Estes Industries Rocket Plan No. 31

the COMMUTER

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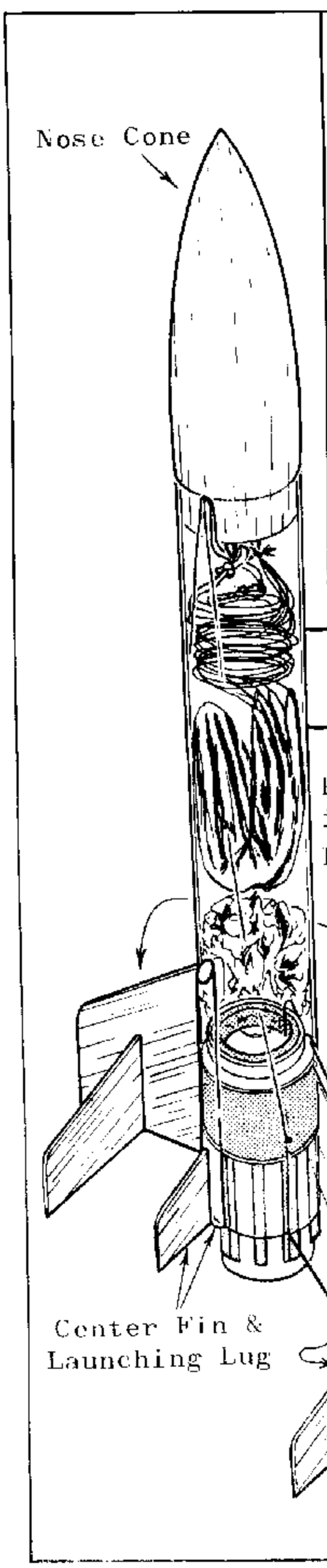


PARTS LIST

PART NAME	PART NO.
1 Balsa Nose Cone	BNC-50K
1 Main Body Tube	BT-50H
1 2050 Engine Mount	EH-2050
1 Launching Lug	LL-1B
1 Balsa Fin Stock	BFS-20
1 12" Parachute Kit	PK-12
1 Shock Cord	SC-1
1 Screw Eye	SE-1

MISCELLANEOUS

1 Scrap piece of BT-50 tube
1 12" x 3/32" Sq. strip balsa (or cut two square strips from a sheet of BFS-30)

NOTICE

Except for appearance the COMMUTER is a normal VERTICAL takeoff, parachute recovered model rocket.

LAUNCH VERTICALLY ONLY!

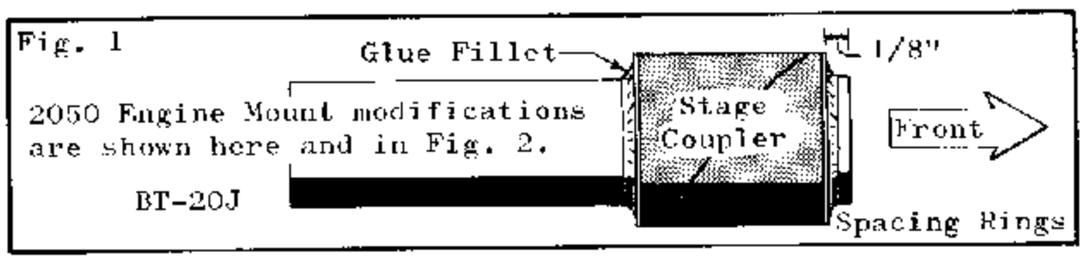
Looking into a slightly cracked watch crystal, here is what we see as one possiblity for future short haul(?) air travel. The COMMUTER would admirably serve those who, for instance, had a job in New York but liked to live in Calif. One would board the COMMUTER in L.A. at 5:30 PST and land in New York at 9:AM EST...Going home after 5:PM EST would have you home in L.A. in time for a 3:PM golf date. Crazy man!

ASSEMBLY STEPS

1. Put glue on both edges of the stage coupler and position the spacer rings. Wipe off excess glue and allow to dry.

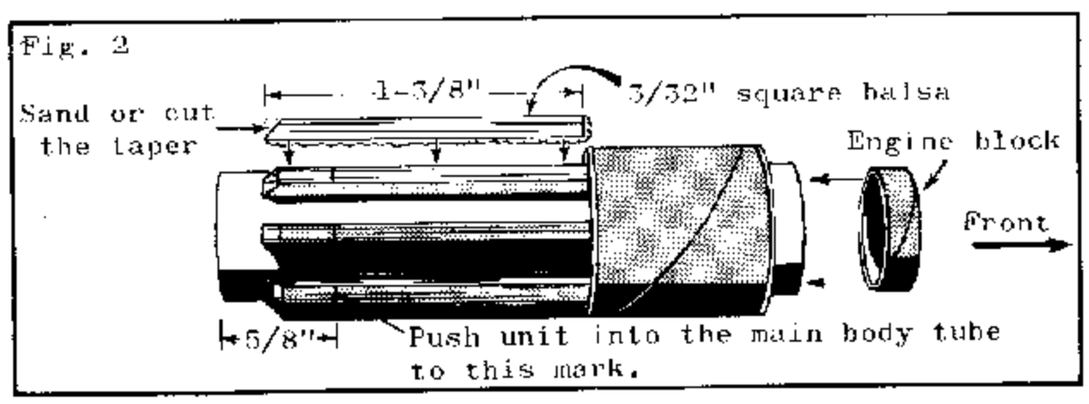
2. Trace the fin and landing gear pieces onto a sheet of BFS-20 or onto a sheet of paper. If you trace directly on the balsa be sure to position the patterns so the wood will match the grain shown on the pattern.

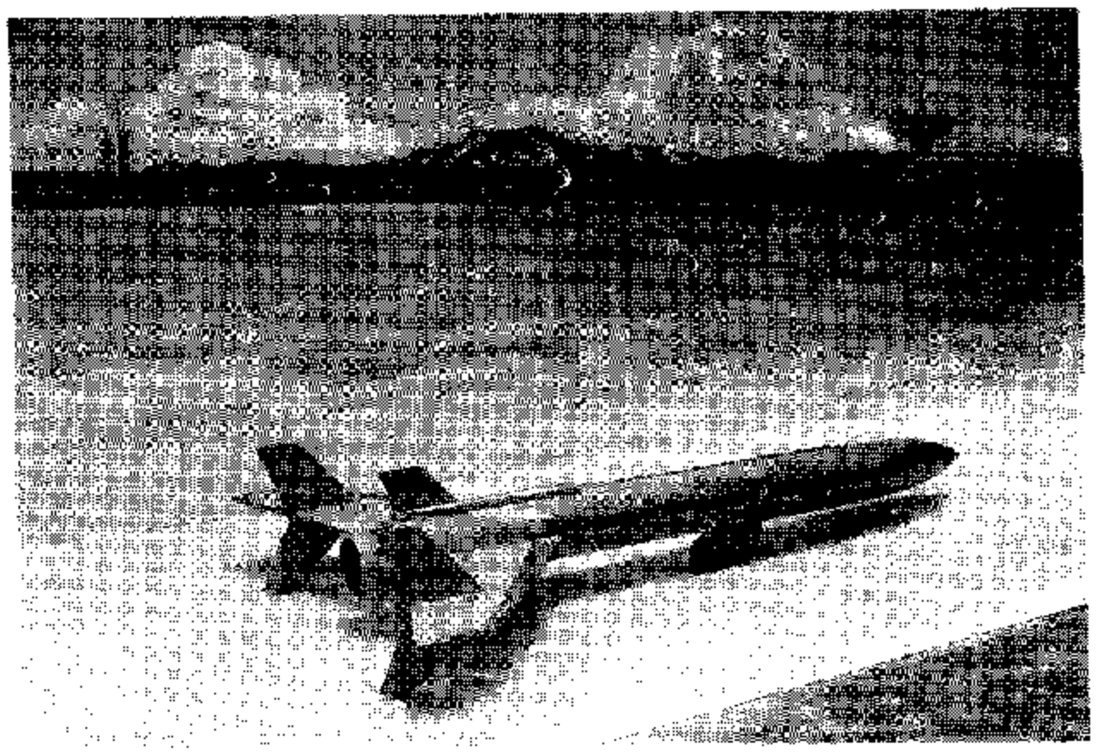
Fig. 1



3. Slide the engine holder tube (BT-20J) through the ring-coupler assembly until it sticks out 1/8" on one side (see Fig. 1). Run a glue fillet around both ring-body joints. While the glue sets cut 8 pieces of 3/32" square balsa strips 1-3/8" long and sand one end to a slight taper as shown in Fig. 2. Glue the strips to the rear portion of the engine holder tube spacing them as shown in the Fig. 2 end view. Set this assembly aside to dry completely.

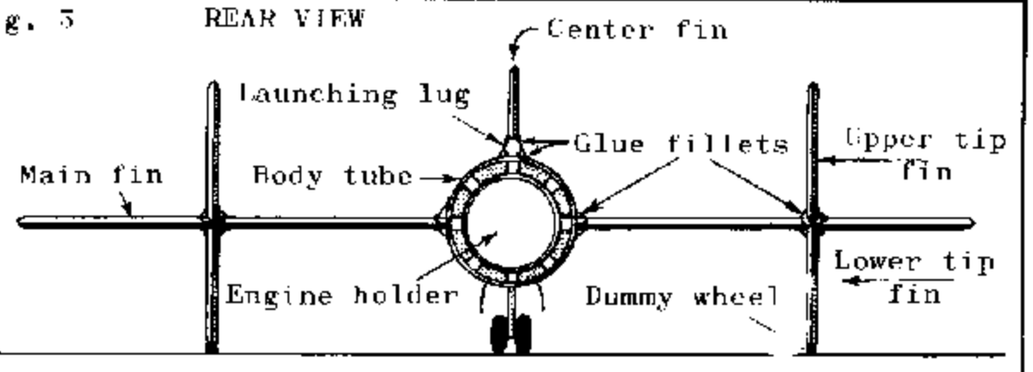
Fig. 2





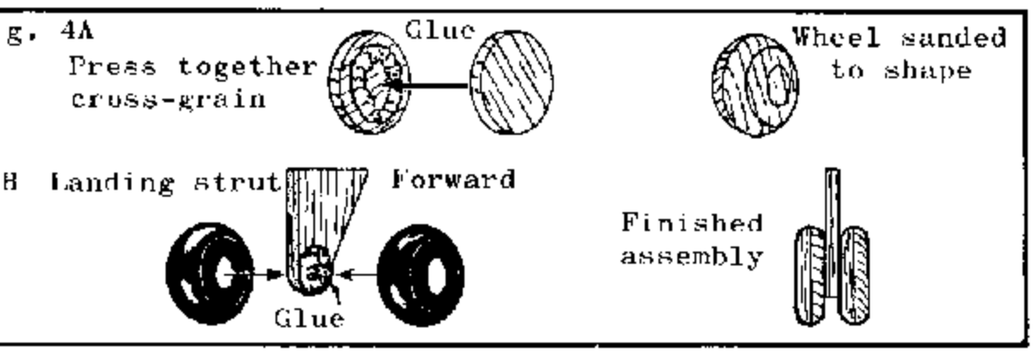
4. Lay the patterns on the balsa sheet (if you did not trace them directly). Make sure the grain direction is correct. Cut out the fin and landing gear pieces. Sand the fin pieces until the sides are smooth and all but the root edges are rounded. Set the landing gear pieces aside for now.

Fig. 3 REAR VIEW



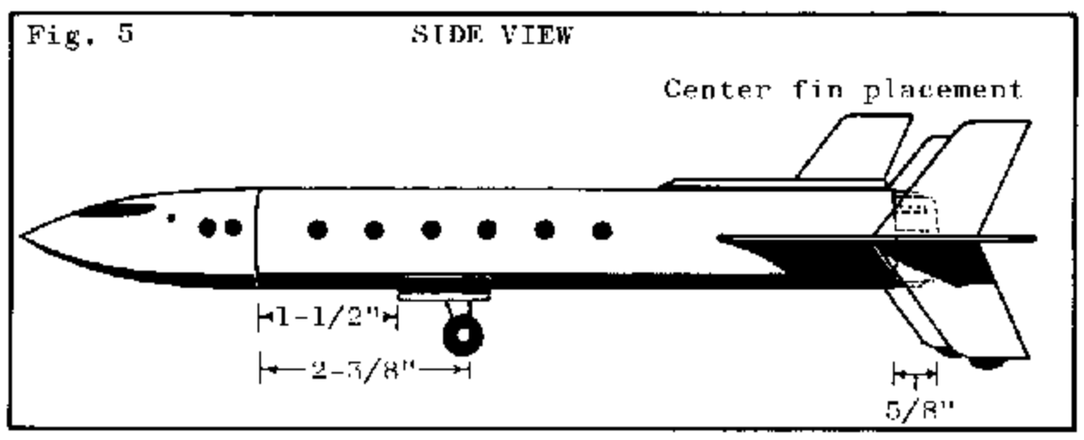
5. Mark the body tube for the positions of the main fins, launching lug and bottom centerline. Draw guide lines from these marks so that all lines parallel the tube centerline. Smear a liberal amount of glue 1-1/2" up into the rear end of the body tube. Push the engine holder assembly into place until the mark (made as in Fig. 2) on this assembly is even with the rear of the body tube. Glue the launching lug and the main fins in their positions and stand the assembly aside to dry.

Fig. 4A



6. Glue two wheel halves together so their grains cross at a 90° angle. Do the same with the other two wheel halves. When dry, sand the wheels to the shape shown in Fig. 4A. Glue the wheels to the landing strut and set aside to dry. (Fig.4B)

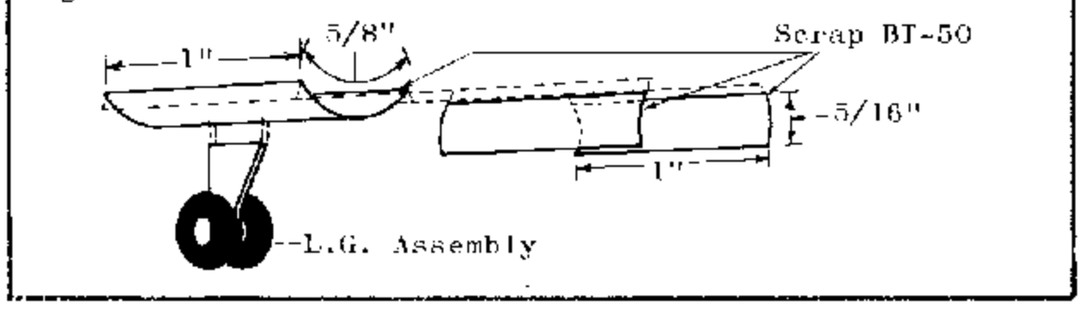
Fig. 5 SIDE VIEW



7. Apply glue to the root edges of the upper tip fins and position them on the topside of the main fins on the location marks. Glue the center fin into place on top of the launching lug, positioning it as shown in Fig. 3 and Fig. 5. Apply glue to the root edges of the lower tip fins and place them on the lower side of the main fin directly under the upper tip fins as shown in Fig. 3. Allow to dry.

8. The landing gear may be built as a detachable display support or it may be permanently attached to the rocket. For detachable gear, cut a 1" by 5/8" piece from a scrap of BT-50 and glue the landing gear to the centerline of the piece as shown. Cut two 1" by 5/16" pieces and glue them to the edges of the larger piece (see Fig. 6A). For permanent landing gear, cut two pieces 1" by 5/16" from scrap BT-50 for the landing gear well covers. Glue them to the body guide lines drawn 5/16" to each side of (and parallel to) the bottom centerline. The front edge of the covers should be 1-1/2" from the front edge of the body tube. Glue the landing gear unit in place with the rear of the strut positioned 1/8" forward from the rear edge of the covers and straddling the bottom centerline. Stand this assembly aside to dry.

Fig. 6A DUMMY GEAR SET FOR DISPLAY



FULL SIZE PATTERNS

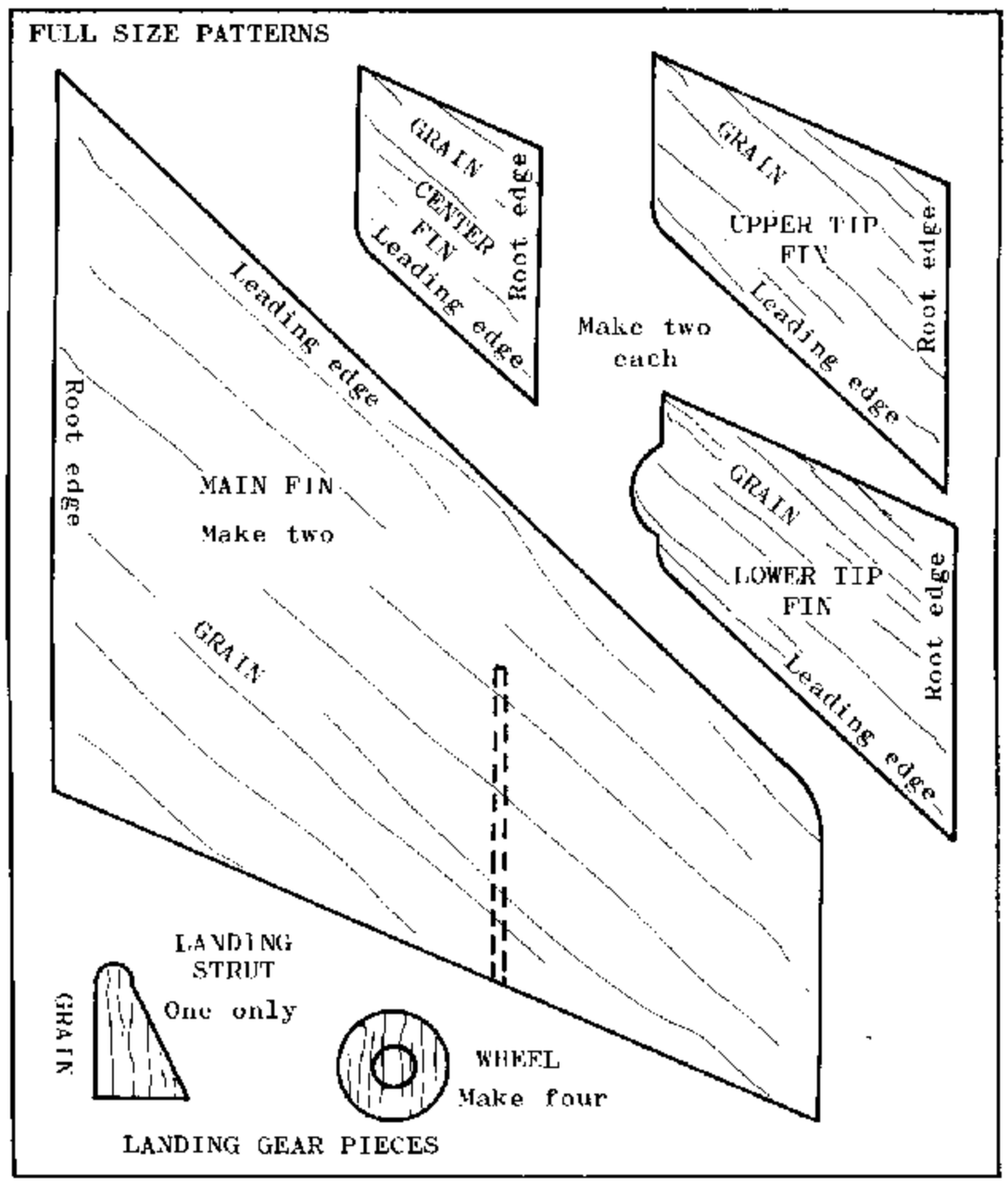
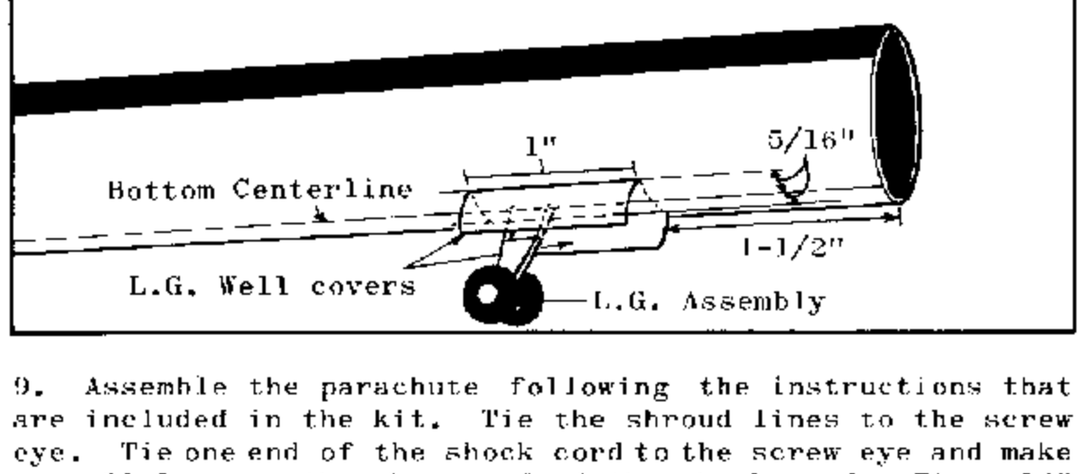
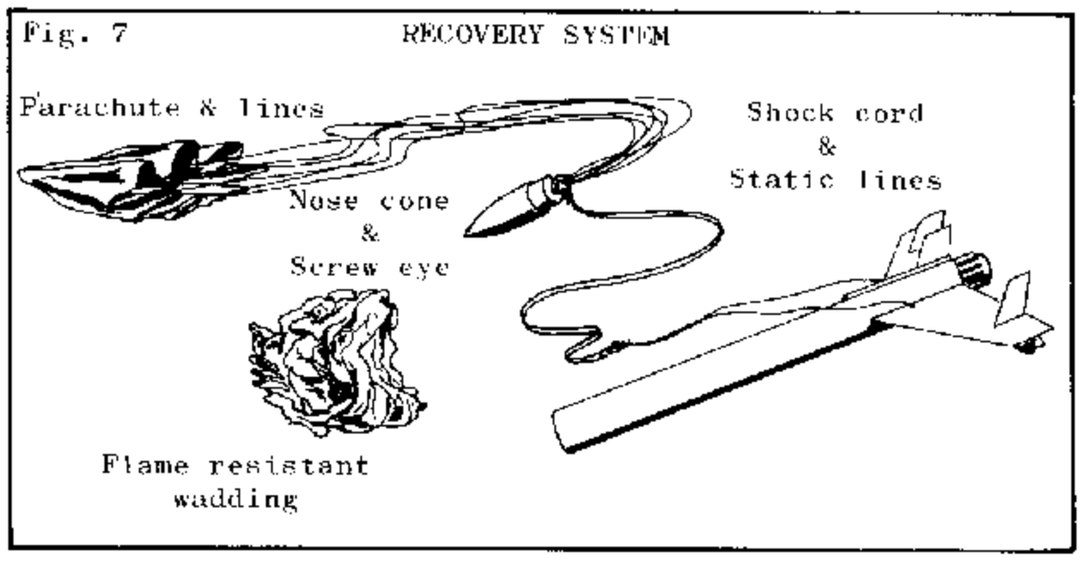


Fig. 6B GEAR MOUNTED PERMANENTLY



9. Assemble the parachute following the instructions that are included in the kit. Tie the shroud lines to the screw eye. Tie one end of the shock cord to the screw eye and make a small loop on the free end of the shock cord. Tie a 14" piece of shroudline to the loop, centering this piece so 7" of line is on each side of the loop. Drill a small hole on each main fin at the root edge 1-1/4" back from the leading edge and attach the ends of the line to the holes. The entire recovery system is shown in Fig. 7.

Fig. 7 RECOVERY SYSTEM



10. Prepare the COMMUTER for flight in the usual way. Insert wadding, parachute, shroud lines and shock cord into the forward end of the body tube. Gather the static lines so they meet at the forward edge of the body tube on top, and push the nose cone into place. The COMMUTER flies well with any Series I single stage engine.

REMEMBER... LAUNCH VERTICALLY!