

SANDIA SANDHAWK

FLYING MODEL ROCKET

Skill Level 5

49 Long

Specifications:

Length—49"

Body Dia.—2.00"

Takeoff weight without
engine 9.14 oz. (256 g.)

Recommended F.S.I.

Engines: E60-4, F100-6

1/6 SPORT SCALE

ADULT SUPERVISION RECOMMENDED

This kit requires assembly. Launch system, engines,
glue, and finishing supplies are not included.

1031



Sandia Sandhawk

1/6 scale

ASSEMBLY INSTRUCTIONS with Detail Sketches

Skill Level 5

The Sandia Sandhawk was developed by Sandia National Laboratories in the late 1960's. The TE-M-472 motor had a total impulse of 269,764 lb-seconds. The Sandhawk could reach altitudes of 170 km (568,000 feet).

Specifications:

Length — 49"

Body Dia. — 2.00"

Takeoff weight without engine:

9.14 oz. (256 g.)*

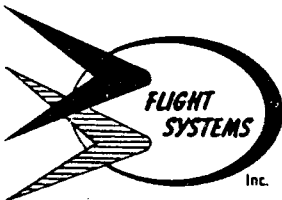
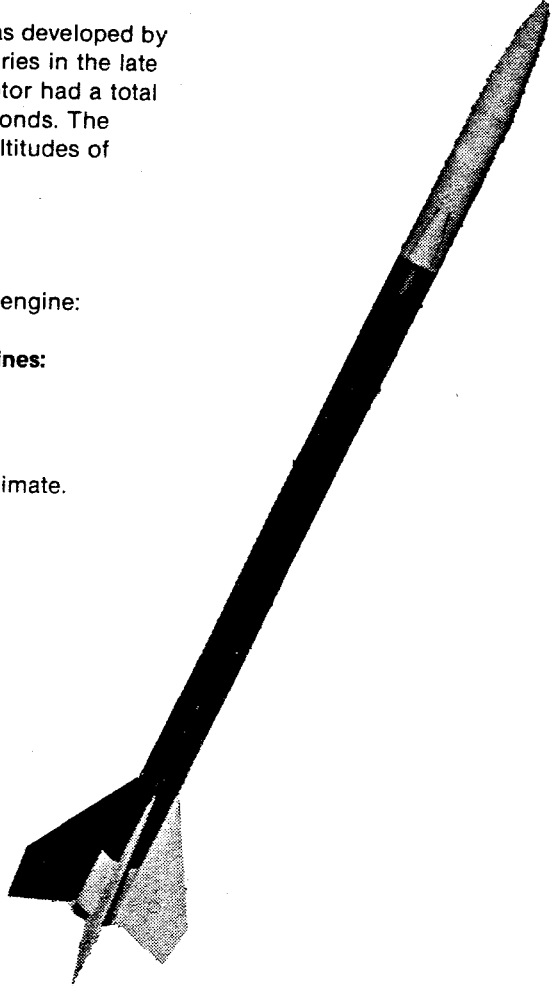
Recommended F.S.I. Engines:

E60-4, F100-6

Catalog Number 1031

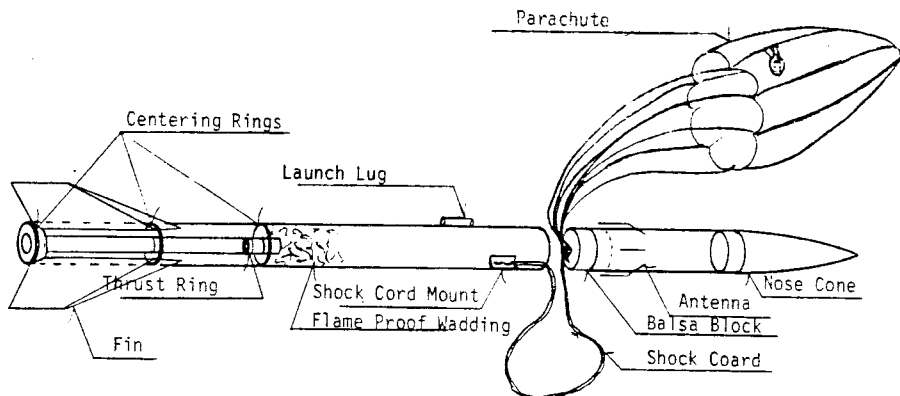
Ship. Wt. 24 oz.

*All takeoff weights approximate.



9300 EAST 68TH. STREET
RAYTOWN, MISSOURI 64133
816-566-2011

SANDIA-SANDHAWK



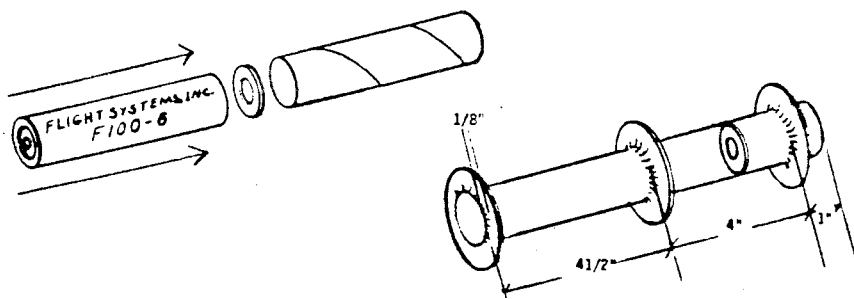
PARTS LIST:

- | | |
|-----------------------------------|-------------------------|
| 2 18" X 2" Body Tube | 1 Shock Cord Anchor |
| 1 6.4 X 2" Body Tube | 1 Nylon Parachute (24") |
| 1 Nose Cone | 1 Snap Swivel |
| 4 Fins | 2 Launch Lugs (1/4") |
| 1 Balsa Block | 1 Antenna Material |
| 1 Engine Holder Tube (9" X 1.13") | 1 Cardboard Sheet |
| 3 Centering Rings (20F) | 1 Tube Coupler |
| 1 Thrust Ring (TR-2) | 1 Flameproof Wadding |
| 1 Shock Cord (32") | 1 Decal |

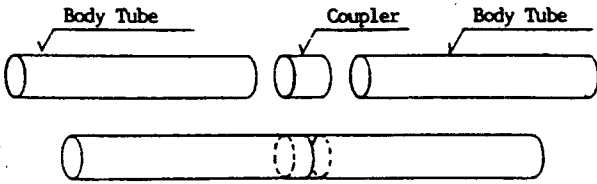
ASSEMBLY INSTRUCTIONS

Important:

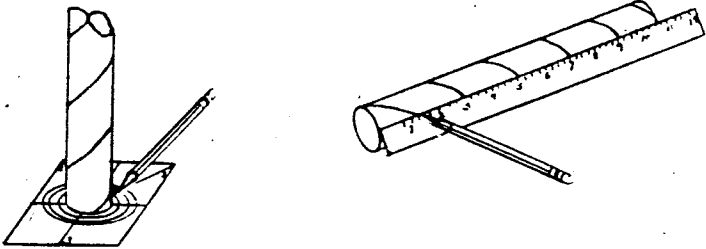
Read through entire instructions before starting assembly. Check to be sure all parts are included. Test fit the parts together before applying any glue. If a part doesn't fit properly, sand or build up for precision fit. Please read each step before starting that step. Check off each completed step.



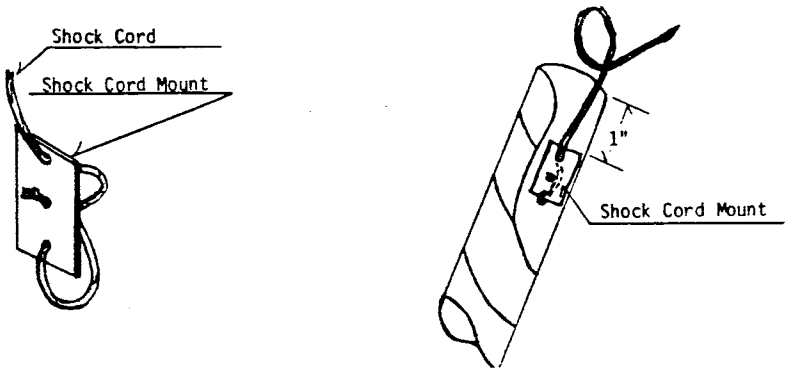
1. First determine which size F.S.I. engine you intend to use in your Sandia-Sandhawk rocket (E60-6 or F100-6 is recommended). Locate the TR-2 thrust ring (1.13 O.D. fiber board ring) and the 9" X 1.13" I.D. engine holder tube. Next put a ring of glue inside of one end of the engine holder tube. Now using a F.S.I. 27mm engine push the thrust ring into the engine holding tube until the engine projects out of the end of the tube 1/2". Remove the engine. Install rings as pictured and glue in place. Apply a fillet of glue on each side of the rings as shown. Set aside and allow to dry.



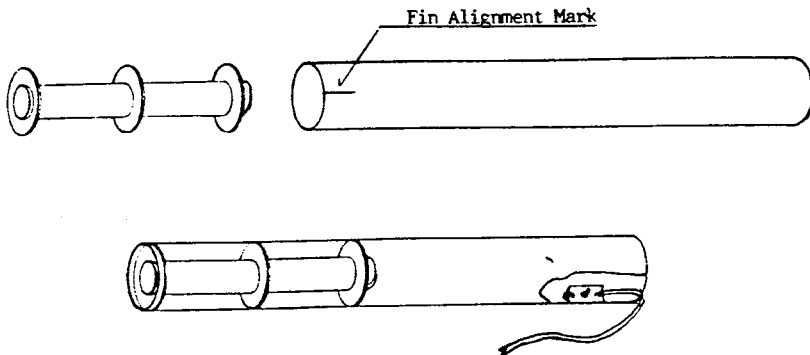
2. Locate the SC-19 coupler. Put a ring of glue inside one end of a 2" X 18" body tube. Slide the tube coupler into the glued end until 1" protrudes. Put a ring of glue inside one end of other 2" X 18" body tube and slide it over coupler until the two tubes butt together. Roll the assembly on a table or other flat surface to assure proper alignment. Lay on a flat surface and allow to dry.



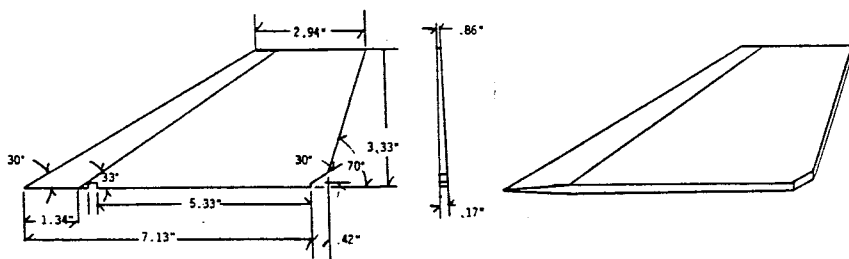
3. Using fin alignment guide mark lines on one end of the (2.00") body tube for 4 fins as shown. Using a straight edge extend lines parallel to the body tube about 7".



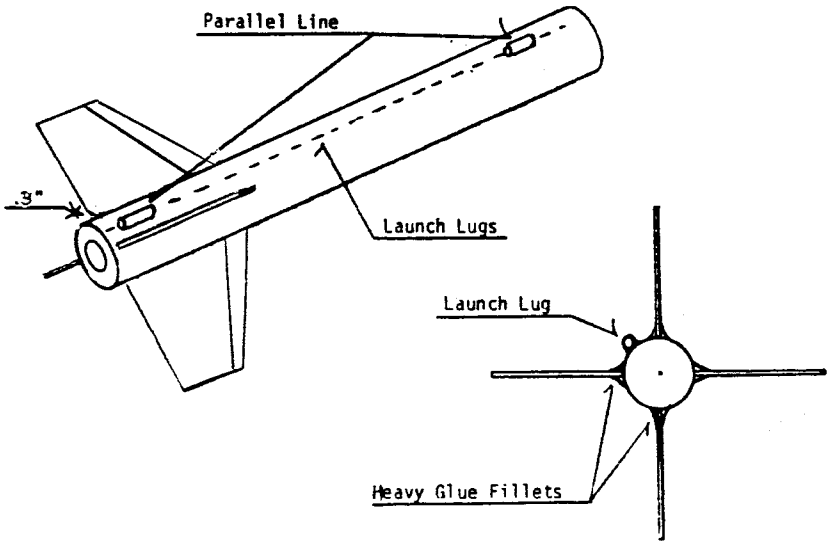
4. Install shock cord in shock cord mount as shown. Spread a heavy layer of glue over the side opposite the shock cord knot. Curve shock cord mount and insert into end opposite fin alignment marks. Drawing shows the proper position in the body tube.



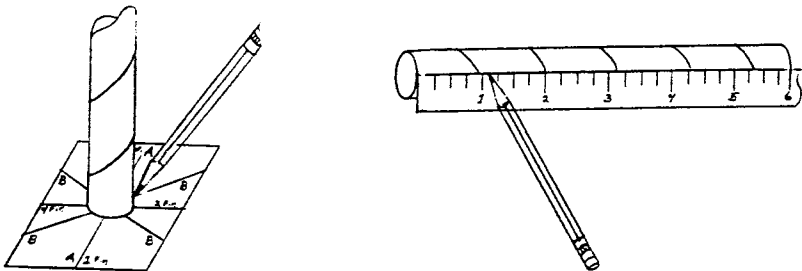
5. Install the engine mount unit. Be sure the engine mount will slide easily into the large body tube. (2" I.D.) If it is too tight, sand the ring until a precision fit is obtained. Apply a ring of glue inside the body tube. Insert the engine mount unit using one smooth motion until it is flush with the back of the body tube. DO NOT STOP pushing engine mount until it is in position or it will stick in the position in which you stopped. Be sure to insert engine mount in end of tube that you have previously marked for fin alignment.



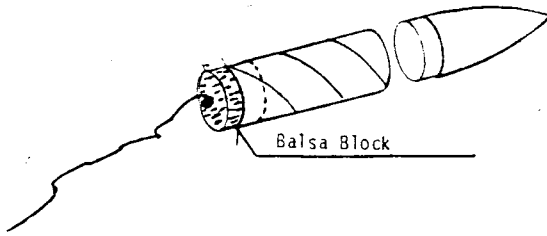
6. Sanding the fins: If you are building your model to scale sand and shape fins as shown in the detailed drawing. For sport flying you may want to simply round the edges of the fins. If so round all edges except the red one. The red edge attaches to body tube.



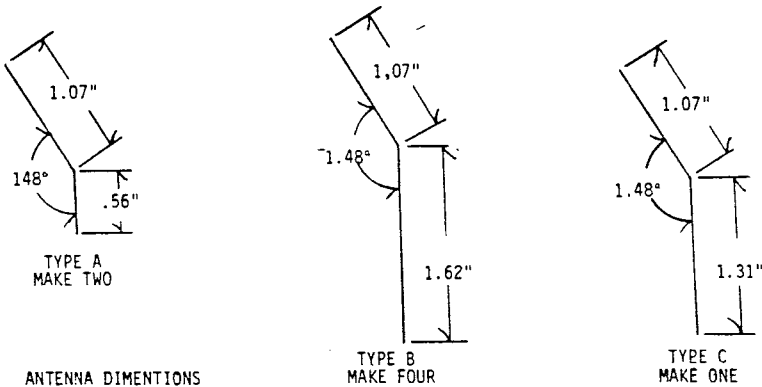
- 7. Attach the red edge of the fins to the body tube. The fins should be placed so that the bottom of the root edge is $3/10$ " above the back of the body tube. Be sure that the fins stick straight out from the body tube and are carefully aligned with the lines previously marked. Stand unit on its forward end and allow to dry. When dry run 2 or 3 heavy glue fillets on both sides of fins for added strength.
- 8. Installing launch lugs on booster section: Extend a line up the body tube half way between 2 fins and parallel with the body tube as shown. Now glue launch lug assemblies on the parallel line. Refer to drawing for proper placement.



- 9. Using antennae placement guide mark 2" X 6.4" body tube as shown using a straight edge. Make vertical lines up tube.

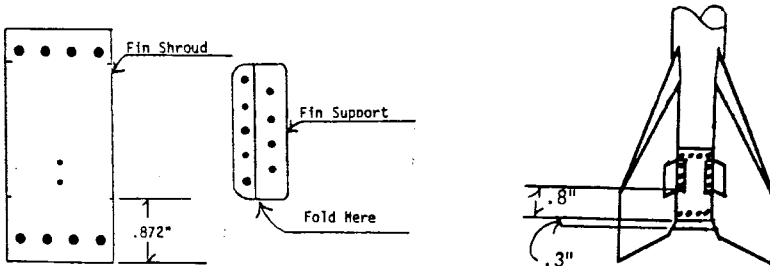


10. Glue the balsa block in the payload section as shown. Twist the eye screw into the center of the block and attach the end of the shock cord. A small amount of glue may be applied to the eye screw to prevent it from coming loose. Install nose cone.



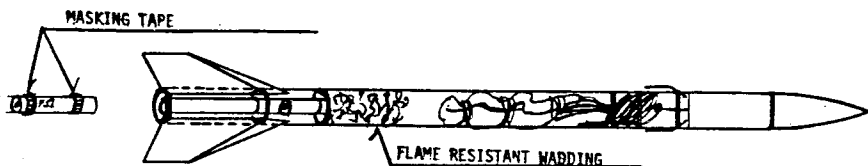
ANTENNA DIMENSIONS

11. Cut and bend antennae to shapes shown with wire cutters and pliers. Install antennae into body tube on lines and approximately 4.6" from base of nose cone. Use 5-minute epoxy to hold them in place. Use antennae placement guide to determine location of each antennae type.



12. Cut out fin shroud and fin support. Glue in position shown.
13. The rocket is now ready to paint and add decals. It is recommended that a light coat of paint be sprayed on and let dry. Add a couple more mist coats lightly sanding between them. Then apply a wet coat (gloss just appears) and set aside to dry. Refer to back cover for scale detailing information.

FLIGHT PREPARATION



- ___ 1. Separate payload section from rocket body. Tamp a piece of wadding down into the inside of the lower body tube until it comes in contact with the top of the engine holder tube.
- ___ 2. Bring shroud lines of 24" nylon parachute together and tie into knot about 1" from shroud line ends. Leave 1 shroud line intact and cut the others off 1/4" below the knot. Now put a couple of drops of glue on the knot to insure it does not come loose during ejection. Tie snap swivel to shroud line that you left 1" long. Attach swivel to eye screw. Fold parachute. Insert shock cord first and then the parachute into upper end of lower body tube. Rejoin mid and lower sections.
- ___ 3. Install engine using friction fit several wraps of masking tape are placed around the engine as shown to hold the engine in place. Insert F.S.I. engine until contact is made with the thrust ring. Be sure that engine fits tight enough that it will not come out of engine holder tube during ejection phase of flight.
- ___ 4. Flight trim model for proper stability as follows.

Step A: Take an 8 to 10 foot string. Tie a loop in end of string. Place loop around rocket body tube and slide until a balance point (CG) is established. Tape loop to body tube at this point.

Step B: Swing rocket overhead in a circular motion. A very stable rocket will point forward. It may be necessary to start rocket forward by hand if so questionable stability exists. Slide string back until a rocket nose tilts down at about 10 degrees. Repeat test. If rocket proves unstable, this condition can usually be corrected by moving the CG forward by adding weight to the nose.

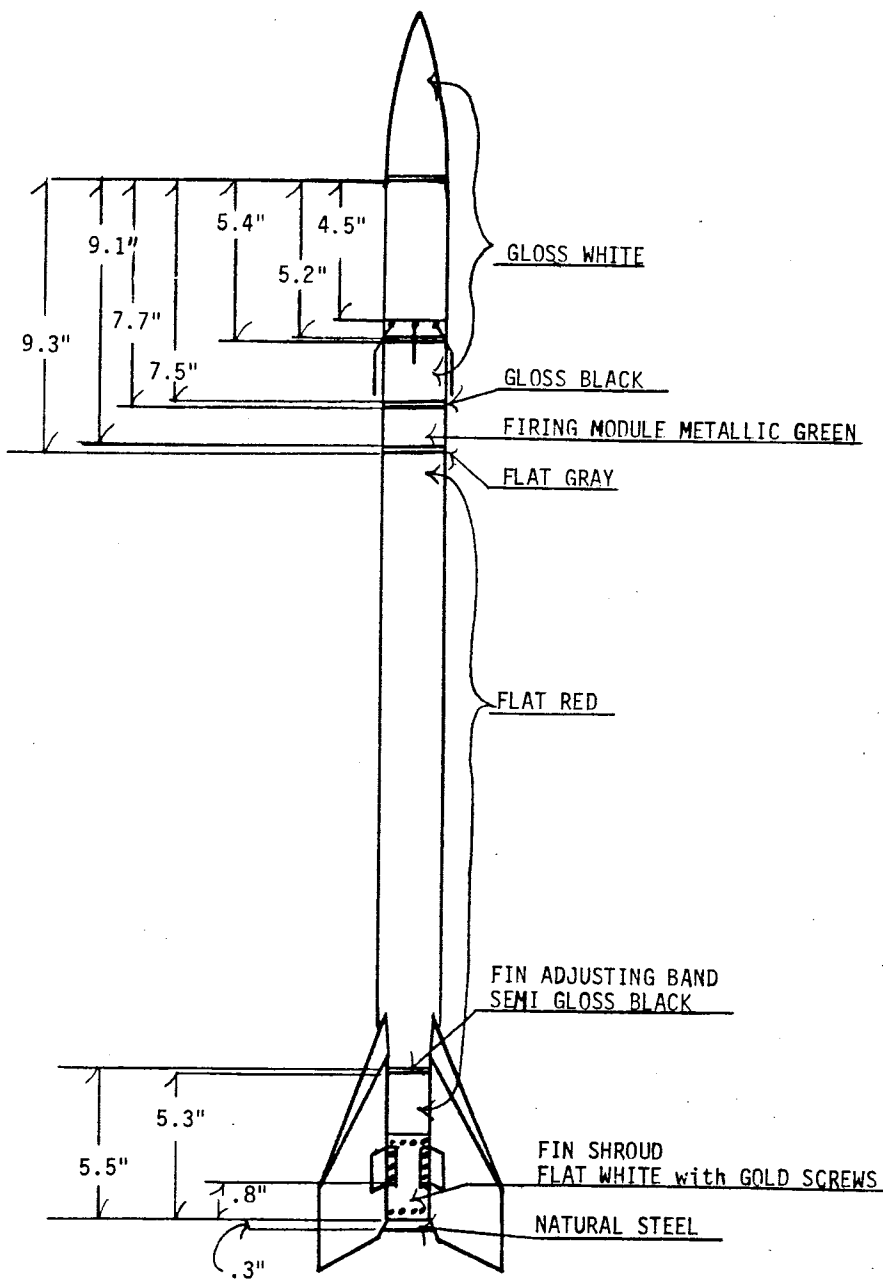
- ___ 5. Place rocket on the launcher. Insert the F.S.I. ignitor and attach the firing clips as shown in engine instructions.
- ___ 6. Go back to launch control and clear the area. Arm the launch control by inserting the phone jack attached to the firing line.
- ___ 7. Give count down 5-4-3-2-1, ignition.

Be sure to follow the *HIA-NAR Model Rocketry Safety Code when carrying out your model rocket activities.

*HIA- Hobby Industry of America

NAR- National Association of Rocketry

Sandia Sandhawk



TODAY

1993

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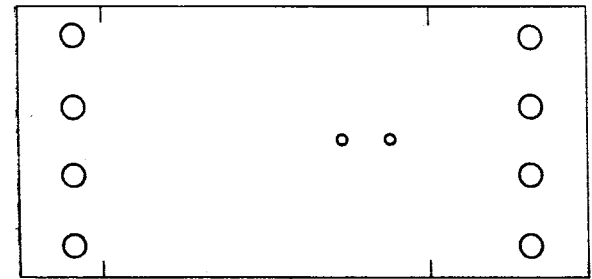
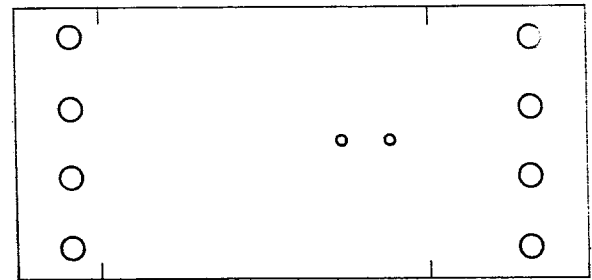
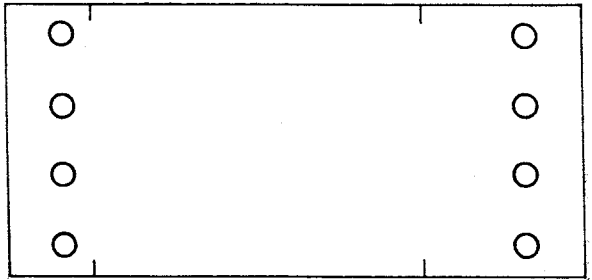
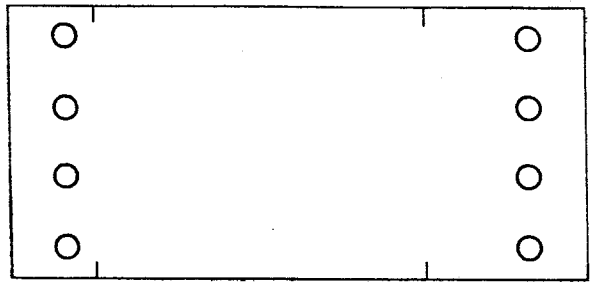
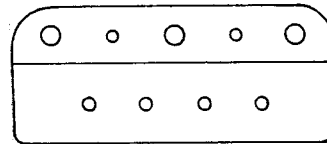
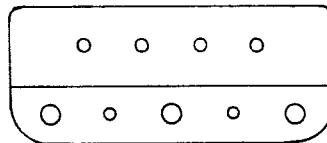
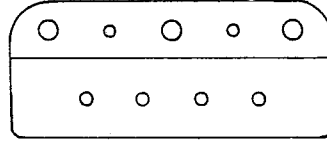
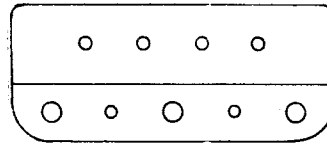
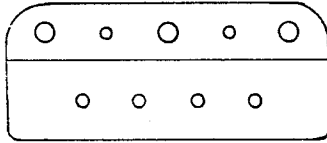
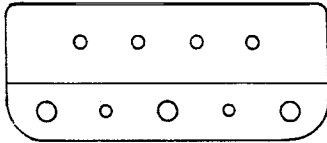
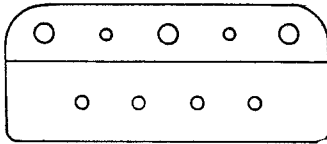
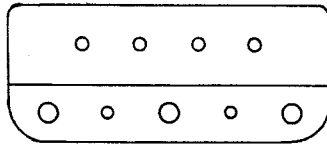
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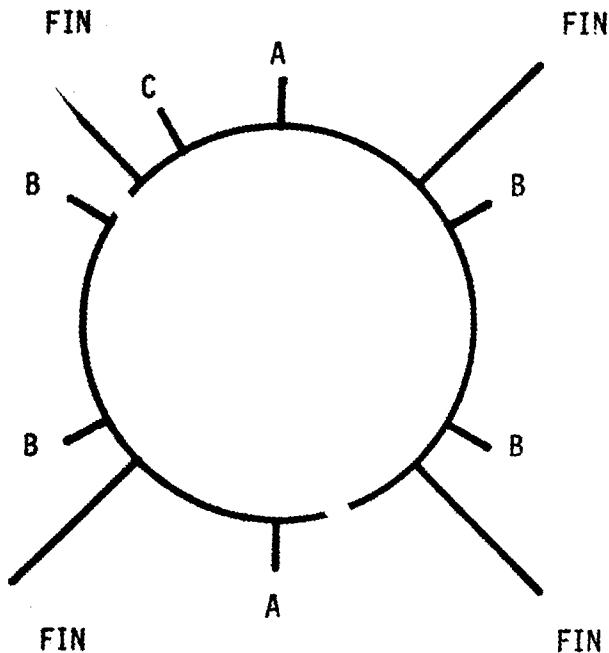
FIN SUPPORTS

FIN SHROUDS

SANDIA SANDHAWK



Fin and antenna placement guide



Center end of tube in the circle and mark lines for fins and antenna locations.

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