

# Estes Industries Rocket Plan No. 39

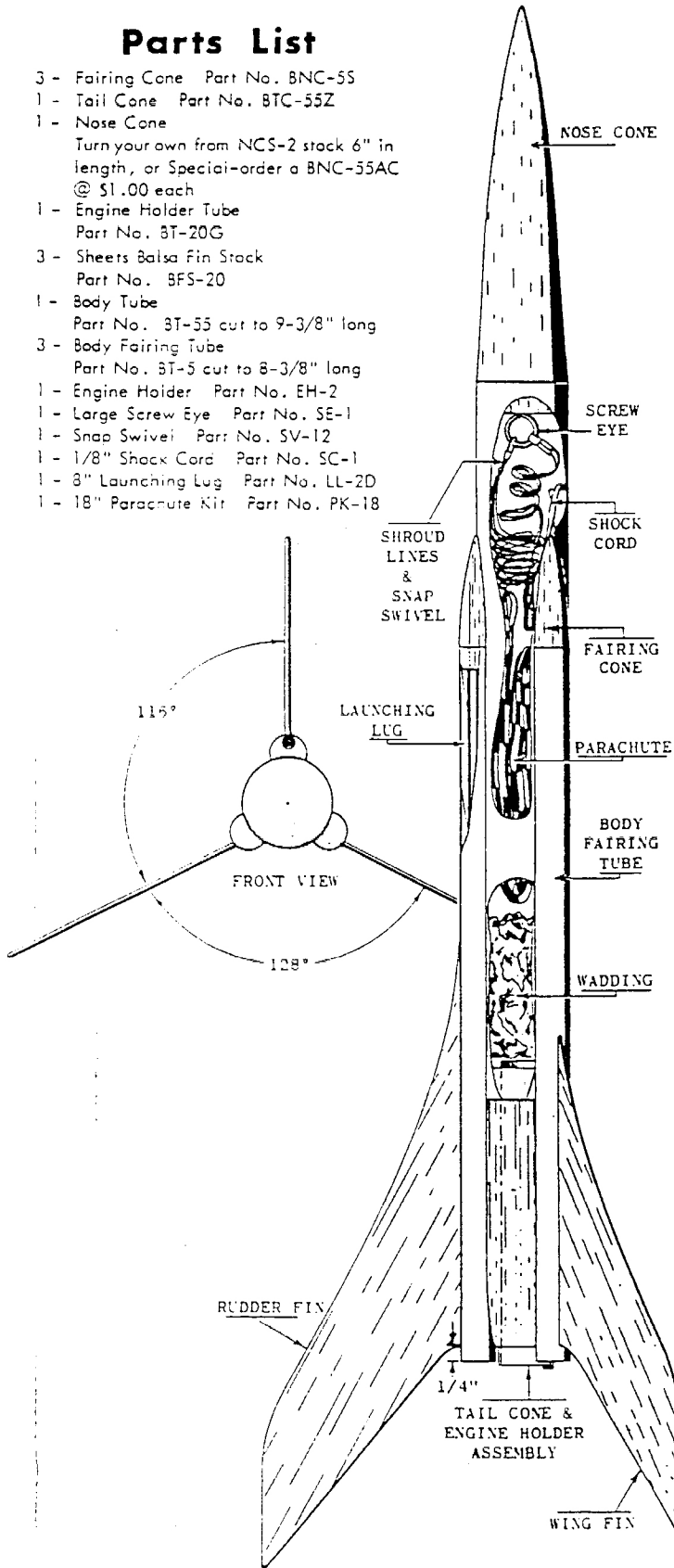
## Saturnian

## Larger Single Stage Rocket

Published as a service to its customers by Estes Industries, Inc., Box 227, Penrose, Colorado. Estes Industries, Inc. 1966

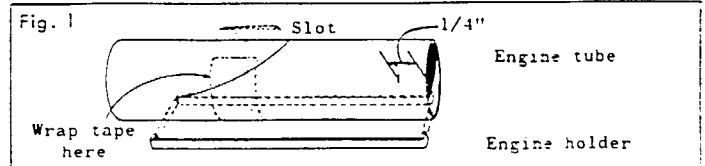
### Parts List

- 3 - Fairing Cone Part No. BNC-55
- 1 - Tail Cone Part No. BTC-55Z
- 1 - Nose Cone  
Turn your own from NCS-2 stock 6" in length, or Special-order a BNC-55AC @ \$1.00 each
- 1 - Engine Holder Tube Part No. BT-20G
- 3 - Sheets Balsa Fin Stock Part No. BFS-20
- 1 - Body Tube Part No. BT-55 cut to 9-3/8" long
- 3 - Body Fairing Tube Part No. BT-5 cut to 8-3/8" long
- 1 - Engine Holder Part No. EH-2
- 1 - Large Screw Eye Part No. SE-1
- 1 - Snap Swivel Part No. SV-12
- 1 - 1/8" Shock Cord Part No. SC-1
- 1 - 8" Launching Lug Part No. LL-2D
- 1 - 18" Parachute Kit Part No. PK-18

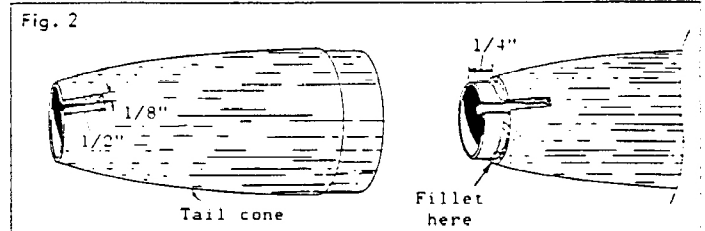


### ASSEMBLY

- 1. Mark the BT-20G engine tube 1/4" from one end. Lay the engine holder on the tube with one hook just over the end of the tube you have just marked. Mark the tube at the other end of the engine holder and cut a slit to accept the front hook. Apply a strip of masking tape as shown.



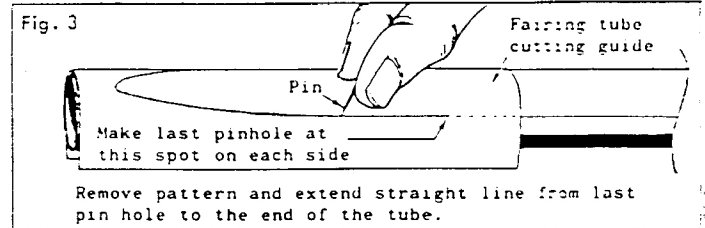
- 2. Prepare the tail cone by cutting a 1/8" wide and 1/2" long slot as shown. Slide the engine tube into the tail cone to the mark made in step 1. Apply a filler of glue around both ends at the tube-cone joints.



- 3. Cut the BT-55 body tube to 9-3/8" long. Apply glue to the inside of one end. Slide this end of the tube over the shoulder of the tail cone and set the unit aside to dry.

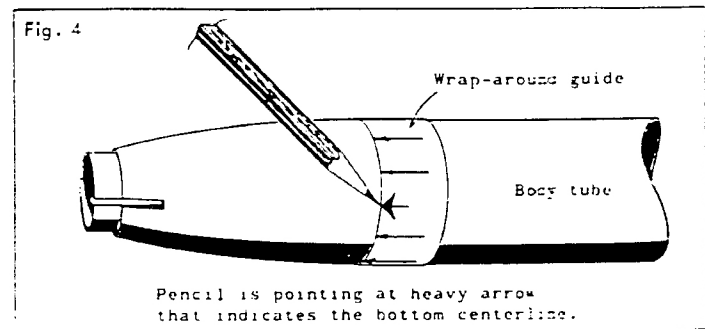
### PREPARE THE FAIRING TUBES

- 4. Trace the wrap-around guide and the fairing tube cutting guide on typing paper and carefully cut out as shown. Cut three 8-3/8" long pieces of fairing tube (BT-5). Wrap the fairing tube cutting pattern around one end of a tube so tube and pattern ends are even as shown in fig. 3. Using

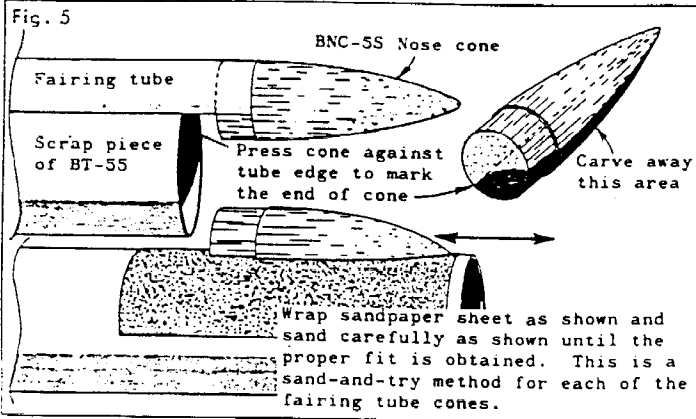


- Remove pattern and extend straight line from last pin hole to the end of the tube. a straight pin, punch a series of holes thru the pattern just deep enough to mark the tube beneath. Remove the pattern and extend a straight line from the last pinhole to the far end of the tube. If necessary, connect each pin hole with a line. Follow the same procedure with the other two tubes. Cut out the tube segments carefully for a good fit.

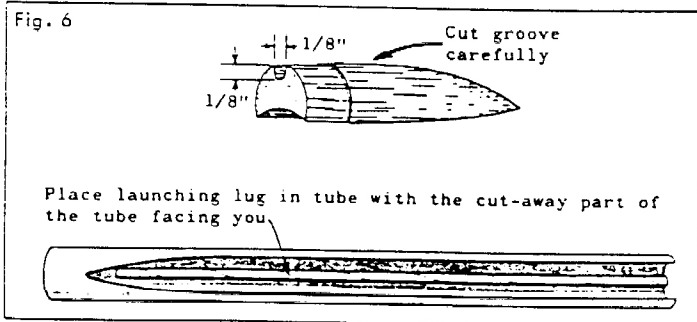
- 5. Place the wrap-around guide at the tail cone-tube joint with the heavy arrow in line with the slot in the rear of the tail cone. Mark the tube at each of the smaller arrow points and use a drawer or door sill to draw straight lines forward on the body tube for five inches.



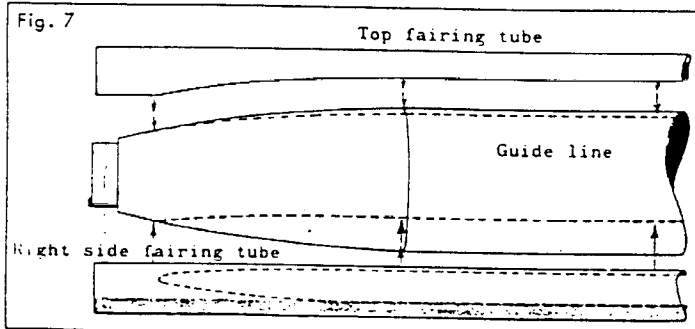
□ 6. Select one of the fairing tubes and one small nose cone. Place the shoulder of the nose cone in the open (cut) end of the fairing tube. Do not glue the cone in place at this time. Place the fairing tube-cone assembly on a spare piece of BT-55 body tube as shown in fig. 5. Mark the base of the nose cone as shown using just enough pressure to crease the BT-55 tube curvature on the base of the cone. Follow this procedure with the other two tube-cone pairs and hereafter keep them together. Carve away the portion of all three cones and fit them to the main body tube as in fig. 5.



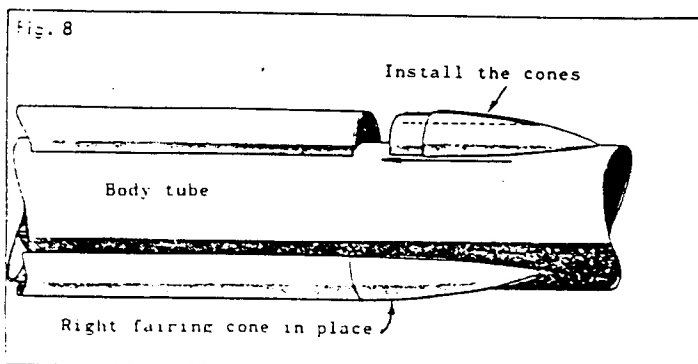
□ 7. Select one fairing tube and cone for the top fairing. Glue the 8" launching lug in it as shown in fig. 6. Carve a 1/8" slot from the top side of the cone as shown to fit snugly around the launching lug.



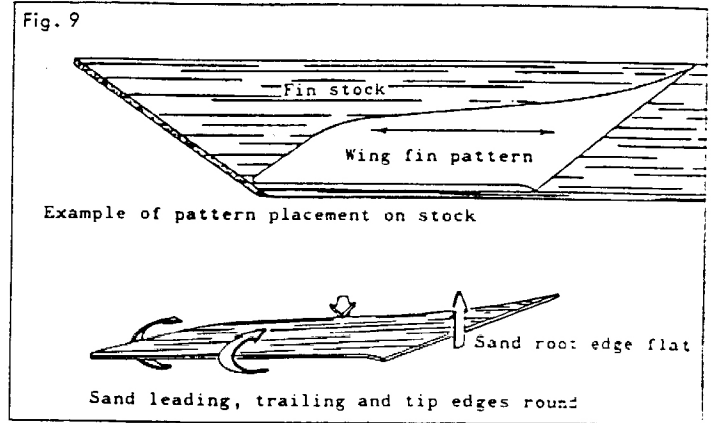
□ 8. Place a line of glue along both cut edges of the top fairing tube assembly. Locate the pair of guide lines opposite the engine holder slot and place the fairing assembly as shown in fig. 7. Follow the same glue and positioning procedure with the right and left fairing tubes. BE SURE YOU KNOW WHICH CONE SECTION BELONGS TO EACH TUBE as they have been match-fitted.



□ 9. Apply glue to the inside front edge of the top fairing tube and to the concave side of its matching cone piece and install the cone piece. Do the same with the right and left side fairing cone pieces.



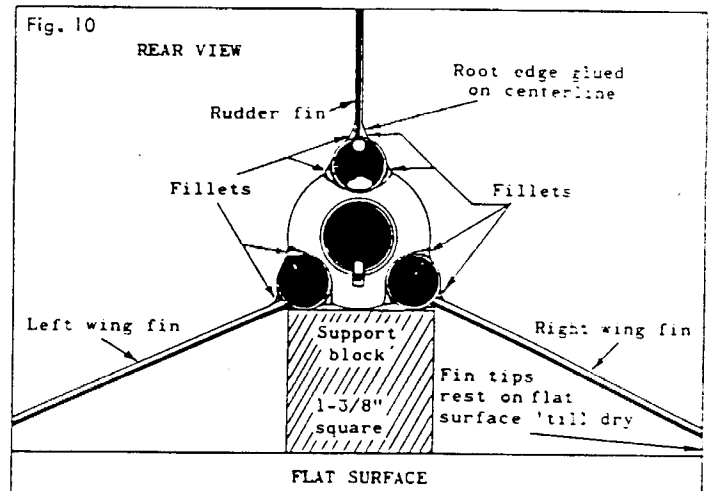
□ 10. Trace the fin patterns onto heavy paper. Cut out the copies carefully and lay them on the sheet balsa fin stock. Align the grain direction mark with the grain of the stock. Trace around the patterns onto the balsa stock and cut out one top fin and two side fins. Use a sharp knife and make more than one pass to cut thru the balsa stock. Sand both sides of each fin



until smooth and sand all outer edges round. Sand all fin root edges flat.

### Fin Placement

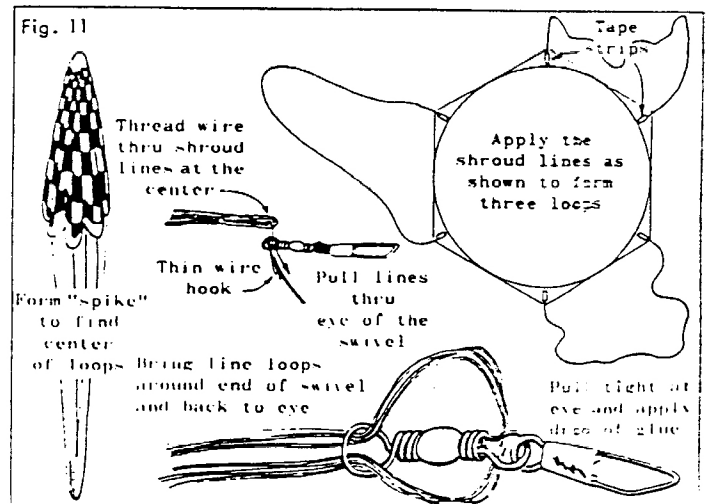
□ 11. Draw a center line on each fairing tube starting 1/4" from the rear of each one. The fins will be centered on the lines. Make a support 1-3/8" square. (Use cardboard or balsa scrap.) Set the support on a flat surface and place the body unit on it as shown in fig. 10.



□ 12. Apply fillets at the points shown in fig. 10. After smoothing all fillets support the model in a horizontal position until dry. On this model, apply the fillet coats lightly. The fillets dry faster and build up more smoothly. Apply and smooth out at least three coats of glue for a smooth contour.

### Prepare the Recovery Gear

□ 13. Assemble the 18" parachute and attach the snapswivel to the shroud lines as shown in fig. 11 below.



Press the shock cord anchor onto a piece of typing paper, cut out and glue in the shock cord as shown below.

**Fig. 12**

**Step 1:** Apply glue to section 1. Lay the end of the shock cord into place. Fold the 1st. section over the second one as shown.

Fold forward

Glue areas

**Step 2:** Apply glue over the backside of the first and the exposed part of section 2. Lay the shock cord as shown and fold the cord and section 2, over section 3.

Fold forward

Center the shock cord at this edge

Press into place

**Step 3:** Apply glue to the inside of the body tube where the shock cord mount will seat. Hold the shock cord as shown and place the mount into position, pressing it to conform to the inside curve of the body tube.

15. Insert the screw eye into the base of the nose cone and remove it. Squirt glue into the hole just made and replace the screw eye and wipe away any excess glue.

**Fig. 13**

Nose cone

Screw Eye

16. Tie the free end of the shock cord to the screw eye in the nose cone. Stretch the rubber as shown and while stretched, wrap a tape strip tightly around the cord as shown. A spot of glue across the end of the tape strip as shown will keep the tape strip firmly in place.

**Fig. 14**

Cut off excess

Wrap

Nose cone

Stretch

Shock cord

Body tube

To parachute

## General Information

The engine types recommended for use in this model are the 1/2A .8-2, A .8-3, and B .8-4. For the first test flights 1/2A .8-2 engines should be used. Due to the model's slow takeoff characteristics, it is best to launch it on calm days. Launch your rocket with a standard Electro-Launch unit of six or twelve volts.

Preparing the Saturnian for a launch is the same as for any single stage rocket. Installing the rocket engine into the rocket has been made easier by using an engine holder. Five or six squares of flame-resistant wadding is packed into the body tube, followed by chute, shroud lines, shock cord and nose cone. Folding procedure for the parachute is shown below.

**Fig. 15**

Form "Spike"

Fold once

Insert into tube

## BASIC ASSEMBLY References

SCREW EYE and NOSE CONE (Fig. 13)

SHOCK CORD ATTACHMENT (Figs. 12 and 14)

FAIRING TUBE and CONE (Figs. 3, 5 thru 8 and Fig. 10)

FIN PREPARATION and PLACEMENT (Figs. 9 & 10)

ENGINE HOLDER and TAIL CONE (Figs. 1, 2 and 4)

