

# BREAK-AWAY

A SPECIAL PARACHUTE DURATION MODEL ROCKET

## ASSEMBLY INSTRUCTIONS:

Start assembly of nose cone by putting a thin coat of plastic (styrene) cement around the inside. Rub cement with the end of your finger to smooth it out and remove excess. Use cement sparingly as it will melt nose cone.

Insert adapter into nose cone then slip nose cone into body tube to insure alignment. With a twisting motion, carefully remove nose cone from body tube and allow to dry.

Before starting construction the interior of the body tube can be strengthened with model airplane dope or polyester resin from the engine liner forward. Insert two cotton balls in rear of body tube and then push a used engine, nozzle forward, against the cotton until engine is flush with rear of tube. Pour dope into top of body tube. Immediately push engine from rear with a rod or dowel out of top of tube. Do not stop until engine is out of tube. As engine approaches end of tube, tilt tube and collect excess dope in container. Allow to dry. Repeat as necessary until inside of body tube is smooth.

Glue nose cone into front end of body tube. Sand junction lightly with fine sandpaper until smooth.

Cut body tube for Break-away as shown. See instructions.

Construct parachute. See instructions.

Glue 1" connector to front edge of rear body section so that it protrudes 1/4". When dry, trim to shape shown. Cut a 2" piece of soft wire and bend hairpin hook to shape and glue to inside of connector. Reinforce with small piece of silk covered with glue. When dry, put shock cord thru wire loop, remove paper backing from 1" piece of paper tape and wrap around shock cord while stretching rubber.

Glue balsa adapter to upper body section with 3/16" protruding beyond rear edge. Make a hole thru balsa adapter with a pin. Cut soft wire to 2 1/2", form loop on one end, push other end thru hole in adapter and bend back into balsa. Insert free end of shock cord from rear body tube thru wire loop in adapter and tie with 1" piece of paper tape. Coat end facing engine with white glue for protection from engine ejection charge and to hold hook in place.

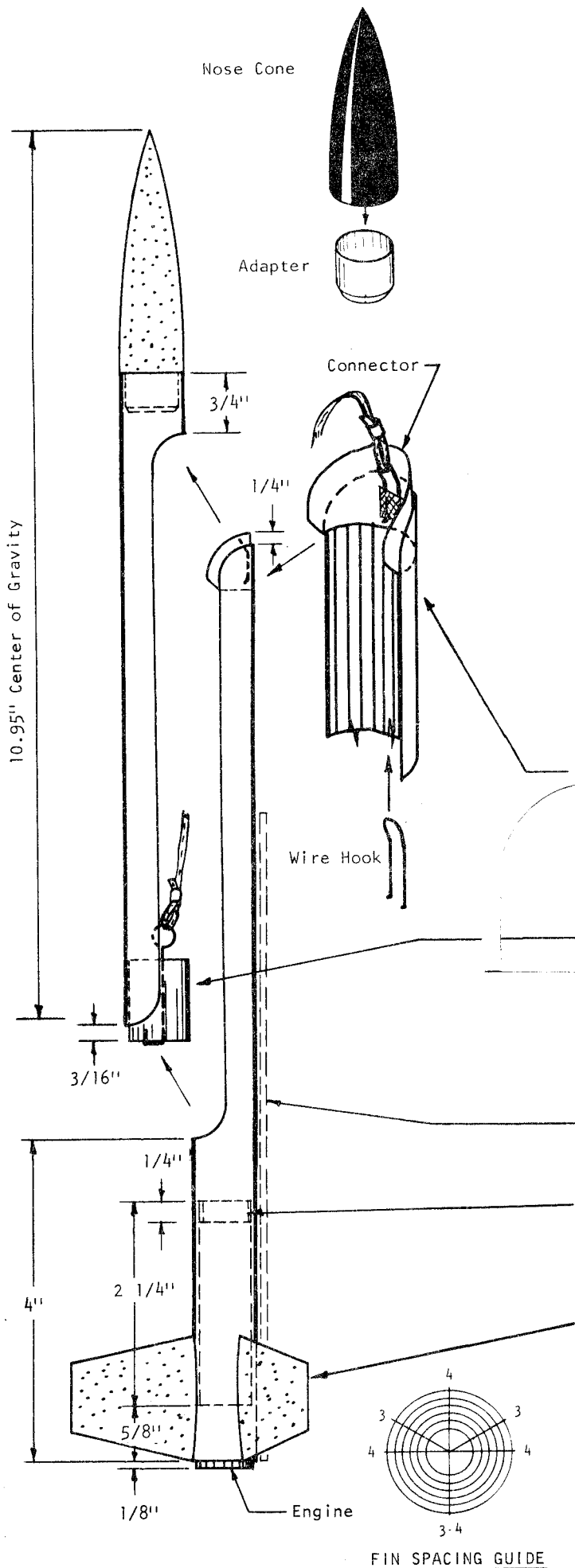
Build pop launch lug. See separate instructions.

Glue engine stop flush with front edge of 2 1/4" liner. Insert an engine into liner, smear glue around body tube 1 1/2" from bottom, push engine with line into body until 1/8" of engine protrudes. Remove engine.

Sand fins to an airfoil shape. The front (leading) edge should be rounded while the rear (trailing) edge should be sharp like a knife. The root edge (part that glues to the body) should be straight and square. Sand body tube at fin locations.

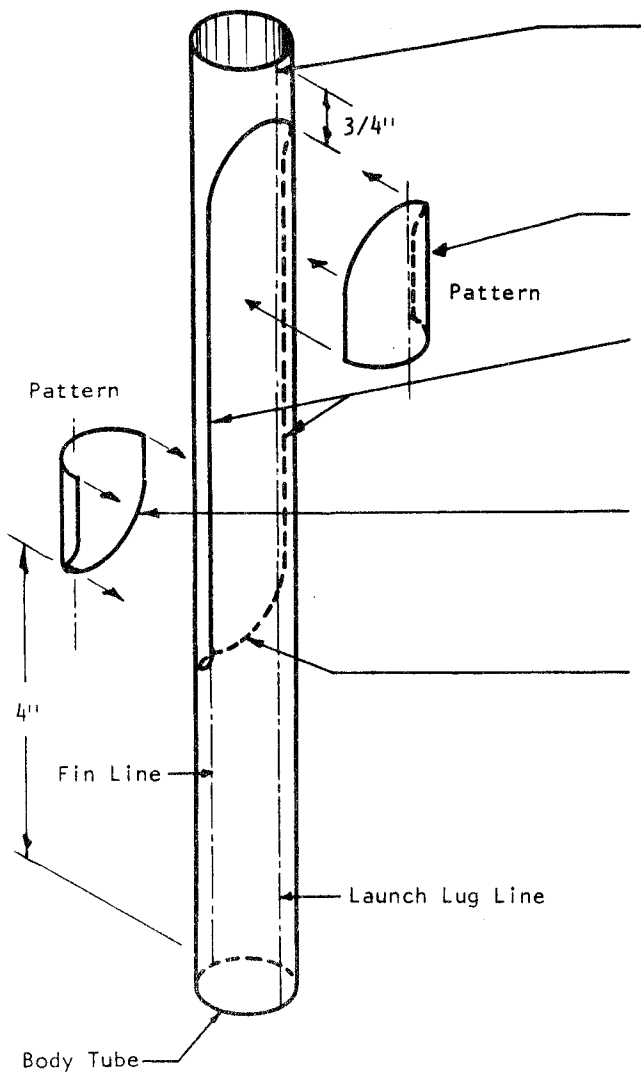
Using the fin spacing guide, center the end of the body tube in the circles and mark at the 3. Use a "V" notch of a drawer or door frame and draw a line at the mark parallel to the body. Glue the three fins on this line flush with the bottom of the body. When dry, apply a glue fillet on each side of all fins.

Finish the rocket by filling all wood surfaces with sanding sealer. Coat several times sanding between each coat until wood is smooth. Coat body tube with sanding sealer and sand until smooth. Paint entire rocket, except nose cone, with a bright color.



FIN SPACING GUIDE

## BODY TUBE CUTTING INSTRUCTIONS:



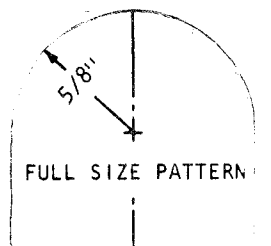
Seal body tube with sanding sealer before cutting. Place body tube in CMR Body Tube Cutter or "V" notch of a drawer and run a pencil along the top of the cutter or drawer against the tube for its complete length. This is the starting line and alignment guide for the "Pop" lug.

Cut out pattern and wrap around body tube until round end is 3/4" from top and center line follows long line on tube. Draw a pencil line around pattern.

Place tube in CMR Body Tube Cutter, or "V" notch in drawer, and draw two pencil lines along tube, connecting to the two lines already drawn around the pattern. Extend these lines until they are 4" from the bottom of the tube.

Turn the pattern around and place it on the body tube so that the round end is 4" from the bottom and on the side opposite the other pattern lines. Align the edges with the two lines drawn from the pattern before. Draw a pencil line around the pattern. Place a mark on the tube at the center line of the rounded end of the pattern. From the mark, draw a straight line to the bottom of the body tube. This locates the first fin.

Place body tube in CMR Body Tube Cutter. Place a blade flat on top of the cutter and cut along straight lines. (If a body tube cutter is not available, cut by hand.) Carefully cut along the curved lines drawn with the pattern until the body tube comes apart in two opposing parts. (Proceed with assembly instructions.)



Check pattern to be sure it is accurate before proceeding further. It should only extend half way around the body tube. Trim edges if necessary.

## FLYING INSTRUCTIONS:

The "Break-Away" is designed especially for the parachute duration events. Large size, lightweight parachutes will fit in the compartment. The parachute furnished with the kit was selected as the optimum for general contest flying. As more experience is gained with this special bird, larger parachutes may be constructed. Any size engine can be used as long as the center of gravity of the fully loaded bird is forward of point shown on the drawing.

It is extremely important to use short delay engines when using large parachutes. The lightweight rocket and large chute makes it necessary that the ejection charge ejects while the rocket is still on its way up so that the speed of the rocket opens the parachute. Recommended engines are: 1/2A6-2, A5-2, B4-4.

Pack flameproof wadding into open end of rocket engine. Wrap engine with masking tape to fit snugly into rear of rocket. Hook parachute snap swivel over wire in nose cone. Fold parachute to size of opening and lay shroud lines into side of rocket with the fins. Then place folded parachute over the shroud lines. Place other half over it and slide into place. If pieces of parachute remain out of slot in tube, push inside with 1/32" balsa strip or piece of thin cardboard. Attach "Pop" launch lug by inserting into slot in body tube and hooking over rear of rocket. Slip launch lug over launch rod, then wrap 2 or 3 turns of masking tape around top of rod. Hook up launcher clips to igniter and fire. The bird should lift off the pad smoothly and leave the launch lug on the rod. The bird can be put back on the rail without removing the launch lug from the rod.

For the Break-Away, the main (19mm) body tube should be 12" long.  
The fins are: root 1.25" tip .625" (5/8) and semi span of 1.25"