

Estes Industries Rocket Plan No. 27

DEACON

FIRST PLACE WINNER! '64 MULTI-STAGE CONTEST

Design by Ronald Tessendorf

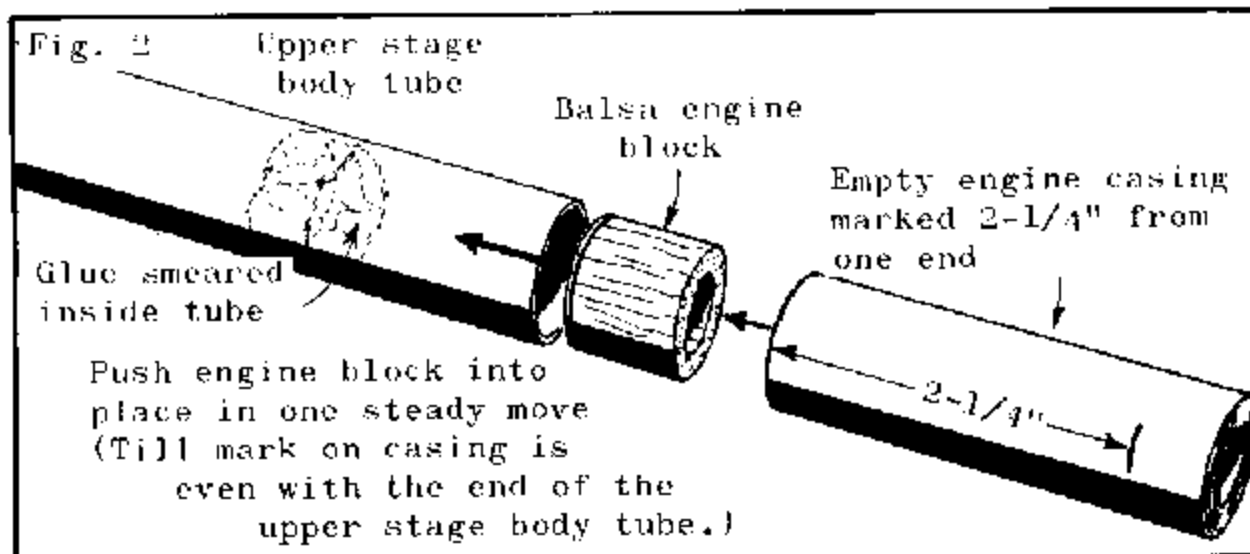
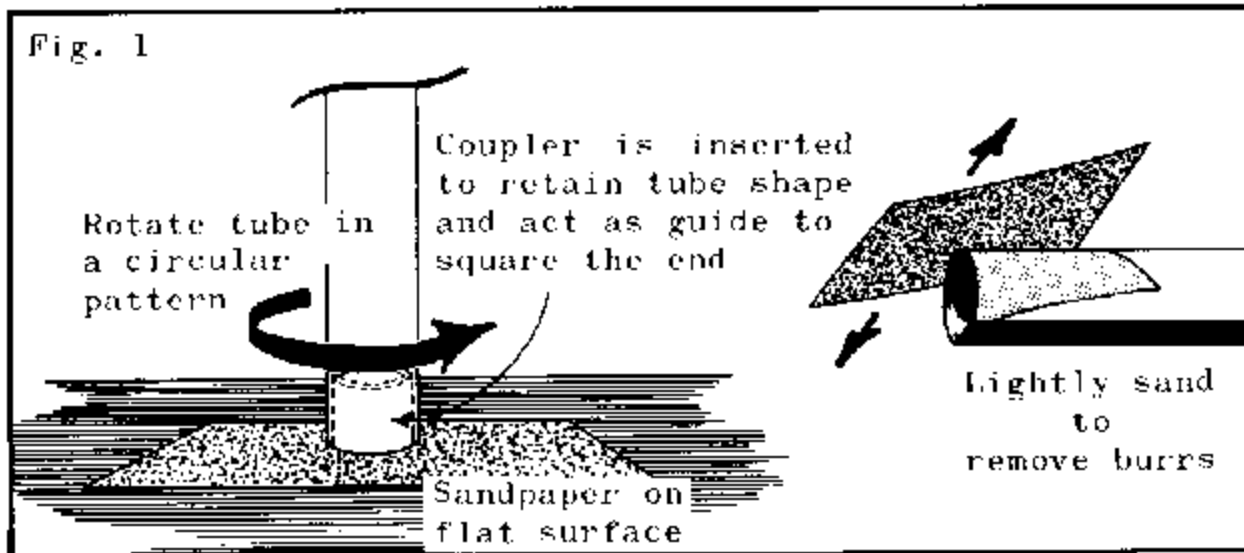
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PARTS LIST

1	Nose Cone	BNC-50K
1	Body Tube	BT-508
1	Body Tube	BT-20
1	Balsa Adapter	TA-2050
1	Screw Eye	SE-2
1	Launching Lug	LL-1C
1	Engine Block	EB-20
1	Shock Cord	SC-1
2	Parachute Kits	PK-12
5	Sheet Fin Stock	BFS-20
When Flown without large payload section		
1	Nose Cone	BNC-20N
1	Screw Eye	SE-2

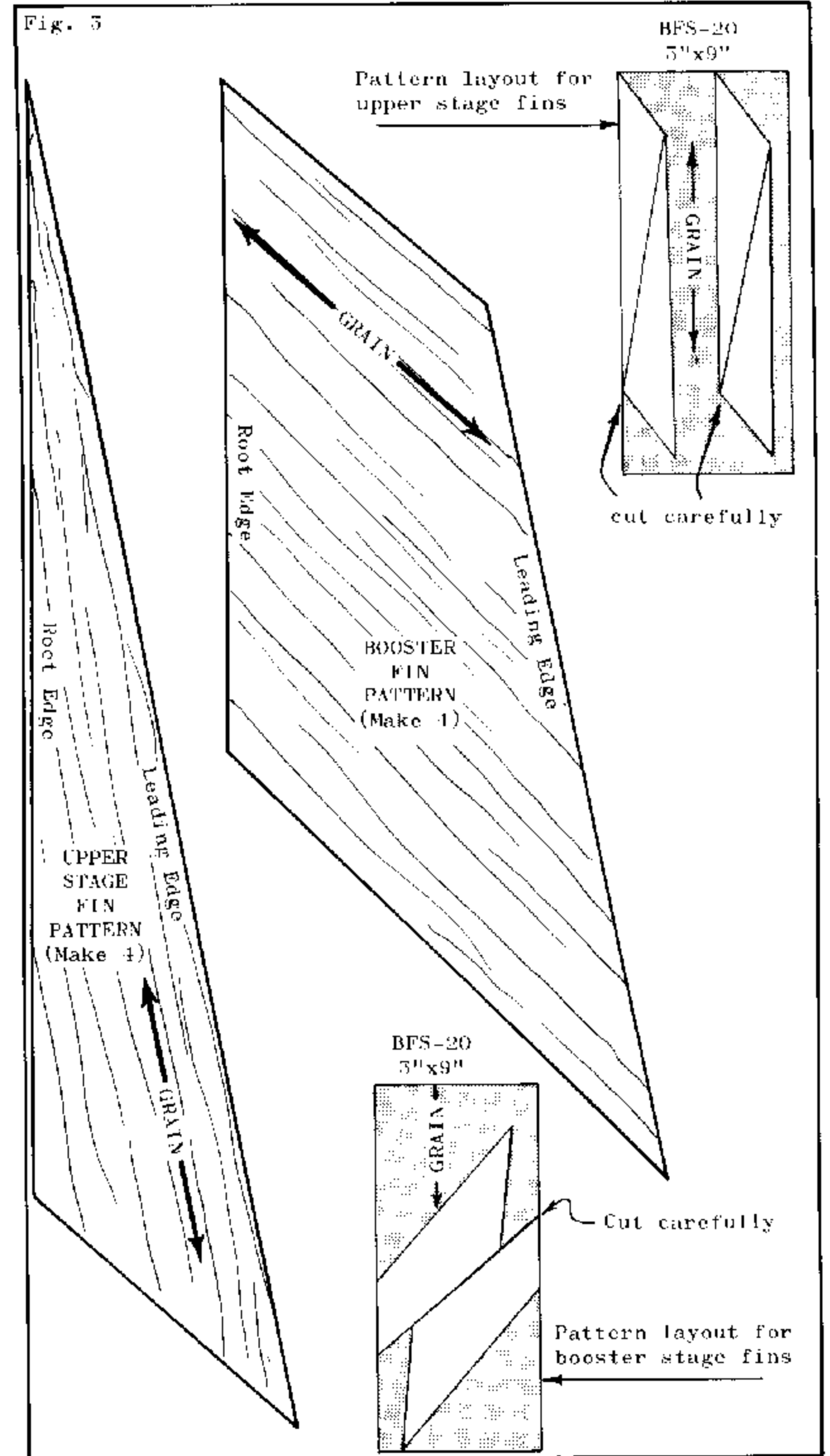
ASSEMBLY

Cut the upper stage and booster bodies from the BT-20 body tube. Make the booster tube exactly 3" long and the upper stage tube 9-1/2" long. Dress the ends of each piece as shown in Fig. 1. Smear a liberal coat of glue around the inside of the upper stage tube about 2" from one end. Insert the engine block into this end of the tube and push it into position 2-1/4" forward with an empty engine casing as in Fig. 2.



Trace the fin patterns onto the balsa with the grain of the pattern and the grain of the balsa aligned perfectly. (For tracing methods, see page 2 of this issue.) Trace out four of each fin and cut out with a sharp knife or single edge razor blade.

Tape one booster and one upper stage fin together as shown and carefully sand until rounded, all exposed edges except the root edge. Sand the root edge flat. Repeat with the other sets (see Fig. 4). Make a fin marking guide as shown in Fig. 4B and mark both the booster and upper stage bodies for four



fin. The marks on the upper stage should be at the same end as the engine block.

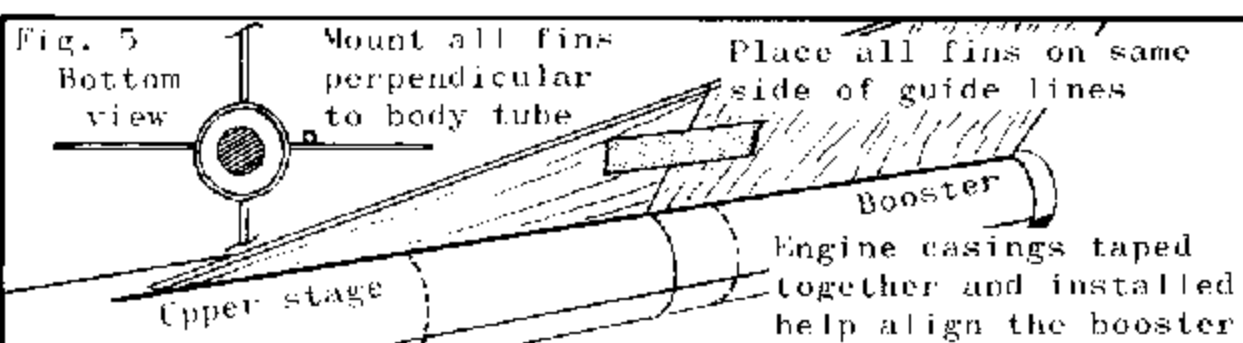
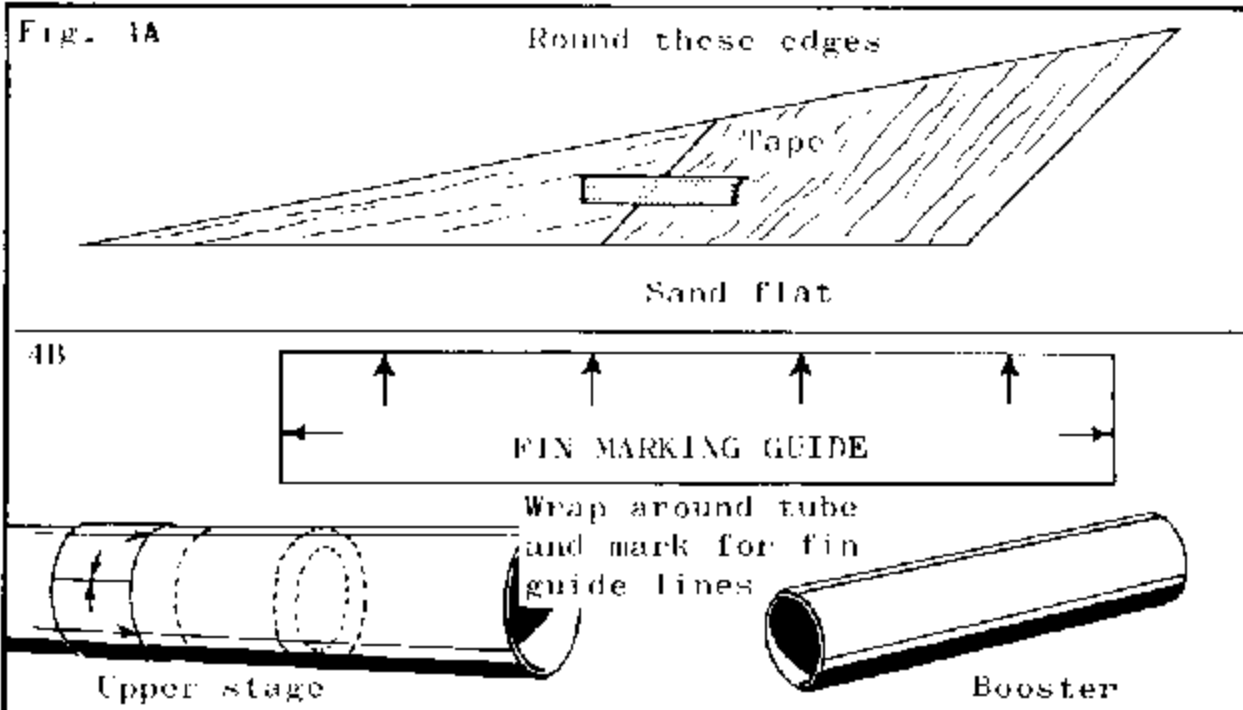
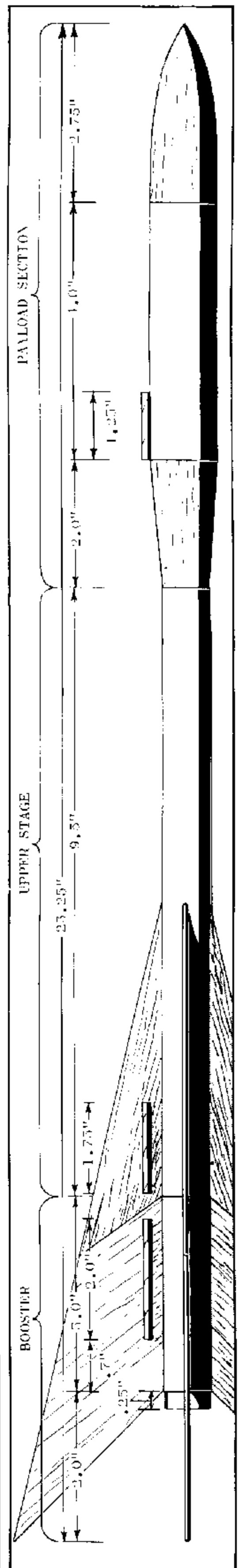
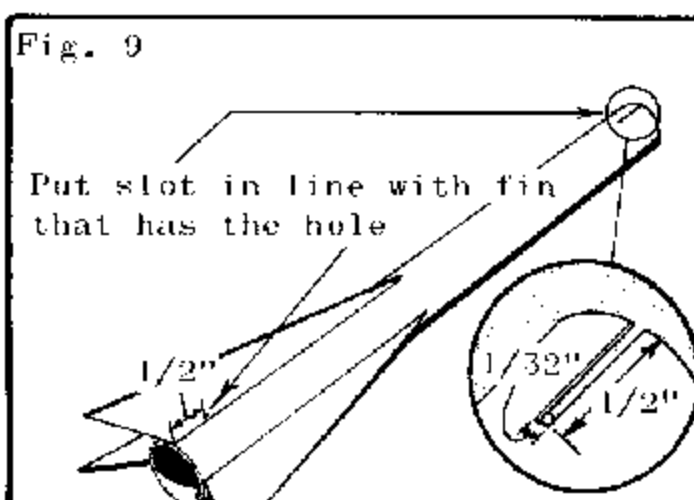
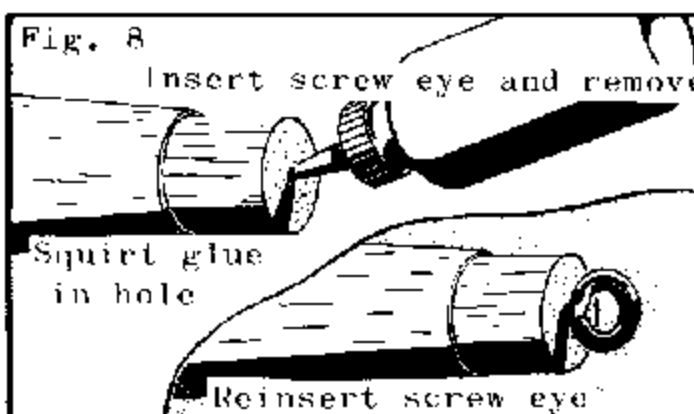
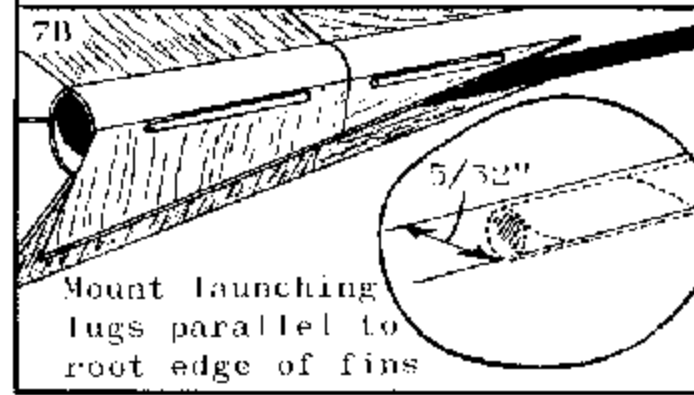
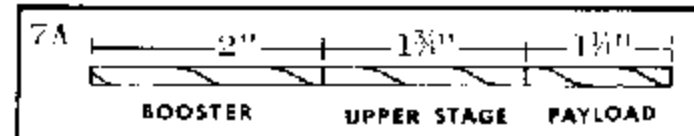
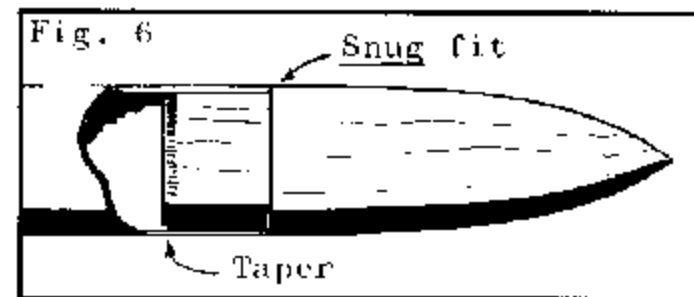
Tape two engine casings together with cellophane tape and place in body section in normal position. Slide the booster tube into place and line up the fin guide lines with those of the upper stage. Apply glue to the root edge of one fin set and position one fin on one side of a guide line as in Fig. 5. Attach the other three fin sets in place in the same manner, making sure that each set is on the same side of the guide line. Be sure all fins protrude straight out from the body tube. set the rocket aside to dry, but do not

set it on its fins. (For best results support the rocket in a vertical position.)

Glue the balsa adapter in one end of the payload section (BT-508) and check the fit of the nose cone BNC-50K in the other end. Tape or sand the shoulder of the nose cone until it is a firm fit into the payload tube. A slight taper as shown in Fig. 6 will make the nose cone easier to insert. Sand the adapter and nose cone with fine sandpaper and apply the first coat of sanding sealer to both. During this part of the work protect the shoulder of the adapter with a scrap piece of BT-20. Leave the scrap in place while sanding and applying sealer.

Before separating the upper stage and booster, draw a line parallel to the root edge of one fin set exactly $5/32$ " from the root edge. Cut the launching lug LL-1C into three pieces as shown in Fig. 7A. Install two of these pieces as shown in Fig. 7B. If the fins have been glued carefully, removal of the tape may be all that is needed to separate the upper stage from the booster. If a film of glue has bridged the tube separation point, carefully insert a knife blade between the fins near the root edge and cut this film. The booster and engine casings may now be easily separated from the upper stage.

Install the screw eye in the center of the adapter base as in Fig. 8. Remove the screw eye, squirt glue into the hole and replace the screw eye. Install the third piece of the launching lug (see Fig. 7A) on the payload tube with the rear of the lug even with the tube-adapter joint. Align it carefully to parallel the centerline of the section.



Recovery System

Drill a small hole $1/2$ " from the trailing edge of the fin opposite the one on which the launching lug is mounted. Thread one end of the static line (a 10" piece of shroud line) through this and make a large knot. Secure the other end of the static line to the shock cord. Make a small loop in the free end of the shock cord as in Fig. 9. Cut a $1/2$ " long by $1/32$ " wide slit in the upper end of the body directly above the fin with the hole, to admit the static line.

Cut out the parachutes and attach the shroud lines. Tie one set of lines to the payload section screw eye. Tie the other chute lines to the shock cord loop and your bird is ready for final assembly and painting.

Painting

Sand, seal and paint your model as described on page two of this issue.

Launching

Follow the procedures described in Technical Report No. TR-2.