



# Rain Maker™

FLYING MODEL ROCKET

#2009

The Rain Maker™ is a model of a purely imaginary rocket. It does, however, have a somewhat factual background. The basic design of the model is reminiscent of two stage sounding rockets which were flown during the 1950s and '60s. On several occasions sounding rockets were used in cloud-seeding experiments in an attempt to produce rain over drought-stricken areas of the country. These experiments were only partially successful. To enhance the rainmaking capabilities of our fanciful model, it has a decor based on Southwest American Indian art. The Southwestern Indians performed (and sometimes still perform) ceremonial dances designed to please the Rain Gods and therefore bring moisture to corn and grain crops in the normally dry high desert country. We make no claim that our combination of science and legend will produce positive results. We do, however, suggest that you take an umbrella with you to the launch site.



A DAMON COMPANY

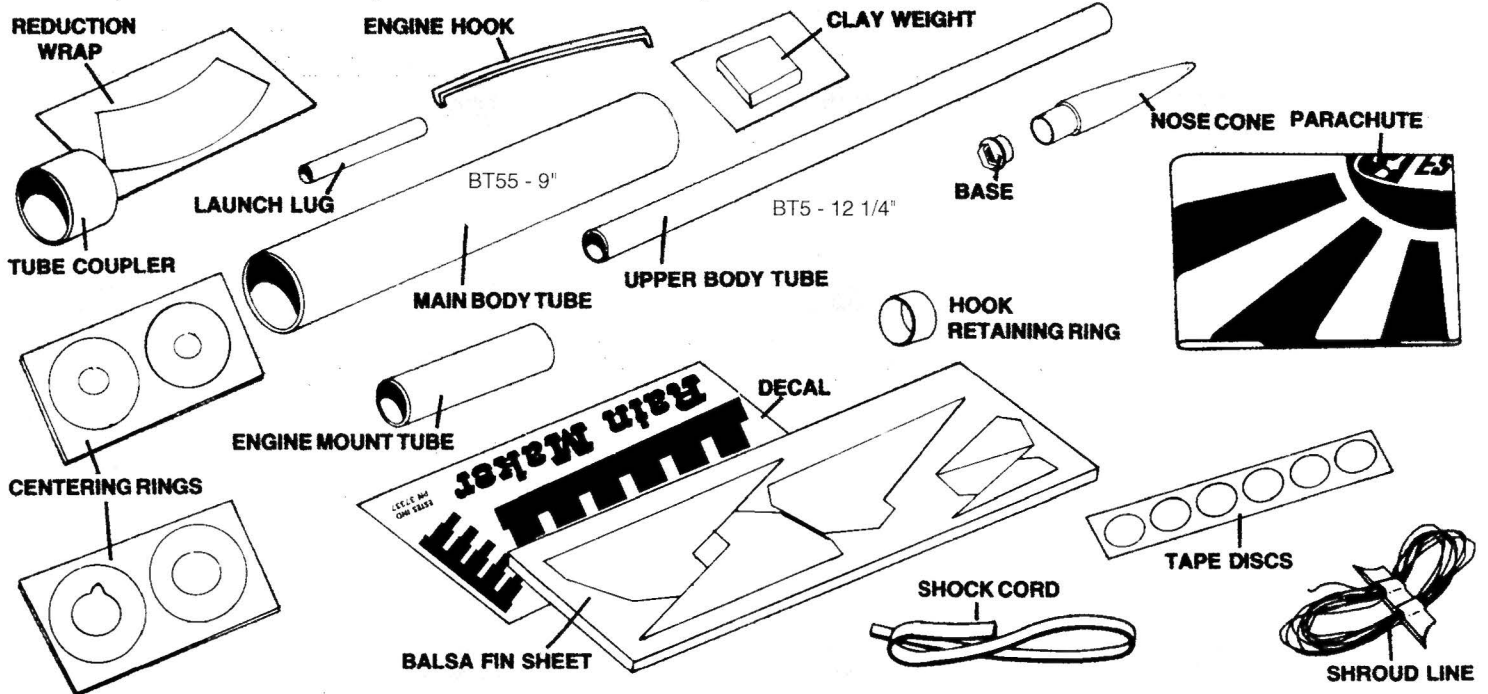
**ESTES INDUSTRIES**  
1295 H St.  
Penrose, CO 81240 USA

## ASSEMBLY TIP

Read all instructions before beginning work on your model. Make sure you have all parts and supplies. Test-fit all parts together before applying any glue. If any parts don't fit properly, sand as required for precision assembly.

## PARTS

Locate the parts shown below and lay them out on the table in front of you.



## SUPPLIES

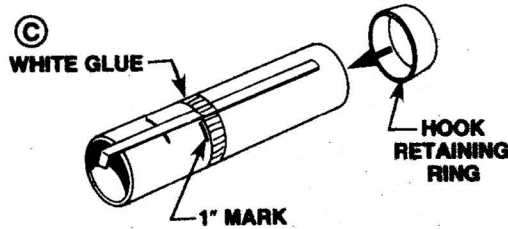
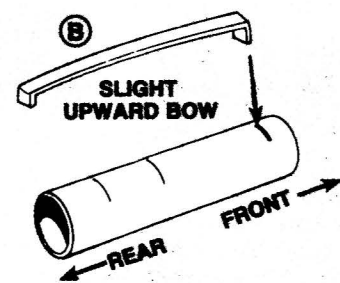
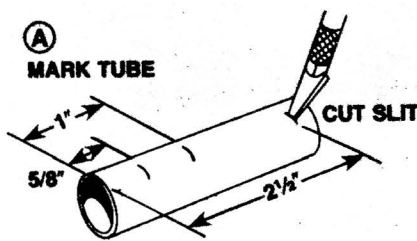
In addition to the parts included in the kit you will also need:



# ROCKET ASSEMBLY

## 1.

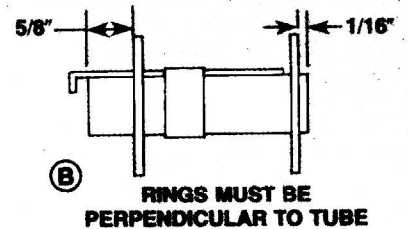
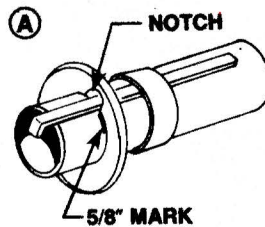
- Mark engine mount tube at 5/8 inches, 1 inch, and 2 1/2 inches from one end. Cut 1/8 inch long slit at 2 1/2 inch mark.
- Gently bend engine hook so it has a very slight upward bow. Insert one end of engine hook into slit. Make sure hook runs straight along tube.
- Apply a bead of glue around tube just above the 1 inch mark. Slide hook retaining ring over end of tube and push down to the 1 inch mark.
- Smear a film of glue over the upper portion of the engine hook.



## 2.

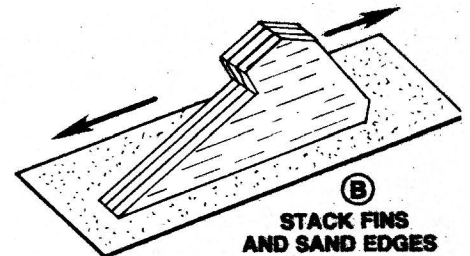
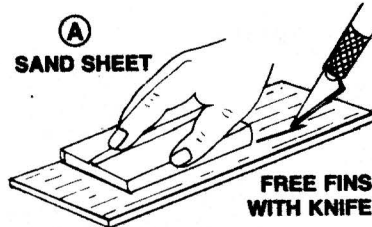
Note: There are two die-cut ring sets in this kit. One ring set has a larger inside diameter opening which fits around the engine mount tube. This is the set you will use in this step.

- Use a hobby knife to free the rings from the card. Slide the notched ring onto the rear of the tube with the notch centered over the engine hook. Slide the ring up to the 5/8 inch mark and glue it in place. Make sure the ring is perpendicular to the body tube and allow glue to dry.
- The remaining ring is glued to the front of the tube about 1/16 inch from the end.



## 3.

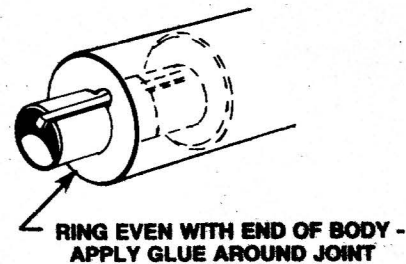
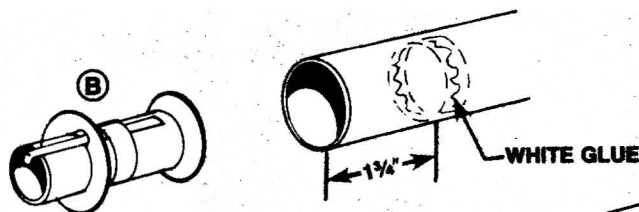
- Sand both sides of the balsa sheet. Free the die-cut fins with a hobby knife.
- Stack the three large fins together and sand edges square. Do the same with the three small fins.



## 4.

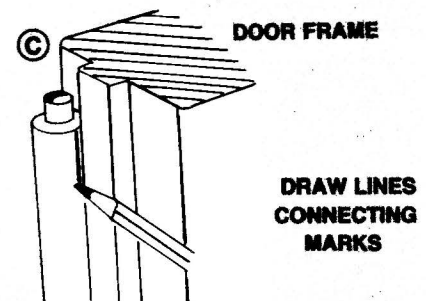
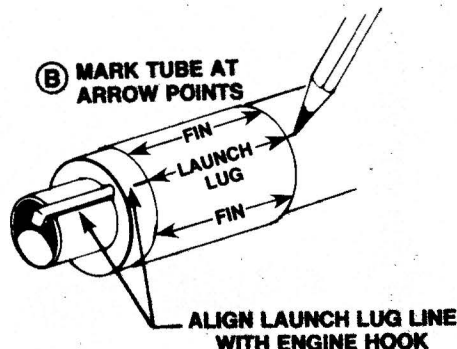
Do not proceed with this step until glue on mount is COMPLETELY DRY.

- Check fit of mount in main body tube. If fit is too tight, sand inside edge of body tube and outside edges of rings until a good fit is obtained.
- Apply a bead of glue around inside of body tube about 1 3/4 inches from one end. Slide mount into tube and push forward until rear ring is even with rear of tube. Apply a bead of glue around joint between ring and body. Wipe away excess glue.
- Stand body on its front end and allow glue to dry.



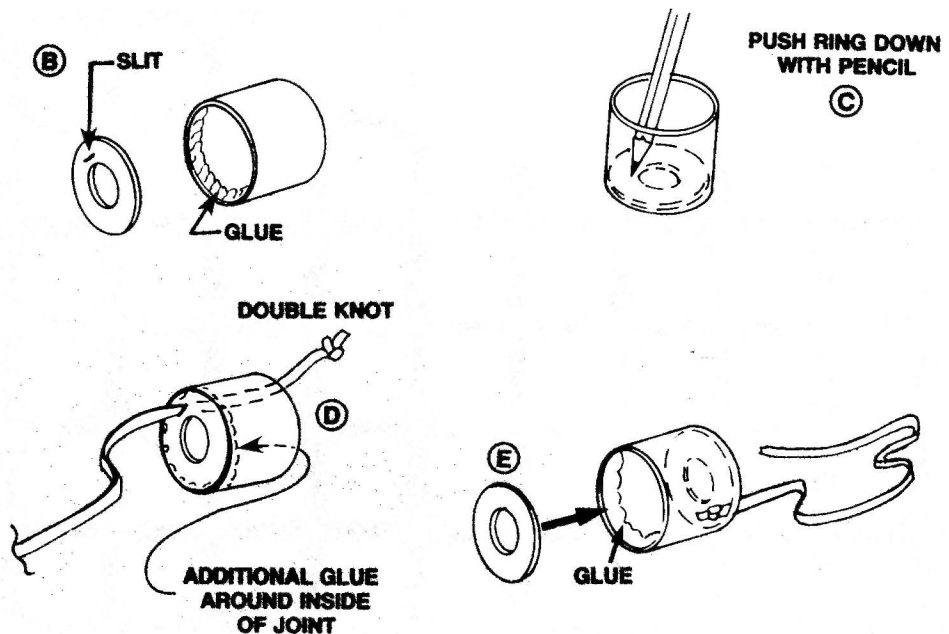
## 5.

- Cut the BT-55 body marking guide from page 5 of these instructions. Wrap the guide around rear of body and tape ends together.
- Rotate guide so the launch lug line is aligned with the engine hook. Mark the body at each of the arrow points, then remove guide.
- Using a door frame as a guide, draw lines on the body at the marks. Fin lines should extend from the rear of the body forward about 3 inches. The launch lug line should extend the entire length of the tube.



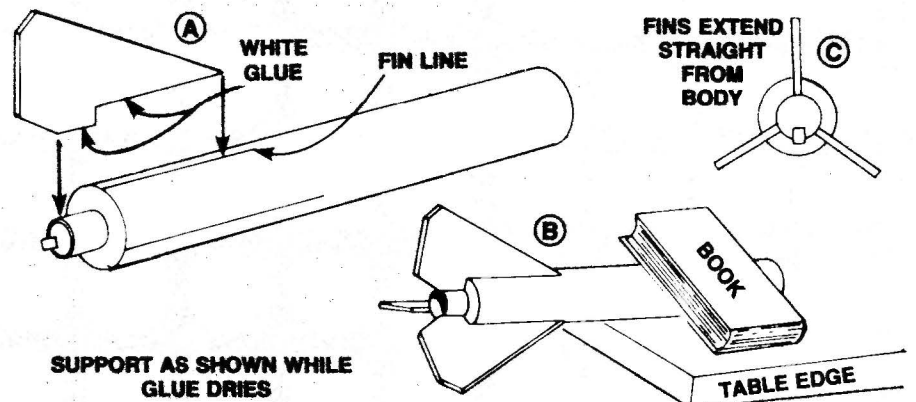
## 6.

- Free the remaining set of rings from die-cut card.
- One ring has a small slit in it. Use this ring first. Apply a bead of glue around the inside of one end of the tube coupler and push ring into the end of the coupler.
- Place the coupler on a flat surface and push down on ring so it is even with end of coupler all around. Let glue dry.
- Place the point of the knife blade into the slit and rock it back and forth to enlarge the opening just enough so the shock cord will slide through the slit. Push the shock cord through the slit and tie a double knot in the end of the shock cord. Pull the cord back until the knot is against the inside of the ring. Since this ring will absorb deployment shock, apply a reinforcing bead of glue around the inside of the ring-coupler joint.
- Apply a bead of glue around the inside of open end of coupler and glue remaining ring in place.



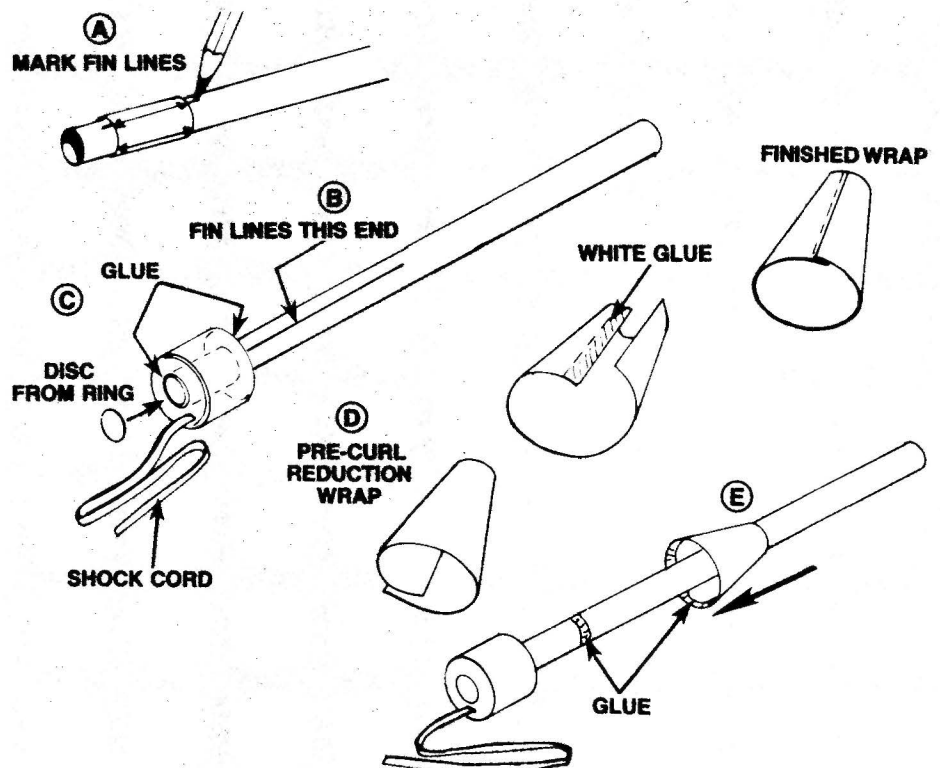
## 7.

- Apply glue to the root edge of a large fin. Attach the fin to the body with the fin centered on a fin line. Make sure the fin extends straight out from the body.
  - Support the rocket as shown with the fin extending straight up until glue is completely dry.
  - Attach the remaining fins in the same manner. Be sure to allow glue to dry on one fin before attaching the next fin.
- FINS MUST BE ATTACHED CORRECTLY FOR STABLE FLIGHT**



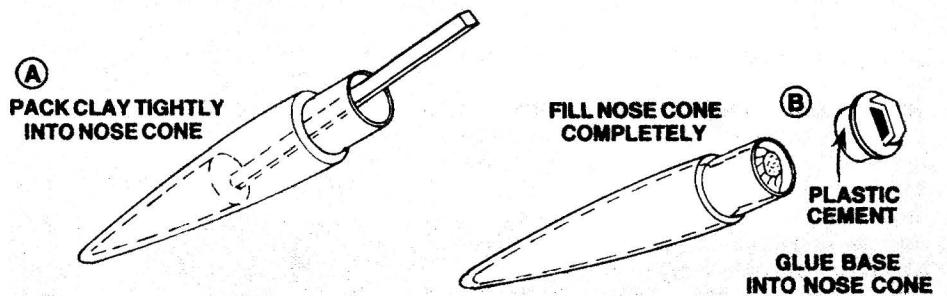
## 8.

- Cut the BT-5 marking guide from page 5. Tape guide around one end of upper body tube and mark fin lines. Using door frame as a guide, extend fin lines along tube about 5 inches.
- Insert end of tube with fin lines into top of coupler assembly. Push tube through until it extends about 1/16" from bottom of coupler. NOTE: Shock cord extends from bottom of coupler.
- Apply a bead of glue around ring-body tube joints. Glue the disc (from center of one ring) over the bottom of the body tube.
- Carefully cut the reduction wrap from printed card. Gently curl wrap, a little at a time, until it retains curled shape when released. Apply glue to gluing tab area and glue ends together with gluing tab underneath. Make sure the outer edge of the wrap is positioned exactly on dotted line of gluing tab.
- Slide wrap over top of body tube. If fit is too tight, lightly sand inside top edge of wrap. Slide wrap down until it fits over coupler. Draw a line around tube at top of wrap. Remove wrap. Apply a bead of glue around inside bottom edge of wrap and around pencil line on body tube. Slide wrap onto tube and push down until it is firmly seated on coupler. Wipe away any excess glue.



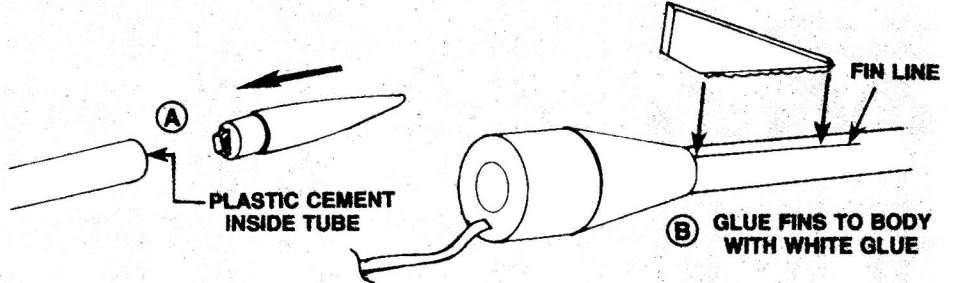
## 9.

- Remove the piece of clay from the plastic bag. Pinch off a very small amount of clay and drop it into nose cone. Use a piece of scrap balsa to pack the clay tightly into the end of the nose cone. Keep packing small amounts of clay into nose cone until it is filled with tightly packed clay. There will be a small amount of clay left. This is discarded.
- Push the base into the nose cone and remove. Scrape away any clay from the bottom edge of the nose cone. Apply plastic model cement around the edge of base and glue it into nose cone.



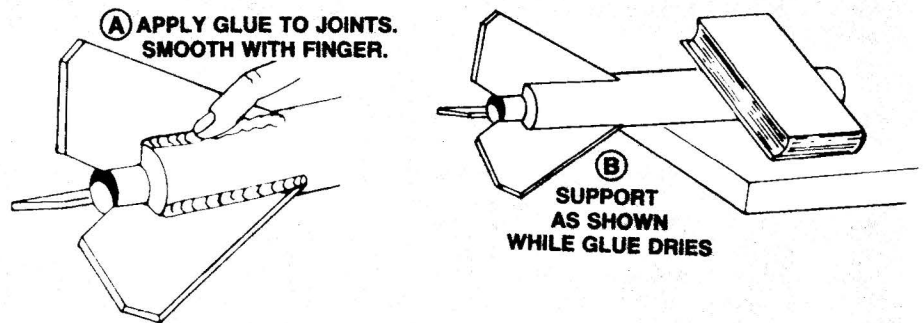
## 10.

- Apply plastic cement around inside of top of upper body tube. Socket nose cone into place.
- Attach the small fins to the upper body as shown. Make sure fins extend straight from body.



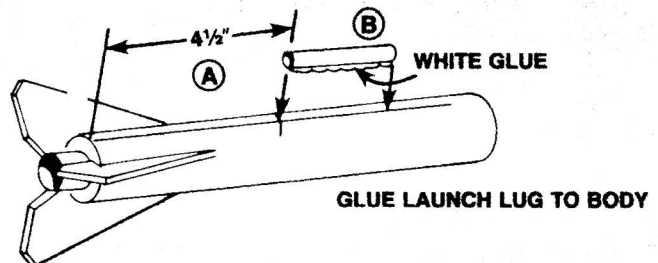
## 11.

- Apply a bead of glue to the joint between main body and one fin. Pull your finger along joint to smooth glue into an even fillet and to remove excess glue. Repeat this process on both sides of three fin-body joints.
- Support model in horizontal position as shown while glue dries. When the glue on the upper body fins is dry (step 10), fillet those fins in the same manner.



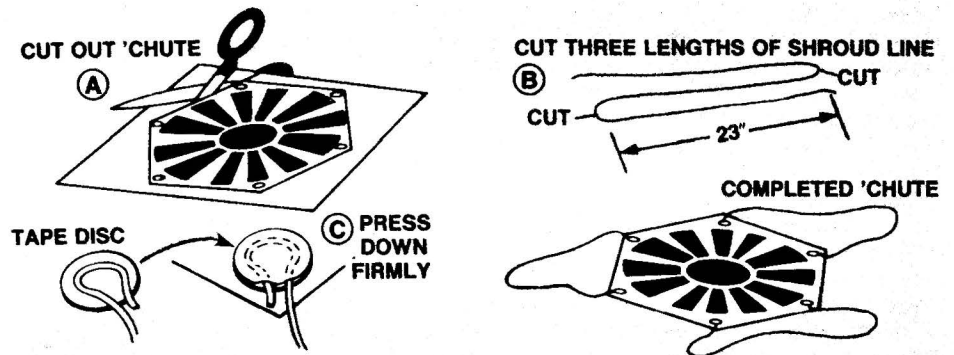
## 12.

- Place a mark on the launch lug line  $4\frac{1}{2}$  inches from rear of main body tube.
- Apply a bead of glue to the launch lug and glue to body centered on the line and with rear edge of lug on  $4\frac{1}{2}$  inch mark. Adjust lug so it runs straight along body. Allow glue to dry, then apply small glue reinforcements to both sides of the body-launch lug joint.



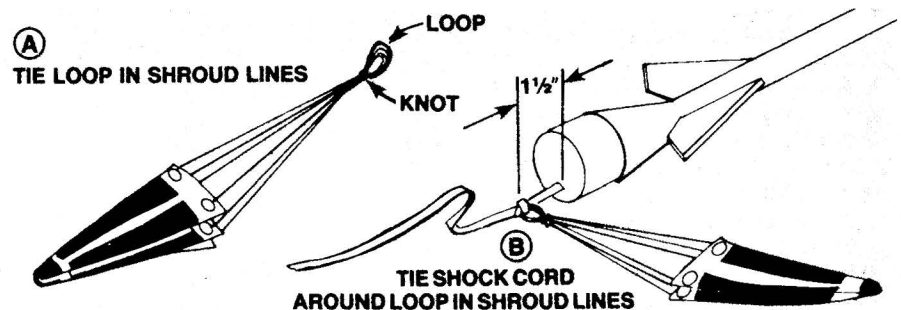
## 13.

- 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.



## 14.

- Hold the 'chute at its center point and pull shroud lines tight. Tie the free ends of the shroud lines into a small loop.
- Insert the end of the shock cord through the loop. Slide the shroud line loop along the shock cord until it is about  $1\frac{1}{2}$  inches from the coupler. Tie shock cord around loop to keep 'chute in place.



# 15.

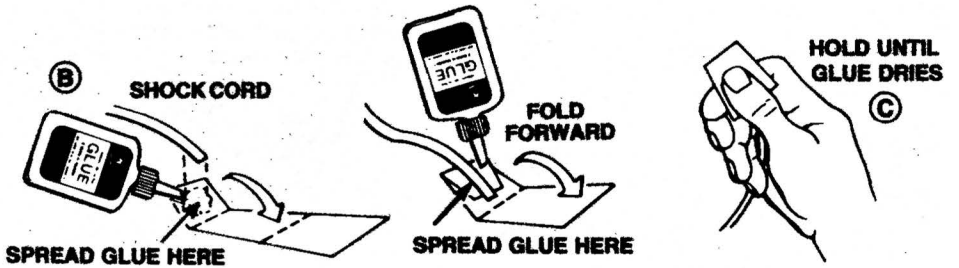
Make sure the glue fillets on the fins are completely dry before proceeding with this step.

- A. Brush a coat of sanding sealer on all exposed surfaces of the fins. Let sealer dry, then lightly sand. Repeat the sealing and sanding process until balsa grain lines are filled and parts feel smooth.



# 16.

- A. Cut shock cord mount from page 5 of the instructions.
- B. 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.
- C. Clamp unit together with fingers until glue sets.



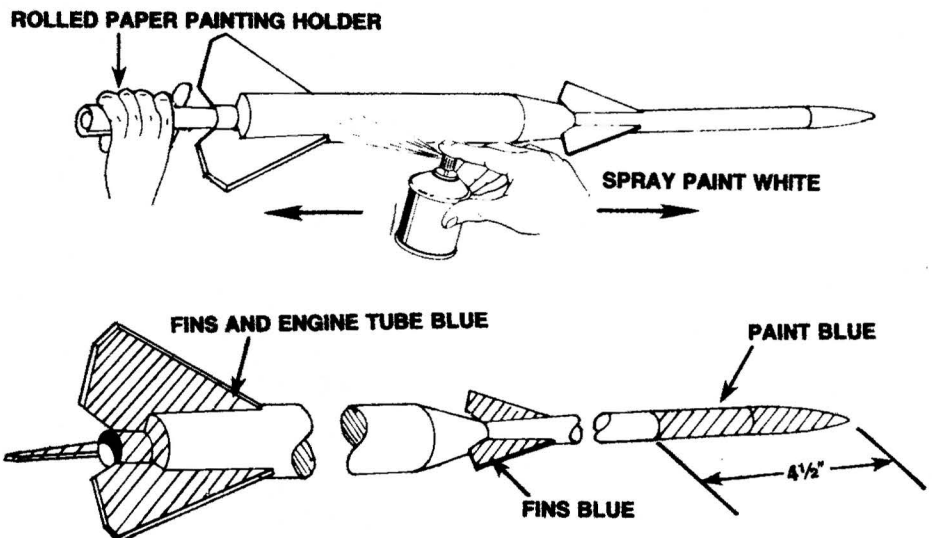
# 17.

- A. Apply a film of glue inside front of the body at least 1 1/2 inches from the end. The glue area must be at least as large as the shock cord mount. Press the shock cord mount into the glue molding the mount with your finger to fit the contour of the tube. After the glue is dry, smear a film of glue over the mount and surrounding body area.



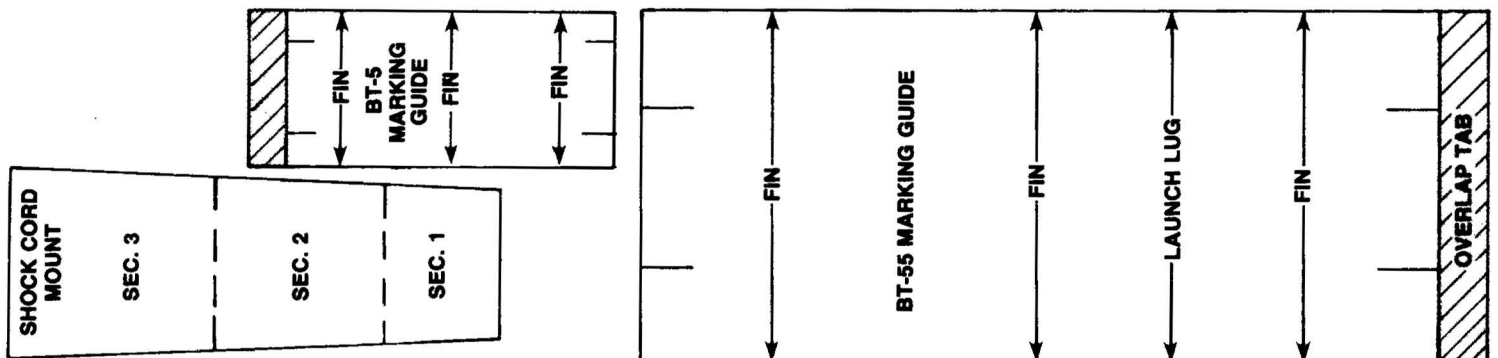
# 18.

The basic rocket color is white. It is recommended that enamel in a spray can be used for spraying the model. The fins and upper portion of the upper body are turquoise blue. You may wish to spray the blue areas. In that case, it will be necessary to mask off the areas which remain white with paper and masking tape after the white paint is thoroughly dry. If you cannot find turquoise paint, a light blue will look O.K. An alternate method to masking and spraying is to brush paint the blue areas. We used a type of paint called Pactra Acrylic Enamel to paint our model. This paint goes on smoothly, dries fast, and brushes may be cleaned with water. We used A5 Gloss Sea Blue with a small amount of A8 Gloss Lemon Yellow mixed into it to obtain the turquoise blue color. Since this paint is water-base it will not "soften" the white enamel base color.



This is a definite advantage for brush painting. Use a small brush to carefully paint along the color demarkation lines. A larger brush may be used to fill in the blue areas. The first coat of paint will not cover well. Don't keep brushing over it. Just let the paint dry. The second coat will look much better. If necessary, a third coat may be applied after the second has dried.

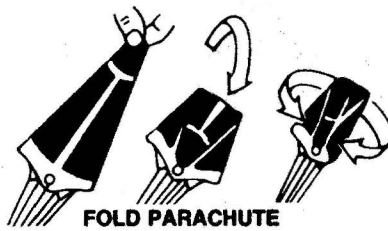
After allowing paint to dry for 2-3 hours, decals may be applied. Refer to photos on kit panel and front of instructions for decal placement. Cut a decal from the sheet and soak in water until decal slides on backing sheet (20 to 30 seconds). Slip decal off backing sheet and onto model. Position decal where desired, then gently blot away water with a soft cloth.



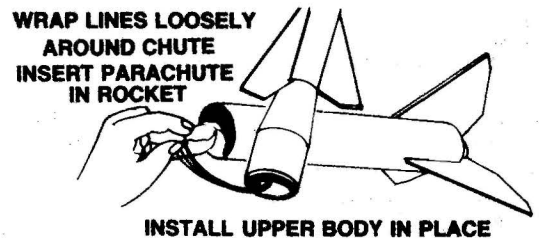
## ROCKET PREFLIGHT



CRUMPLE AND INSERT  
3 SQUARES OF RECOVERY WADDING



FOLD PARACHUTE

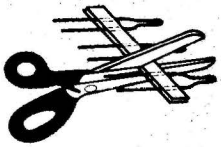


WRAP LINES LOOSELY  
AROUND CHUTE  
INSERT PARACHUTE  
IN ROCKET

INSTALL UPPER BODY IN PLACE

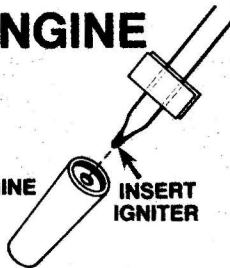
## PREPARE ENGINE

SEPARATE THE IGNITERS

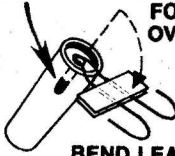


ENGINE

INSERT  
IGNITER



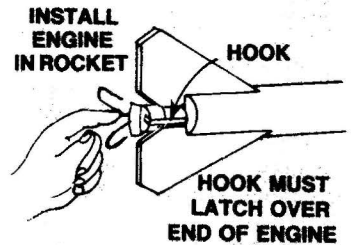
IGNITER TIP MUST TOUCH  
PROPELLANT DEEP INSIDE  
NOZZLE OPENING



FOLD  
OVER

BEND LEADS

APPLY AND FIRMLY  
PRESS TAPE DISC  
OR MASKING  
TAPE IN PLACE



INSTALL  
ENGINE  
IN ROCKET

HOOK

HOOK MUST  
LATCH OVER  
END OF ENGINE

## LAUNCH SUPPLIES

To launch your rocket you will need the following items:

- Estes Electrical Launch System
  - Estes Recovery Wadding (No. 2274)
  - Recommended Estes Engines: A8-3, B4-4, B6-4, B8-5, or C6-5.
- To become familiar with your rocket's flight pattern, use an A8-3 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 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.

Don't leave parachute packed more than a minute or so before launch during cold weather, [colder than 40° Fahrenheit (4° Celsius)].

Parachute may be dusted with talcum powder to avoid sticking

## MISFIRES

Failure of the model rocket engine to ignite is nearly always caused by incorrect igniter installation. 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.

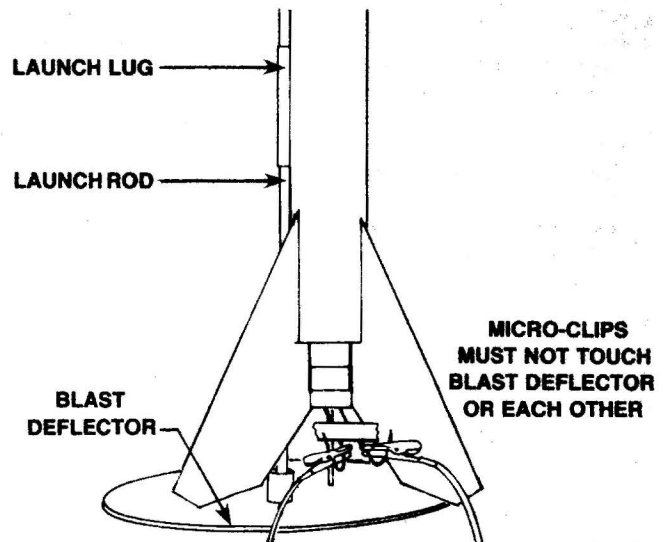
When an ignition failure occurs, remove the safety key from the launch control system and wait one minute before approaching the rocket. Remove the expended igniter from the engine and install a new one. Be certain the coated tip is in direct contact with the engine propellant, then tape the igniter leads firmly to base of engine as illustrated above. Repeat the countdown and launch procedure.

## FOR YOUR SAFETY AND ENJOYMENT

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

\*National Association of Rocketry-The Hobby Industry of America

## COUNTDOWN AND LAUNCH

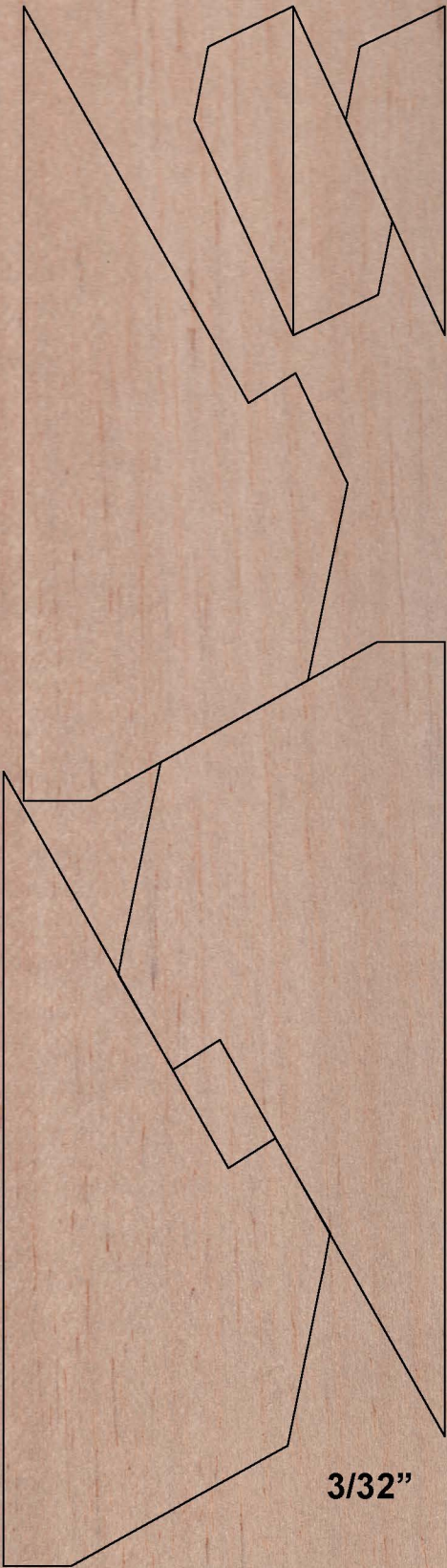


- ⑩ REMOVE SAFETY KEY to disarm the launch controller.
- ⑨ Remove safety cap and slide launch lug over launch rod to place rocket on launch pad. Make sure the rocket slides freely on the launch rod.
- ⑧ Attach micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the 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).
- 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—Replace cap on rod.

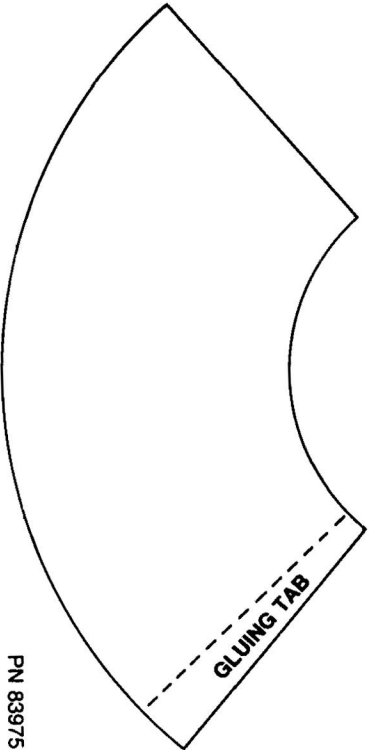


3/32"

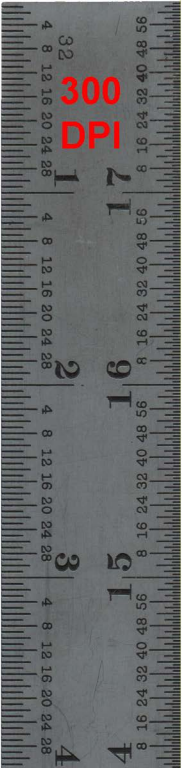


300  
DPI

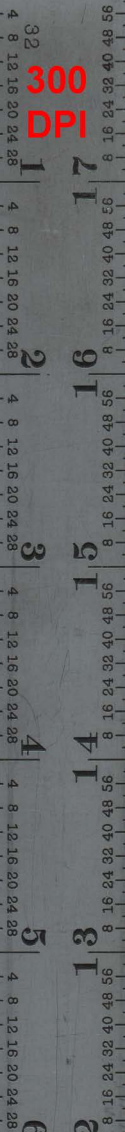
No. C303SR



PN 83975



300  
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**W**

**W**

**Rain Maker**

ESTES IND.  
PN 37337

## PARTS LIST KIT NO. 2009 - Rain Maker

Quantity	Description	Type	Number	Detail1	Detail2	Detail3	Detail4	Comment
1	Shroud Wrap	N/A	83975	110 lb. stock				Scan
1	STAGE COUPLER	JT-55C	30262	1.25" ID	1.28" OD	1.3" long	fits BT-55	
1	LAUNCH LUG	LL-2B	38178	5/32" ID	1/8" rod	2-3/8" long		
1	ENGINE HOLDER	EH-2	35025	2.8" long	.100" wide	.025" thick		Reg. & D
1	NOSE CONE WEIGHT	CB-M4	85264	1" wide	1" high	1/2" thick	.5 oz.	CLAY NOSE CONE WEIGHT
2	PAPER ADAPTER	RA-555	30119	.542" ID	1.27" OD	.05" thick		BT-5 in BT-55
1	PAPER ADAPTER	RA-2055	30125	0.738" ID	1.27" OD	.05" thick	Set of 2	
1	PAPER BODY TUBE	BT-55IJ	30384	9" long	1.283" ID	1.325" OD	0.021" wall	
1	PAPER BODY TUBE	BT-20J	30326	2.75" long	0.710" ID	0.736" OD	0.013" wall	Glassine
1	PAPER BODY TUBE	BT-5?	?????	12.25" long	0.515" ID	0.541" OD	0.013" wall	
1	PLASTIC NOSE CONE	PNC-5A	72600	2.125" long	.541" dia.	.375 shoulder	2.5" Total Length	Use with 72601 insert
1	NOSE CONE INSERT	PIN-5	72601		.541" dia.		Glue on	Base with shock cord attachment
1	MYLAR RETAINER RING	HR-20	30168	.774" ID	.25" wide			Fits over BT-20
1	Parachute	PK-12	85564	12" dia.				
1	Shroud Line	SLT-72	38237	72"				
1	Tape Disc	TD-3F	38406	1/2" dia.				6x
1	Shock Cord	SC-1	38367	25" long	1/8" wide			Rubber
1	Decal	KD-2009	37337	6" long	3" wide	Blk/Red	Waterslide	Scan
1	BALSA FIN STOCK	BFS-30	3168	3/32" thick	3" wide	9" long		Scan



# RAINMAKER™

## FLYING MODEL ROCKET

### FEATURES

- "CLOUD BENDER"™
- 1/2 inch "Chute Recovery"
- Quick Release Engine Mount
- Die-Cut Score Lines

Length: 20 1/2" x 1 1/2" dia.  
Wgt: 2.00 oz. x 1.00 oz.  
Wings: 1.00" x 1.00"  
Recommended Engine:  
Aerotech® #A14, #A14  
#A14 #A14, #A14

LAUNCH TO  
600 FOOT  
ALTITUDES!



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the joys of model rockets,  
visit our website at  
www.aerotech.com

#2009

