



# Sport Flying Parachute Recovery

K-31

Series III Engines Only

- 1/4A3-1S
- 1/2A6-2S
- 1/2A6-4S

**\$1.75**

NASA

# STAR BLAZER

Weight 1.0 oz. Length 12.5 in.  
Body Dia. .736 in.



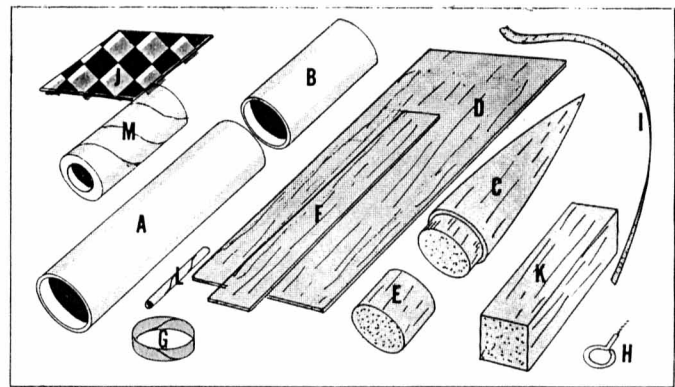
ESTES INDUSTRIES  
BOX 227, PENROSE, COLO. 81240

Your STAR BLAZER kit consists of the following parts as illustrated in the drawing at the right:

- (A) 1 Body Tube. . . . . Part #BT-20D
- (B) 1 Body Tube. . . . . Part #BT-20M
- (C) 1 Nose Cone. . . . . Part #BNC-20N
- (D) 1 Fin Stock. . . . . Part #BFS-20
- (E) 1 Nose Block. . . . . Part #NB-20
- (F) 1 Fin Stock. . . . . Part #BFS-20B
- (G) 1 Engine Block. . . . . Part #EB-20A
- (H) 1 Screw Eye. . . . . Part #SE-2
- (I) 1 Shock Cord. . . . . Part #SC-1
- (J) 1 Parachute Kit. . . . . Part #PK-12
- (K) 1 Nose Cone Stock. . . . . Part #NCS-3
- (L) 1 Launching Lug. . . . . Part #LL-2A
- (M) 1 Engine Casing. . . . . Part #EC-1

NOTE: The engine casing provided with this kit is one which has been rejected as unsuitable for use in the construction of a rocket engine. It is provided as a measuring device only, and is not suitable for any other use.

READ the assembly instructions carefully before beginning to work on your rocket. THEN start construction following each step in order, checking off each step as it is completed.

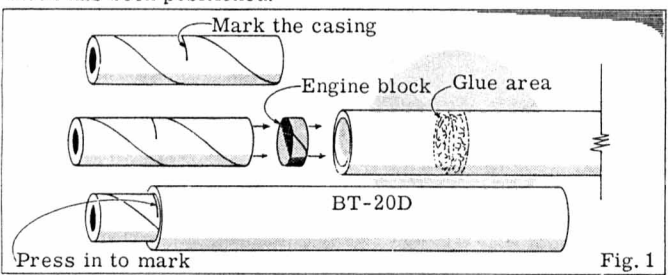


In addition to the materials included in your kit, you will need the following tools and supplies:

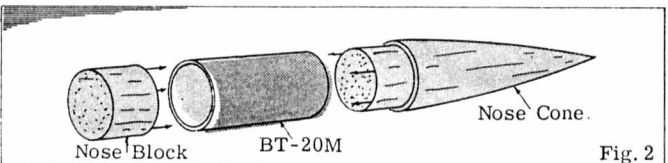
- 1) Modeling knife or single edge razor blade—razor saw if available.
- 2) Scissors
- 3) Extra strong white glue
- 4) Ball point pen or pencil
- 5) Fine and extra-fine sandpaper
- 6) Sanding sealer and paint or dope

## Assembly Instructions

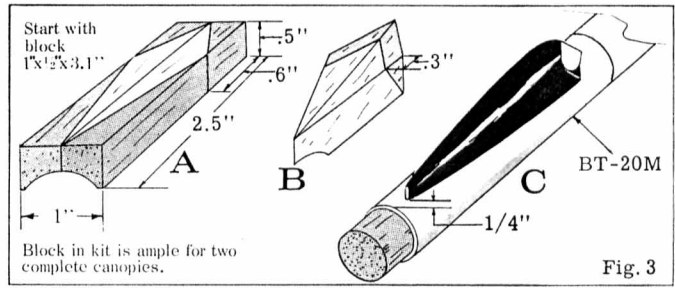
(1) To install the engine block, first mark the empty engine casing 1-1/2" from one end. Using your little finger or a brush, smear glue around the inside of the body about 1-1/2" from one end. Insert the engine block into this end and push it forward with the casing until the mark is even with the end of the tube (so only 1-1/4" of the casing projects from the end of the body). Do not pause during this operation or the glue may set with the block in the wrong position. Remove the casing as soon as the block has been positioned.



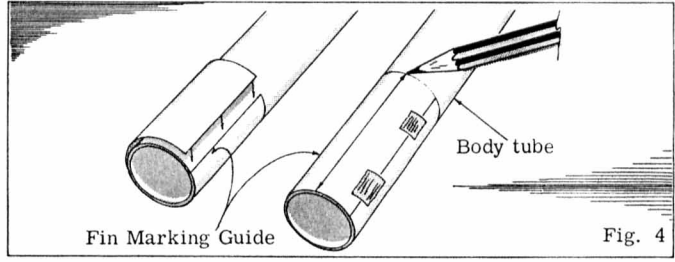
(2) Spread glue inside one end of the BT-20M body tube and insert the NB-20 nose block 1/4" into the tube. Spread glue inside the other end of the tube and insert the nose cone.



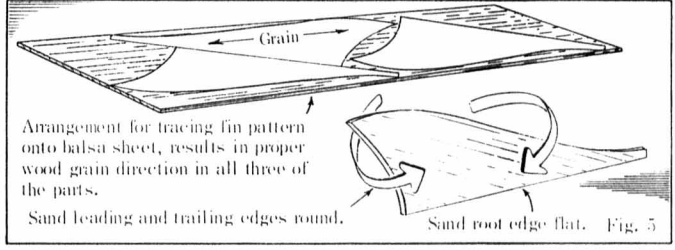
(3) Draw a center line on the top of the canopy block using a ball point pen. From one end of the block, measure back .6" and draw a line across the block. Draw diagonal lines from the center line at each end of the block to the outside ends of the cross line. Using a razor saw, cut away the pieces shown in the shaded portion of the picture. From the tip of the short angle, measure back .3" and make a mark. From this mark draw lines parallel to the edge of the short angle. Again using a razor saw, cut as shown by the shaded area in fig. 3B. Wrap a piece of sandpaper around a section of BT-20 and sand the bottom side of the canopy block to fit snugly around the body tube as shown in the picture. Glue the canopy to the nose section so that the long point of the canopy is 1/4" from the rear end of the BT-20M tube. Carve and sand the canopy to the shape shown in fig. 3C.



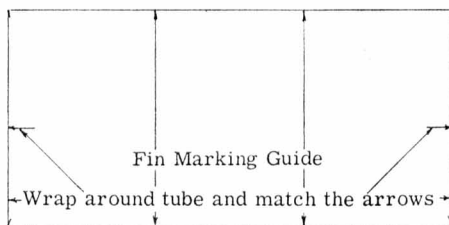
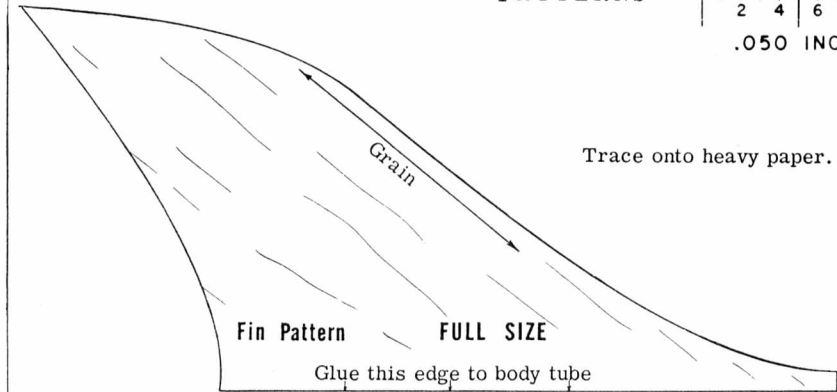
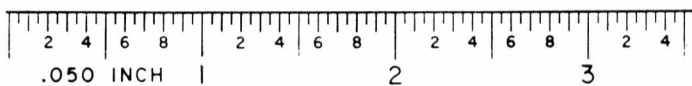
(4) Trace the Fin Marking Guide onto heavy paper and cut out carefully. Wrap the guide around the tube as shown (Fig. 4) and mark the tube at each arrow tip. Lay the tube in the "V" notch of a drawer or door sill and align one set of marks with one edge of the sill - now draw a line on the tube for its full length. Repeat this procedure with the two remaining sets of marks.



(5) Cut out the fin pattern. Lay the pattern on the balsa fin stock with the grain of the wood and the grain shown on the pattern matched perfectly. Trace out three copies of the fin. Cut out the fins carefully with a sharp blade. Be especially careful to make straight, clean cuts. Sand the sides of the fins so they are flat and smooth. Round all edges of the fins except the root edges with sandpaper. Sand the root edges so they are flat and square with the sides of the fins.

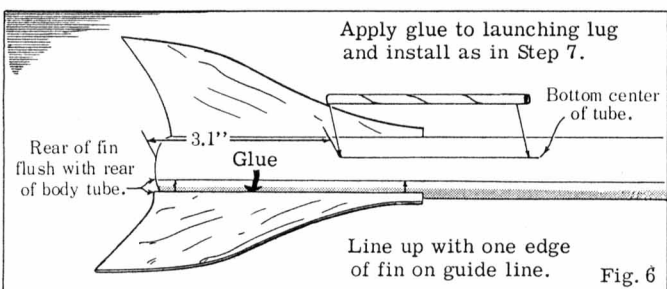


PATTERNS

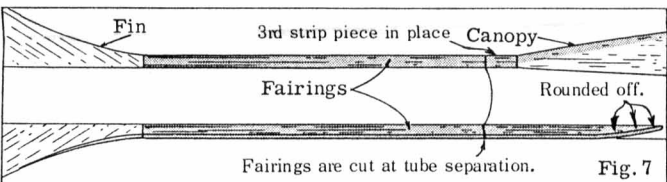


(6) Apply glue to the root edge of one of the fins. Attach the fin to the rocket's body tube with the edge of the fin along one of the lines drawn in step 4. Align the fin so it projects straight away from the body tube. Following the same procedure, attach the other two fins. Do not set the rocket on its fins while the glue is wet.

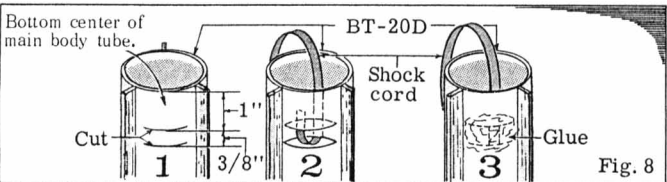
(7) Glue the launching lug to the body tube so its rear is 3.1" from the rear of the body and is halfway between two fins as shown. Sight along the tube and align the lug so it runs parallel to the body tube.



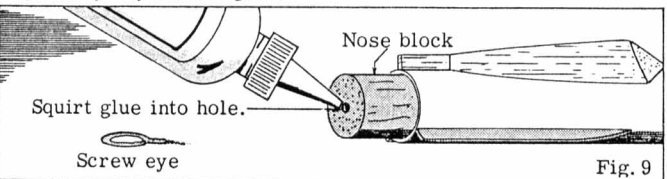
(8) Cut the BFS-20B balsa sheet into three 1/8" strips. Glue two of the full length strips along the fin lines of the side of the tube. The third strip is cut to fit between the front of the fin to the back of the canopy as shown in the picture.



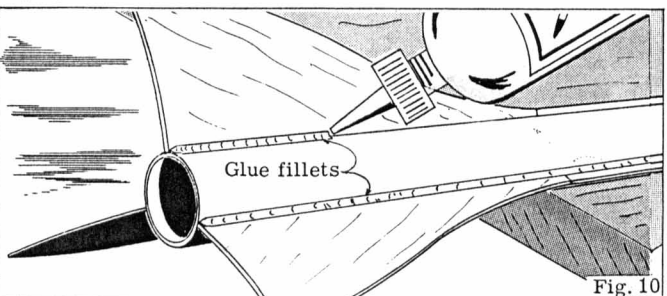
(9) Cut two 3/8" wide slits in the forward end of the body as shown in fig. 8. Cave in the section between the slits and hook the shock cord through the slits as shown. For an extra secure attachment, knot the inside end of the shock cord. Press the caved-in portion of the tube outward until it is round again and apply glue to the cut edges and to the shock cord to anchor it in place.



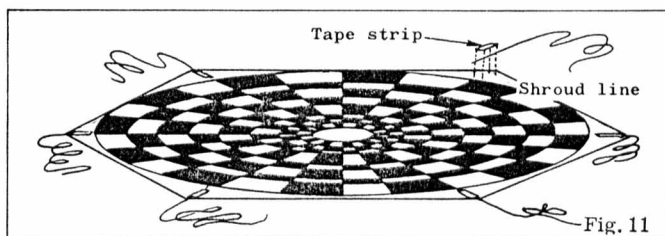
(10) Insert the screw eye into the base of the nose block. Remove the screw eye, press the nozzle of the glue bottle to the hole and squirt glue into the hole. Replace the screw eye and wipe away any excess glue.



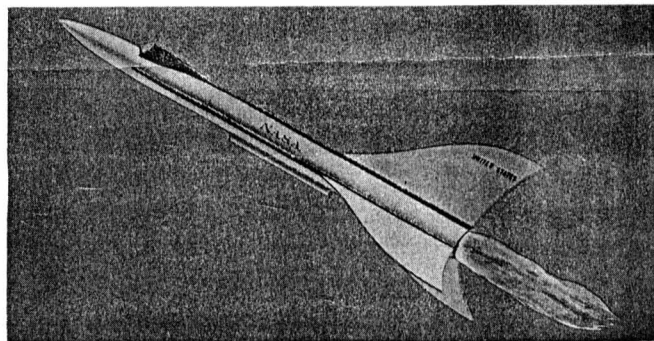
(11) When the first glue on the fins and launching lug has become hard, apply a glue fillet to each of the fin-body joints and to the launching lug as shown. The fillets should be smooth and bubble-free. Support the rocket horizontally while the glue is drying.



(12) Cut the parachute out on the edge lines. Cut six 12" lengths of shroud line cord and attach the lines to the points marked on the parachute, using the tape strips supplied in the parachute kit. Tie the free ends of the shroud lines to the screw eye. Tie the free end of the shock cord to the screw eye.



(13) Before finishing let all the glue on the outside of the rocket dry so it is hard and clear. Cover all balsa surfaces with a coat of sanding sealer. Let it dry completely and sand lightly with extra fine sandpaper. Apply a second coat, sand and apply still another coat until all the pores in the balsa are filled and the surfaces look and feel smooth. Give the rocket at least one clean base coat of glossy white paint or dope, let dry and follow with black trim on the fairings and canopy.

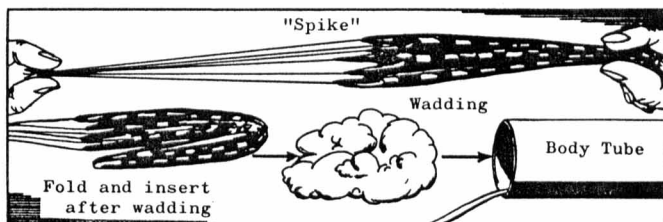


## Countdown Checklist

Your STAR BLAZER is designed to fly with Series III engines ONLY. The recommended engines are:

1/4A3-1S, 1/2A6-2S, 1/2A6-4S.

10. Pack flameproof wadding into the body tube. The wadding should rest against the engine block and extend about one and one-half inches up the tube. Fold the parachute carefully and pack it on top of the wadding. Pack the shroud lines and shock cord on top of the 'chute and slide the nose cone assembly into place.



9. Select an engine and install an igniter as in the instructions that came with the engines. Wrap tape around the nozzle end of the engine until it fits snugly in the body tube.

8. Place the rocket on the launcher, clean the micro-clips and attach them to the igniter wires.

7. Clear the area. Check for low flying aircraft. Alert your recovery crew and trackers.

6. Arm the launch panel.

-5-  -4-  -3-  -2-  -1- LAUNCH!