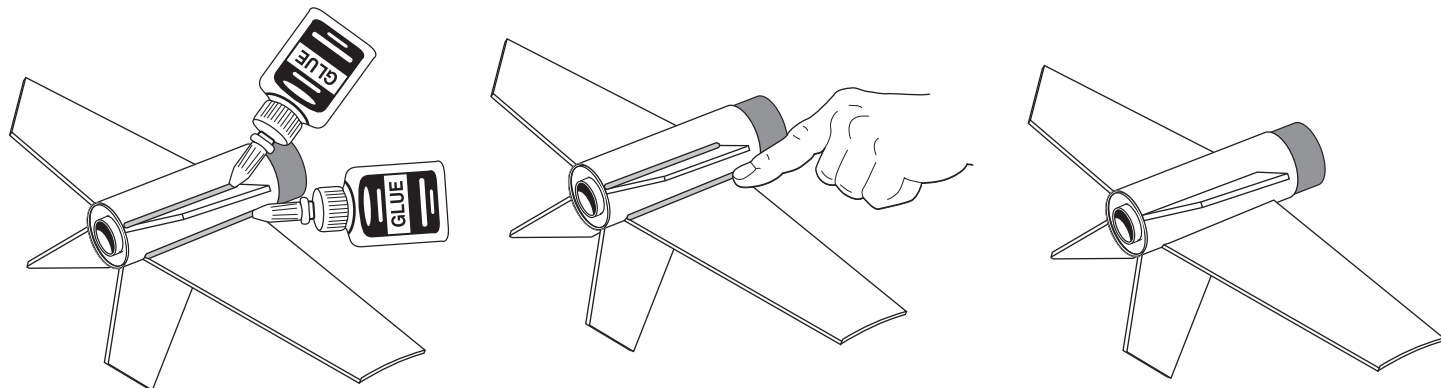
C. Apply thin layer of glue to large fin, wait 1 minute, apply 2nd layer and attach large fin to "FL" line. Let dry.

D. Repeat for 2nd large fin. Let dry.

NOTE: FINS MUST BE ATTACHED CORRECTLY FOR A STABLE FLIGHT.



7. APPLY GLUE FILLETS

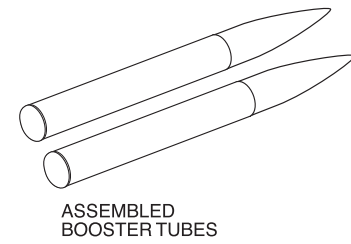


A. Apply glue fillets to both sides of all fins. Smooth with finger. Let dry.

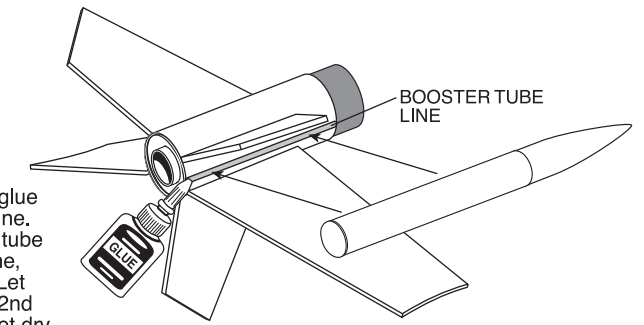
COMPLETED ASSEMBLY

8. INSTALL BOOSTER TUBES

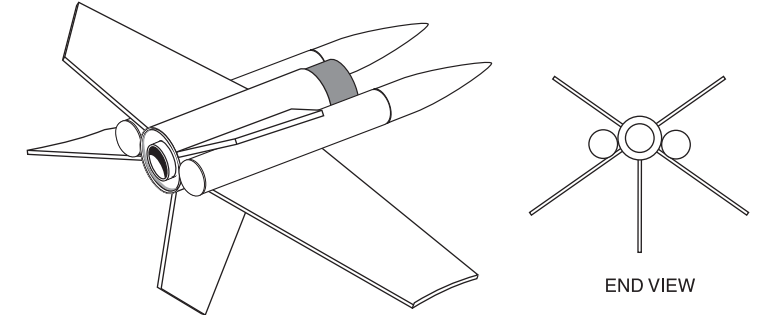
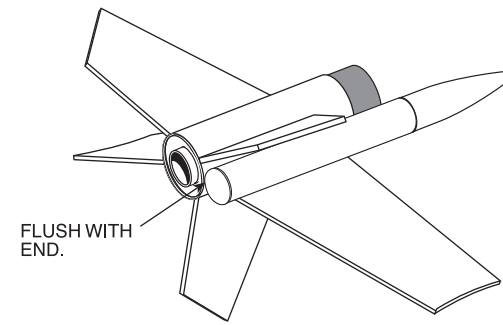
PARTS



A. Apply a line of glue along booster line. Center booster tube assembly on line, flush with end. Let dry. Repeat for 2nd booster tube. Let dry.



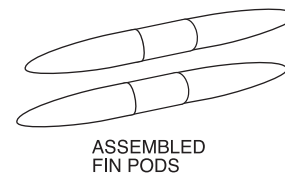
B. Repeat for other side.



END VIEW

9. INSTALL FIN PODS

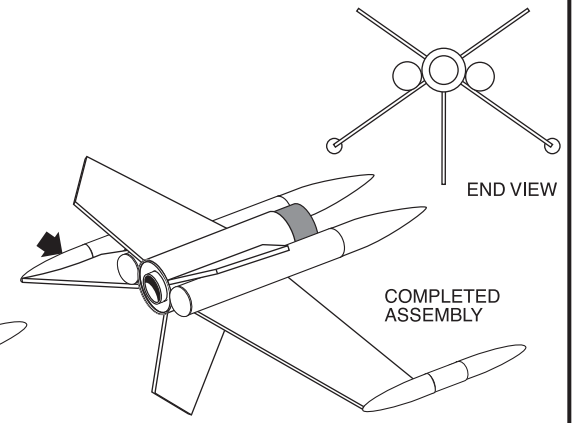
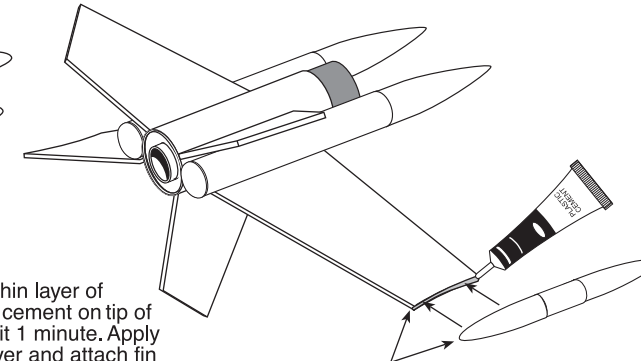
PARTS



A. Apply thin layer of plastic cement on tip of fin. Wait 1 minute. Apply 2nd layer and attach fin pod centered on fin, flush with end. Let dry.

NOTE: End of nose cone flush with back of fin.

B. Repeat for 2nd pod. Let dry.

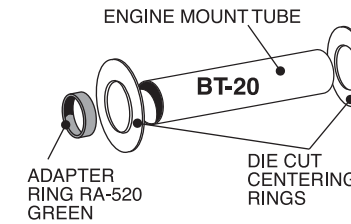


END VIEW

COMPLETED ASSEMBLY

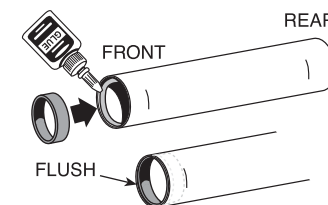
10. UPPER STAGE ENGINE MOUNT ASSEMBLY

PARTS

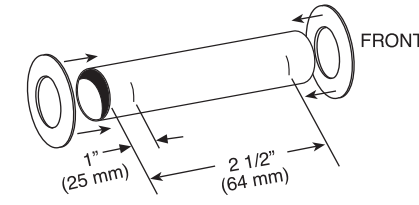


A. Carefully remove centering rings from card using a modeling knife.

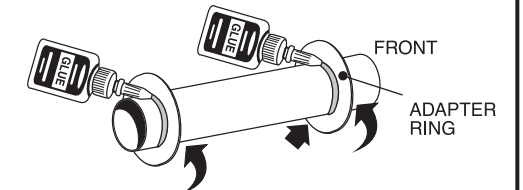
B. Mark tube at 1" (25 mm) and 2 1/2" (64 mm) from end.



C. Apply a ring of glue just inside the end of the tube, insert the adapter ring until flush with end. Let dry.



D. Push the centering rings onto the tube, at the 1" (25 mm) and 2 1/2" (64 mm) marks.



E. Apply glue fillets to both sides of each ring. Let dry.