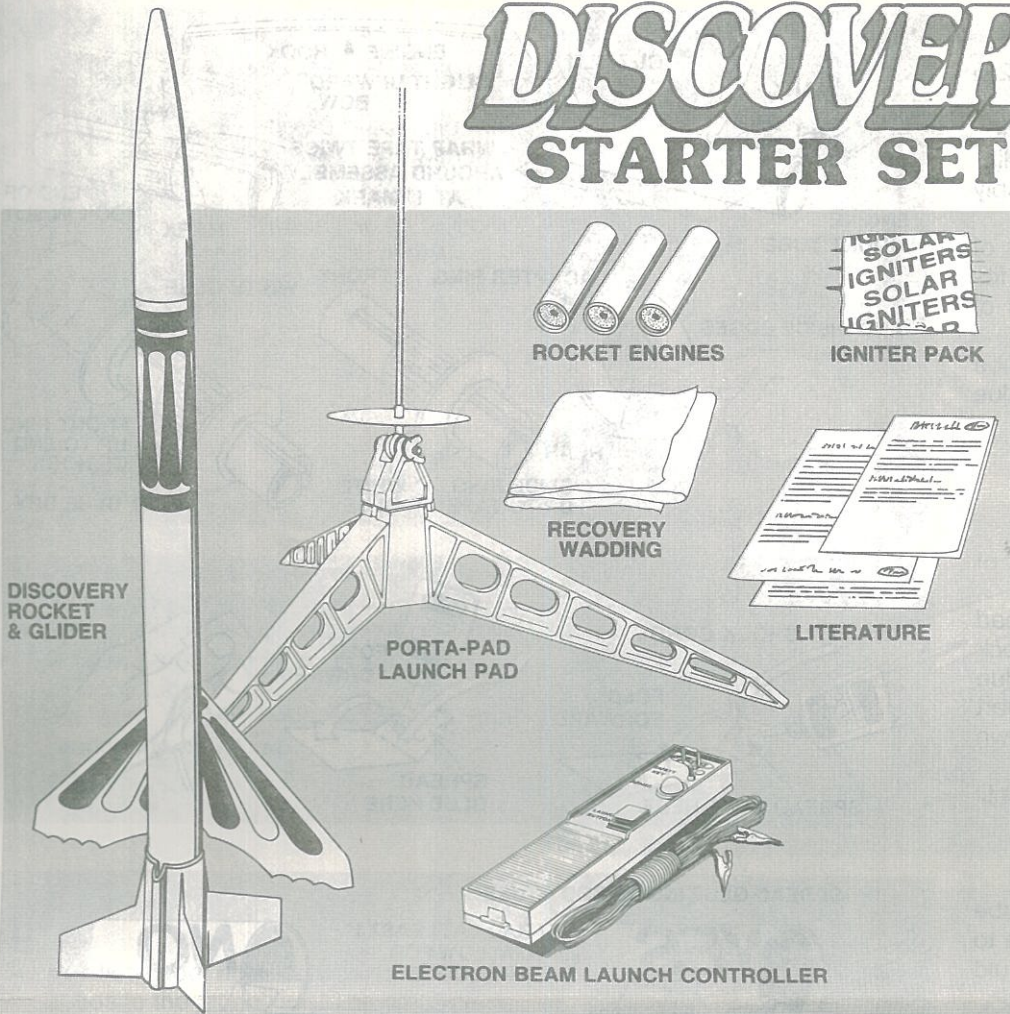
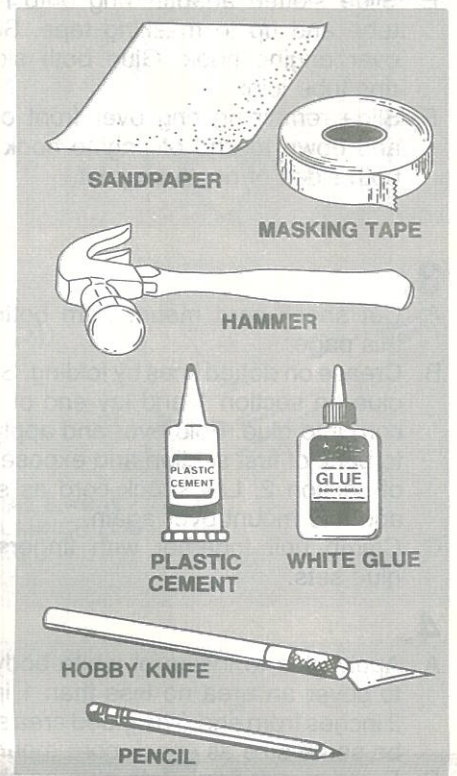


# DISCOVERY

## STARTER SET #1440

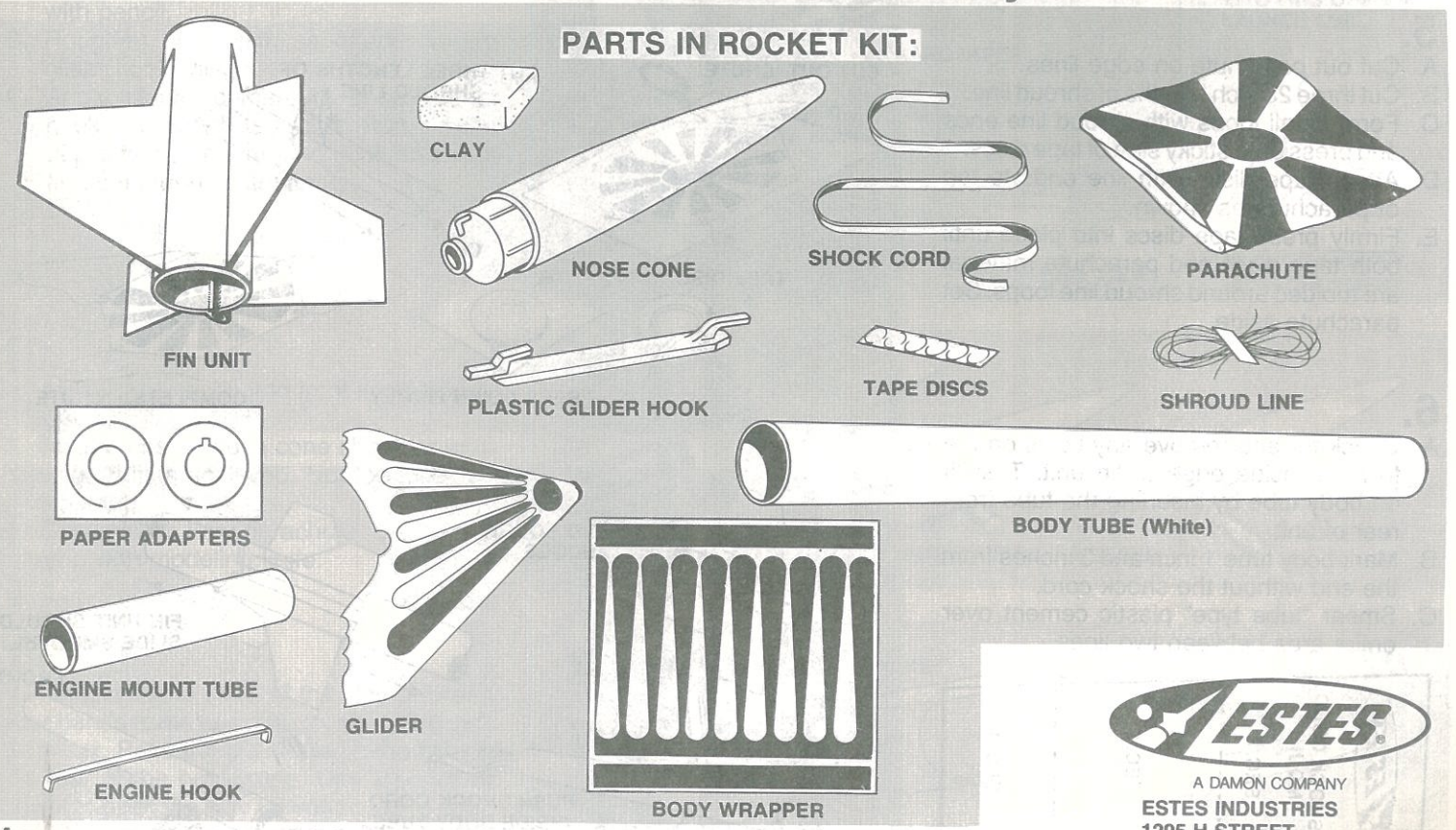


### SUPPLIES YOU WILL NEED:



## Part One: Rocket Assembly

### PARTS IN ROCKET KIT:



1. Sort and identify the parts shown above.

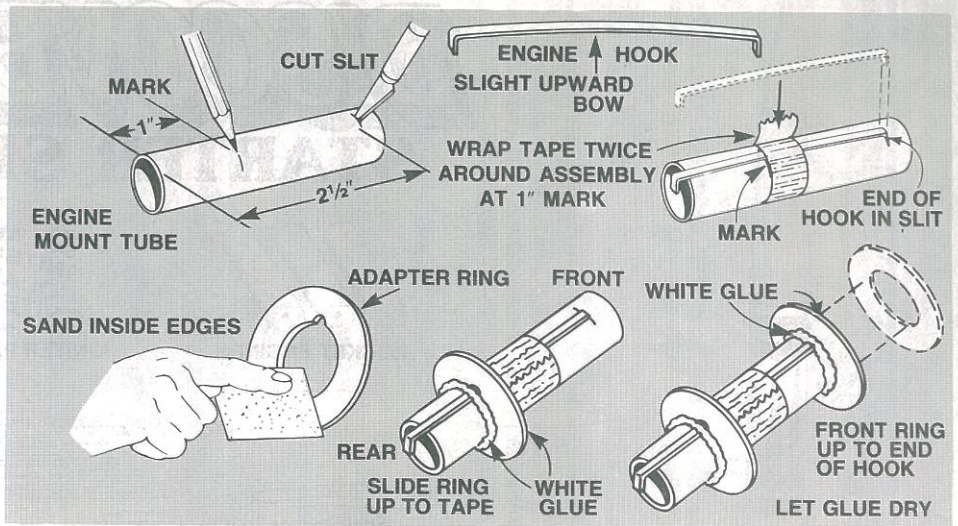


A DAMON COMPANY  
**ESTES INDUSTRIES**  
 1295 H STREET  
 PENROSE, CO 81240 USA



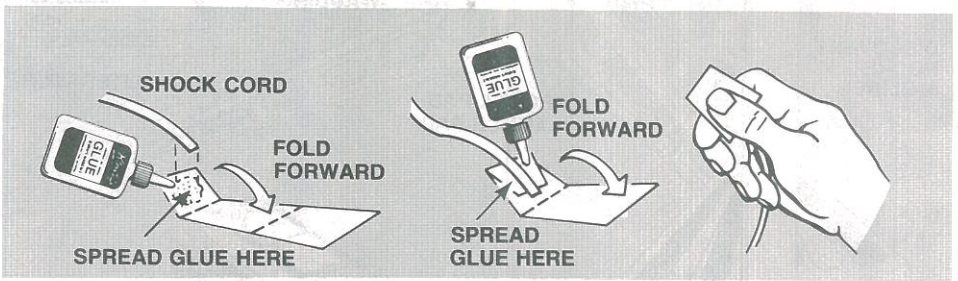
## 2.

- Mark engine mount tube 1 inch and 2½ inches from one end.
- Cut 1/8 inch long slit at 2½ inch mark.
- Insert one end of engine hook into slit.
- Wrap masking tape around assembly twice at 1 inch mark.
- Slide slotted adapter ring onto rear of tube and up to masking tape. Slot fits over engine hook. Glue both sides of ring/tube joint.
- Slide remaining ring over front of tube and down to end of engine hook. Glue both sides of ring/tube joint.



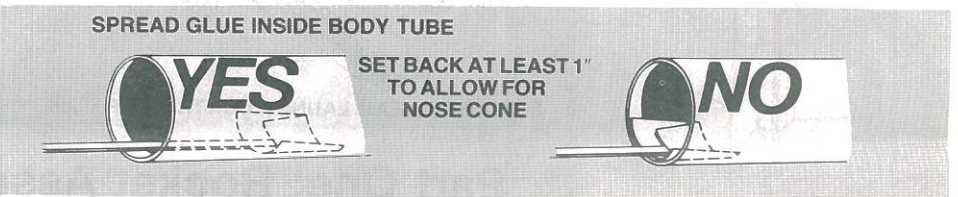
## 3.

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



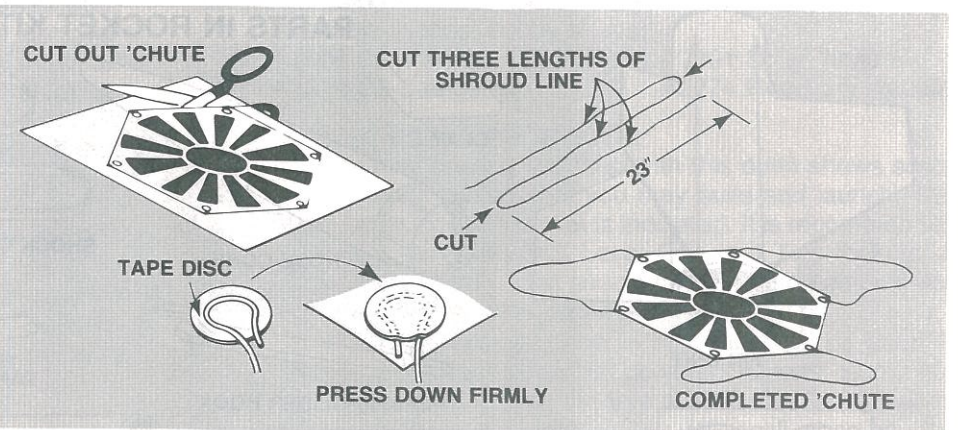
## 4.

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



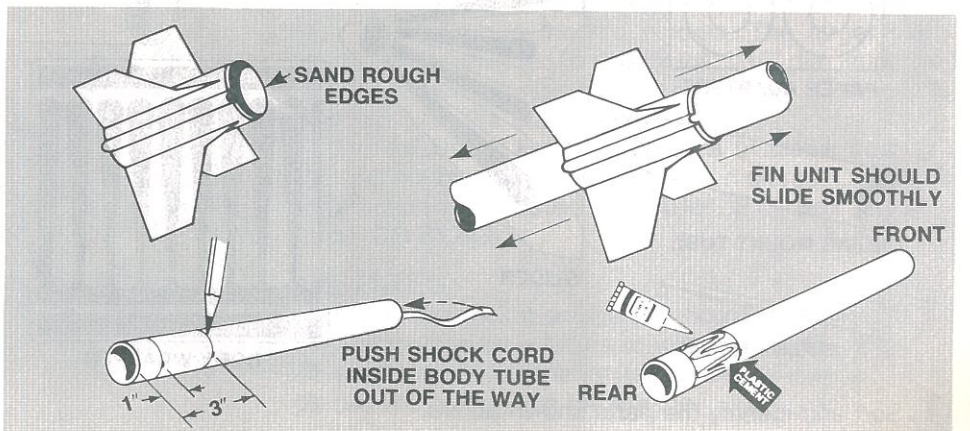
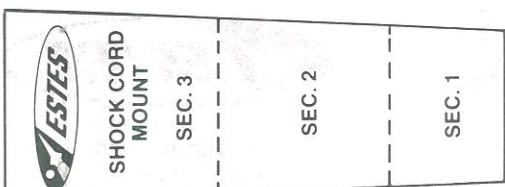
## 5.

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



## 6.

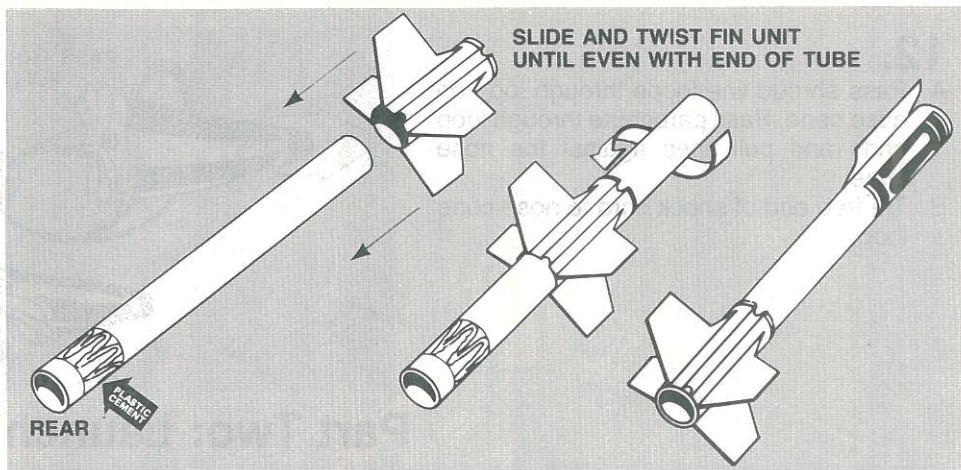
- Check for and remove any burrs on the forward inside edge of fin unit. Test fit on body tube by inserting the tube from rear of unit.
- Mark body tube 1 inch and 3 inches from the end without the shock cord.
- Smear "tube type" plastic cement over entire area between two lines.





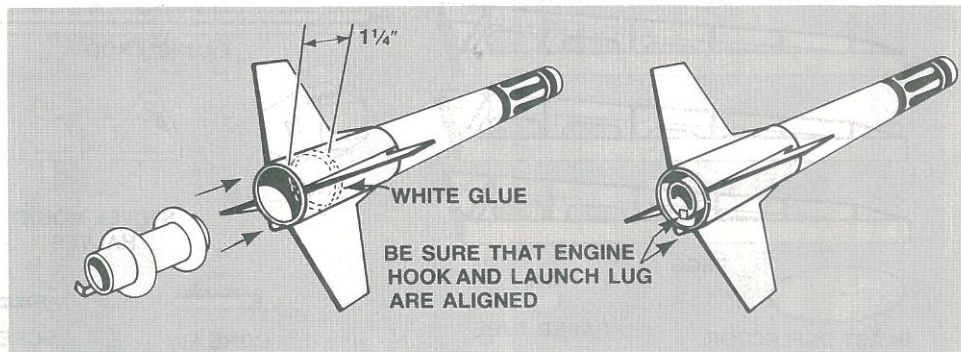
## 7.

- Insert opposite end of body tube into rear of fin unit.
- Slide down tube with a twisting motion until end of fin unit is even with end of body tube.
- Apply self-adhesive body wrap to front end of body tube of your Discovery rocket. Refer to photograph on end of box for location.



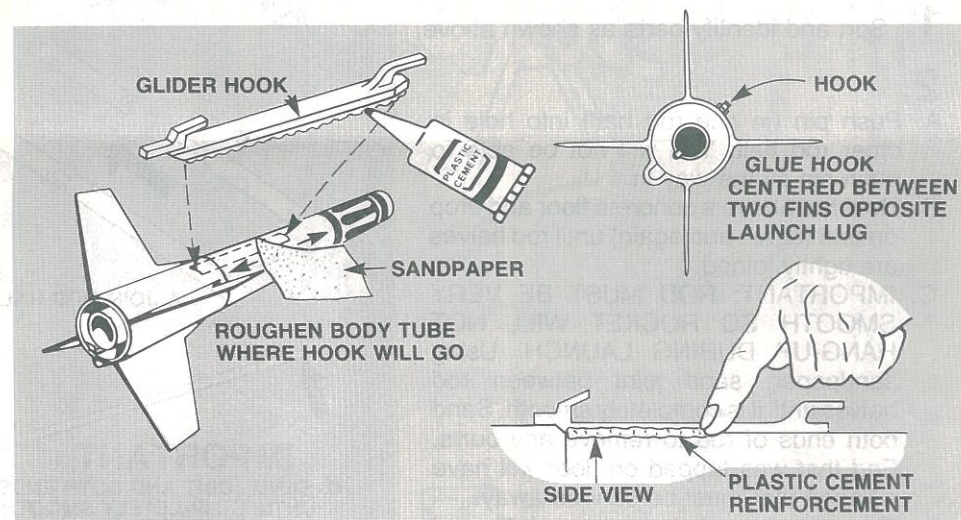
## 8.

- Smear white glue inside rear of body tube about 1/4 inch from the end.
- Slide engine tube assembly into this end of tube so engine tube is even with end of body tube.
- Be sure engine hook is aligned with launch lug as shown.



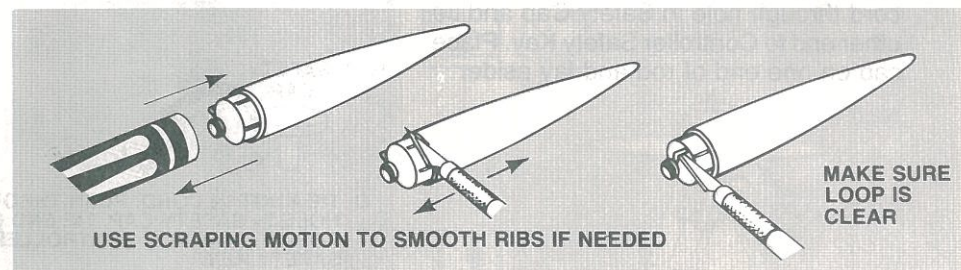
## 9.

- Position glider hook between the two fins opposite the launch lug. The small piece extending from rear of hook glues directly to fin unit. Mark location on body tube with pencil.
- Roughen body with sandpaper where glider hook will go.
- Apply plastic cement to underside of hook and attach to rocket. Run a bead of plastic cement around hook/tube joint and smooth out with finger.



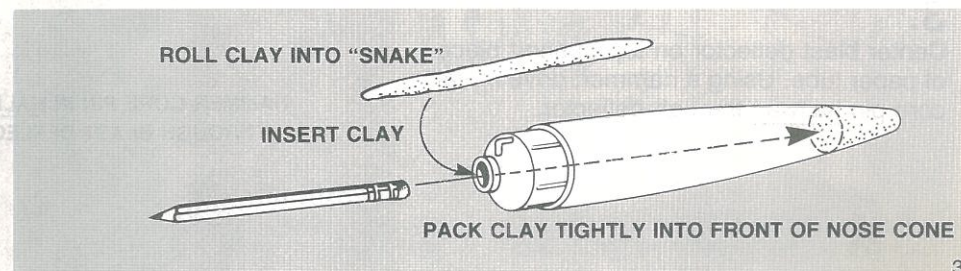
## 10.

- Test fit nose cone into front end of body tube.
- Scrape ribs on nose cone shoulder until smooth fit is achieved. Not too loose or too tight.
- Clear plastic from parachute attachment loop with modeling knife.



## 11.

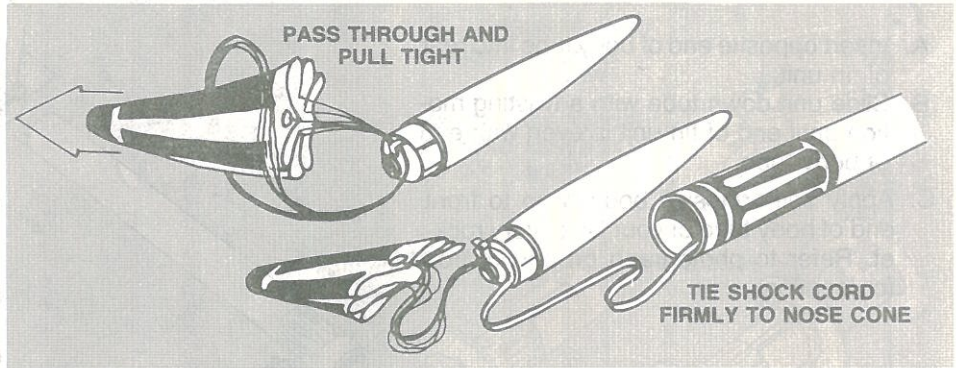
- Roll approximately 3/4 of the clay between your hands to make a "snake" about 1/8 inch diameter. Poke the clay through the hole in the rear of the nose cone. Use a pencil or dowel to push the clay forward into the cone until it is packed tightly in the front of the cone. Save remainder for glider trimming.



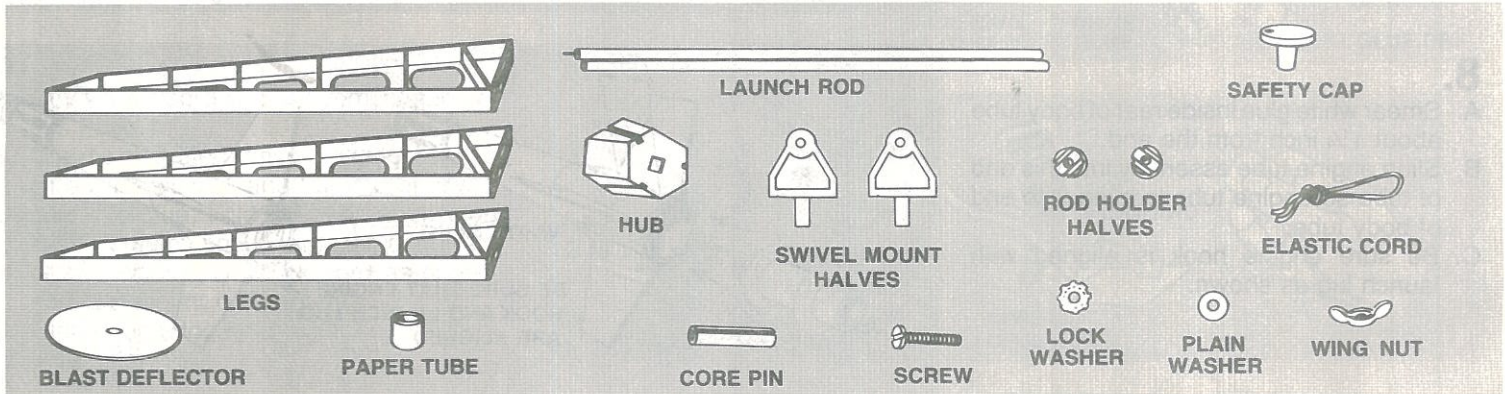


## 12.

- A. Pass shroud line loops through loop on nose cone. Pass parachute through loop on ends and pull lines against the nose cone.
- B. Tie free end of shock cord to nose cone loop.



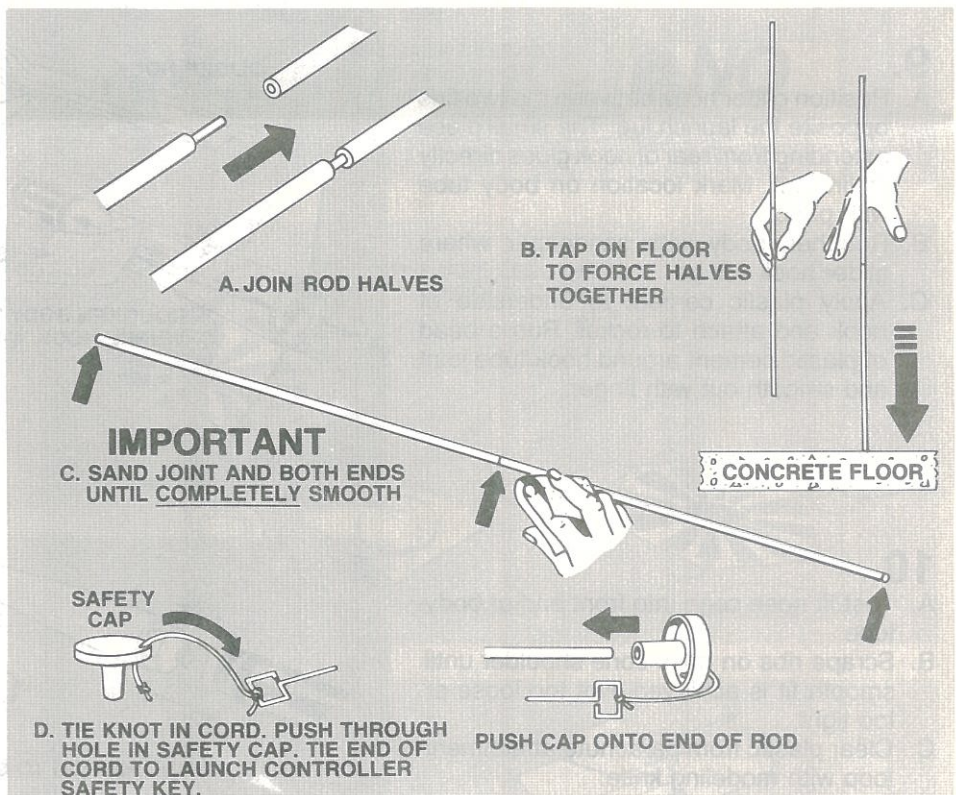
## Part Two: Launch Pad



1. Sort and identify parts as shown above.

## 2.

- A. Push pin (in one rod half) into hole in other rod half. You will not be able to push pin all the way in.
- B. Hold rod above a concrete floor and drop on end (again and again) until rod halves are tightly joined.
- C. **IMPORTANT: ROD MUST BE VERY SMOOTH SO ROCKET WILL NOT HANG-UP DURING LAUNCH.** Using sandpaper, sand joint between rod halves until it is completely smooth. Sand both ends of rod to remove any burrs. End that was tapped on floor will have a flange that must be sanded away.
- D. Tie a knot in end of elastic cord. Thread cord through hole in Safety Cap and tie other end to Controller Safety Key. Place cap on one end of rod and lay aside.



## 3.

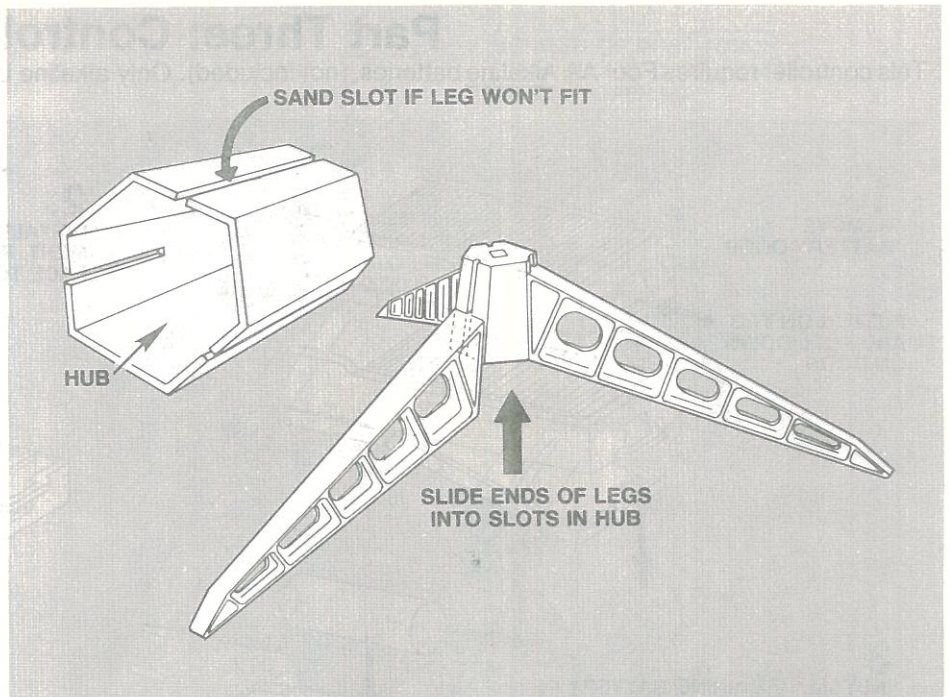
- Center blast deflector on top of short piece of paper tube. Using a hammer, drive metal core pin halfway through deflector.





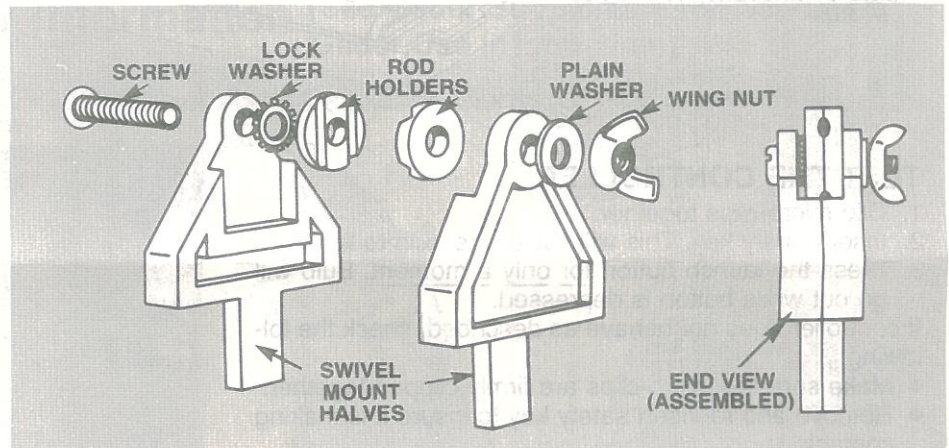
#### 4.

Slip ends of legs into slots in hub. If a leg will not fit into a slot, DO NOT FORCE IT. There is probably some excess plastic "flash" in the slot. Lightly sand inside edges of slot to remove "flash".



#### 5.

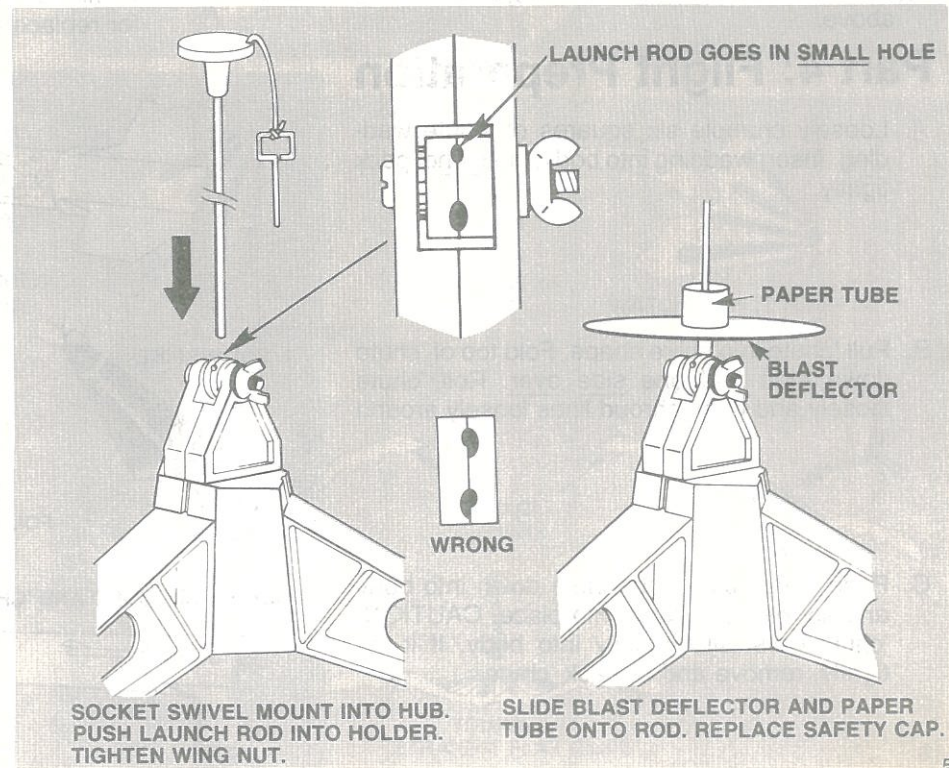
Assemble swivel mount. Make sure parts are put together EXACTLY AS SHOWN. Thread wing nut onto screw, but do not tighten.



#### 6.

Insert base of mount into square opening in hub. Rotate the round rod holder halves until grooves are lined up as shown. Insert launch rod into the SMALLER hole. Hold rod vertical and tighten wing nut.

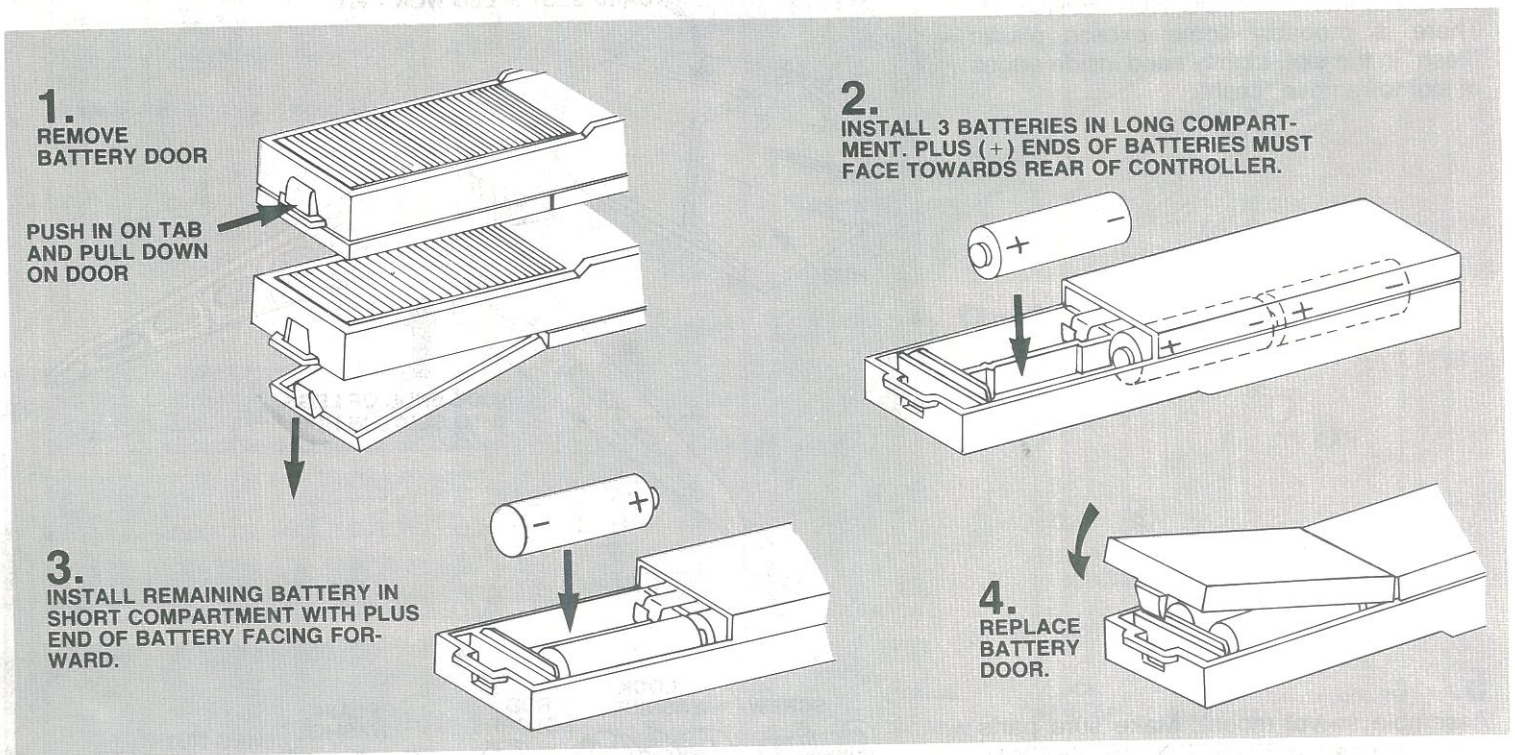
Remove Safety Cap. Slide blast deflector and paper tube onto rod and replace safety cap.





## Part Three: Controller

This controller requires Four AA Alkaline batteries, (not included). Only alkaline batteries are recommended.

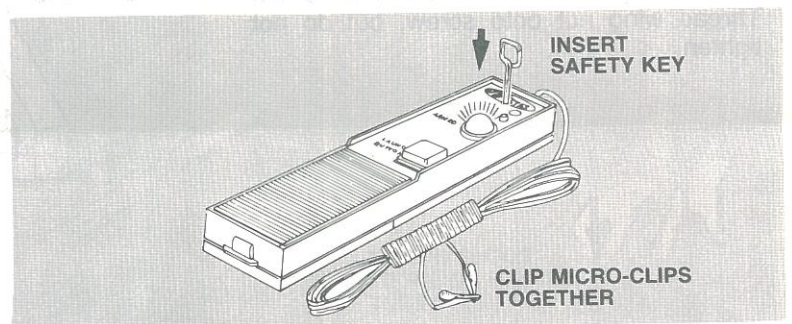


### TEST THE CONTROLLER

1. Clip micro-clips together.
2. Insert safety key. This will cause the bulb to light.
3. Press the launch button for only a moment. Bulb will go out while button is depressed.

If controller does not behave as described, check the following:

- Make sure the micro-clips are firmly clipped together.
- Remove and re-insert safety key to insure it is making contact.
- Make sure batteries are correctly inserted as described above.



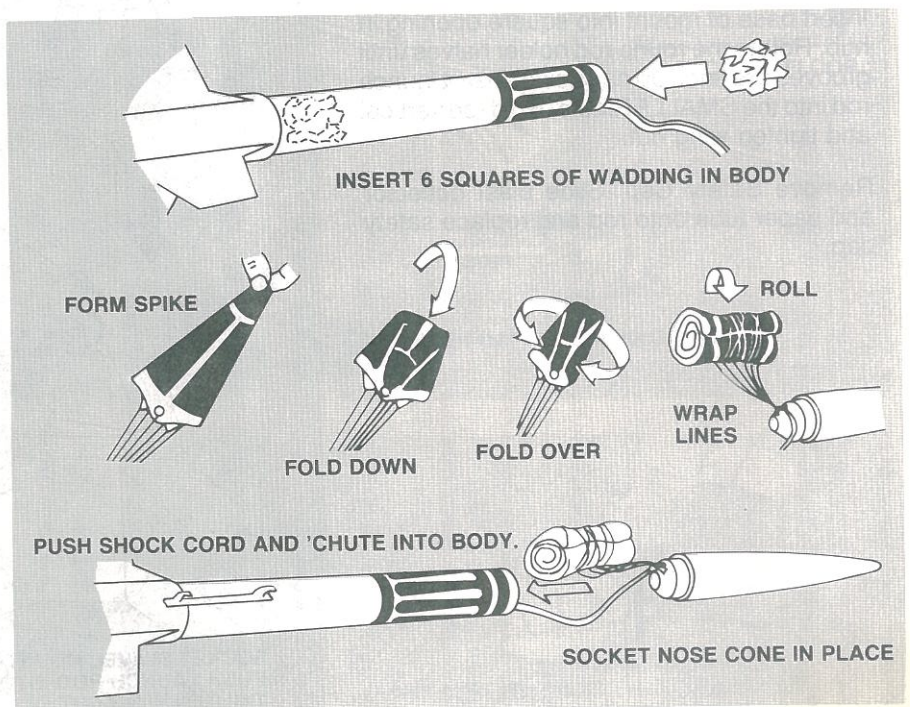
If you cannot get the controller to work, return it to Estes for replacement (see enclosed warranty).

### Part 4: Flight Preparation

A. Loosely crumple six squares of 'chute wadding. Insert wadding into body, but do not pack tightly.

B. Pull 'chute into spike shape. Fold top of 'chute down then fold one side over. Roll 'chute loosely and wrap shroud lines loosely around it.

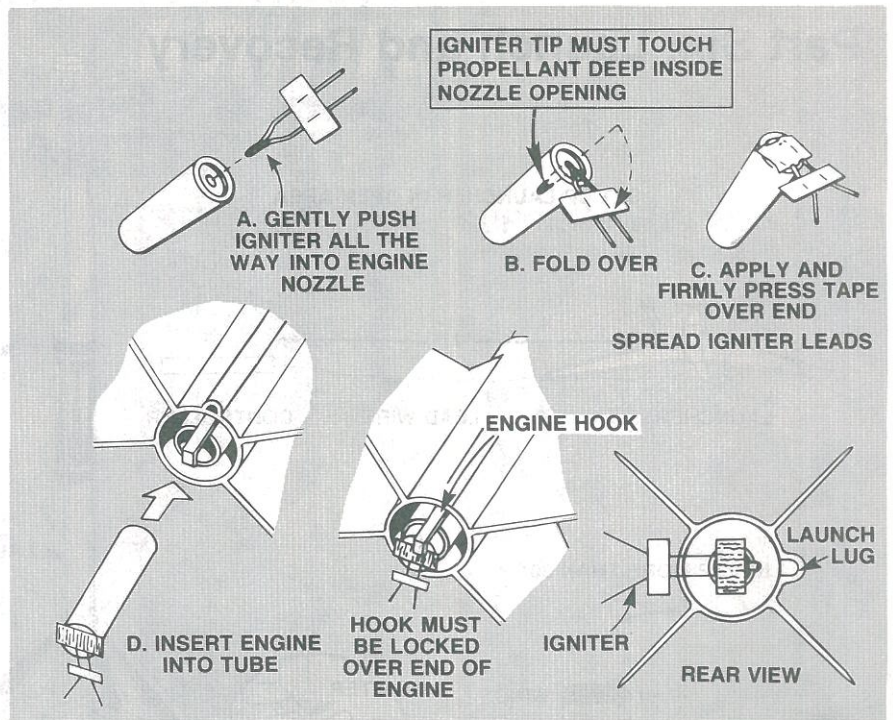
C. Push shock cord and 'chute down into body and socket nose cone into place. **CAUTION:** 'chute must slide easily into body. If it fits tightly, remove and re-pack 'chute.





## ENGINE-IGNITER INSTALLATION

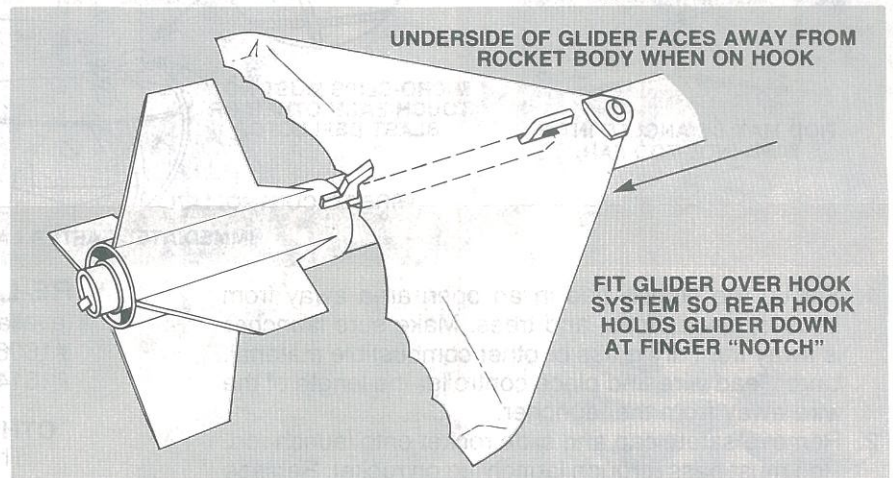
- A. Carefully remove the staple holding igniters in paper. Cut one igniter from strip. Insert igniter into engine nozzle. Gently push in as far as it will go.
- B. Fold exposed portion of igniter down flat against end of engine.
- C. Apply a piece of tape over end of engine. Push tape down **FIRMLY** over nozzle and igniter.
- D. Push end of engine hook back and insert engine into tube. Engine must be rotated so igniter is **NOT** aligned beneath launch lug. Make sure engine hook is securely locked over end of engine.



## Part 5: Glider Information (See Glider Supplement for Additional Glider Use Information.)

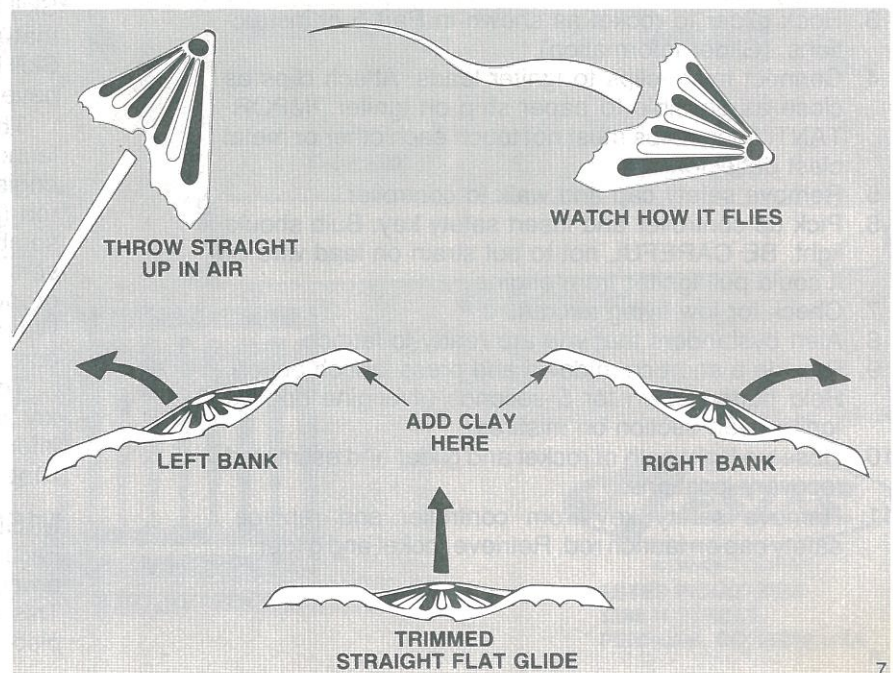
1.

- A. Test fit glider on hook system.
- B. Front hook goes through slot in glider body near front. Rear hook holds glider against rocket body at finger "notch" in rear edge of glider body.



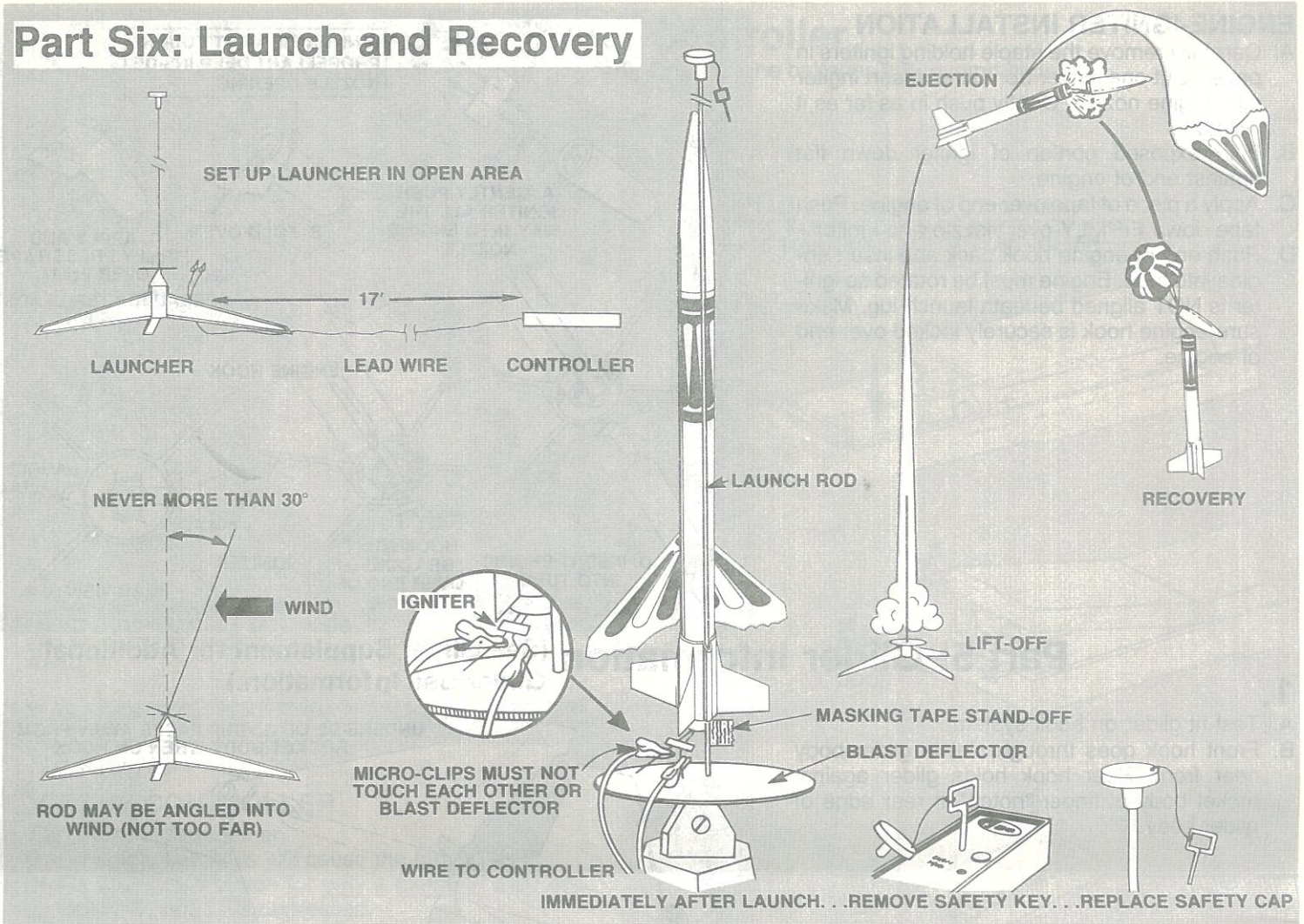
2.

- A. A "trimmed" (balanced) glider flies best. Check trim before flying your glider on the Discovery rocket.
- B. Toss your glider straight up into the sky and watch how it flies. If it settles into a flat, circling glide it is ready to fly.
- C. If the glider "banks" (turns) to the left or right while coming down, add clay as indicated in the illustration to achieve a flat glide.
- D. When the glider is properly trimmed it is ready to be flown on your rocket.





## Part Six: Launch and Recovery



1. Set up the launch pad in an open area away from houses, power lines, and trees. Make sure launcher is away from dry grass or other combustible material. Unroll lead wire and place controller the length of the wire away from the launcher.
2. Remove safety cap and slide rocket onto launch rod. Rod must pass through launch lug on rocket. Replace safety cap.
3. Hook glider to rocket as shown in Part 5 of instructions. (Glider Information).
4. Connect micro-clips to igniter leads. Attach clips as close as possible to paper strip on igniter. **IMPORTANT:** Micro-clips must not touch each other or metal blast deflector.
5. Remove safety cap and walk to controller.
6. Pick up controller and insert safety key. Bulb should light. **BE CAREFUL** not to put strain on lead wire or it could pull igniter from engine.
7. Check for low flying aircraft.
8. Alert bystanders that you are ready to launch.
9. Provide a short countdown and press launch button. Hold button down for 5 seconds (if engine doesn't ignite, read section on misfires).
10. Observe flight path of rocket and glider and estimated recovery locations.
11. Remove safety key from controller and replace safety cap on launch rod. Retrieve rocket and glider.

### RE-LAUNCH COMPONENTS:

(available in most hobby shops):

- |                                   |                        |
|-----------------------------------|------------------------|
| #1606 B6-4 engines (first flight) | #2301 Solar igniters   |
| #1614 C6-5 engines                | #2274 Recovery wadding |

### OTHER ESTES PRODUCTS:

The mini catalog included with this outfit shows some of the other rockets that you may build and launch. The Skill Level for each rocket is indicated. It is recommended that you start with Skill Level One and Two rockets. A Skill Level Three rocket should not be attempted until you have gained more experience.

The launch components in this outfit can be used to launch even very large "D" powered rockets. Some "D" engine rockets require the use of a larger (3/16") launch rod (purchased separately). You will recall when you assembled the launch pad swivel mount, there were two sets of grooves in the rod holders. The larger pair of grooves are designed to accept the 3/16" dia. launch rod. When using the larger rod, you will have to remove the core pin from the blast deflector.

The full line of Estes products is available from most toy and hobby shops and many chain stores. Or for more information write: **Estes Industries, P.O. Box 227, Penrose, CO 81240.**

### MISFIRES

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