



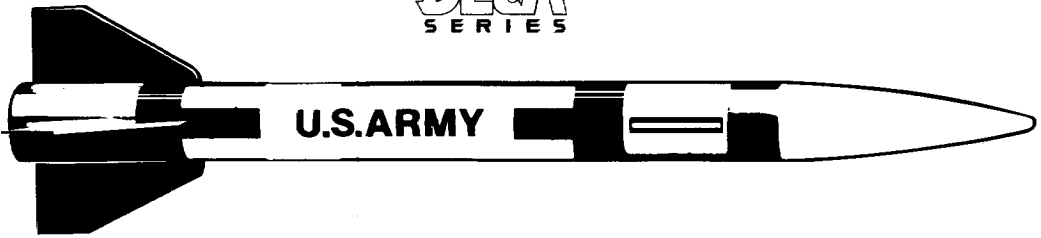


ESTES INDUSTRIES
1295 H STREET
PENROSE, CO 81240 USA

BETA
SERIES

Mini-Patriot™

FLYING MODEL ROCKET KIT #0896

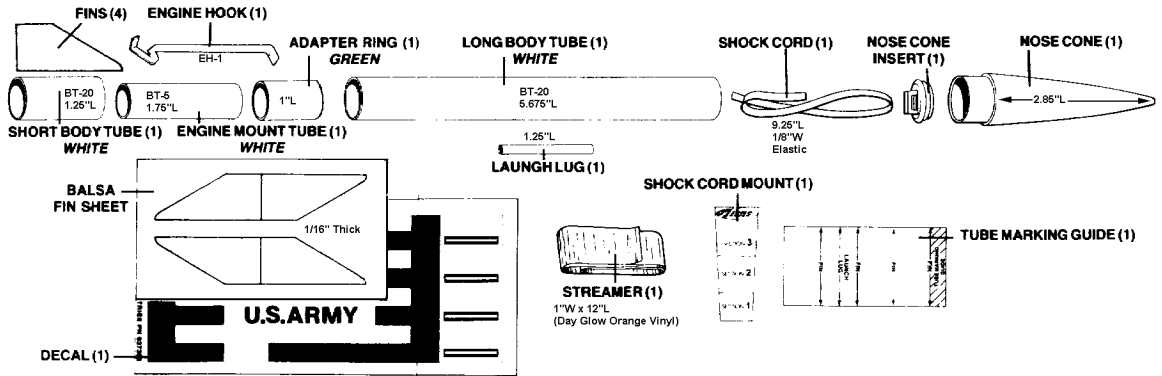


HOW TO USE THESE INSTRUCTIONS:

READ ALL INSTRUCTIONS BEFORE STARTING WORK ON THIS MODEL

- A. This rocket, incorporating basic model rocketry construction techniques, will help you in the development of your rocketry modeling skills.
- B. Read each step first and visualize the procedure thoroughly in your mind before starting construction.
- C. Lay parts out on the table in front of you. (Check inside tubes for any small parts.)
- D. Use exploded view to match all parts contained in kit.
- E. Collect all construction supplies that are not included in the kit.
- F. Tube marking guide and shock cord mount are printed in the instructions and will be found on page 7 in the patterns section.
- G. Test fit parts before applying any glue.
- H. Sand parts as necessary for proper fit.
- I. The construction supplies required for each step are listed at the beginning of each step.
- J. Check off each step as you complete it.

EXPLODED VIEW



EXTREMELY IMPORTANT: THE EXPLODED VIEW IS FOR REFERENCE ONLY! DO NOT USE THIS DRAWING ALONE TO ASSEMBLE THIS MODEL.

The exploded view is only intended to assist you in locating the parts included in this kit. Refer back to this exploded view as you build your model step by step. This method will help you to put the parts into perspective as you progress through the construction.

CONSTRUCTION SUPPLIES

In addition to the parts included in your kit, you will need these construction supplies. Each step shows which supplies will be required.



PLASTIC TUBE
TYPE CEMENT

RULER

PENCIL

HOBBY KNIFE

WOOD GLUE

SCISSORS

SANDPAPER
(#400 &
#600 grit)

PAINT
BRUSH

SANDING
SEALER

MASKING
TAPE

SPRAY
PAINT

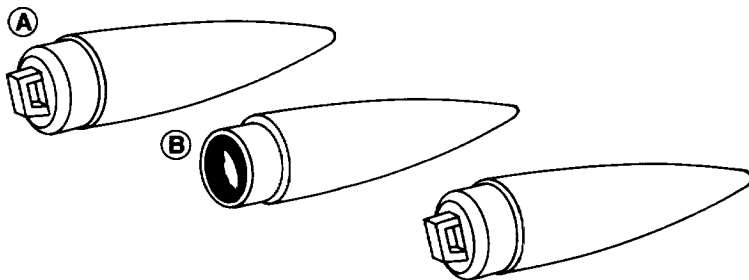
GLUE IS APPLIED TO SURFACES SHOWN IN RED.

1. NOSE CONE ASSEMBLY

NOTE: This is the only step in the construction of your model rocket that requires plastic cement.



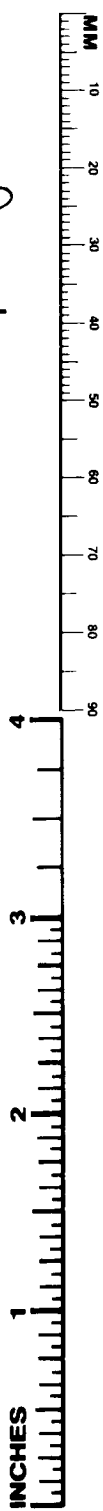
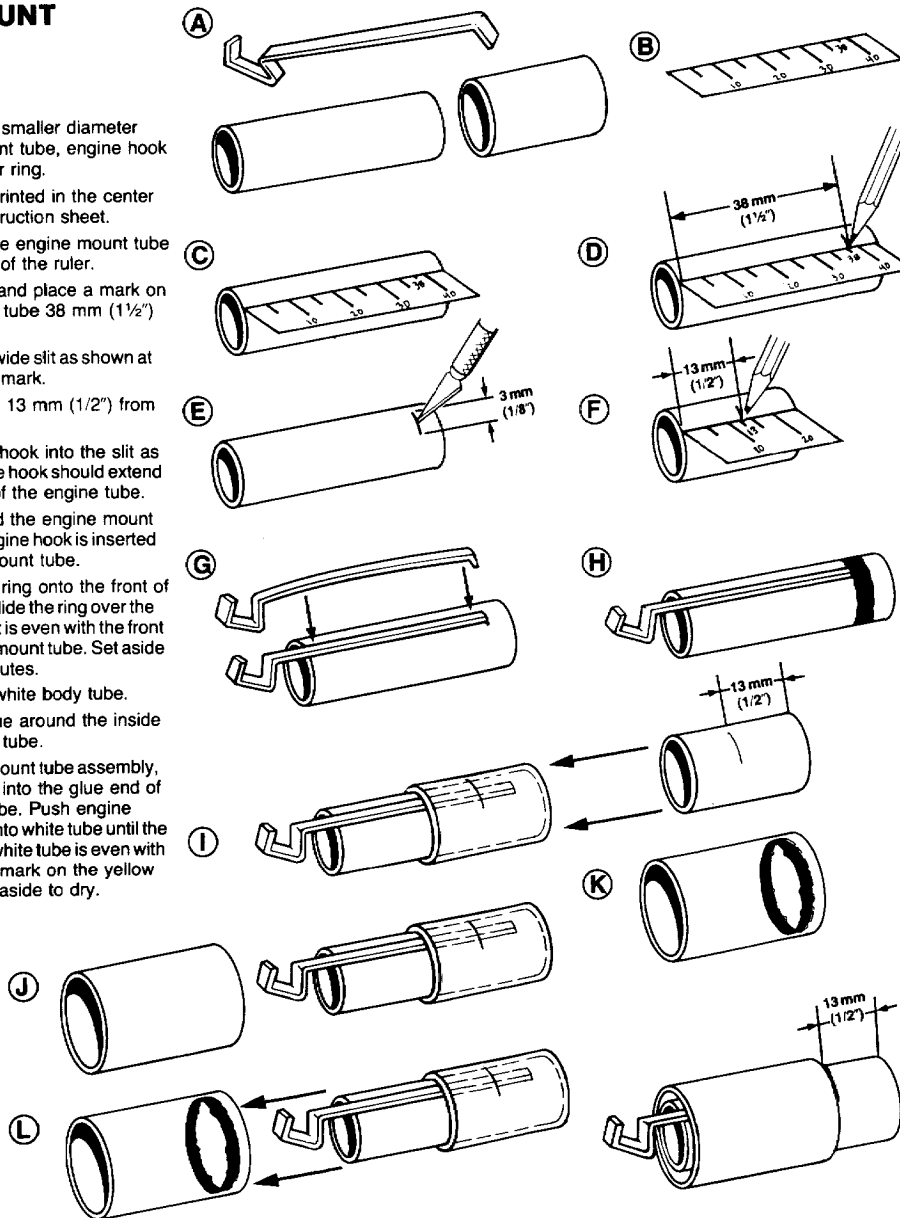
- A. Test fit the nose cone insert into the nose cone. **Do not glue at this time.** Remove the insert.
- B. Apply plastic cement as shown in the illustration and assemble the nose cone and insert pieces. Allow assembly to dry.

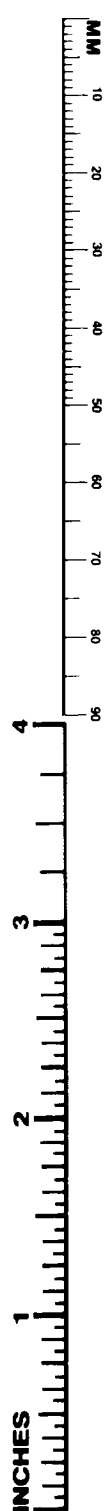


2. ENGINE MOUNT ASSEMBLY



- A. You will need the smaller diameter white engine mount tube, engine hook and green adapter ring.
- B. Locate the ruler printed in the center crease of this instruction sheet.
- C. Lay one end of the engine mount tube on the zero mark of the ruler.
- D. Take your pencil and place a mark on the engine mount tube 38 mm (1½") from zero.
- E. Cut a 3 mm (1/8") wide slit as shown at the 38 mm (1½") mark.
- F. Mark adapter ring 13 mm (1/2") from one end.
- G. Insert the engine hook into the slit as shown. The engine hook should extend beyond the rear of the engine tube.
- H. Apply glue around the engine mount tube where the engine hook is inserted into the engine mount tube.
- I. Slide the adapter ring onto the front of the engine tube. Slide the ring over the engine hook until it is even with the front end of the engine mount tube. Set aside to dry for two minutes.
- J. Locate the short white body tube.
- K. Apply a line of glue around the inside of the white short tube.
- L. Slide the engine mount tube assembly, engine hook first, into the glue end of the short white tube. Push engine mount assembly into white tube until the front end of short white tube is even with the 13 mm (1/2") mark on the yellow adapter ring. Set aside to dry.

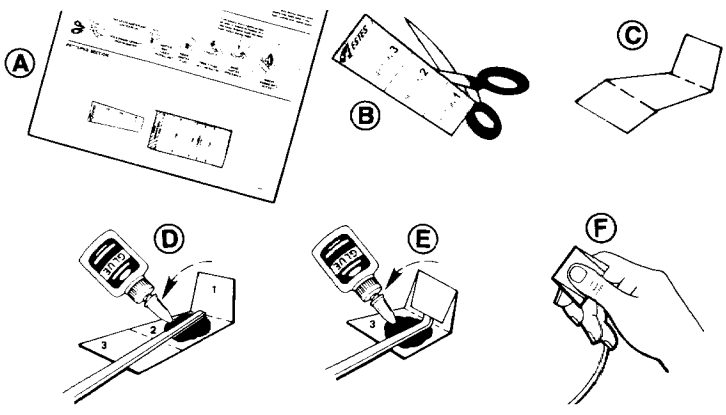




3. SHOCK CORD MOUNT ASSEMBLY



- A. Locate the shock cord mount on the bottom of page 7 in the patterns section.
- B. Cut out the shock cord mount along the solid black outline.
- C. Crease on dotted lines by folding.
- D. Spread glue on section 2 and lay end of shock cord into glue at a slight diagonal as shown.
- E. Fold section 1 forward. Apply glue to section 3. Fold forward again.
- F. Clamp firmly with your fingers until glue dries. Set aside.



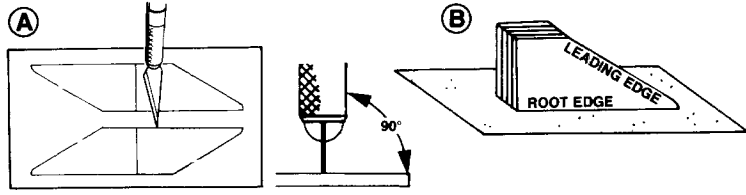
4. FIN PREPARATION

NOTE: Read before proceeding with this step.
- Since your fins are not completely cut out of the die cut card, you will need to **work carefully** with your hobby knife to free the fins.
- Be sure to cut completely around each fin outline before attempting to remove fins from the card.

- Check both sides of the card to make sure you cut through.
- Pay close attention to the corner areas where die cutting is not complete.
- As you cut around each fin, cut away from the adjacent fins so you will not damage the other fins.



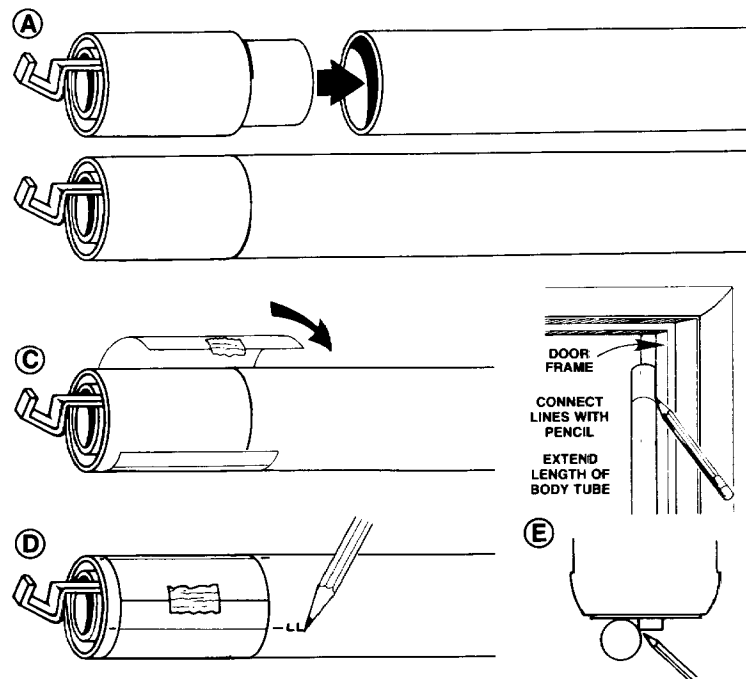
- A. Free the fins from the die cut card with your hobby knife. Keep knife vertical to surface.
- B. Lay sandpaper, rough face up, on your table. Stack the fins together and lightly sand the edges smooth and flat.



5. TUBE MARKING DETAIL



- A. Slide the engine mount tube assembly into large white tube. **Do not glue together.**
- B. Locate the tube marking guide on the bottom of page 7 in the patterns section. Cut the guide along the outline.
- C. Wrap the guide around the short white body tube and tape it in place.
- D. Mark tube at all arrow locations. One line on your tube marking guide is labeled LL, this means launch lug. Write LL on the body tube for that line. Remove marking guide.
- E. Using a door frame as a guide, draw straight lines connecting each pair of fin marks.



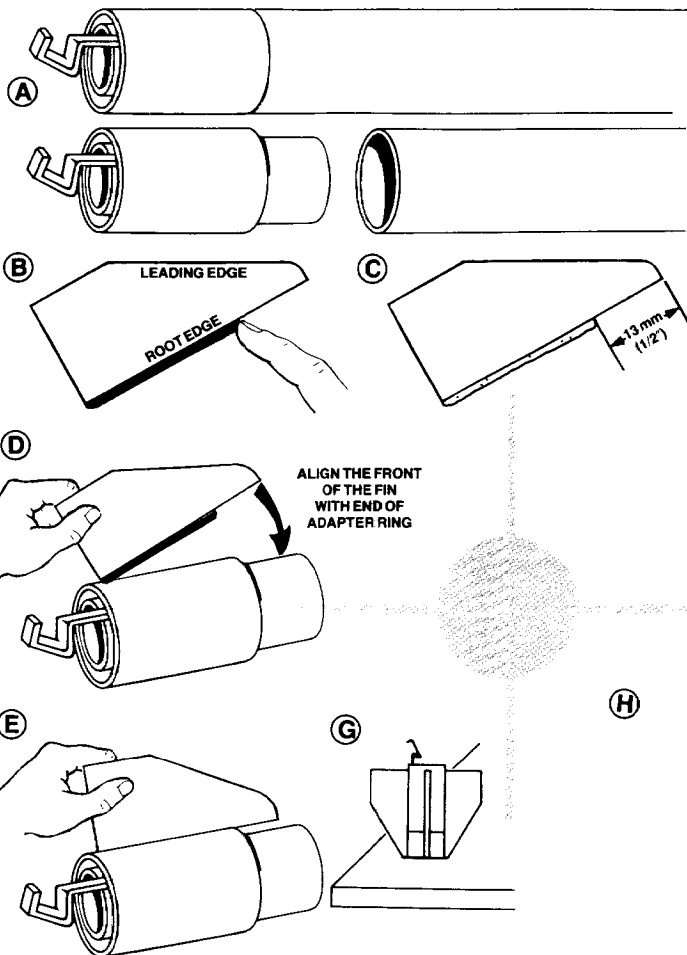
6. FIN ATTACHMENT

NOTE: Before gluing your fins, match the fin shape to the fin pattern shown in this step. Identify the root edge that will be glued to the body tube and the front (leading) edge. This will help you attach your fins correctly. **Remember:** Fins must be attached correctly for stable flights.



- A. Remove the large white tube.
- B. Rub a thin film of glue into the root edge of one fin up to 13 mm (1/2") from the tip of the root edge. Allow it to dry for a minute or two. This will make it easier to attach the fin and will create a stronger bond. Do this for all four fins.
- C. Apply another thin film of glue to the root edge of each fin up to 13 mm (1/2") from the tip of the root edge.
- D. Glue the fin onto the fin line on the small white tube so that the **front tip** of the root edge is even with the edge of the adapter ring. **Be careful to keep glue off the adapter ring so that long body tube may fit properly.**
- E. Carefully adjust the fin, if needed, so it will project straight up from body tube as shown. **IMPORTANT: Let fin dry for approximately five minutes before applying the next one.** Work slowly and carefully so as not to disturb the glue joint.
- F. Hold the fin upright. Do not set the rocket on its fins while glue is still wet.
- G. After all fins are attached, stand the rocket on the table as shown to allow the fins to dry for several minutes.
- H. Use shaded end view to check proper fin spacing.

At this point, it's a good idea to rest for a few minutes and admire your work. Get up and stretch or read through the next steps before doing any more work.

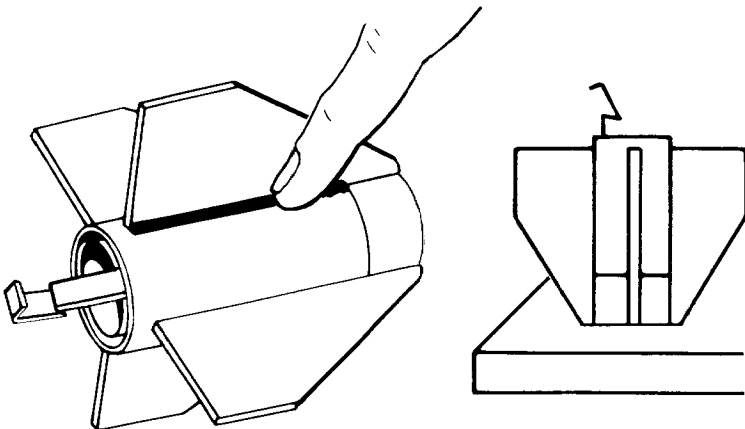


7. GLUE REINFORCEMENT DETAIL

NOTE: Glue joint reinforcements or fillets are important because they help blend the fins, launch lugs or other components into the body tube. This blending improves the looks of your model, allows smoother air flow over your rocket during flight and strengthens the attachment points.



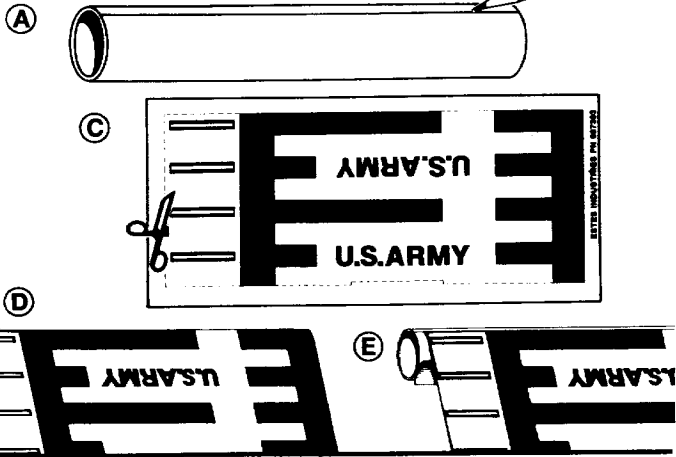
- A. Reinforce each fin/body tube joint on the short white tube with glue. Use your finger to help smooth the glue fillet.
- B. Stand the fin unit on table as shown to allow to dry for approximately five minutes. Wipe away any excess glue that may run down the side of the body tube. Allow to dry.



8. BODY DECAL APPLICATION



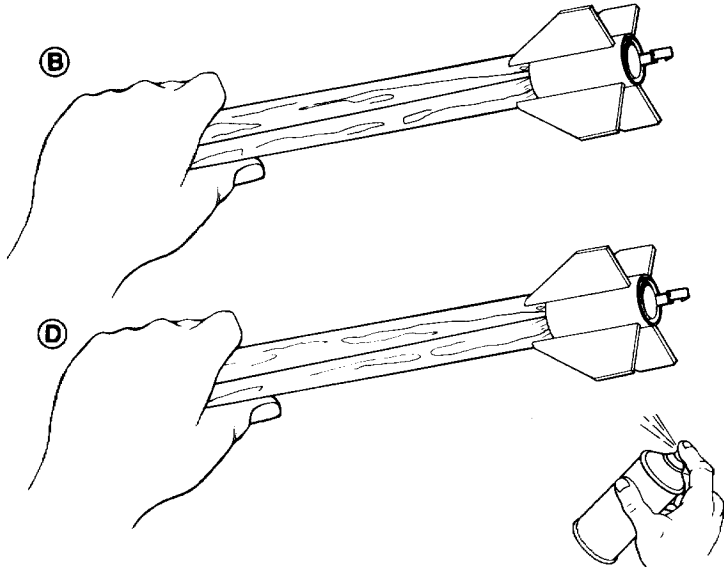
- A. Draw a straight reference line down the length of the large white tube.
 - B. Locate the decal sheet.
 - C. Cut around the printed lines and inside the dashed lines of each decal.
- NOTE: Read the next three steps carefully before proceeding.
- D. Peel backing off along the long edge of decal only enough to expose the sticky edge.
 - E. Position the edge of the decal along the pencil line on the large white tube.
 - F. Roll decal off the backing paper onto the rocket tube. Rub any air bubbles out as you go. When decal is in place, rub the decal to secure it tightly to the model.



9. FIN UNIT FINISHING



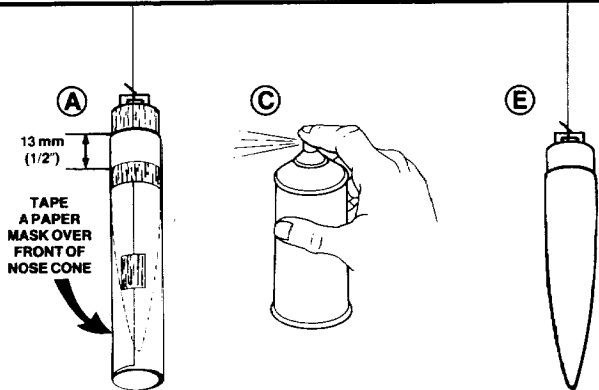
- A. Optional: You may wish to apply sanding sealer onto the fins to seal the edges of the card fins. This is not necessary for proper fin operation. Let the sealer dry and then lightly sand until fins are smooth.
- B. To make holding the fin unit easier while painting, insert a sheet of rolled-up paper into the fin unit.
- C. Optional: For a smoother, better-looking finish, spray a coat of automotive primer before you apply the gloss red paint. Do not apply too much. Lightly sand the rocket with a 400 to 600 grit sandpaper. Apply another coat if needed. Sand between coats. The primer will allow the final coats of paint to adhere better to the rocket.
- D. Spray fin unit with gloss red. Several light coats of paint are preferable. Too much paint will add to the rocket's weight.
- E. Let paint dry completely.



10. NOSE CONE FINISHING



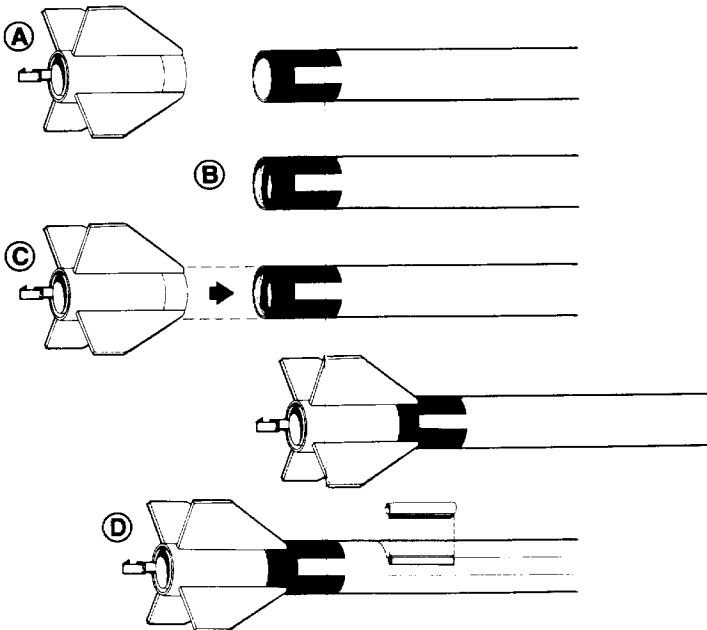
- A. Mask off the shoulder and all but the bottom 13 mm (1/2") of the nose cone using masking tape.
- B. Optional: Spray a coat of automotive primer on the nose cone the same way as was done for the fin unit step 9.
- C. Spray nose cone with gloss red. Several light coats of paint are preferable over a heavy coat. Too much paint will add to the rocket's weight.
- D. Let paint dry completely.
- E. Remove masking material.



11. FIN UNIT/LAUNCH LUG ATTACHMENT



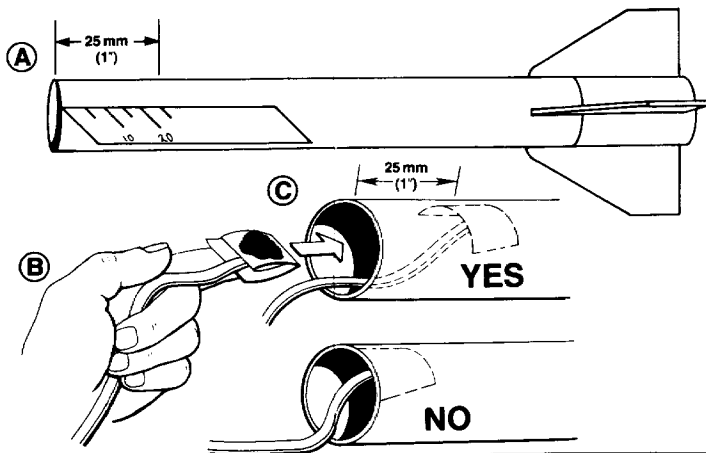
- A. Locate the body tube and the fin unit.
- B. Apply a line of glue around the inside of rear end of the large body tube (the end with the black bands).
- C. Align fins so they are centered within black bands and push fin unit into rear of tube.
- D. Glue launch lug into notched portion of decal. This is the portion of the body tube not covered by the decal. Make sure the launch lug is straight and parallel to the body tube.



12. SHOCK CORD MOUNT ATTACHMENT



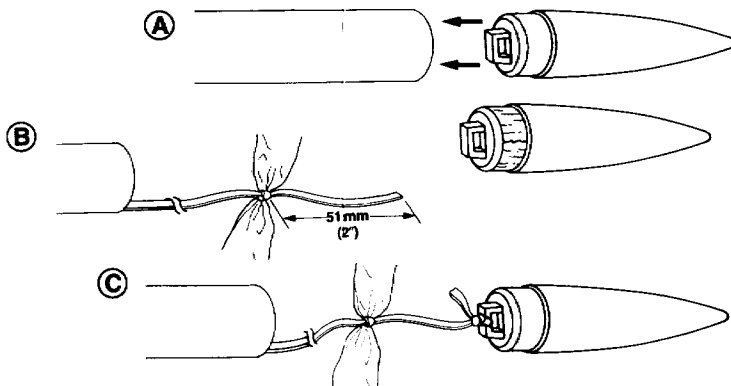
- A. Measure approximately 25 mm (1") from the front end of the body tube.
- B. Apply glue to shock cord mount and insert into tube.
- C. Set the mount back at least 25 mm (1") to allow for nose cone clearance and press mount firmly into glue as shown.
- D. Hold until glue sets.



13. RECOVERY DEVICE ATTACHMENT



- A. Check the fit of the nose cone in the body. Nose cone must slide easily into the tube but not be so loose that it wobbles when you shake the rocket. If it is too tight, lightly sand the shoulder of the nose cone. If too loose, wrap a bit of masking tape around the shoulder.
- B. Using a double knot, tie the free end of the shock cord around the middle of the streamer about 51 mm (2") from the end of the shock cord.
- C. Tie the end of the shock cord to the nose cone.



14. FINISHING YOUR ROCKET (Optional)



- A. To achieve a more realistic appearance of your Patriot™, spray the entire model with a light coat of clear flat spray paint. This will tone down the glossy appearance of the rocket.

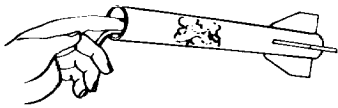


WHAT TO EXPECT WHEN FLYING YOUR MINI-PATRIOT™ ROCKET

The Patriot is a ground-to-air missile capable of downing both aircraft and missiles. It is the next generation to the Hawk missile. The real Patriot Missile is 41 centimeters (16") in diameter and 530 centimeters (209") long. The color scheme found on the Mini-Patriot™ from Estes are the test-round colors. The semi-scale Mini-Patriot™, with its mini engine and streamer

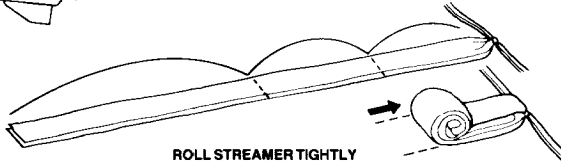
recovery, is perfect for small fields. On an Estes A3-4T, the Mini-Patriot™ will do almost 213 meters (700 feet). Watch for the flutter of the streamer as it's ejected at the apogee (the highest point in the rocket's flight). The streamer is sufficient in slowing the Mini-Patriot™ down for a safe recovery. The streamer will also help you find the rocket once it has landed.

ROCKET PREFLIGHT



CRUMPLE AND INSERT 2 SQUARES OF RECOVERY WADDING

FOLD STREAMER IN HALF 3 TIMES



ROLL STREAMER TIGHTLY

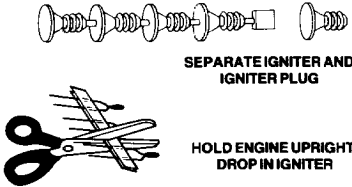


INSERT STREAMER, SHOCK CORD AND NOSE CONE INTO ROCKET BODY

Recovery device should slide easily into body tube. If too tight, unfold and repack again.

PREPARE ENGINE

NOTE: Igniter plugs come with rocket engines. If your engines did not come with plugs, follow the instructions that came with the engines.

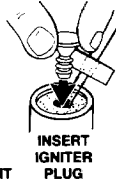


SEPARATE IGNITER AND IGNITER PLUG

HOLD ENGINE UPRIGHT, DROP IN IGNITER



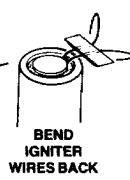
IGNITER MUST TOUCH PROPELLANT



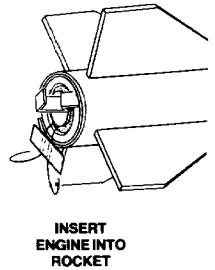
INSERT IGNITER PLUG



FIRMLY PUSH ALL THE WAY IN

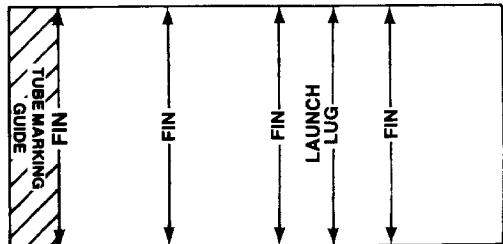
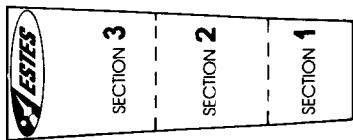


BEND IGNITER WIRES BACK



INSERT ENGINE INTO ROCKET

PATTERNS SECTION



LAUNCH SUPPLIES

To launch your rocket you will need the following items:

- Estes Electrical Launch Controller and Launch Pad
- Estes Recovery Wadding No. 2274
- Recommended Estes Engines: A3-4T (First Flight) or A10-3T

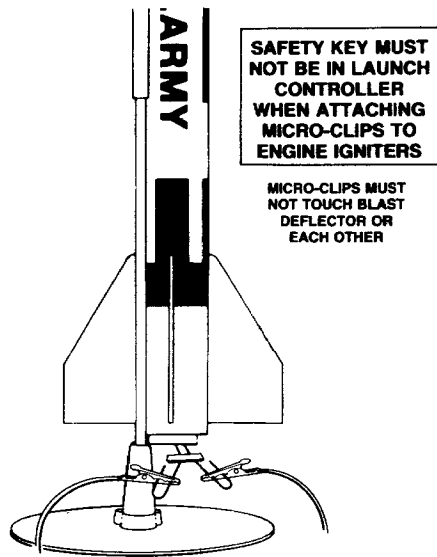
To become familiar with your rocket's flight pattern, use an A3-4T engine for your first flight. Use only Estes products to launch this rocket.

FLYING YOUR ROCKET

Choose a large field away from power lines, tall trees, and low flying aircraft. Try to find a field at least 76 meters (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.



COUNTDOWN AND LAUNCH

MISFIRES

If the igniter functions properly but the propellant does not ignite, keep in mind the following: 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 reinstall the igniter plug as illustrated above. Repeat the countdown and launch procedure.

FOR YOUR SAFETY AND ENJOYMENT

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

*National Association of Rocketry



- ⑩ BE CERTAIN SAFETY KEY IS NOT IN 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 5 meters - 15 feet).
- ⑥ INSERT SAFETY KEY to arm the launch controller.

Give audible countdown 5...4...3...2...1

LAUNCH!!

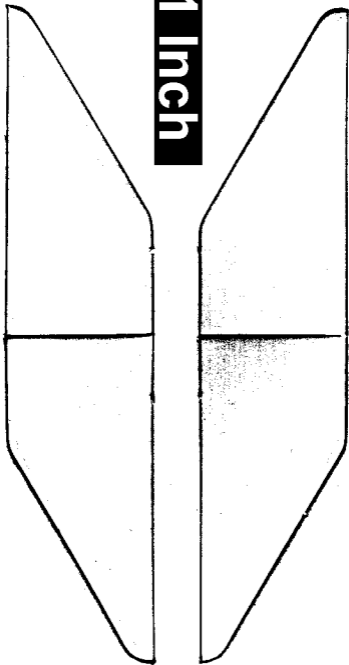
PUSH AND HOLD LAUNCH BUTTON UNTIL ENGINE IGNITES

REMOVE SAFETY KEY FROM LAUNCH CONTROLLER. KEEP SAFETY KEY WITH YOU OR REPLACE SAFETY KEY AND SAFETY CAP ON LAUNCH ROD.

If you use the ultrasafe E2™ or Command™ Launch Controllers to fly your models, use the following launch steps.

- A. After attaching micro-clips, etc., insert the safety key into the controller receptacle. If the igniter clips have been attached properly to the igniter, the red L.E.D. will now begin to flash on and off and the audio continuity indicator will beep on and off.
- B. Hold the yellow (left) arm button down. The L.E.D. will stop flashing and the audio indicator will produce a steady tone.
- C. Verbally count down from five to zero loud enough for the bystanders to hear. Still holding the yellow arm button down, push and hold the orange (right) button down until the rocket ignites and lifts off.

1 Inch



1/16" Thick Fiber Card



U.S.-ARMY



U.S.-ARMY



FLIGHT DATA CARD

FLIGHT NUMBER	DATE	ENGINE TYPE	ALTITUDE PREDICTED/ACTUAL	FLIGHT DURATION PREDICTED/ACTUAL	RECOVERY DEVICE OPERATION	PERFORMANCE COMMENTS	CONDITION AFTER RECOVERY
			/	/			
			/	/			
			/	/			
			/	/			
			/	/			

COPY THIS CARD BEFORE USE SO YOU CAN RECORD MORE THAN FIVE FLIGHTS