



ESTES INDUSTRIES  
1295 H STREET  
PENROSE, CO 81240 USA

*started 12/14*  
**SPARROW™**

*finished 12/18/94*

**BETA™**  
SERIES



**FLYING MODEL ROCKET KIT #0872**

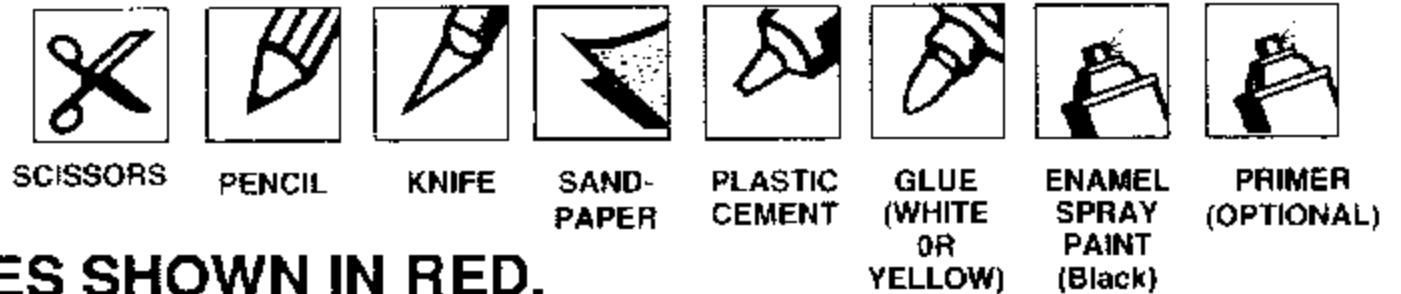
**HOW TO USE THESE INSTRUCTIONS:**

**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. Test fit parts before applying any glue. Sand parts as necessary for proper fit.
- G. The construction supplies required for each step are listed at the beginning of each step.
- H. Check off each step as you complete it.

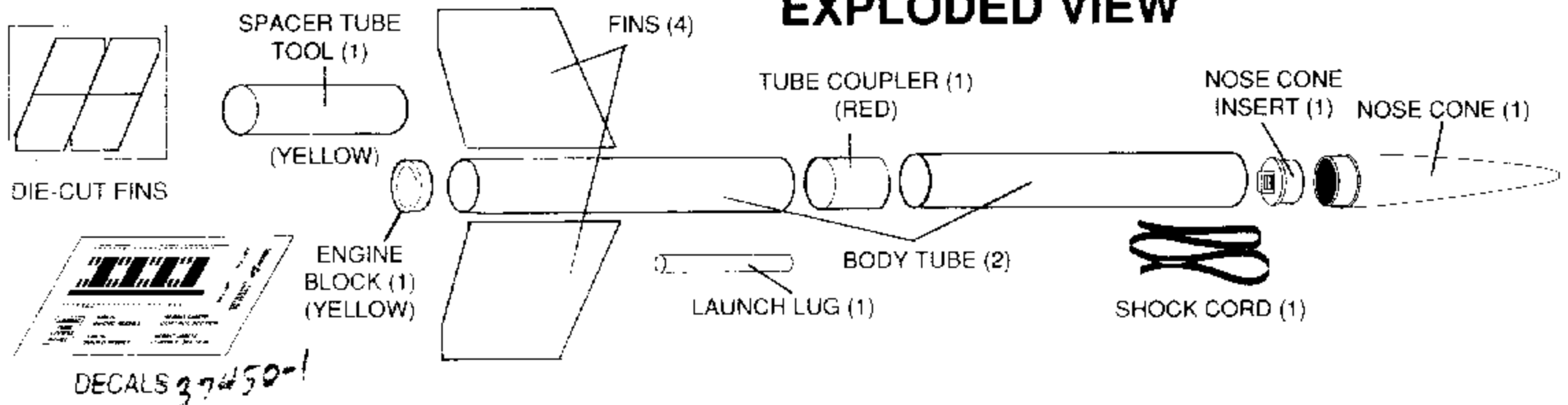
**CONSTRUCTION SUPPLIES**

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



**GLUE IS APPLIED TO SURFACES SHOWN IN RED.**

**EXPLODED VIEW**



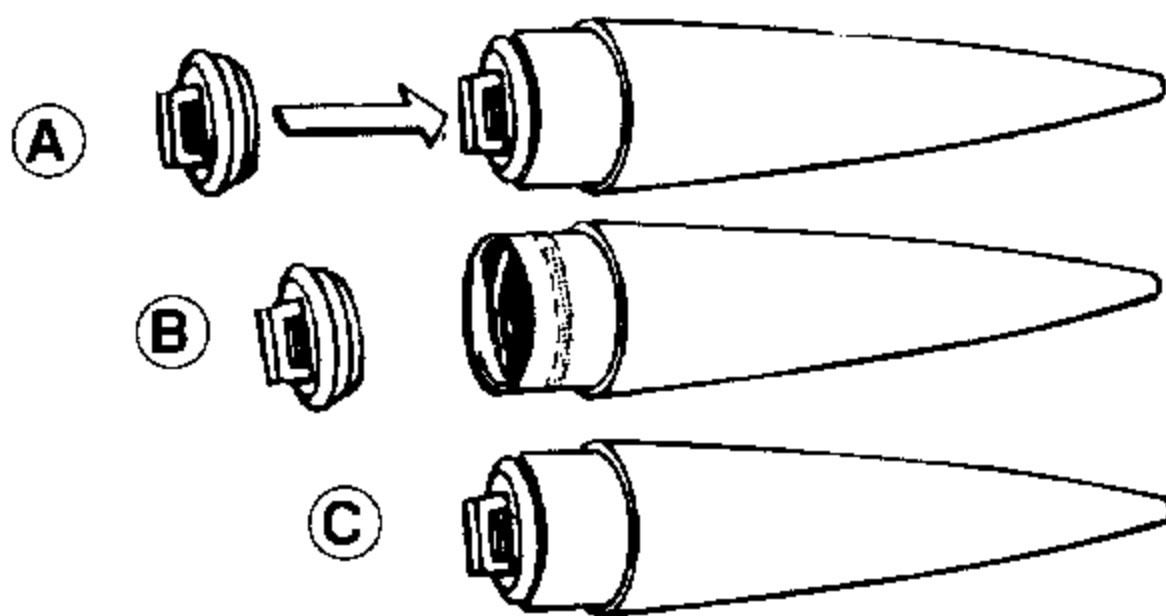
**EXTREMELY IMPORTANT: THE EXPLODED VIEW IS FOR REFERENCE ONLY! DO NOT USE THIS DRAWING ALONE TO ASSEMBLE THIS MODEL.** The exploded view is only intended to assist you in locating the parts included in this kit. Refer back to this exploded view as you build your model step by step. This method will help you to put the parts into perspective as you progress through the construction.

## 1. NOSE CONE ASSEMBLY



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

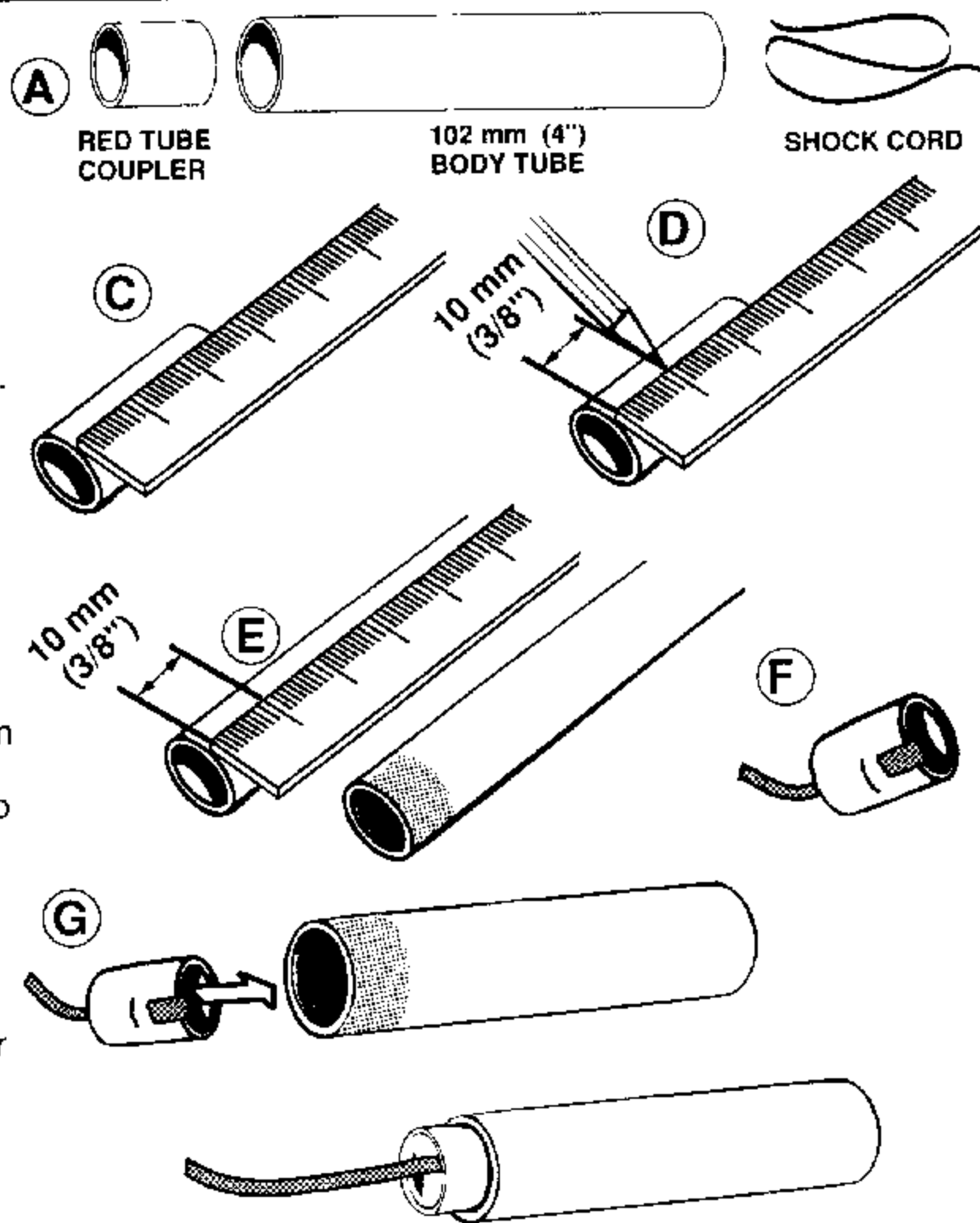
- A.  Test fit the nose cone insert into the nose cone. **Do not glue at this time.** Remove the insert.
- B.  Apply plastic cement as shown in the illustration.
- C.  Assemble the nose cone and insert pieces. Allow assembly to dry.



## 2. TUBE COUPLER AND SHOCK CORD ATTACHMENT



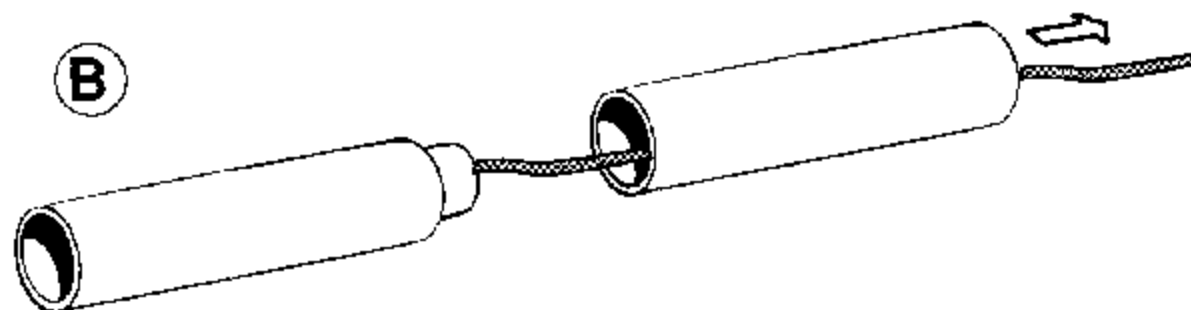
- A.  For this step you will need one of the 102 mm (4") body tubes, the red tube coupler and the shock cord. **NOTE:** Test fit these pieces together before gluing. Read these steps carefully before starting.
- B.  Locate the ruler printed on page 8 of this instruction sheet.
- C.  Lay one end of red tube coupler on the zero mark of the ruler.
- D.  Take your pencil and place a mark on the coupler 10 mm (3/8") from zero as shown. (This measurement is half of the coupler length.)
- E.  Measure approximately 10 mm (3/8") from one end of body tube. Spread the glue **inside** the tube from the edge 10 mm into the tube.
- F.  Pass one end of the shock cord through the red coupler tube and bend 3 mm (1/8") of that end over the edge of the coupler as shown.
- G.  Keeping the shock cord in place with your finger, push the coupler tube and shock cord into the end of the body tube with one quick motion until the mark on the coupler tube is even with the end of the body tube. The shock cord should be tightly captured. Allow glue to dry.



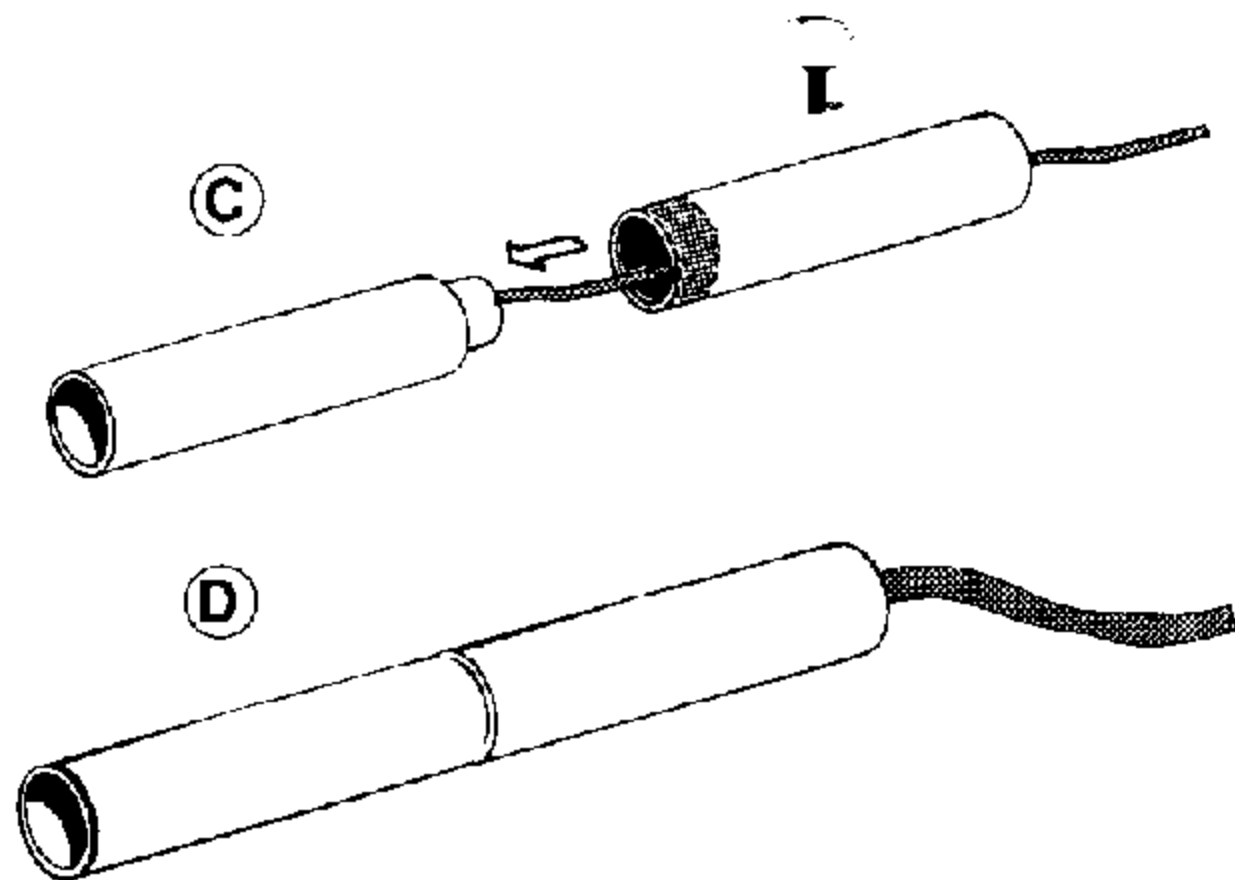
## 3. BODY TUBE ASSEMBLY



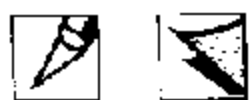
- A.  Locate the remaining body tube.
- B.  Thread shock cord through this body tube as shown.



- C.**  Spread glue around the **inside** of this **End** of the tube. The glue area should extend 10 mm (3/8") back from the edge of the tube. Be careful of getting too much glue on cord.
- D.**  In one quick motion join the two body tubes together by pushing the red coupler into the glued end of the remaining body tube. Push until the tube ends are together.
- E.**  Make sure tubes are straight. Allow glue to dry.
- F.**  Identify the rear end of the rocket body tube. The rear end does not have the shock cord hanging out. You will attach the fins and engine block to the rear end of the rocket.



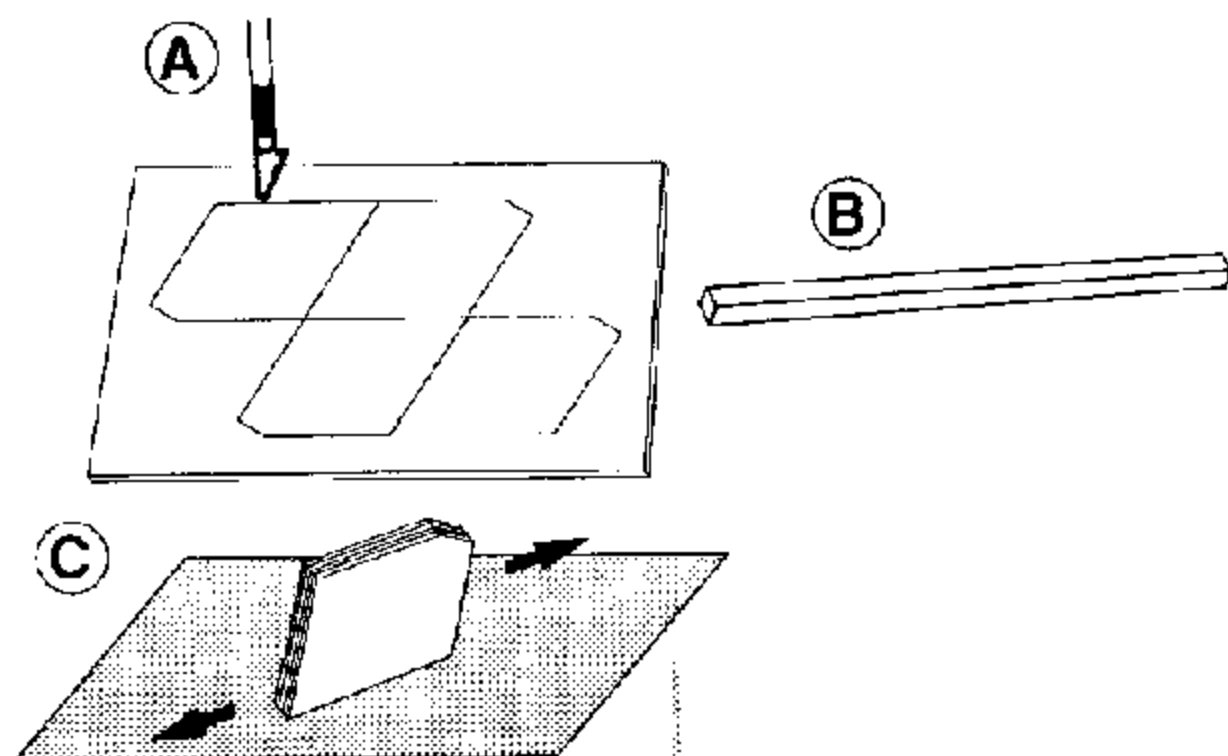
#### 4. FIN PREPARATION



**NOTE:** Read before proceeding with this step.

- Since your fins are not completely cut out of the white card stock, you will need to **work carefully** with your hobby knife to free the fins from the card.
- 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 on the card.

- A.**  Free the fins from the card stock with your hobby knife.
- B.**  Keep a piece of scrap card to use as a glue applicator in step 6E.
- C.**  Lay sandpaper, rough face up, on your table. Stack the fins together and lightly sand the edges smooth and flat.

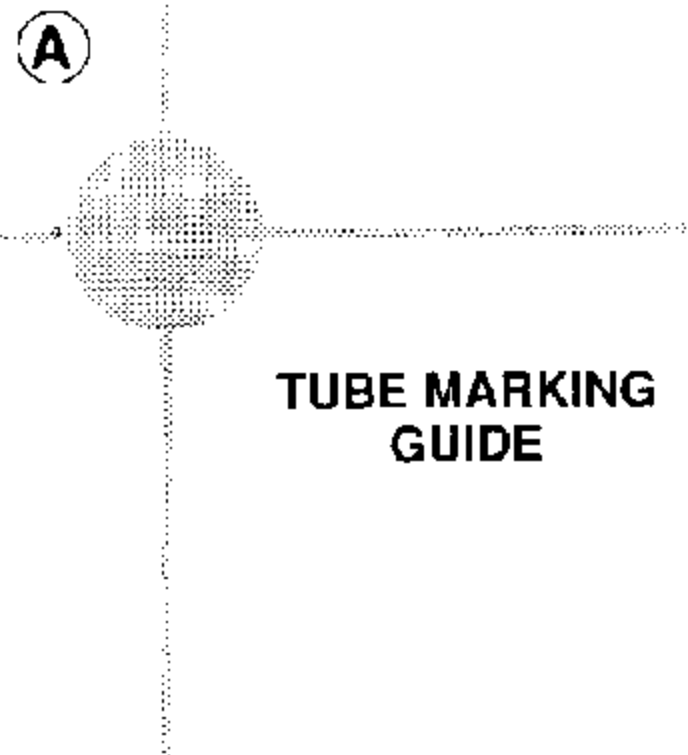
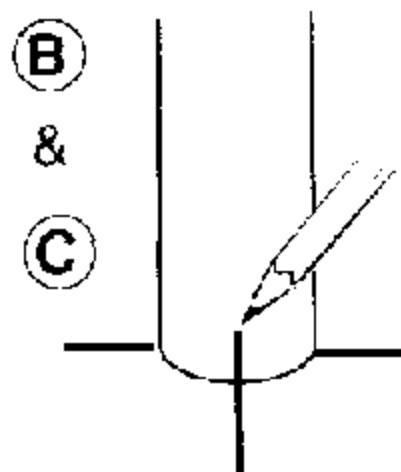


#### 5. TUBE MARKING DETAIL

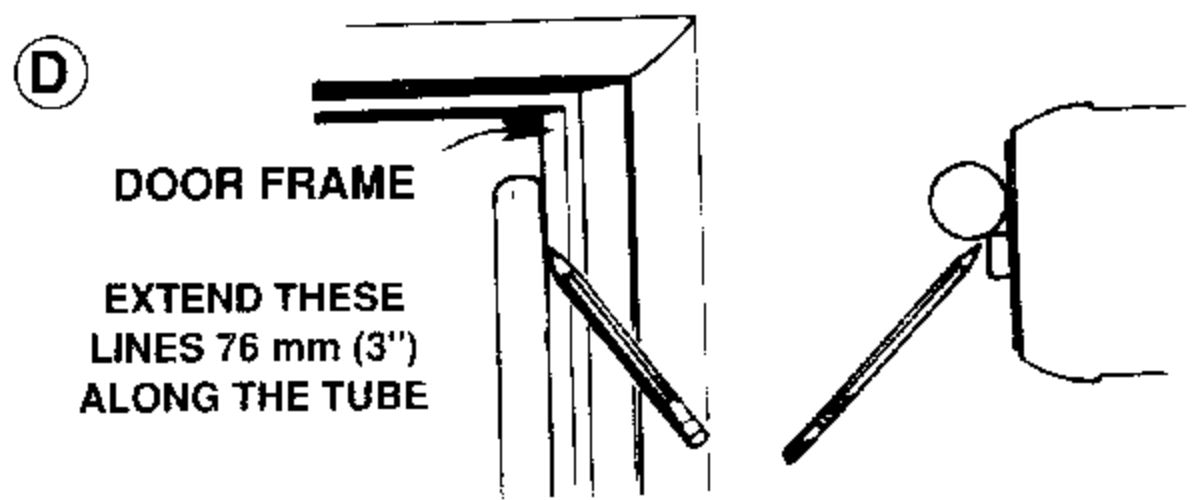


**HINT:** Fins can be glued on easier by lightly sanding the body tubes with #600 grit sandpaper. Do this before you mark the body tube.

- A.**  Locate the tube marking guide illustration to the right.



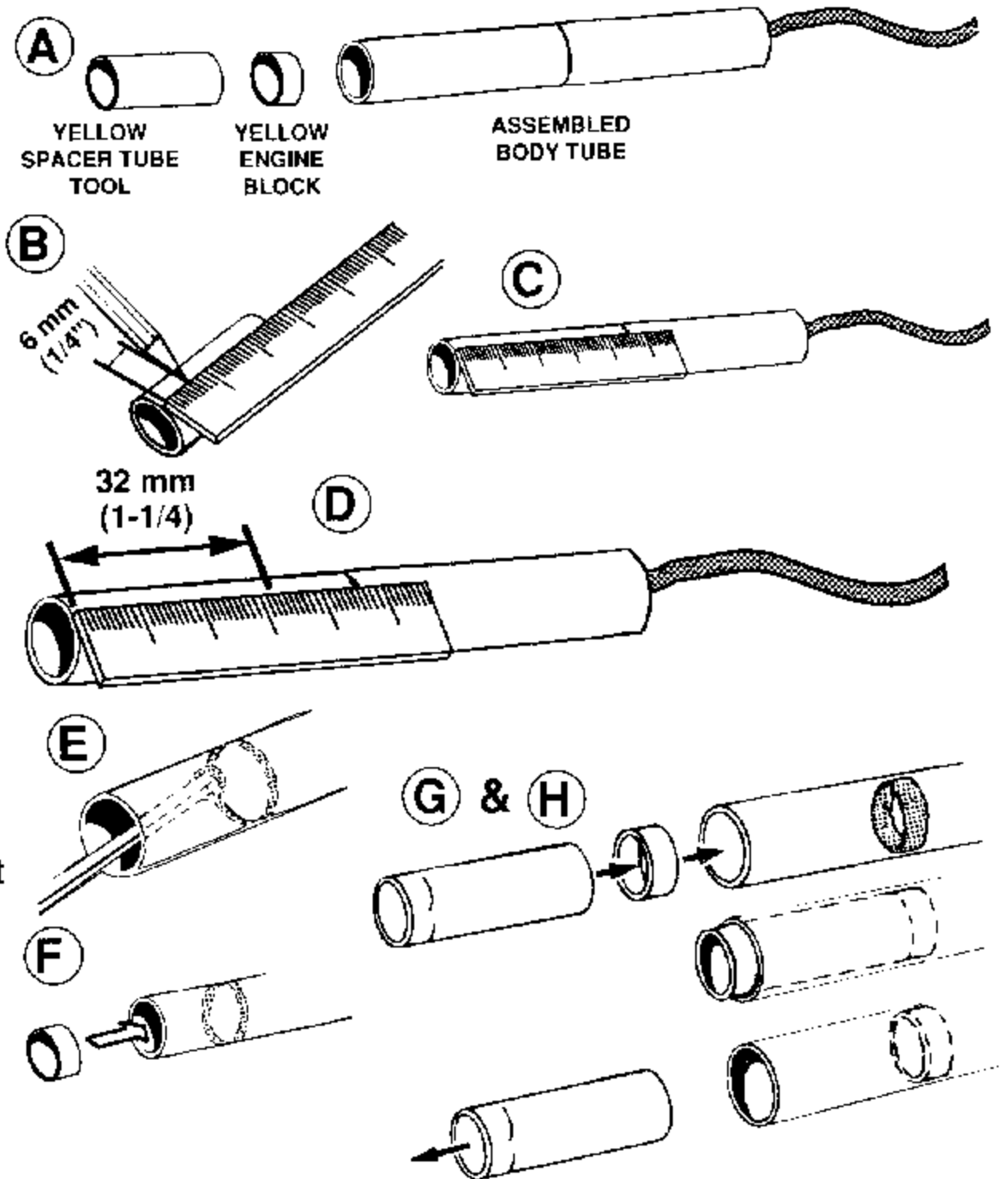
- B.  Stand the **rear** end of the body tube on the tube marking guide. Make sure the tube is centered on the guide. (See page 3.)
- C.  Take a pencil and mark the tube on all four lines as shown. Be careful not to move the tube until all four locations are marked.
- D.  Using a door frame as a guide, draw straight lines from each fin mark. Extend these lines 76 mm (3") along the tube.



## 6. ENGINE BLOCK INSTALLATION



- A.  You will need the assembled body tube, yellow engine block and yellow spacer tube tool for this step.
- B.  Mark the yellow spacer tube 6mm (1/4") from one end using your ruler.
- C.  Lay the **rear** of the body tube, the end without the shock cord, on the ruler at zero as shown.
- D.  Measure approximately 32 mm (1 1/4") from the rear of the body tube. This gives you an idea of where inside the tube you will be spreading glue.
- E.  Using the scrap card glue applicator, spread glue around the **inside** of the tube at approximately 32 mm (1 1/4") from the end.
- F.  Insert the yellow engine block into the tube.  
**NOTE:** The spacer tube is a tool and must be removed as soon as you match the mark with the end of the body tube. Don't accidentally glue the tool into the rocket!
- G.  Use the yellow spacer tube to push engine block into the tube until mark is even with the end of the tube.
- H.  Remove spacer tube quickly before glue sets and discard it.

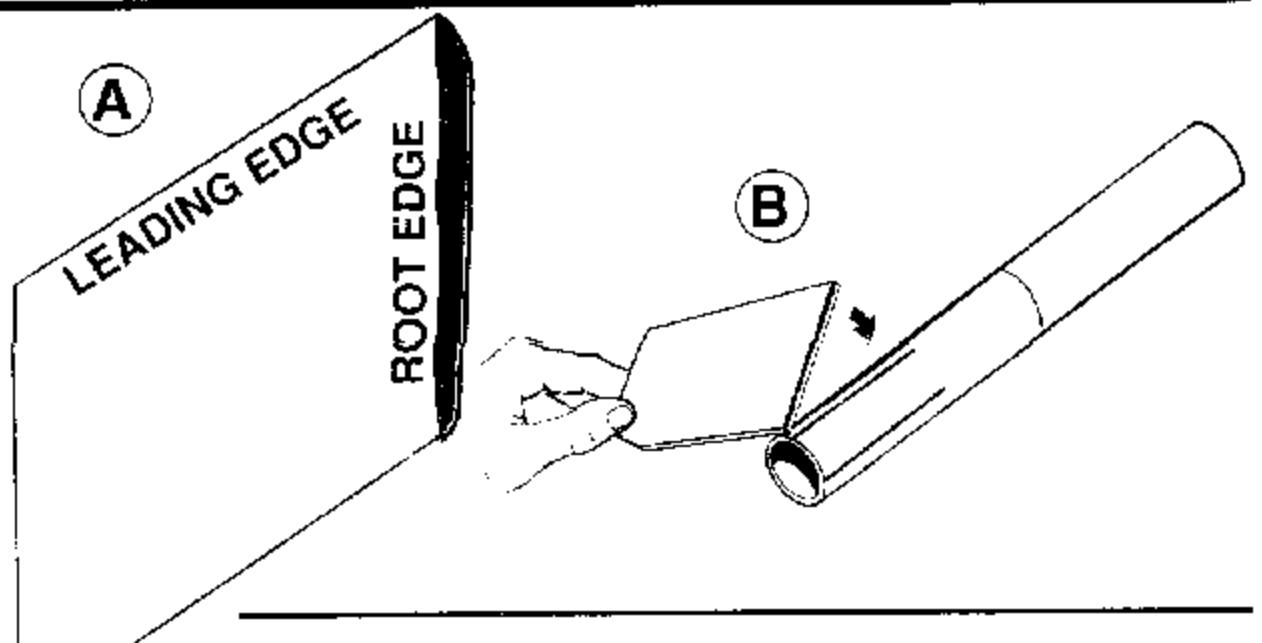


## 7. FIN ATTACHMENT

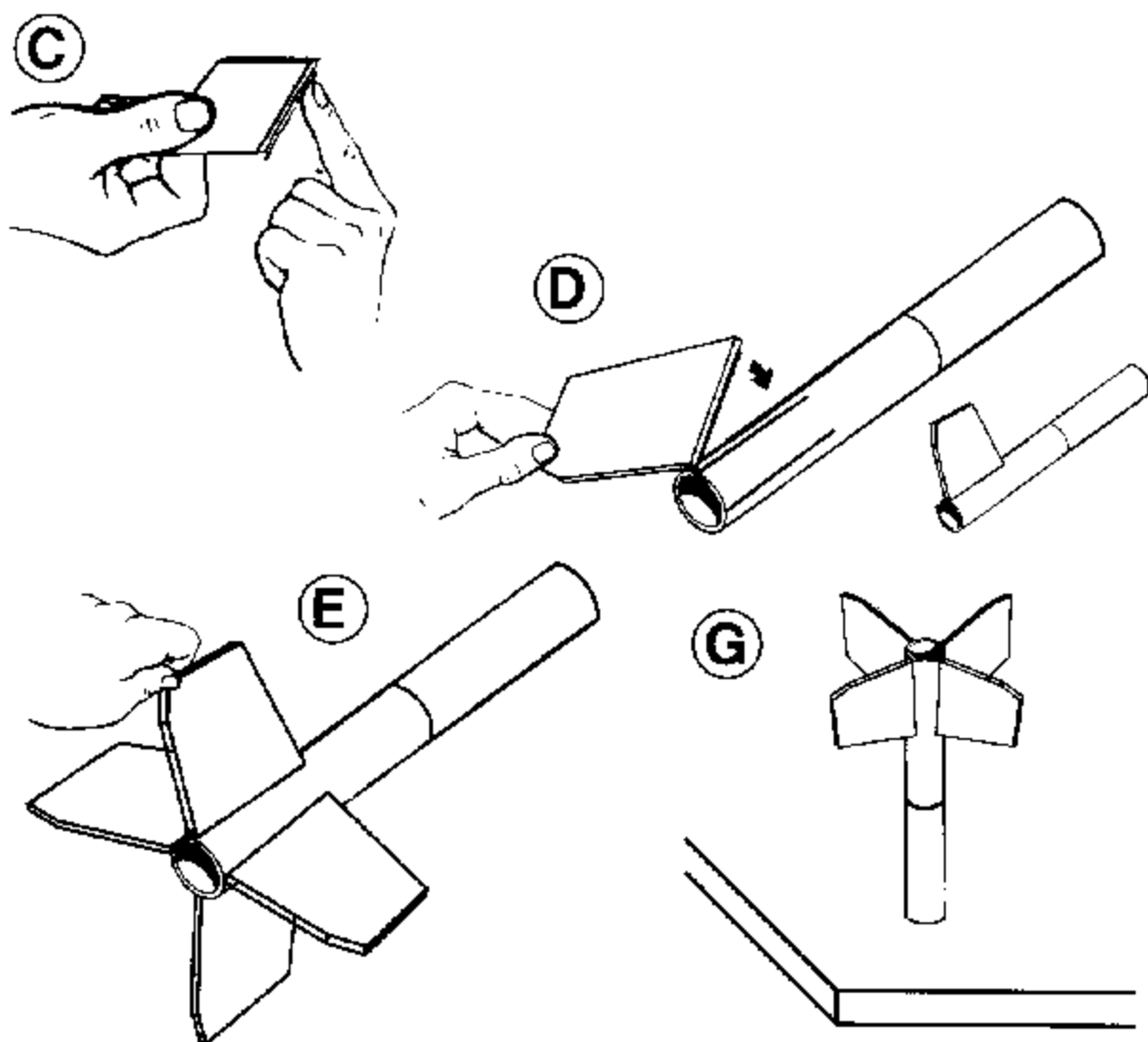


**NOTE:** Before gluing your fins, match the fin shape to the fin pattern shown in this step. Identify the root edge that will be glued to the body tube and the front (leading) edge. This will help you attach your fins correctly.

**Remember:** Fins must be attached correctly for stable flights.



- A.  Apply a thin film of glue to the root edge of one fin. (See page 4.)
- B.  Set the rear edge of the fin at end of body tube and gently press the root edge along the body tube fin line.
- C.  Remove and allow glue to become tacky. Add a bit more glue.
- D.  Place back on tube line.
- E.  Carefully adjust the fin, if needed, so it will project straight up from body tube. Work slowly and carefully so as not to disturb the glue joint. Attach remaining fins in the same manner. Do not set rocket on fins while glue is wet.
- F.  After all fins are attached, use shaded end view to check proper fin spacing. (See page 3.)
- G.  **Important:** Stand rocket on table as shown. Allow fins to dry before proceeding.

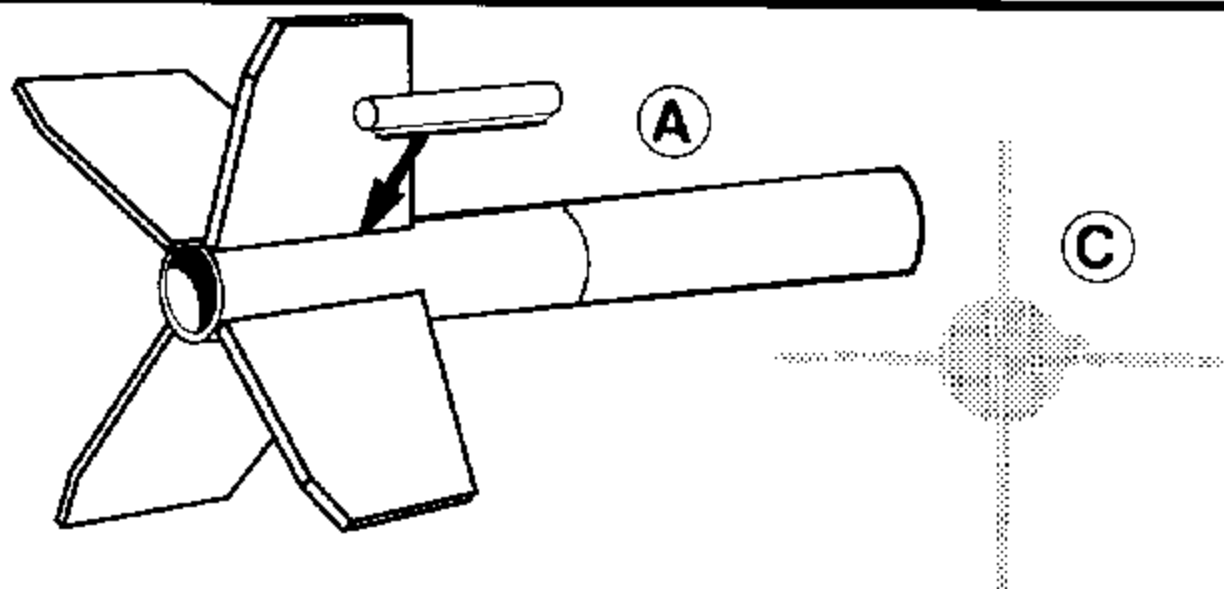


At this point, it's a good idea to rest for a few minutes. Get up and stretch or read through the next steps before doing any more work.

## 8. LAUNCH LUG ATTACHMENT



- A.  Run a line of glue along one side of the launch lug and place the lug against any one of the body tube/fin joints.
- B.  Smooth out the excess glue.
- C.  Make sure the launch lug is aligned with the body tube as shown on the end view. Allow to dry.

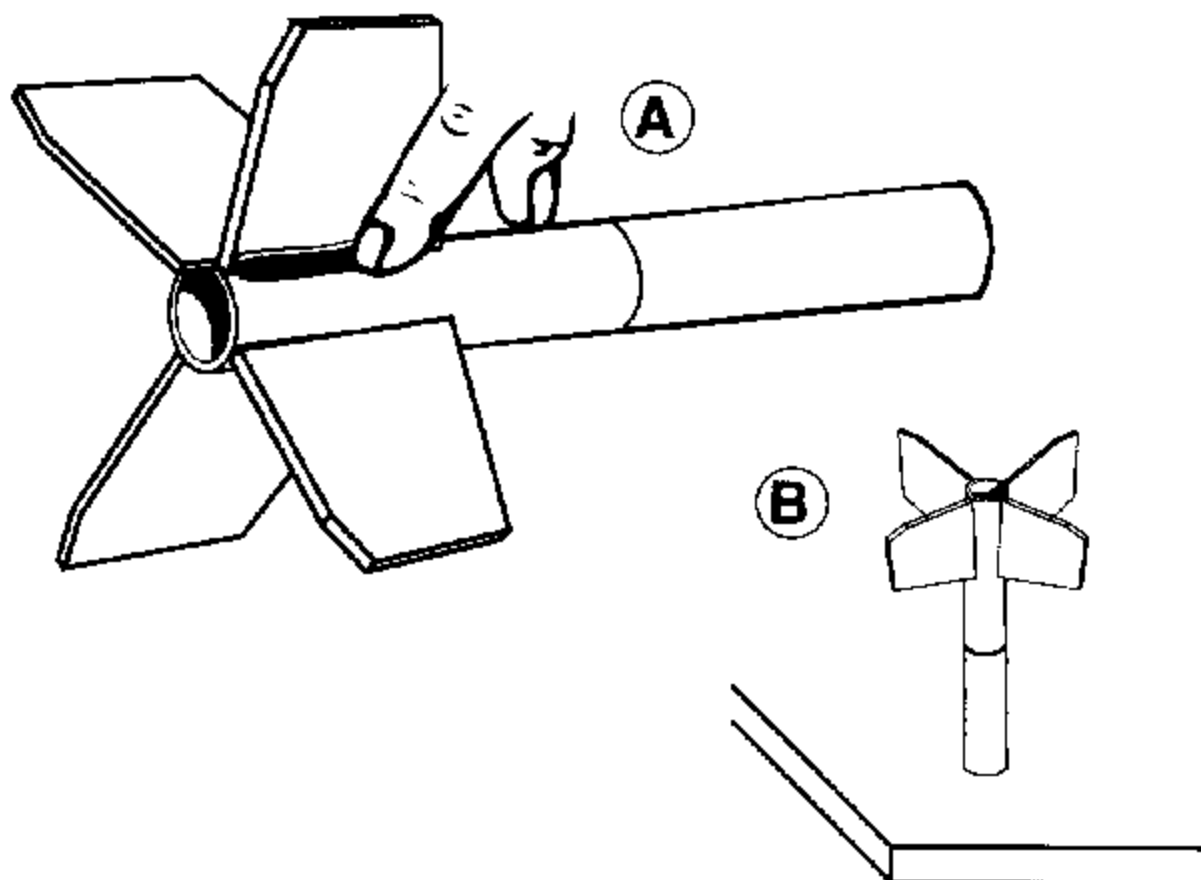


## 9. GLUE REINFORCEMENT DETAIL



**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.

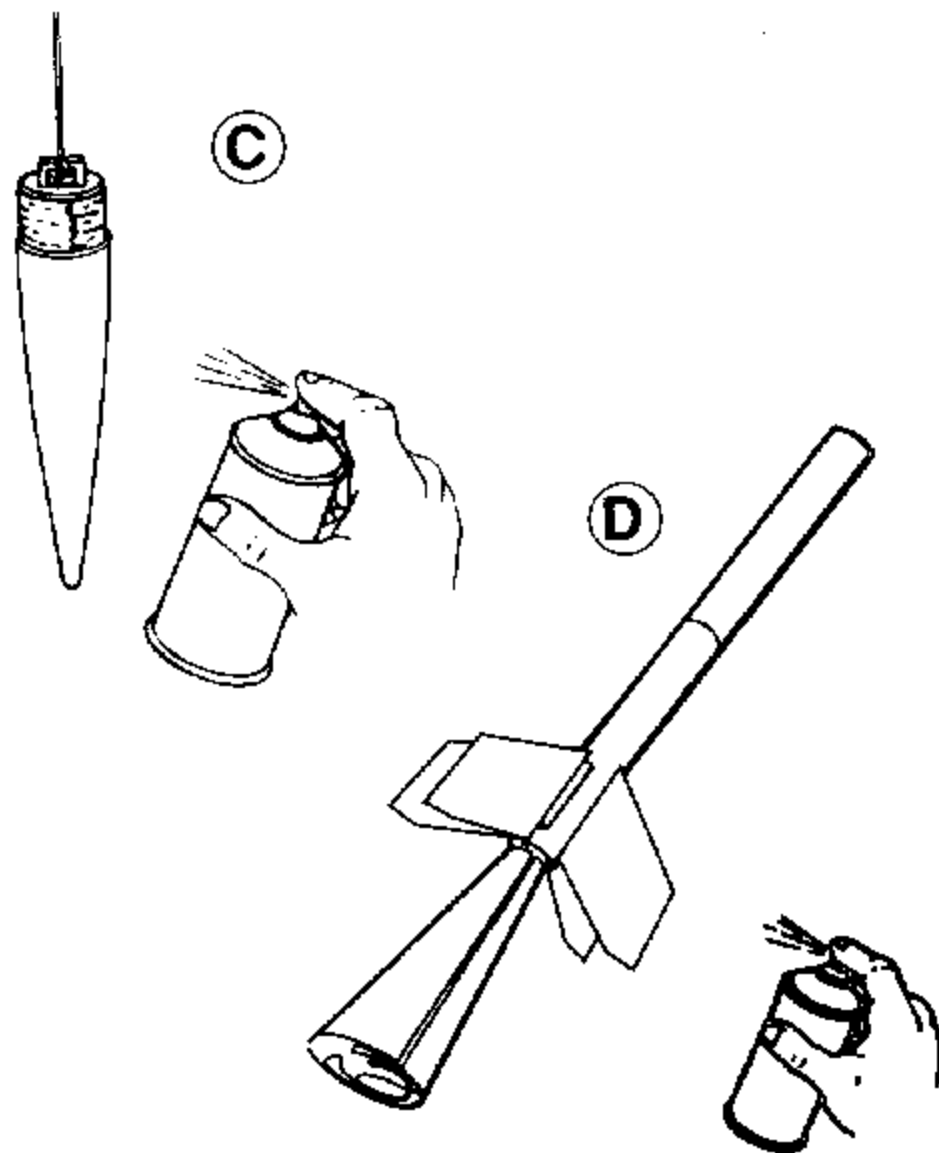
- A.  Reinforce each fin/body tube joint with glue. Use your finger to help smooth the glue fillet.
- B.  Stand rocket on table as shown. Wipe away any excess glue that may run down the side of the body tube. Allow to dry.



## 10. FINISHING <sup>IR</sup> YOUR ROCKET



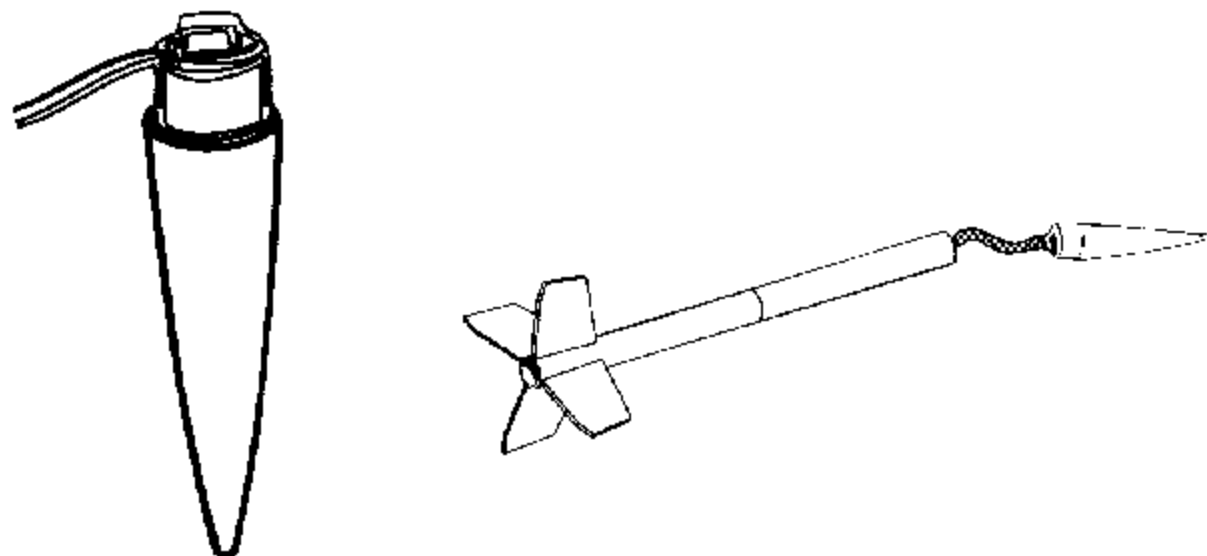
- A.  Before you paint your rocket make sure all of the glue joints are completely dry.
- B.  Optional: For a smoother and better looking finish, spray a coat of automotive primer on your rocket. Do not apply too much. Lightly sand the rocket with a 400 to 600 grit sandpaper. Apply another coat if needed. Sand between coats. The primer will allow the final coats of paint to adhere better to the rocket. Several light mist coats of paint are preferable. Too much paint will add to the rocket's weight.
- C.  Refer to the illustration on the front of the color panel for paint locations and decal placement. Mask the shoulder with tape to prevent overspray. Suspend nose cone from a string and paint. Allow to dry.
- D.  Use spray enamel to paint your model rocket. Roll a piece of paper into the rear as shown to hold the model while painting.



## 11. RECOVERY DEVICE ATTACHMENT

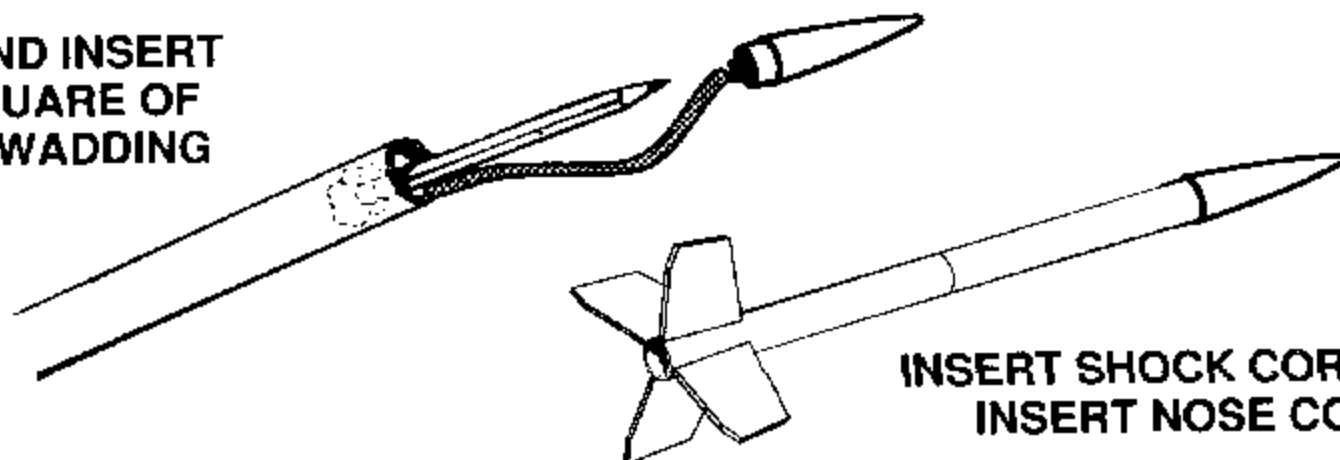
- A.  Tie free end of shock cord to nose cone. Use a double knot.

**NOTE:** Since your Sparrow™ is a very light rocket, it utilizes tumble recovery. Once the nose cone has been ejected, the Sparrow™ will tumble back to Earth safely. No other recovery device is required to slow the vehicle down.

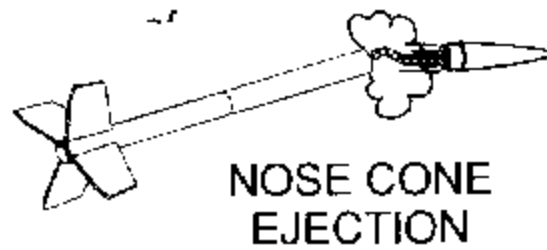


## ROCKET PREFLIGHT

**CRUMPLE AND INSERT  
1/2 OF A SQUARE OF  
RECOVERY WADDING**

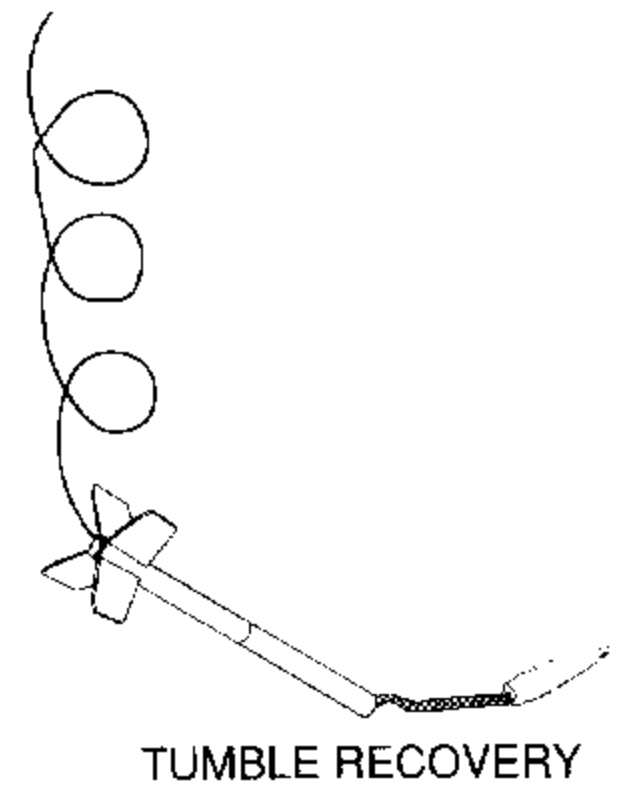
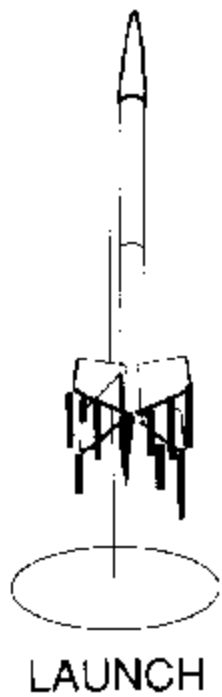


**INSERT SHOCK CORD AND  
INSERT NOSE CONE**



## WHAT TO EXPECT WHEN FLYING YOUR SPARROW™ ROCKET

The Sparrow™ is a high-flying rocket. On an Estes A3-4T engine, this performer will do almost 244 meters (800 feet). On an Estes 1/2A3-2T engine, you can expect almost 122 meters (400 feet). The Sparrow™ features break-apart tumble recovery. This type of recovery allows the Sparrow™ to tumble down safely once the nose cone has been ejected. Because it is light weight, the Sparrow™ does not need a streamer or parachute. Your launching area should be at least the size of a baseball field.

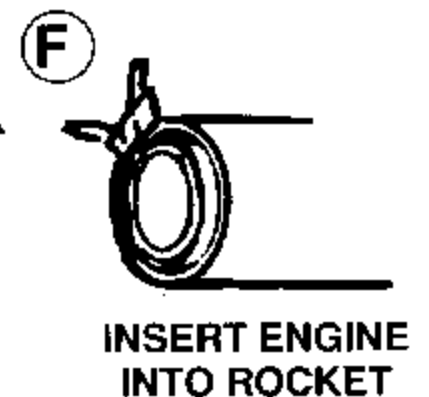
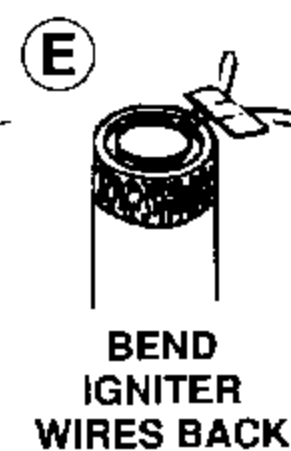
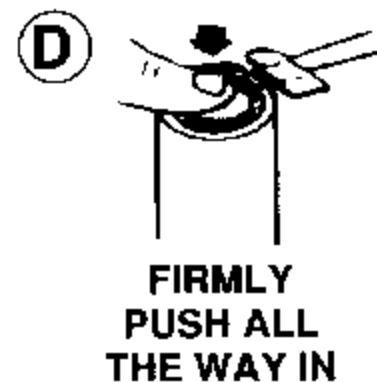
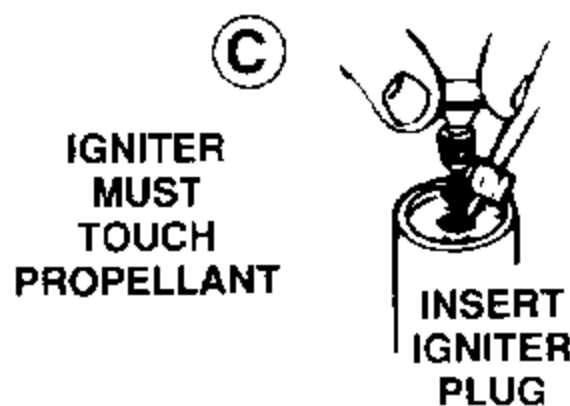
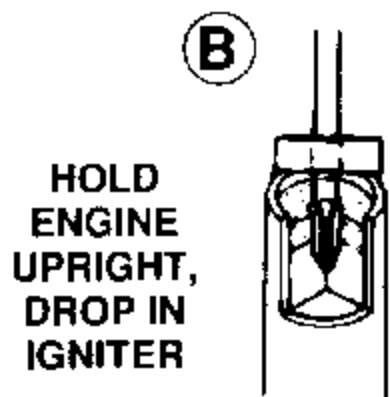


## PREPARE ENGINE

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



WRAP TAPE AROUND ENGINE TO FRICTION FIT IT INTO BODY. ENGINES MUST NOT EJECT FROM ROCKET.



## 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: 1/2A3-2T (First Flight), A3-4T, or A10-3T.

To become familiar with your rocket's flight pattern, use a 1/2A3-2T 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 250 feet (76 meters) 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.

## 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.

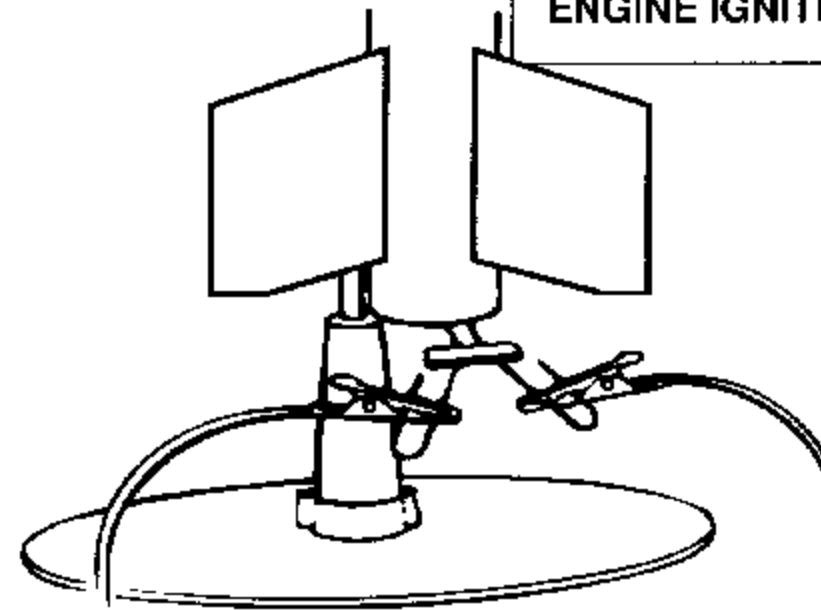
\*National Association of Rocketry

**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.

**MICRO-CLIPS MUST NOT TOUCH BLAST DEFLECTOR OR EACH OTHER**

**SAFETY KEY MUST NOT BE IN LAUNCH CONTROLLER WHEN ATTACHING MICRO-CLIPS TO ENGINE IGNITERS**



## COUNTDOWN AND LAUNCH

- 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 15 feet - 5 meters).
- 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. REPLACE SAFETY KEY AND SAFETY CAP ON LAUNCH ROD.