

# Estes Industries Rocket Plan No. 38

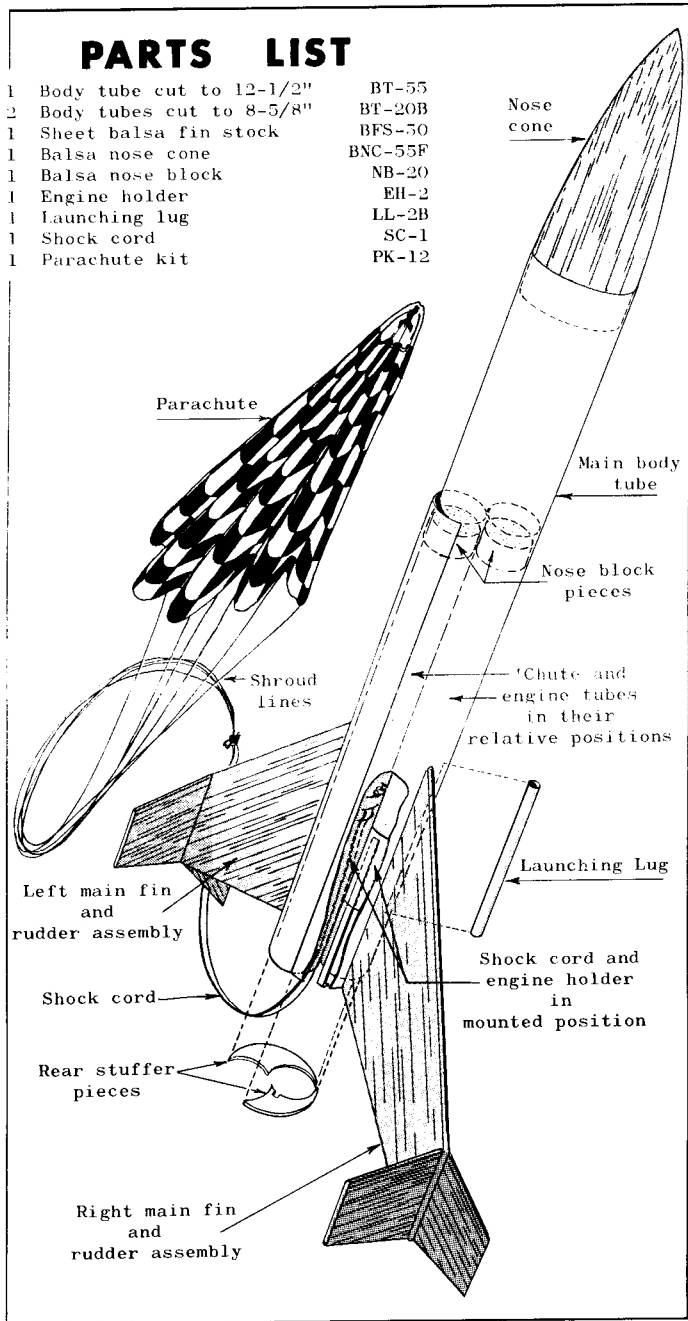
# GAMMA

with  
**REAR EJECTION 'CHUTE**

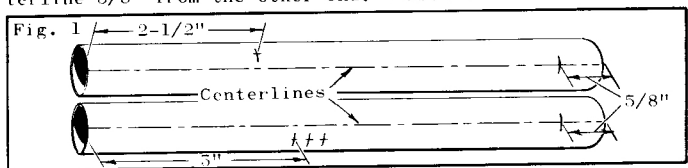
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## PARTS LIST

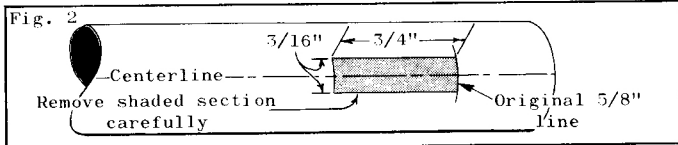
- |                            |         |
|----------------------------|---------|
| 1 Body tube cut to 12-1/2" | BT-55   |
| 2 Body tubes cut to 8-5/8" | BT-20B  |
| 1 Sheet balsa fin stock    | BFS-50  |
| 1 Balsa nose cone          | BNC-55F |
| 1 Balsa nose block         | NB-20   |
| 1 Engine holder            | EH-2    |
| 1 Launching lug            | LL-2B   |
| 1 Shock cord               | SC-1    |
| 1 Parachute kit            | PK-12   |



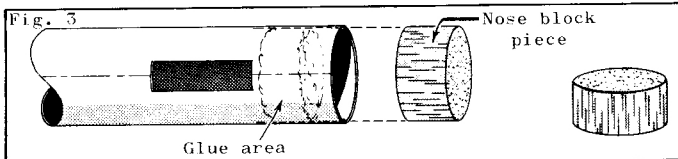
1. Draw a centerline the entire length of both pieces of 8-5/8" long BT-20. Continue the lines onto the ends of the tubes. Select one BT-20 and mark it 2-1/2" from one end 1/4" above the centerline and across the centerline 5/8" from the other end. Label this tube "engine". Mark the other BT-20 3" from the end and 1/4" below the centerline as shown in fig. 1. Make two more marks 1/4" and 1/2" away from the 3" mark as shown and finally a mark across the centerline 5/8" from the other end. Label this tube "chute".



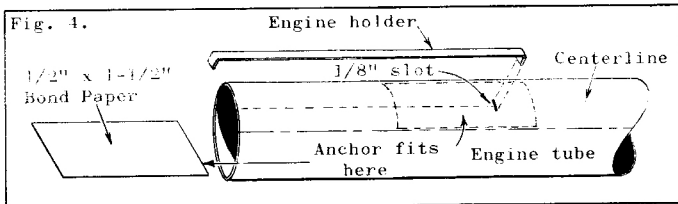
2. Cut a port in each tube 3/16" wide by 3/4" long. Use the marks crossing the centerline 5/8" from the tube end as the starting point as shown in fig. 2.



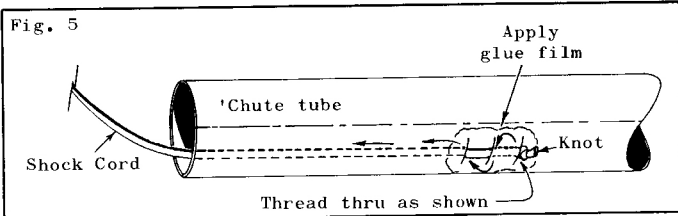
3. Cut the nose block in half. Spread glue inside one of the tubes at the port end, covering an area from 1/4" from the end to the edge of the port. Push one nose block piece into the tube until the inside end of the block reaches the edge of the port. Repeat this step with the other tube and the remaining nose block piece. See fig. 3.



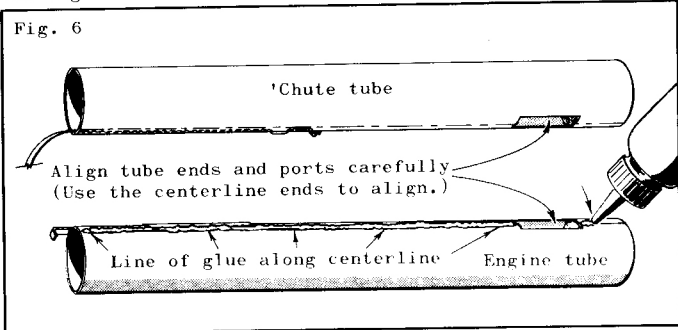
4. Cut a 1/8" slot in the engine tube at the 2-1/2" mark. Place one hook of the engine holder in this slot and glue a 1/2" x 1-1/2" strip of paper over it as shown.



5. Cut 3 slits, each 1/4" long, in the other tube at the marks starting 3" from the tube end as shown. Tie a knot at one end of the shock cord and thread the shock cord thru the slots as shown in fig. 5.

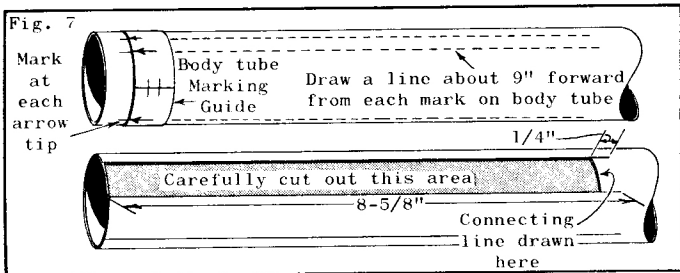


6. Apply a line of glue along the centerline of one tube in line with the port. (See fig. 6.) Carefully align the port of the "engine" tube with the port of the "chute" tube and join both tubes. Match the centerline marks on the ends of the tubes. After the glue has set, apply a good fillet of glue along both sides of the joint except in the area of the engine holder.

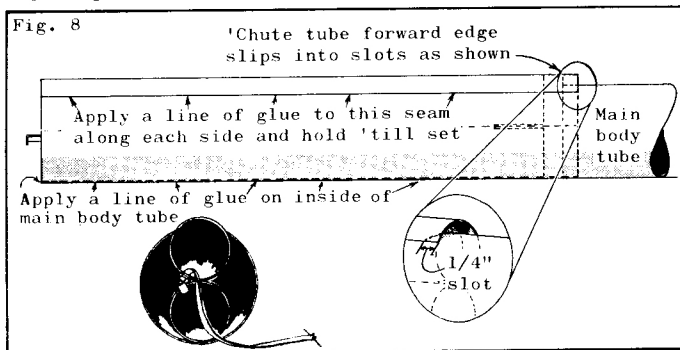


7. Cut a 12-1/2" long piece of BT-55 for the main body tube. Trace the body tube marking guide onto typing paper, cut out and wrap around one end of the tube. Mark the tube at each arrow point. Use a drawer or door sill and extend

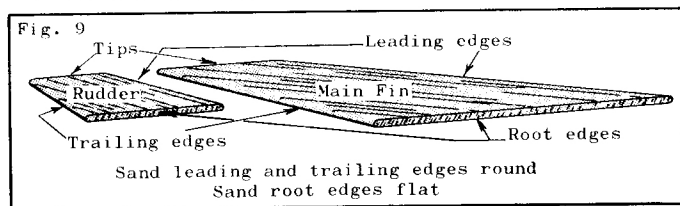
all marks about 9" forward along the tube. Select one of the lines drawn from the "X" arrow points, measure exactly 8-5/8" from the end of the tube as shown and mark the tube. Back up 1/4" and make another mark. Do the same with the other "X" arrow line. Draw a connecting line between the marks which are 1/4" back from the 8-5/8" marks. Carefully cut out the part of the tube as shown in fig. 7.



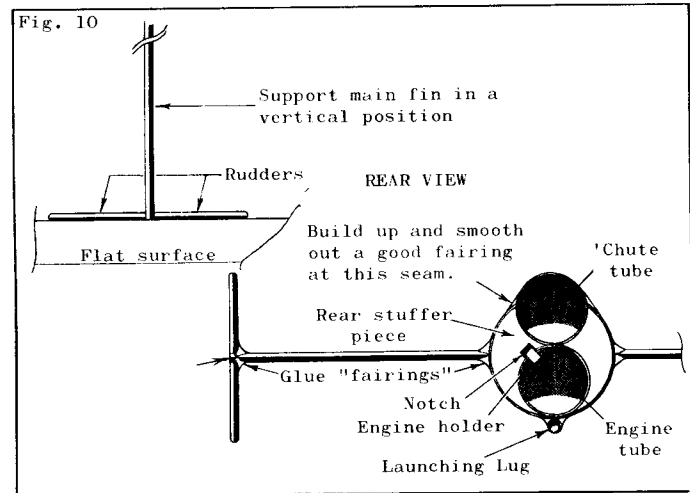
8. Apply glue to the inside of the main body along a line directly opposite the slot. Slide the engine-chute tube directly into the main body tube with the recovery portion partly out thru the slot in the main tube. The forward end of the smaller tube must "seat" in the two 1/4" slits as shown below with the section of the main body tube against the nose block piece. Position the inside tubes so they are centered in the main tube. Apply a layer of glue to the seams along each side as shown. Support on a level surface until dry. Repeat as necessary to build up a strong smooth fillet.



9. Trace the fin patterns onto stiff paper. Trace the rear stuffer pattern onto cardboard as directed. Cut out the tracings. Set the stuffer pieces aside and lay the main fin pattern on the balsa fin stock. Line up the wood grain with the leading edge and trace two fins. Do the same with the rudder pattern, making four pieces. Cut all the pieces from the fin stock and sand them as shown in fig. 9.



10. Glue the rudders to the tip of each main fin as shown. When the rudder joints have set, apply glue to the root edge of one main fin assembly and place it on a guide line next appearing to the right or left of the "chute" tube. Do the same with the other main fin unit and stand the model on its nose until dry. Apply a line of glue along the fin-body joint on each side and smooth it out into a fairing shape as seen in fig. 10. Support the model in a horizontal position until dry.



11. Glue one stuffer piece into place at the rear of the body tube on the side opposite the engine holder. Fit the remaining stuffer piece against its location and mark it on either side of the engine holder. Make a 1/8" notch (see fig. 10, rear view) to allow the engine holder to be sprung outward enough to release a spent engine casing. Glue the fitted stuffer piece in place taking care to get no glue on the engine holder.

12. Glue the nose cone in place. Glue the launching lug along the guide line on the underside of the body tube. Set the assembly aside to dry.

13. Assemble the parachute following the instruction in the kit. Tie the shroud lines to the free end of the shock cord. Pack the parachute, shroud lines and shock cord into the "chute" tube and temporarily seal the end of the tube with a bit of recovery wadding. The Gamma is now ready to be painted the color(s) of your choice.

## Special Flying Instructions

14. Insert two squares of recovery wadding into the "chute" tube. Place the shock cord and shroud lines next and the folded parachute in last. Push the entire mass 2 to 2-1/2" into the tube. Install any Series I single stage engine into the engine holder and your Gamma is ready for flight.

## Pattern Group

