



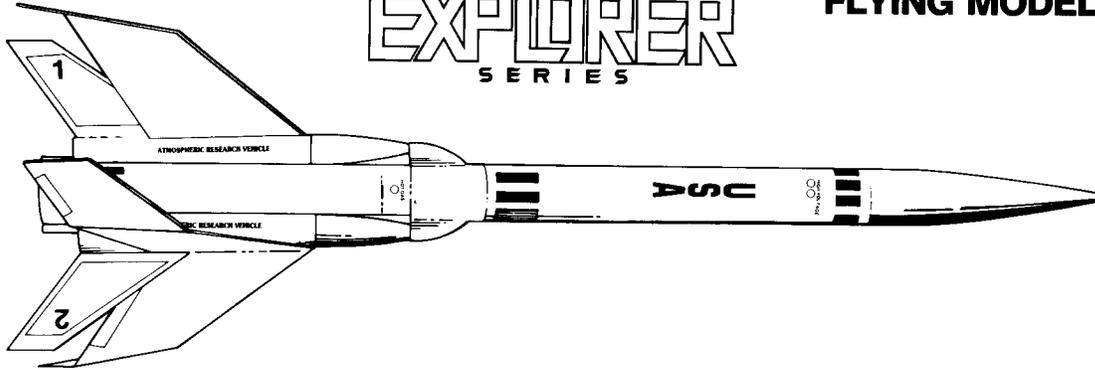


ESTES INDUSTRIES
1295 H STREET
PENROSE, CO 81240 USA

A.R.V. CONDOR™

EXPLORER SERIES

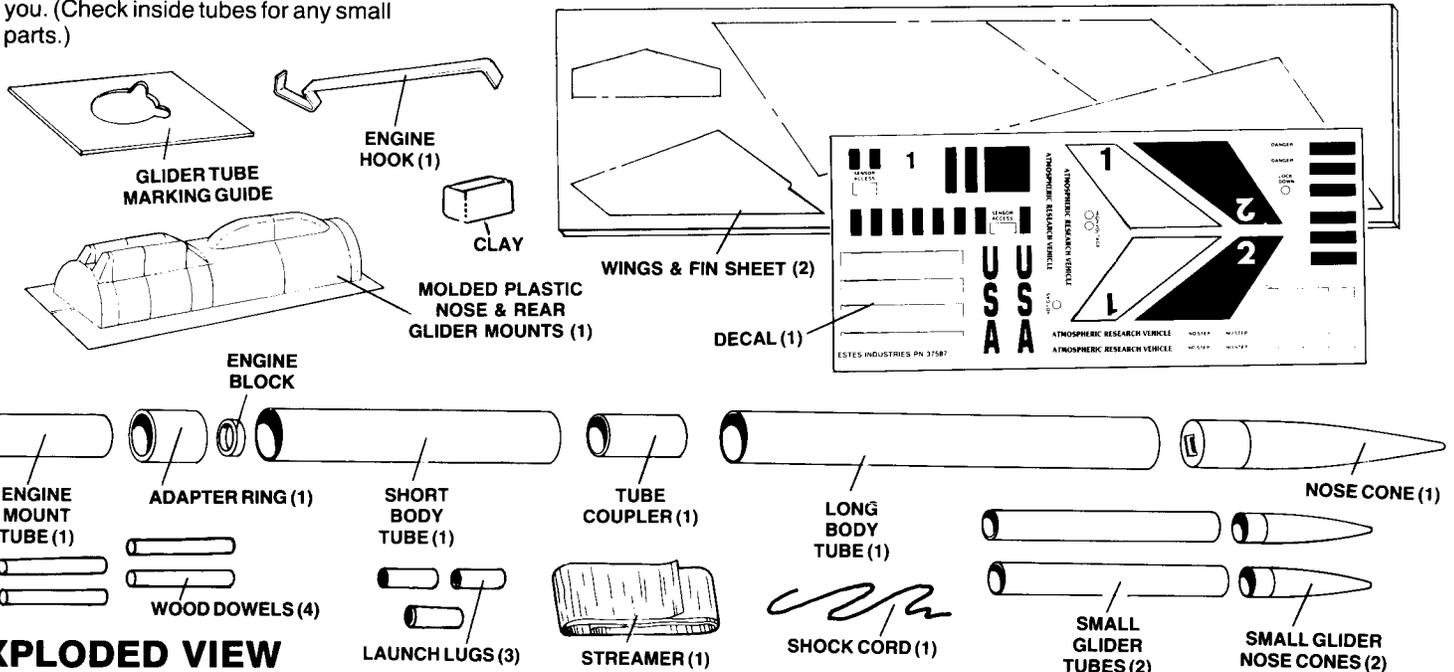
FLYING MODEL ROCKET KIT
KIT #2075



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. The tube marking guide is printed in the instructions and will be found on page 2.
- 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.



SANDPAPER
(#400 and #600 grit)



PLASTIC
CEMENT



PENCIL



PAINT



HOBBY
KNIFE



SCISSORS



GLUE
(white or
yellow)



MASKING
TAPE

GLUE IS APPLIED TO SURFACES SHOWN IN RED.

PART ONE: GLIDER ASSEMBLY

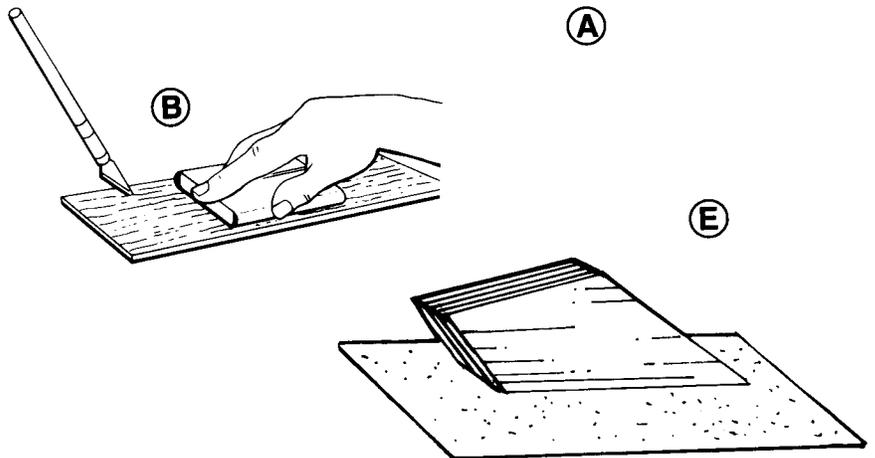
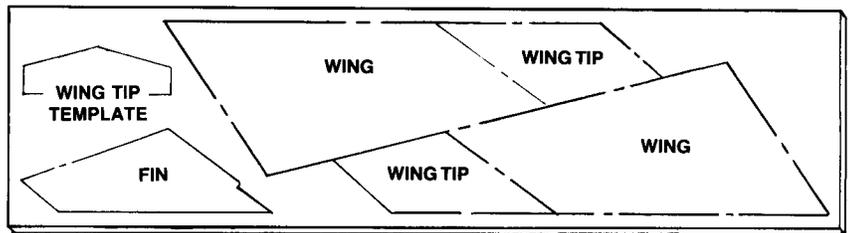
1. WING AND FIN PREPARATION



NOTE: Each balsa sheet contains the components for a single glider. Build one glider at a time.

- A. Identify the components on the die cut sheet.
- B. Lightly sand both sides of the die cut sheets with fine sandpaper.
- C. Carefully remove wings, fins and wing tip templates from one of the balsa sheets. Use hobby knife if necessary.
- D. Use die cut pieces to trace wing and fin patterns. These patterns can be used to make replacement parts. Keep in your A.R.V. Condor™ "Project File".
- E. Stack sand the edges of all wing sections. Repeat for wing tips and rudders.

NOTE: Do not sand tip angle template.



2. WING ASSEMBLY



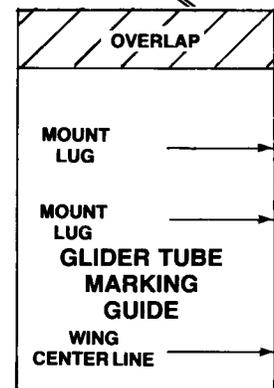
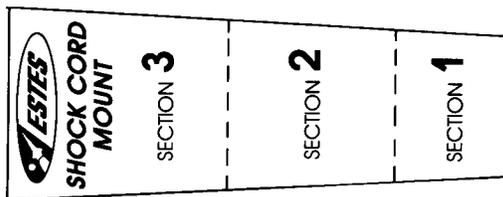
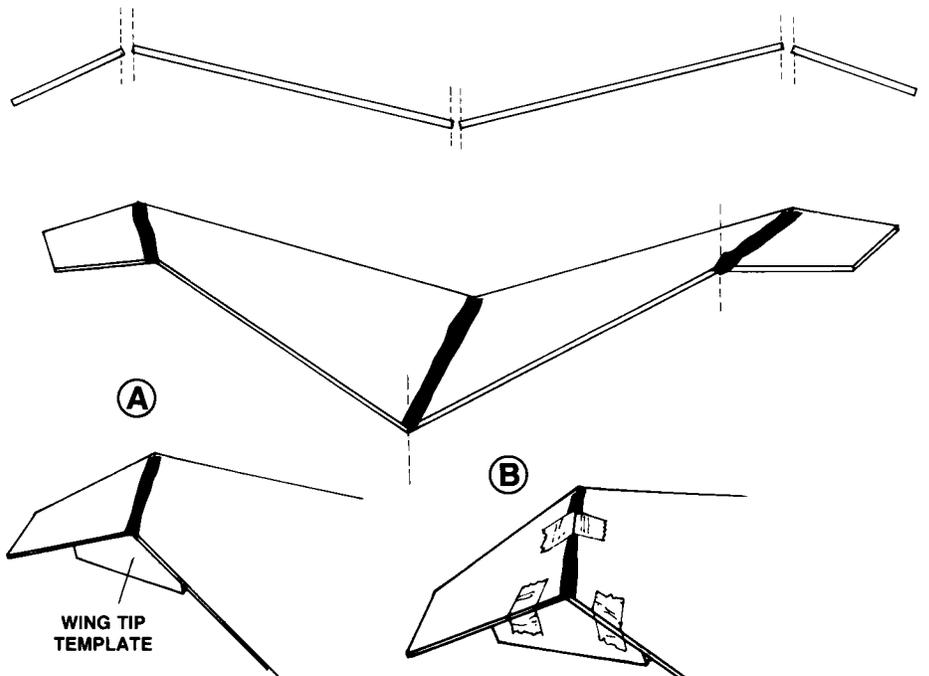
NOTE: You should work on flat surface covered with waxed paper. This will ensure proper wing construction and will prevent your wings from sticking to the work surface.

Stronger glue joints can be made on your wings by sanding the correct angles on the edges to be glued. (See example diagram) Use the wing tip template to check the angle. Test fit the joint several times to avoid sanding too great an angle. **Remember** you are building one left and one right wing per glider. The sanded angles will be opposite for left and right wings.

- A. Glue the wing tip to the wings first. After you have sanded the correct angle at the joint, rub a thin film of glue on the edges to be joined. Do not attach yet. Allow the glue to dry for a minute or two. This will help create a stronger bond. Apply a second thin film of glue to the same edges and press the two edges together for 15 seconds. Use the angle template by placing it across the joint at the trailing edge of the wing to ensure the proper angle. Tape it in position, allow to dry. **The angle is critical for proper flight.**

NOTE: The wing tip template is an alignment tool only. Do not glue template to wing.

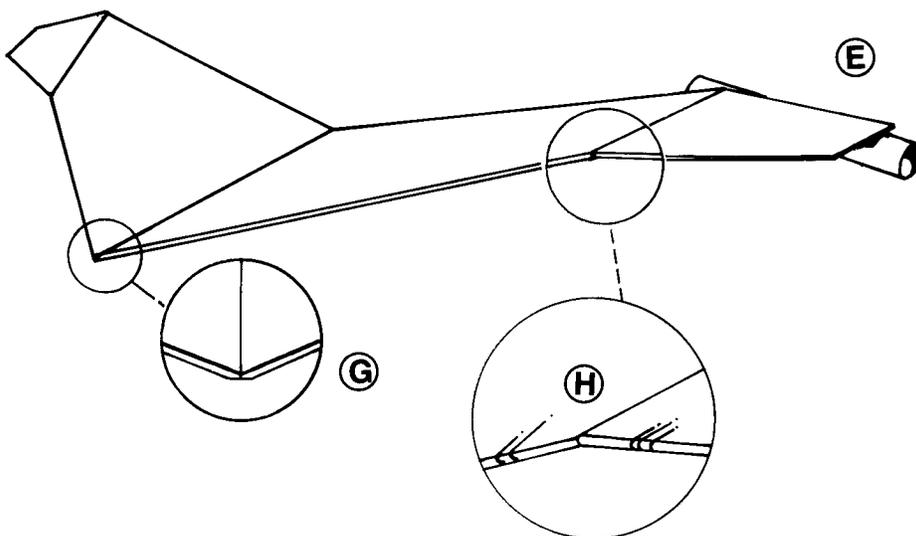
- B. After joint is dry, reinforce top and bottom of joint with glue. Allow to dry.
- C. Rub a thin film of glue into the root edge of both wing halves. Do not join wings yet, allow to dry for a minute or two.
- D. Apply a second thin film of glue to the same edges and press wing halves together. Immediately lay wing down on building surfaces.



- E. Elevate one tip slightly and support it with one small diameter body tube as shown. Before the glue dries, ensure that both wing halves are properly joined and are not misaligned. Allow entire wing to dry thoroughly.

TECHNICAL NOTE: Dihedral - The angle that the two wing halves form when joined together is known as dihedral. Dihedral provides the glider with a built-in self correcting ability. The glider can correct its flight path if disrupted by a destabilizing force such as a wind gust.

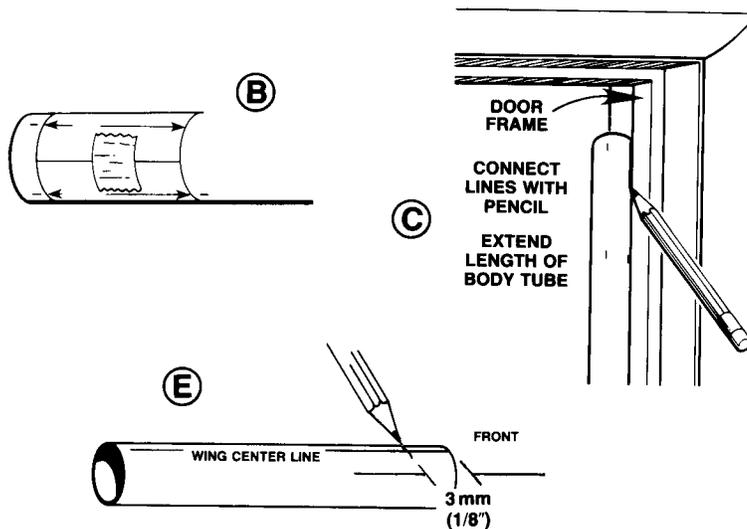
- F. Repeat these steps to build the second glider's wing.
- G. When wing is completely dry, sand a small flat on the bottom of the center section joint for a better body tube mounting surface.
- H. To improve performance, round the leading edges of the wings and fins.



3. MARKING GLIDER BODY TUBES



- A. Locate the BT-5 small diameter body tube.
- B. Use the paper body tube marking guide on page 2. Wrap it around one of the tubes as shown. Mark the tube at the three positions indicated.
- C. Using a door frame as a guide, complete a line down the full length of the body tube at each of the three marks. These lines will help insure proper wing, fin, and glider mounting lug positioning.
- D. Locate the ruler in the fold of this page.
- E. Mark the glider body tube 3 mm (1/8") from one end of the tube on the wing center line. This is now the front of the glider.

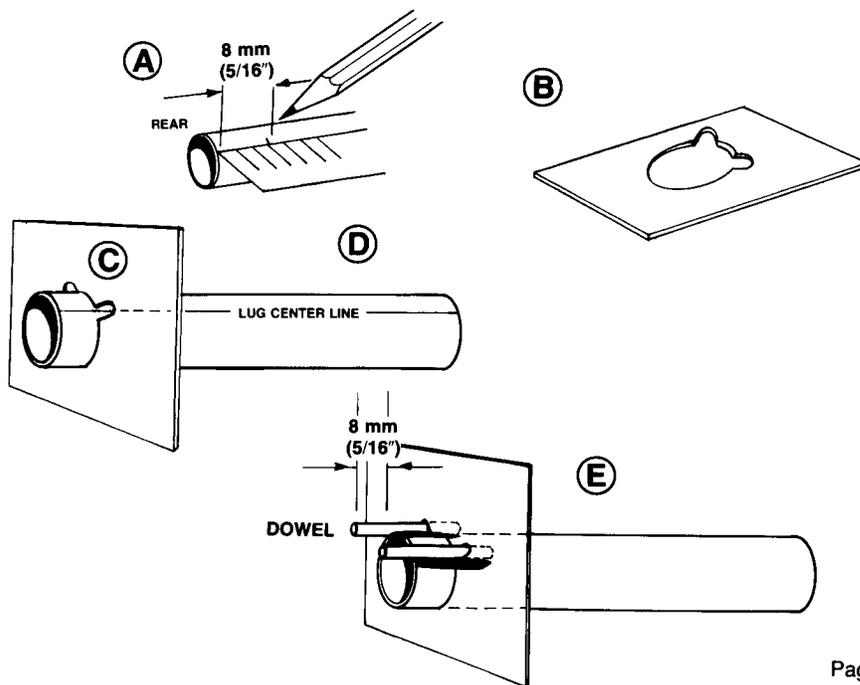


4. MOUNTING LUG DETAIL



- A. Mark the glider tube 8 mm (5/16") from the rear as shown.
- B. Locate the glider mounting lug template. Punch out the template center.
- C. Place the template over the body tube at the 8 mm (5/16") mark.
- D. Align the template with the lug center lines you drew in step 3C. Make sure the template stays perpendicular to the tube.
- E. Position the 3 mm (1/8") x 19 mm (3/4") dowels as shown. Allow the dowels to extend 8 mm (5/16") beyond the rear of the body tube. Apply a glue fillet along the dowel and body tube joint. Allow glue to dry thoroughly.

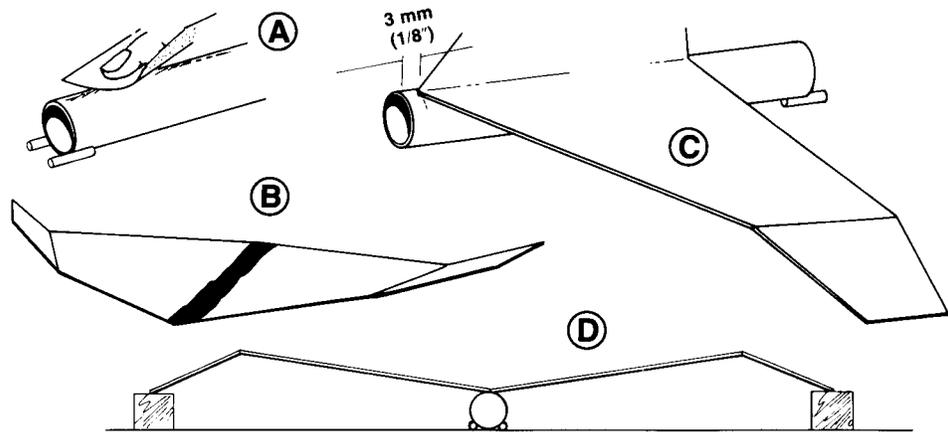
NOTE: Be careful! Do not glue template tool to the body tube. Remove the template and complete the glue joint.



5. MOUNTING THE WING



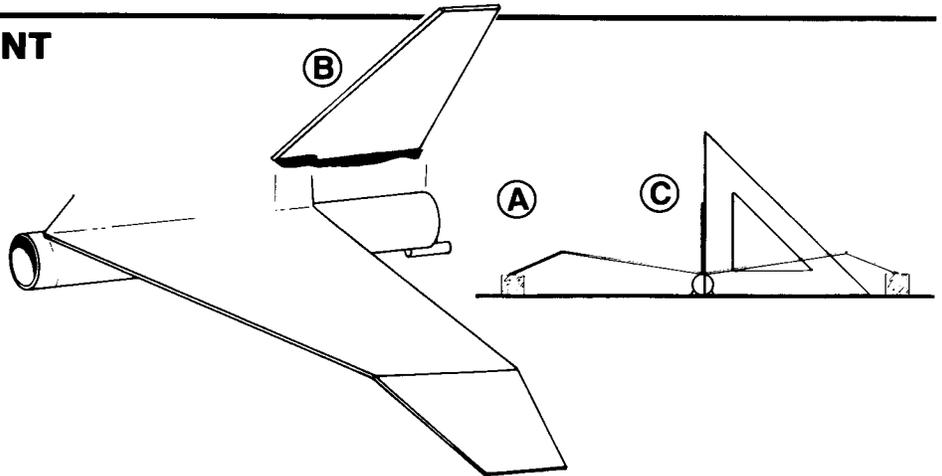
- A. Place the glider body tube on a flat surface so that it rests on the launch lugs. Lightly sand along the line which runs along the top of the tube.
- B. Apply glue along the bottom of the wing center section joint.
- C. Place the wing on the body tube with the leading edge at the 3 mm (1/8") mark.
- D. Level the wings. Use scrap balsa pieces as shown.



6. VERTICAL FIN ATTACHMENT



- A. Apply glue along the root edge of the vertical fin in the same method as wing assembly.
- B. Position fin along reference line (notch portion should rest on wing joint). Make sure fin is projecting vertically from body tube. You may use a drafting triangle or other right angle device to assure this alignment.
- C. Test fit nose cone but **do not glue it to the glider** at this time.
Repeat steps 3-5 for the second glider.



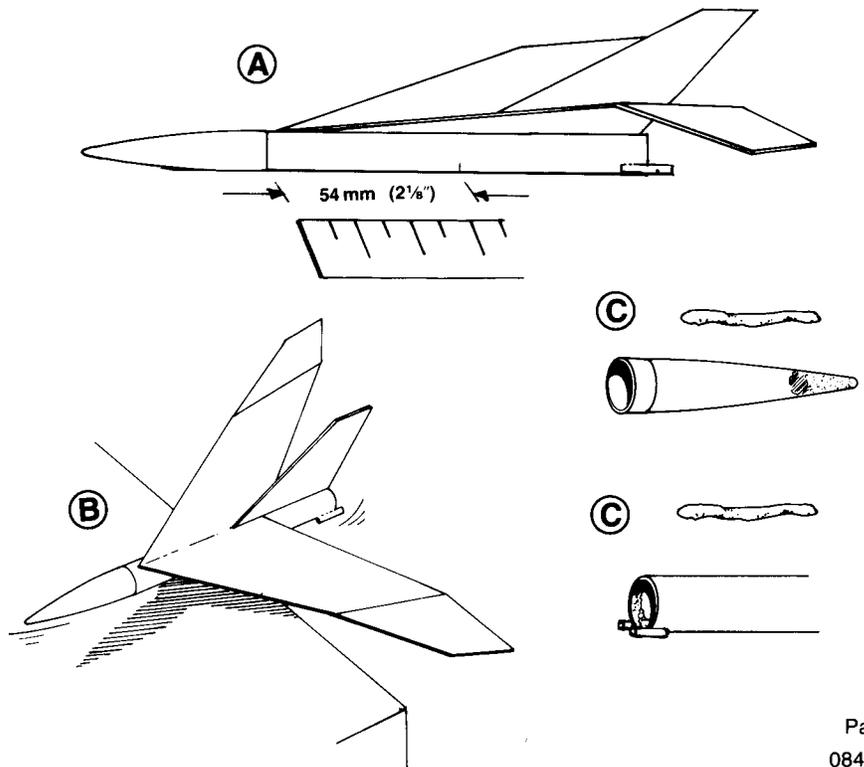
7. CONSIDERATIONS WHEN PAINTING YOUR A.R.V. CONDOR™ GLIDERS

NOTE: Small changes in weight and balance greatly affect your gliders's performance. Your gliders will fly best in unpainted balsa. We recommend that you balance and test fly the models prior to painting. If you decide to paint your gliders, remember to give it a light coat. The excess weight of too many heavy coats will reduce the glide performance.

8. BALANCING AND TRIMMING YOUR GLIDERS FOR FLIGHT



- A. As a starting point, your glider should balance approximately 54 mm (2 1/8") rearward from the front end of the body tube. Measure this position on the underside of the wing near the body tube.
- B. With the nose cone in place, balance the glider at this point on the edge of a table as shown. It should rest with the balance line on the table's edge. If you move the glider back even a fraction of an inch, it will fall off the edge.
- C. If the glider does not balance:
 1. Tail heavy - remove nose cone, add a small amount of clay to the inside and replace cone on glider. Add clay until level.
 2. Nose heavy - add clay to inside rear of body tube until glider is level. Repeat this procedure for the second glider.



9. TEST GLIDE

NOTE: Your gliders are now balanced for gliding flight.

- A. Hold glider body at or near the balancing point.
- B. Make sure the wings are horizontal (even with the horizon).
- C. Hold the glider in a level attitude aimed into the breeze.
- D. Give the glider a firm forward push (do not toss or throw the model). The goal is to fly the model in a flat, gentle glide straight ahead.
- E. **Adjustments for a flat glide:**
1. If the nose points up and the glider behaves like a roller coaster - add a little weight to the nose compartment. If the nose dives quickly for the ground, remove a little weight or add weight to the rear from the nose until the flat glide is obtained.
 2. The gliders are designed to fly in gentle circles so they return to the launch area.
 3. Steep banking turns indicate a wing warp or weight differences between wings. If the gliders turn to the left or right abruptly, check the wing for warps or bends. Sand the heavier wing to remove more weight, if no warps are present. If necessary, a small amount of clay added to the lighter wing tip may be used to correct an out of balance condition.

10. PAINTING YOUR A.R.V CONDOR™ GLIDERS

NOTE: If you decide to paint the gliders, use spray paint for lighter covering. Be sure to relocate the balance point before flying. The added weight of paint will redistribute the balance and change the flight performance of the glider. Remove the nose cone from the glider body. Paint these pieces completely. Seal the wood surfaces with one or two coats of sanding sealer. Paint these pieces completely. Seal the wood surfaces with one or two coats of sanding sealer. Allow each coat to dry. Be sure to sand between coats with medium/fine sandpaper. Spray a coat of primer. Allow to dry. Give a final coat of color.

Allow to dry overnight. Use the illustrations in this instruction booklet to place decals. Cut out the decals one at a time. Allow each decal to soak in water for 30 seconds. Apply to model and lightly blot water away with tissue. Allow to dry. After the decals are dry, test fly each glider one more time to ensure flight qualities haven't changed. Once you're satisfied with the flight profiles of both gliders, glue the nose cones in place and allow to dry. The gliders are now completed. You are now ready to construct the launch vehicle.

PART TWO: LAUNCH VEHICLE ASSEMBLY

1. NOSE CONE ASSEMBLY

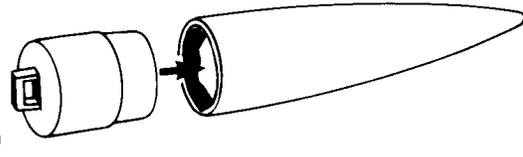


- A. Test fit the nose cone insert into the nose cone. Do not glue at this time. Remove the insert.
- B. Apply plastic cement as shown in the illustration and assemble the nose cone and insert pieces. Allow assembly to dry.

A



B

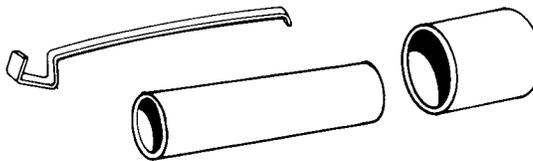


2. ENGINE MOUNT ASSEMBLY

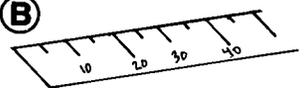


- A. You will need the light blue engine mount tube, engine hook and green adapter ring.
- B. Locate the ruler printed in the center crease of this instruction sheet.
- C. Lay one end of the engine mount tube on the zero mark of the ruler.
- D. Take your pencil and place a mark on the engine mount tube at 25 mm (1") from zero. Make another mark at 64 mm (2½") from zero.
- E. Cut a 3 mm (1/8") wide slit as shown at the 64 mm (2½") mark only.
- F. Insert the engine hook into the slit as shown. The engine hook should extend beyond the rear of the engine tube.

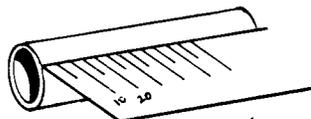
A



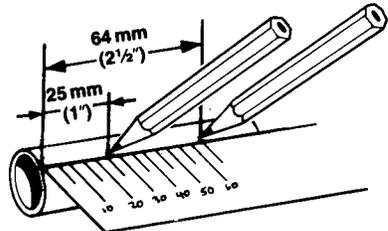
B



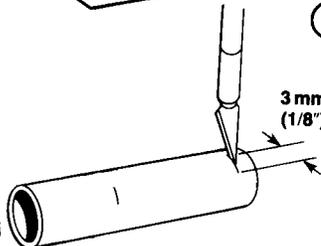
C



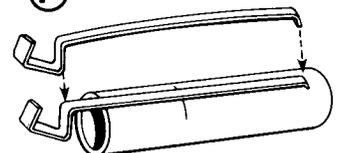
D



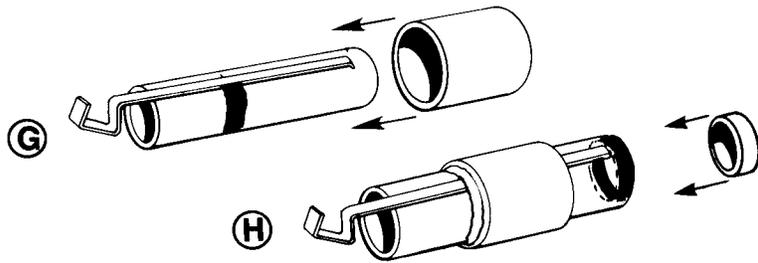
E



F



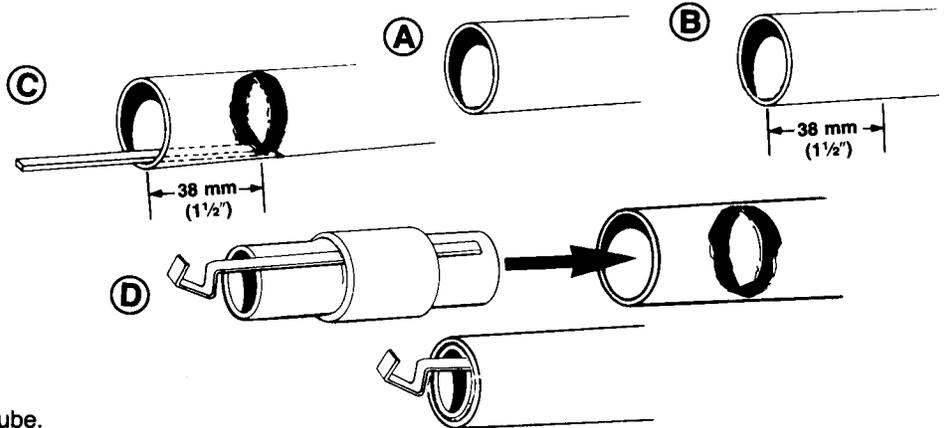
- G. Test fit the green adapter ring by sliding it onto the front of the light blue engine tube. Slide the ring over the engine hook and up to the 25 mm (1") mark you made in step D. Then glue as shown.
- H. Once the ring is in place, apply glue to both sides of the ring.
- I. Install engine block against engine hook and glue as shown. Set assembly aside and allow to dry.



3. ENGINE MOUNT INSTALLATION



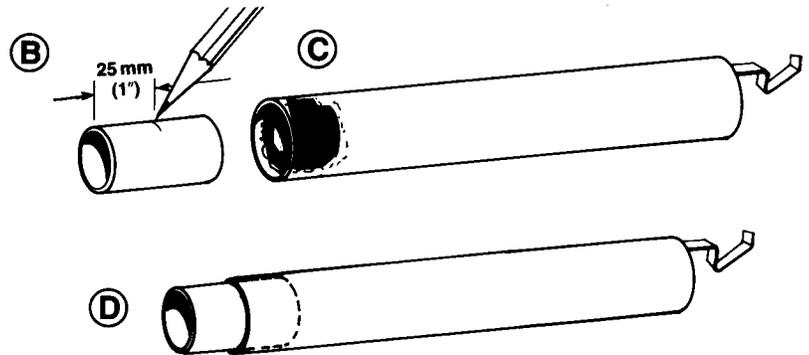
- A. Locate the short body tube.
- B. Measure approximately 38 mm (1 1/2") from one end of the body tube. This gives you an idea of where inside the tube you will be spreading glue.
- C. Using the scrap balsa, glue applicator. Spread glue around the inside of the tube at approximately 38 mm (1 1/2") from one end.
- D. Push the front of the engine mount assembly into the end of the body tube in one continuous motion until the engine tube is even with the end of the body tube.



4. TUBE COUPLER



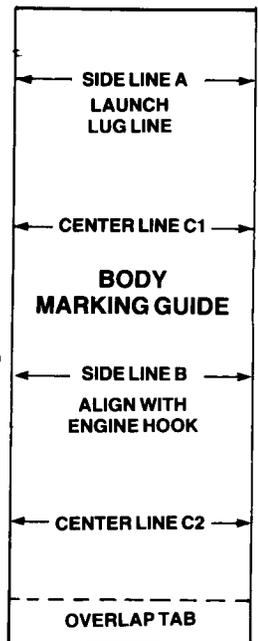
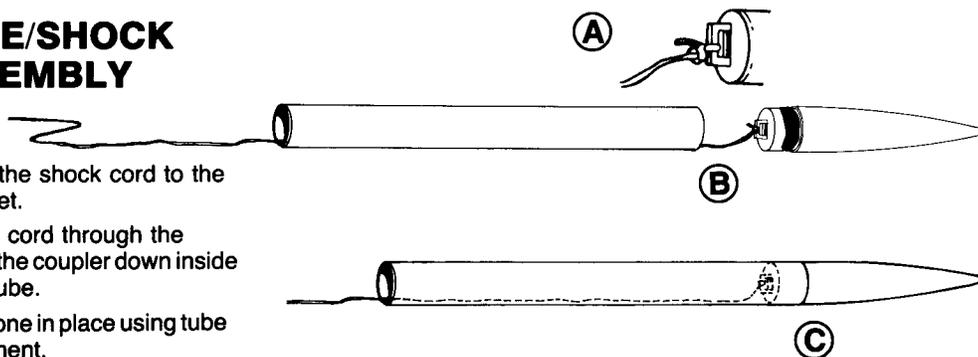
- A. Locate the coupler tube.
- B. Mark the coupler 25 mm (1") from one end.
- C. Apply glue to the inside of the short body tube.
- D. Insert coupler to the 25 mm (1") mark.
- E. Let glue dry.



5. NOSE CONE/SHOCK CORD ASSEMBLY



- A. Tie one end of the shock cord to the nose cone eyelet.
- B. Feed the shock cord through the opposite end of the coupler down inside the long body tube.
- C. Glue the nose cone in place using tube type plastic cement.

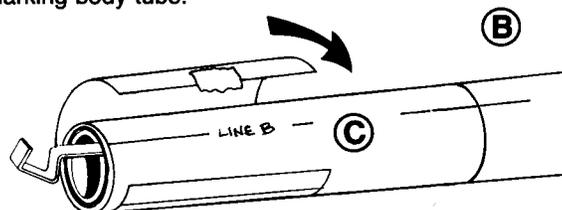


6. TUBE MARKING DETAIL

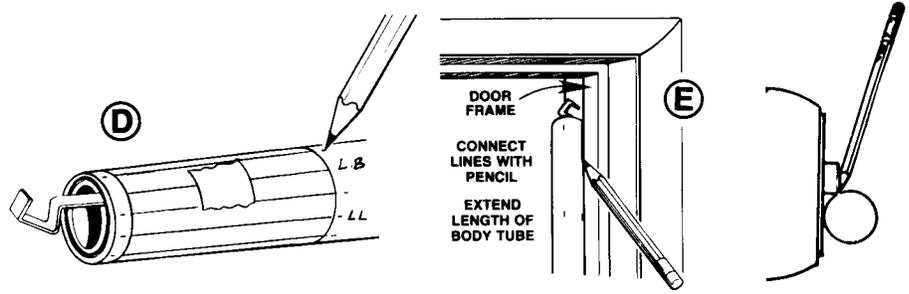


- A. Locate the tube marking guide on this page. Cut the guide along the outline.
- B. Join the two tubes together. **DO NOT GLUE.**
- C. Wrap the guide around the short body tube. Align "Line B" with engine hook and tape in place.

NOTE: The vacuum formed pieces will be easier to attach if the body tube is slightly roughened by sanding with #600 grit sandpaper. Sand before marking body tube.



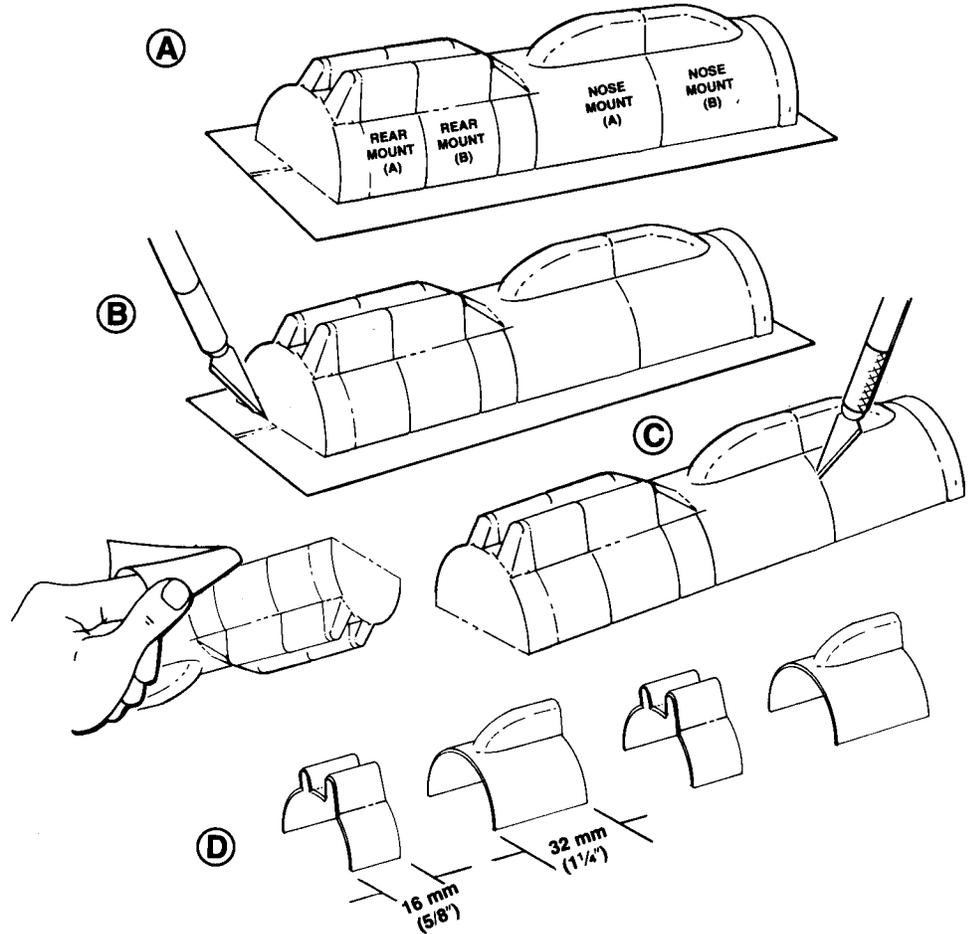
- D. Mark tube at all arrow locations.
- E. Using a door frame as a guide, draw straight lines extending the length of the tubes.
- F. Mark the two center lines with "C1" and "C2". These two lines need to be opposite each other. Mark the other lines "A" and "B". Mark both tubes. Remove marking guide.



7. GLIDER MOUNT PREPARATION



- A. Locate the plastic vacuum-formed piece. Examine it carefully. You will notice that it has two distinct portions. One makes up the two glider nose mounts and the other portion makes up the two glider tail mounts.
- B. Cut the row of parts free from the base. Score a line with your hobby knife all the way around. The plastic will fracture along the line when flexed. Sand edges smooth.
- C. Using the parting lines to guide your blade, score a deep line. The parts will separate when flexed. Sand all edges.
- D. You should now have four parts - two rear mounts and two nose mounts. Make sure the two rear mounts are of equal length (16 mm - 5/8") and that the two nose mounts are of equal length (32 mm - 1 1/4"). Trim and sand if necessary.

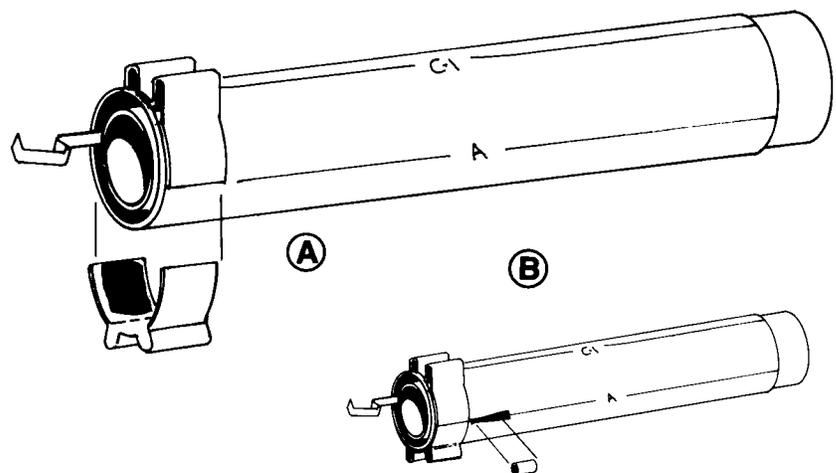


8. REAR MOUNT ASSEMBLY



NOTE: Use glue sparingly in this step.

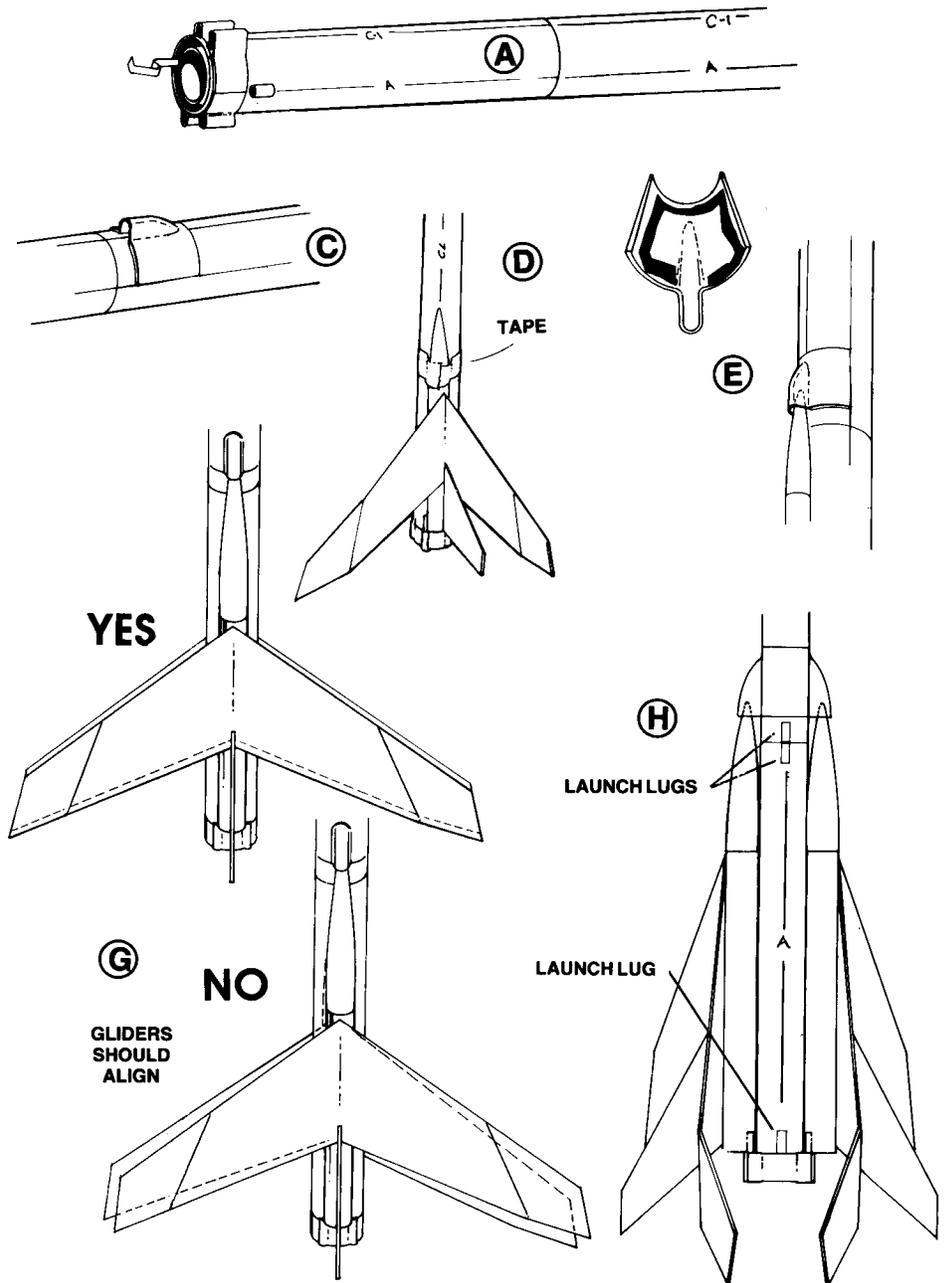
- A. Each of the rear mounts need to be centered on one of the lines you marked C1 and C2. First center the rear mount. The edges should just touch the "A" and "B" lines. Trim and/or sand as necessary.
- B. Once you are satisfied with the fit of the rear pieces, glue it in place using tube type plastic cement. Do not get glue in the "lug" portions of the mount. Make sure it is centered on the C1 line and that the edges just meet the "A" and "B" lines.
- C. Repeat the above steps for other rear mount. Center it on the C2 line. When you glue the second mount on, make sure it is straight and perfectly opposite the first rear mount.
- D. Glue the rear launch lug on line "A" as shown.



9. NOSE MOUNT ASSEMBLY



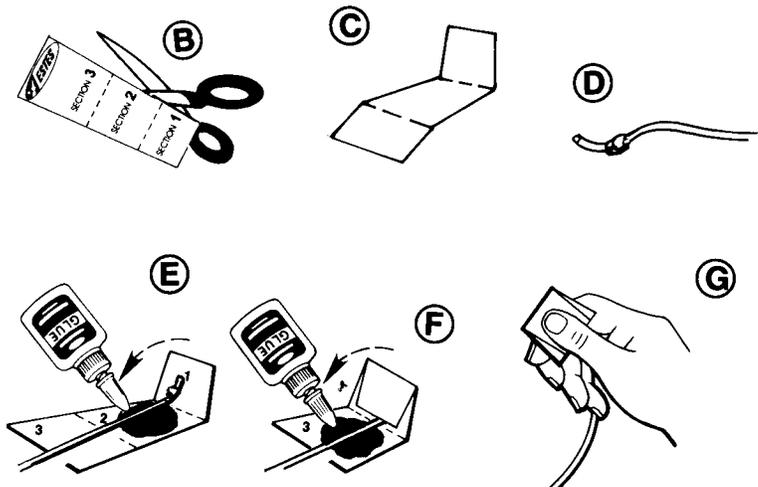
- A. Join the two tubes. **DO NOT GLUE.** Make sure the C1 line on the bottom tube is lined up with the C1 line on the top line.
- B. Locate the two vacuform nose parts.
- C. Each of these vacuform parts needs to be centered on the C1 and C2 lines. First center one of the nose parts on the C1 line. The edges should just touch the side lines. Trim and/or sand as necessary. **DO NOT GLUE YET.**
- D. Fix one of the gliders into the rear mount. The nose of the glider should line up with C1 line. To keep the glider positioned, tape it with masking tape to the body tube of the launch vehicle.
- E. Apply glue to the inside of the nose mount. Do not get glue inside the "hood" section of the nose mount. Glue into position so that it is centered on the center line and snug against the glider nose. Make sure the glider is securely in the rear mount. **DO NOT GLUE** the glider to the nose mount.
- F. Repeat above steps A, B, and C with the other glider and the C2 line. **DO NOT GLUE** the nose mount in place yet.
- G. This is an important alignment step. After you have taped the second glider in place make sure the two gliders are exactly opposite each other. One way to insure alignment is to hold rocket vertically (with gliders pointing nose up). The wing panels and body surface of one glider should line up with the other (see illustration).
- H. Glue nose mount for the second glider.
- I. Glue the two forward launch lugs as shown. Place them on either side of the body tube parting line along line "A".



10. SHOCK CORD MOUNT ASSEMBLY



- A. Locate the shock cord mount on page 2 in the patterns section.
- B. Cut out the shock cord mount along the solid black outline.
- C. Crease on dotted lines by folding.
- D. Pull apart tubes, tie a knot at the very end of the loose shock cord.
- E. Spread glue on section 2 and lay knotted end of shock cord into glue at a slight diagonal as shown.
- F. Fold section 1 forward. Apply glue to section 3. Fold forward again.
- G. Clamp firmly with your fingers for two minutes until glue dries.



ROCKET PREFLIGHT

CRUMPLE AND INSERT
3 SQUARES OF
RECOVERY WADDING

FOLD STREAMER IN
HALF 2 TIMES



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.



HOLD ENGINE UPRIGHT,
DROP IN IGNITER

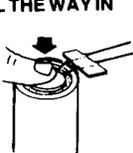


IGNITER
MUST
TOUCH
PROPELLANT



INSERT
IGNITER
PLUG

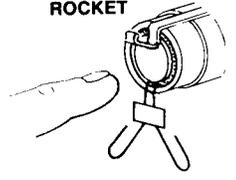
FIRMLY PUSH
ALL THE WAY IN



BEND
IGNITER
WIRES BACK



INSERT
ENGINE INTO
ROCKET



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: B4-2, B6-2 (First Flight), C6-3

To become familiar with your rocket's flight
pattern, use a B6-2 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 152 meters (500 feet) square. The larger
the launch area, the better your chance of
recovering your rocket. Football fields and large
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.

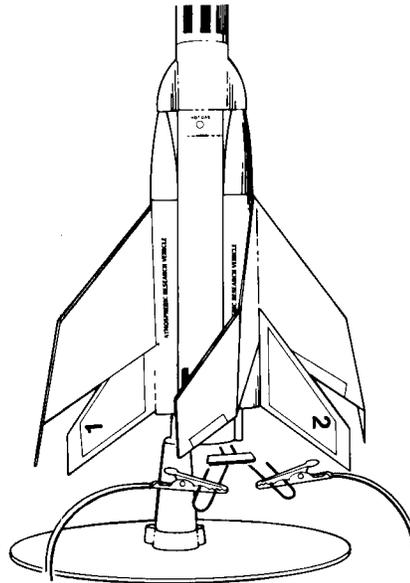
When an ignition failure occurs, remove the
safety key from the launch control system and
wait one minute before approaching the rocket.
Remove the expended igniter from the engine
and install a new one. Be certain the coated tip
is in direct contact with the engine propellant,
then reinstall the igniter 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

Page 10



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

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

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 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.

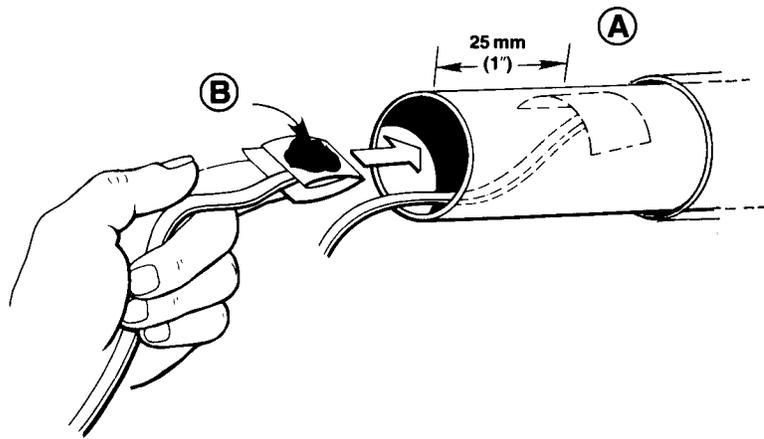
If you use the ultrasafe E2™ or Command™ Launch Controllers to fly your models,
use the following launch steps.

- 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.

11. SHOCK CORD MOUNT ATTACHMENT



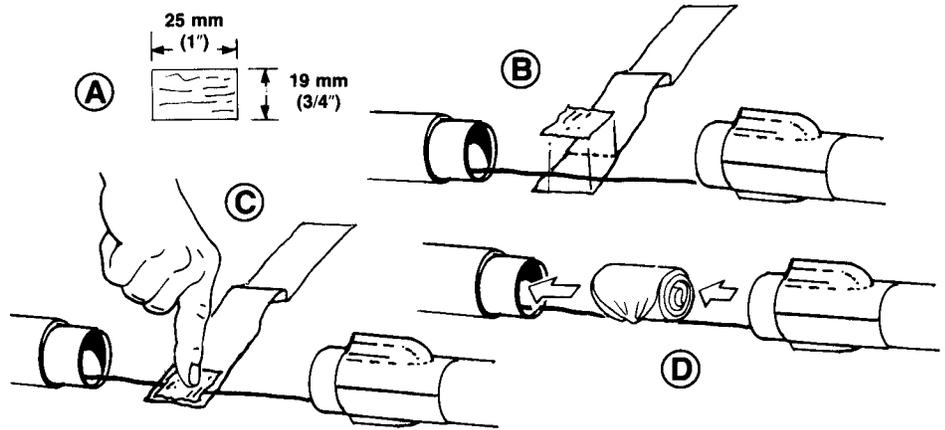
- A. Measure approximately 25 mm (1") from the front end of the rear body tube coupler.
- B. Apply glue to shock cord mount and insert into tube.
- C. Set the mount back at least 25 mm (1") to glue as shown.
- D. Hold until glue sets.



12. RECOVERY DEVICE ATTACHMENT



- A. Cut a 25 mm (1") long piece of 19 mm (3/4") wide masking tape.
- B. Lay end of shock cord over end of streamer material as shown and tape shock cord and streamer together.
- C. Press tape down firmly to assure a strong bond.
- D. Roll streamer, insert streamer, shock cord and nose cone into body tube. Recovery device should slide easily into body tube. If too tight, unfold and repack.

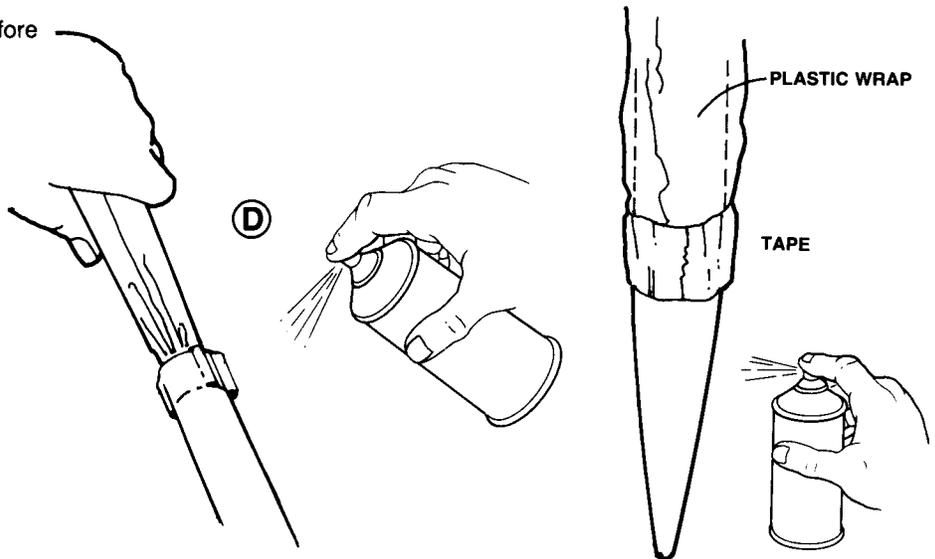


13. FINISHING YOUR ROCKET



NOTE: Read this section completely before painting 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. This 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. Make a handle by rolling a piece of paper. Insert it into the rocket while painting. Allow to dry. Use spray enamel to paint your model rocket.
- D. Refer to the illustration on the front of the color panel for paint locations and decal placement.

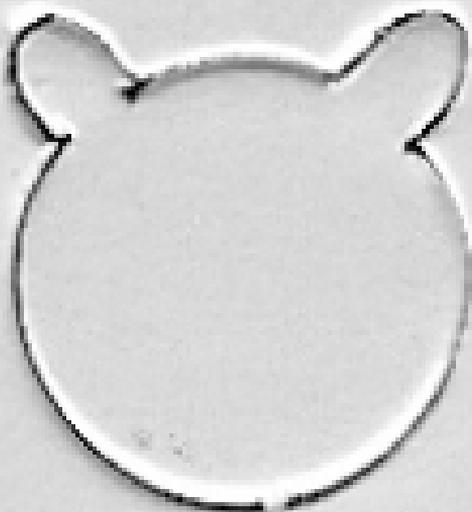


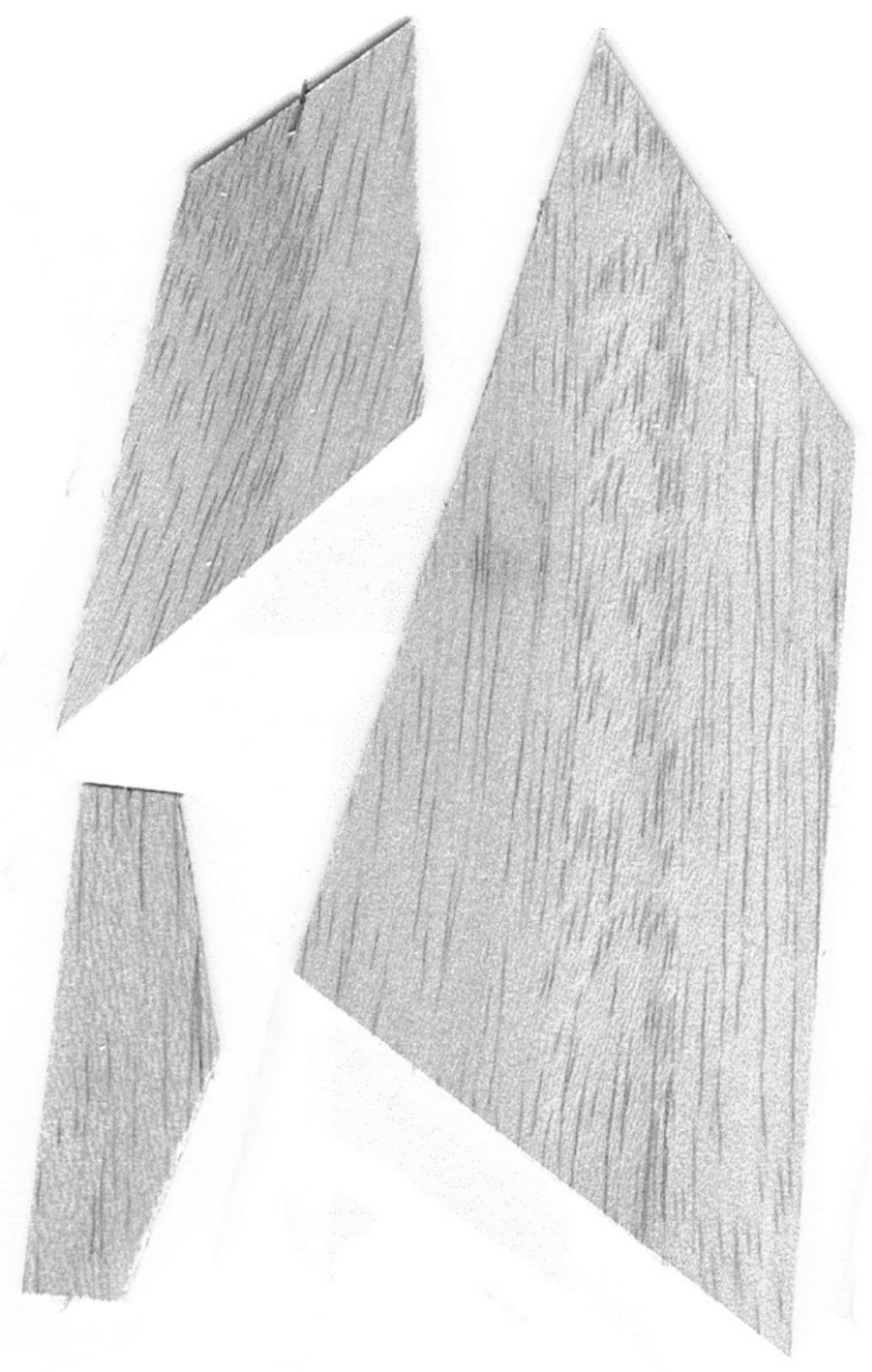
WHAT TO EXPECT WHEN FLYING YOUR A.R.V. CONDOR™ ROCKET

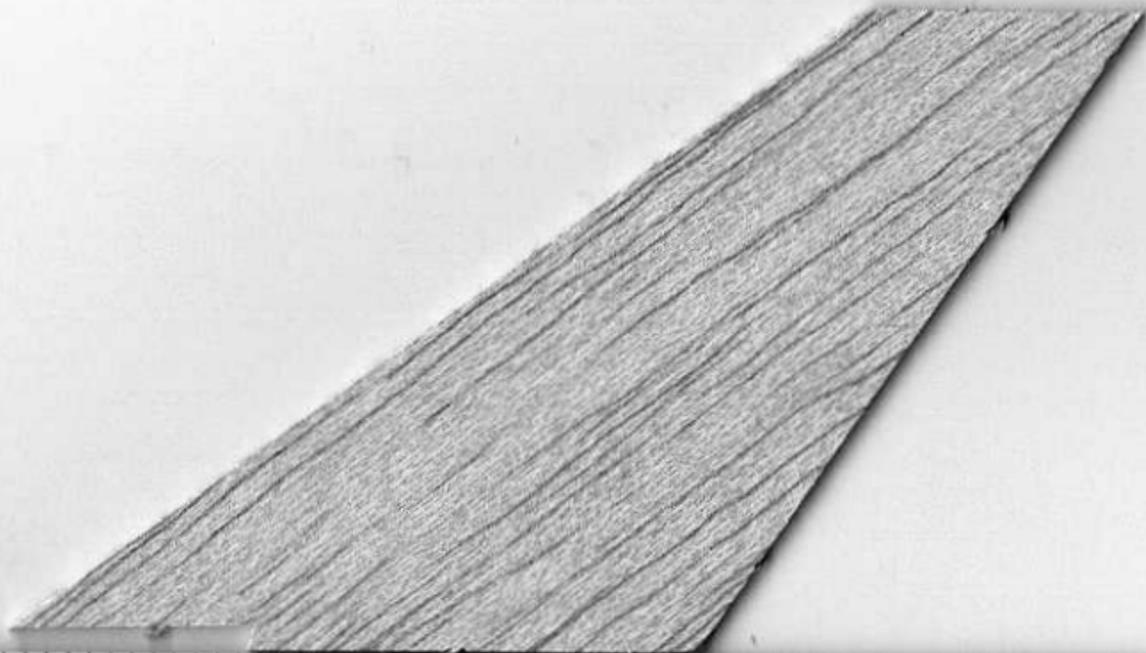
If you've built your A.R.V. Condor™ straight and true, with all dimensions matching the instructions, you should expect a straight-up boost. When the ejection charge fires, the launch vehicle will separate releasing the two drone gliders. The launch vehicle will

return to earth with the streamer to slow its descent. If you've balanced the gliders properly, they will glide in large circles as they head down to land.









**Liberty
National
Bank**

of Northern Kentucky

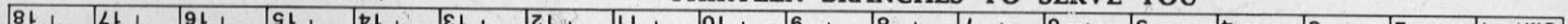
3414 DIXIE HIGHWAY
ERLANGER KY 41017
727-7200

MAIN OFFICES

7000 DIXIE HIGHWAY
FLORENCE KY 41042
727-7330

34 N. FORT THOMAS AVENUE
FORT THOMAS KY 41075
727-7300

THIRTEEN BRANCHES TO SERVE YOU



Skill Level 2

Booster with Twin Gliders

Body Tube Length: BT 50 - 6" and 8.2"
BT 5 - 4"

Balsa Fin Stock: 1/16"

Booster Length: 18.5 "

Booster Diameter: .976"

Booster Weight: 1.1 oz

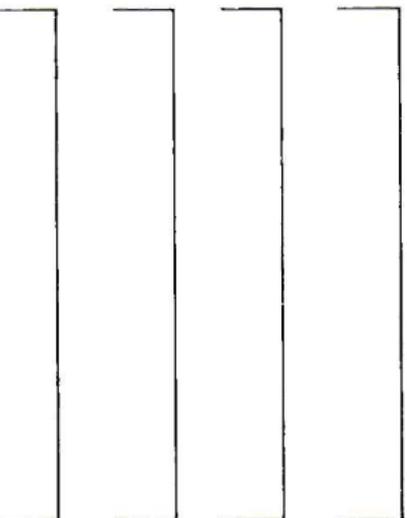
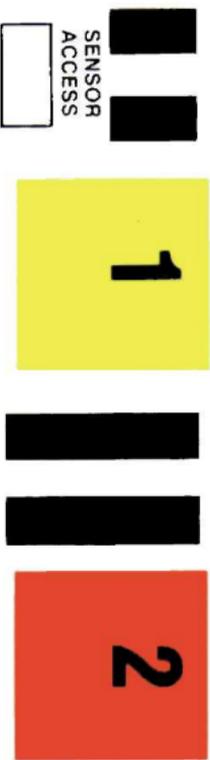
Glider Length: 6.13"

Glider Diameter: .544"

Wing Span: 10.63"

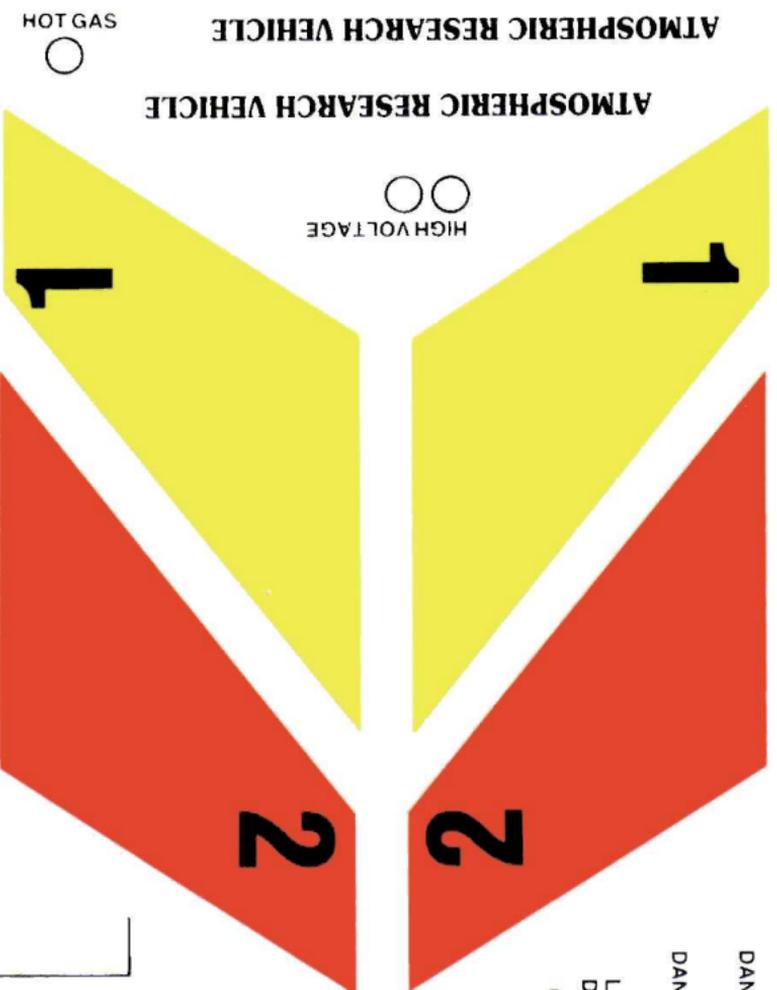
Weight: .5 oz

Recommended Engines: A8-3 (First Flight), B4-2, B6-2, B6-4, C6-5

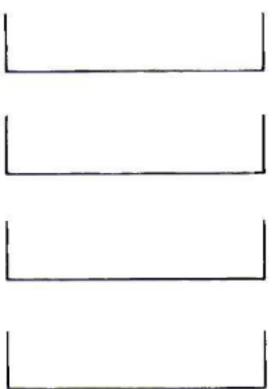
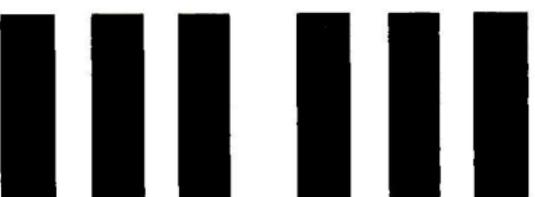


U S U S
A A

ESTES INDUSTRIES PN 37587



DANGER
DANGER
LOCK
DOWN



ATMOSPHERIC RESEARCH VEHICLE **NO STEP**
ATMOSPHERIC RESEARCH VEHICLE **NO STEP**