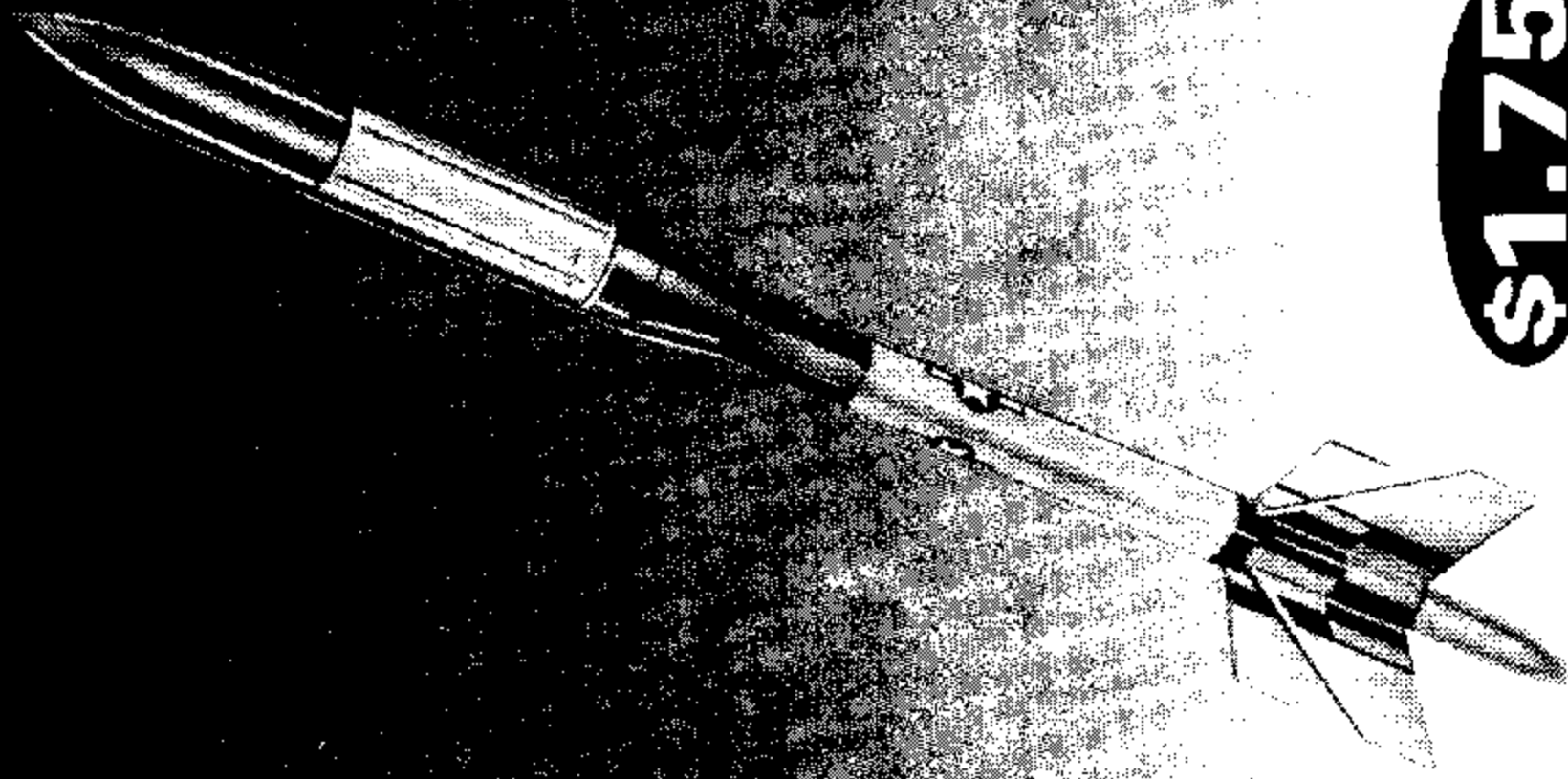


ESTES



\$1.75

X-RAY

KIT NO. K-18 \$1.75

RECOMMENDED ENGINES  
 1/2 A6-2 B6-4  
 A8-3 B14-5 C6-3  
 (Use A8-3 engines for first flights.)

Length 16.75"  
 Body Dia. 7/16"  
 Payload Sec. Dia. .950"  
 Weight 7 oz.

PARACHUTE RECOVERY

# Astron X-Ray Instructions

Your Astron X-Ray payload rocket kit consists of the following parts as illustrated in the drawing at right:

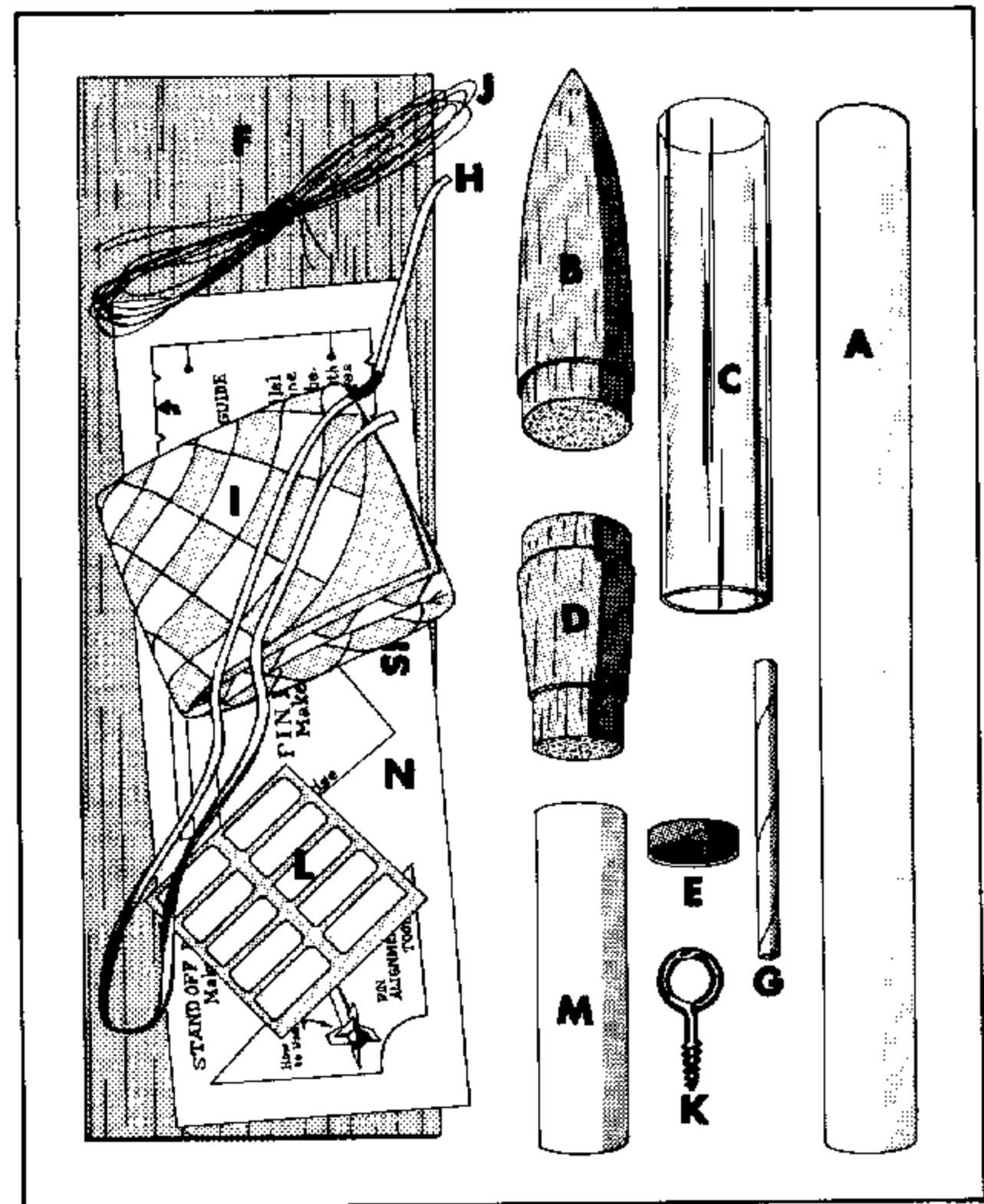
- (A) 1 body tube--Part #BT-20B
- (B) 1 balsa nose cone--Part #BNC-50K
- (C) 1 payload section tube--Part #PST-50S
- (D) 1 balsa adapter--Part #TA-2050A
- (E) 1 engine block--Part #EB-20A
- (F) 1 sheet balsa fin stock--Part #BFS-20
- (G) 1 launching lug--Part #LL-1B
- (H) 1 shock cord--Part #SC-1B
- (I) 1 parachute--Part #PK-12A
- (J) 72" shroud line cord--Part #SLT-12
- (K) 1 screw eye--Part #SE-2
- (L) 10 tape strips--Part #TD-2J
- (M) 1 empty engine casing--Part #EC-2
- (N) 1 pattern sheet--Part #SP-18

**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.

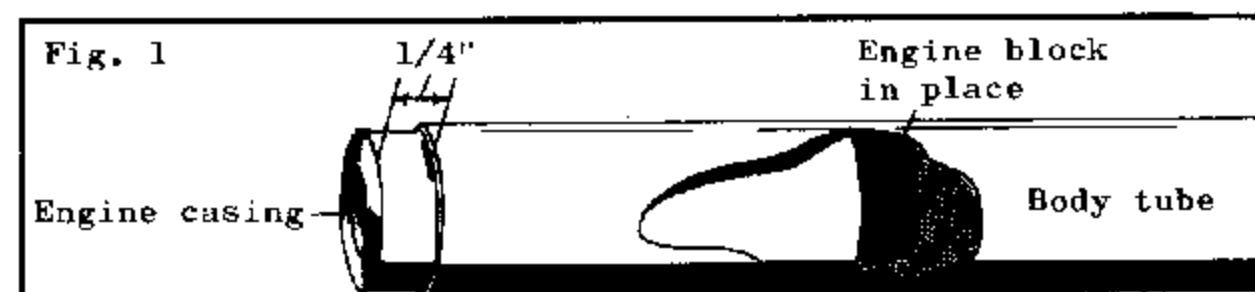
In addition to the materials included with your kit you will also need the following tools and supplies:

- 1) Modeling knife or single edge razor blade
- 2) Scissors
- 3) Extra strong white glue
- 4) Ball point pen or pencil
- 5) Fine and extra fine grit sandpaper
- 6) Paint or dope

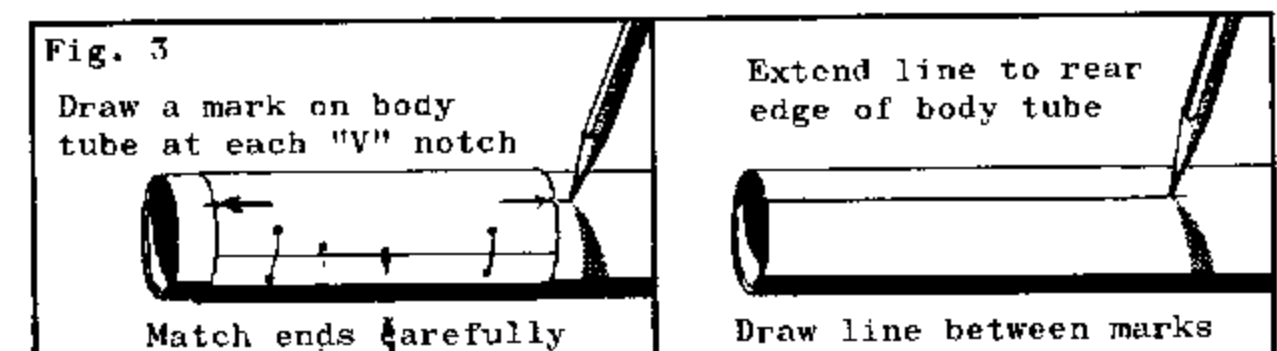
Read the entire assembly instructions carefully before beginning work on your rocket. Then start construction, following each step in order, checking off each step as it is completed.



□ (1) To install the engine block, first mark the empty engine casing 1/4 inch from one end. Using your little finger or a brush, smear glue around the inside of the body about 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 1/4" 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.



□ (3) Cut out the fin spacing guide, wrap it around the rear end of the body and mark the tube at each of the arrow points. Apply glue to the root edge of a fin and place it against the body exactly on one of the marks. Align the fin by sighting along the body and adjusting it until it is perfectly parallel with the body and projects straight away from it. Repeat this procedure with the other three fins. Do not set the rocket on its fins while the glue is wet.



# Astron X-Ray Instructions

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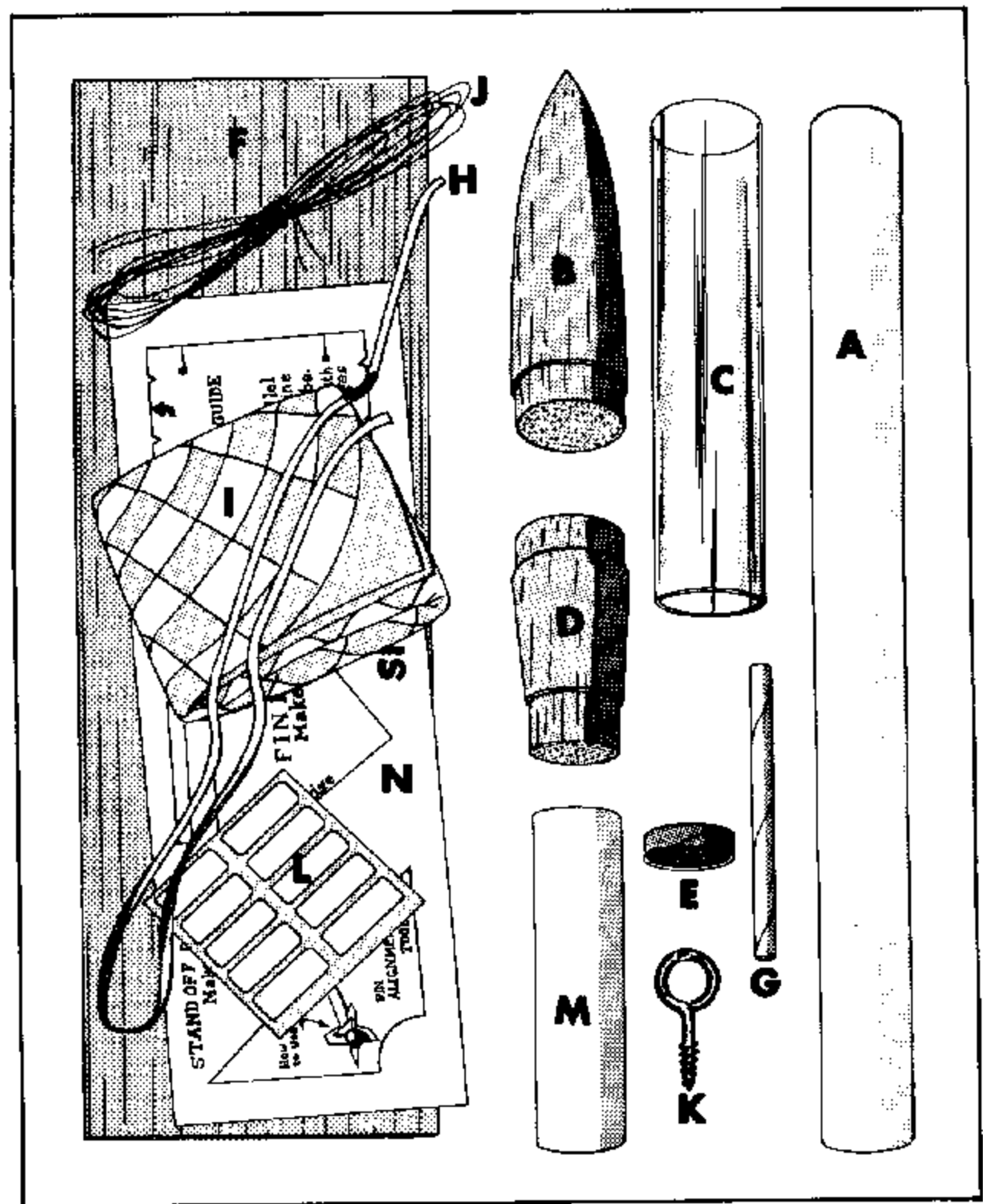
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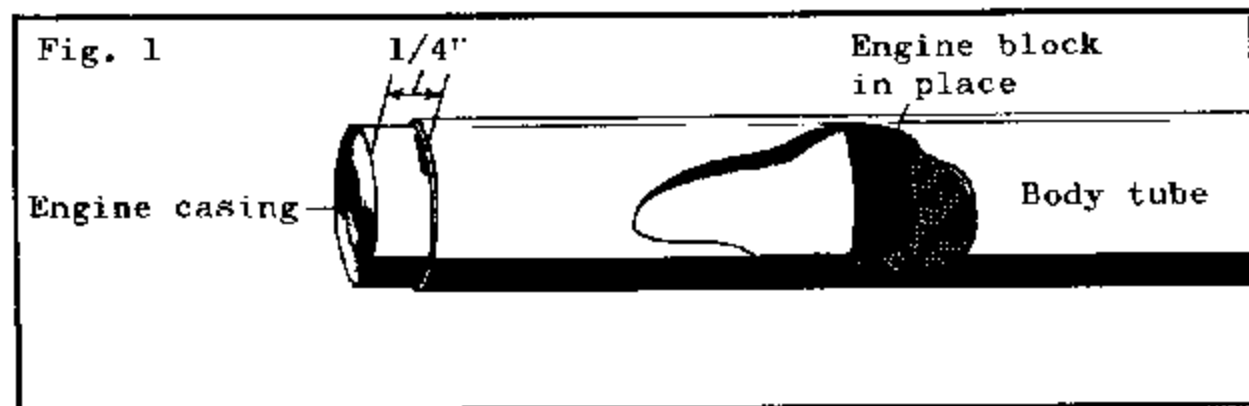
In addition to the materials included with your kit you will also need the following tools and supplies:

- 1) Modeling knife or single edge razor blade
- 2) Scissors
- 3) Extra strong white glue
- 4) Ball point pen or pencil
- 5) Fine and extra fine grit sandpaper
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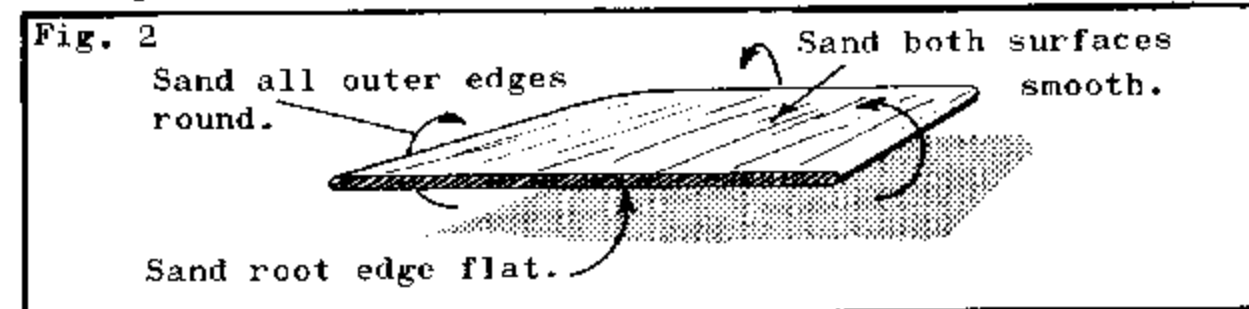
Read the entire assembly instructions carefully before beginning work on your rocket. Then start construction, following each step in order, checking off each step as it is completed.



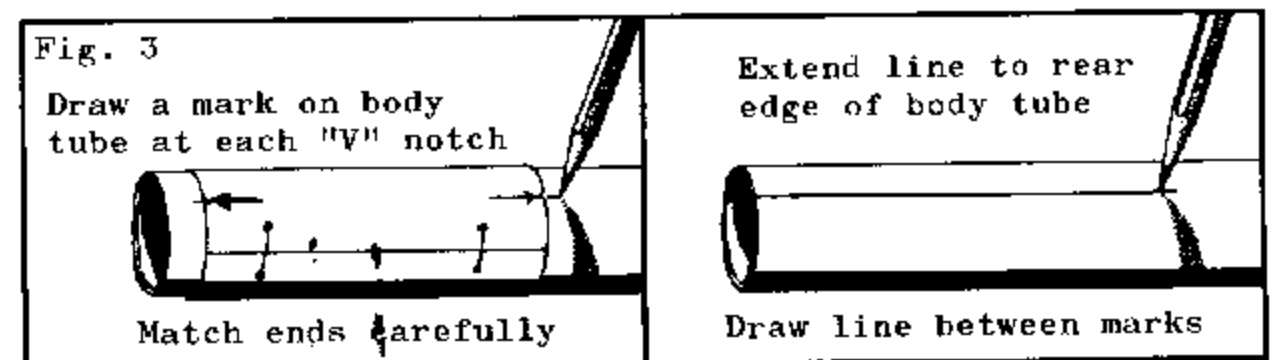
- (1) To install the engine block, first mark the empty engine casing 1/4 inch from one end. Using your little finger or a brush, smear glue around the inside of the body about 2" from one end. Insert the engine block into this end and push it forward with the casing until the mark is even with the end of the tube (so only 1/4" 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.



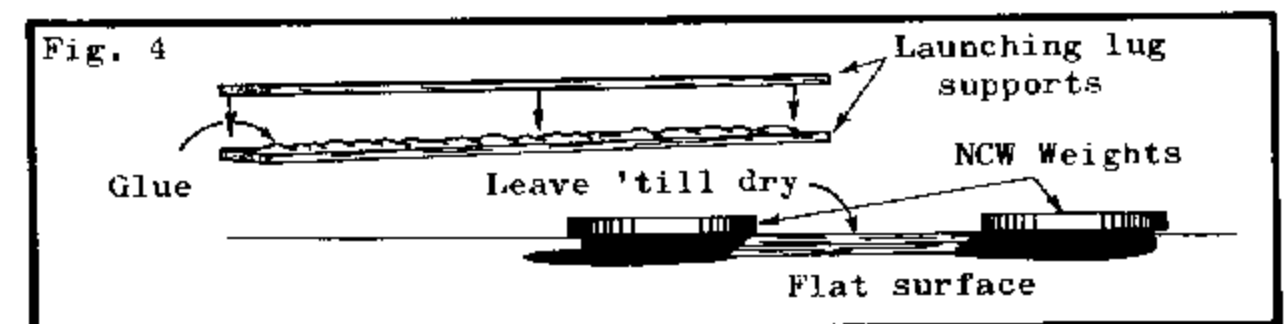
- (2) Cut out the fin pattern. Lay the pattern on the balsa fin stock with the grain of the wood and the grain shown on the pattern matched perfectly. Trace out four copies of the fin. Cut out the fins carefully with a sharp blade. Be especially careful to make straight, clean cuts. Sand the sides of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



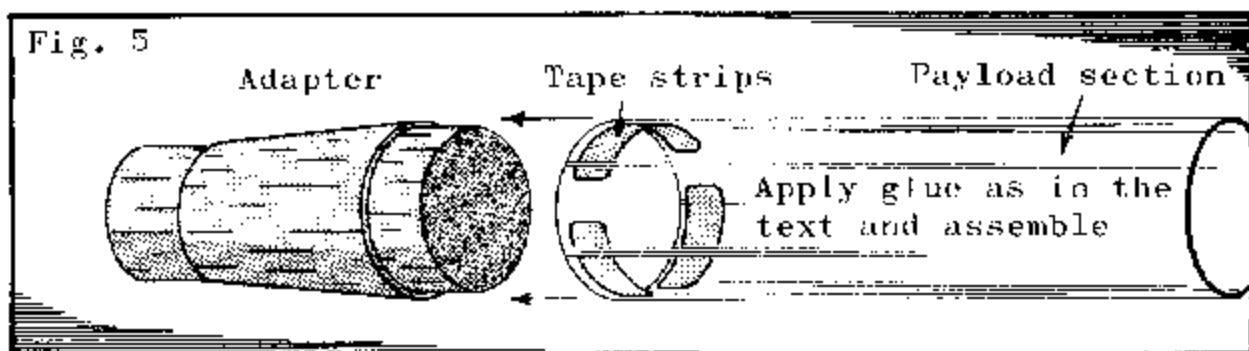
- (3) Cut out the fin spacing guide, wrap it around the rear end of the body and mark the tube at each of the arrow points. Apply glue to the root edge of a fin and place it against the body exactly on one of the marks. Align the fin by sighting along the body and adjusting it until it is perfectly parallel with the body and projects straight away from it. Repeat this procedure with the other three fins. Do not set the rocket on its fins while the glue is wet.



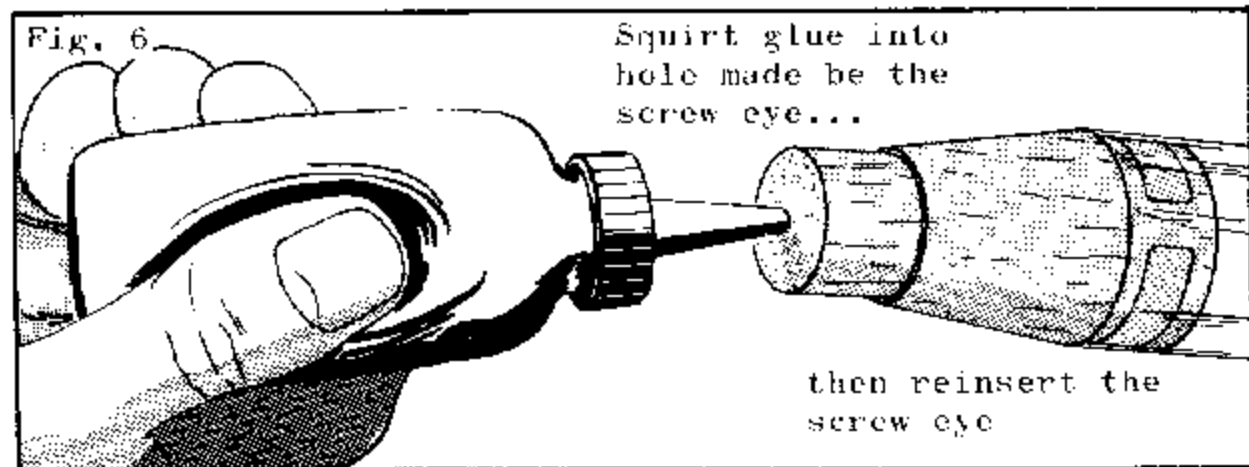
- (4) Cut out the launching lug support pattern and trace two copies of it onto the balsa. Cut the two support pieces out and glue them together, side-to-side as shown. Lay the assembly on its side and weight down the ends to prevent warping while the glue dries.



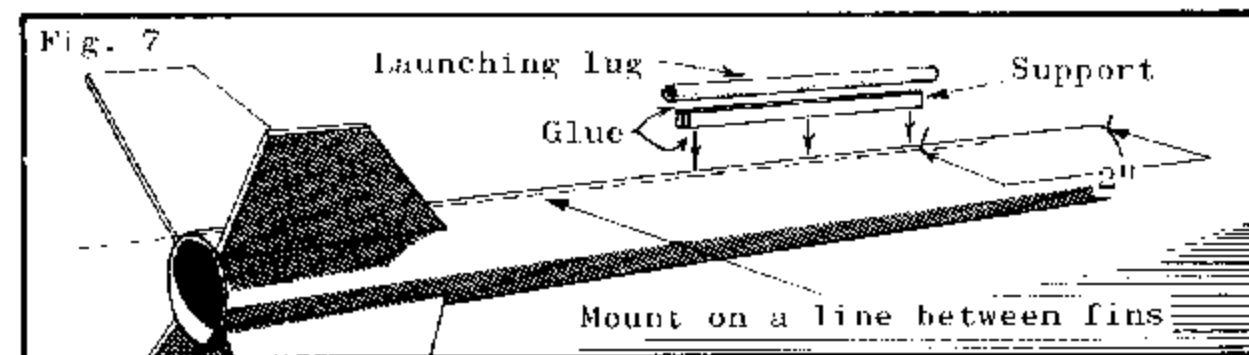
- (5) Apply three tape strips to the inside of the payload tube as shown. Bevel the large end of the adapter with sandpaper, smear glue over the tape strips and slide the adapter into position in the tube.



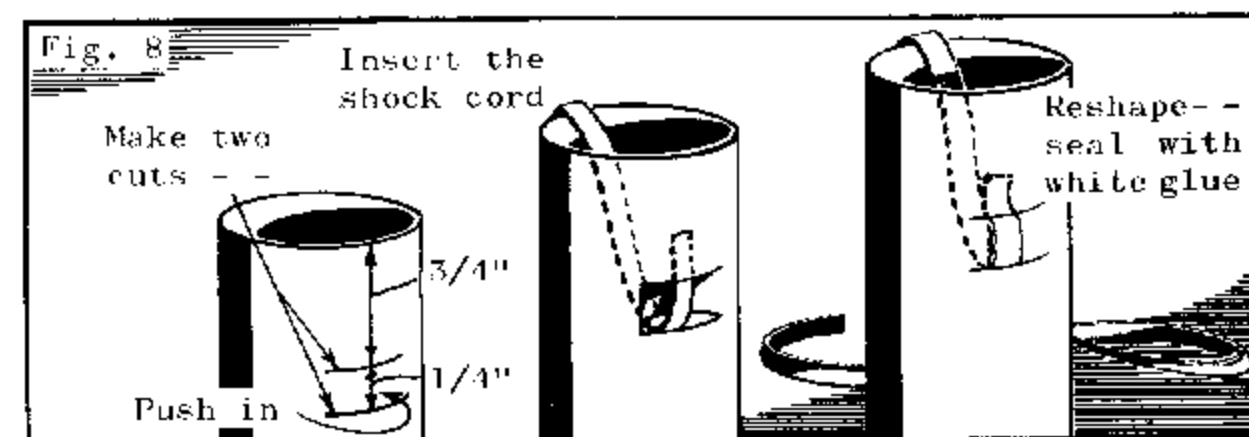
(6) Insert the screw eye into the small end of the adapter. Remove the screw eye, press the nozzle of the glue bottle to the hole and squirt glue into the hole. Replace the screw eye and wipe away any excess glue.



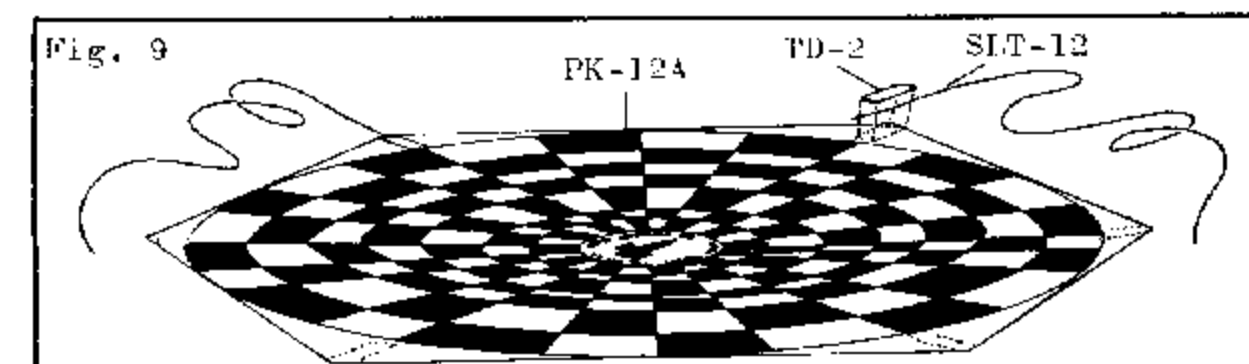
(7) Glue the launching lug to one edge of the launching lug support as shown. Glue the other edge of the support to the rocket body 2" from the front of the tube along a line which will pass between two of the fins. Align the assembly so it is perfectly parallel to the rocket body.



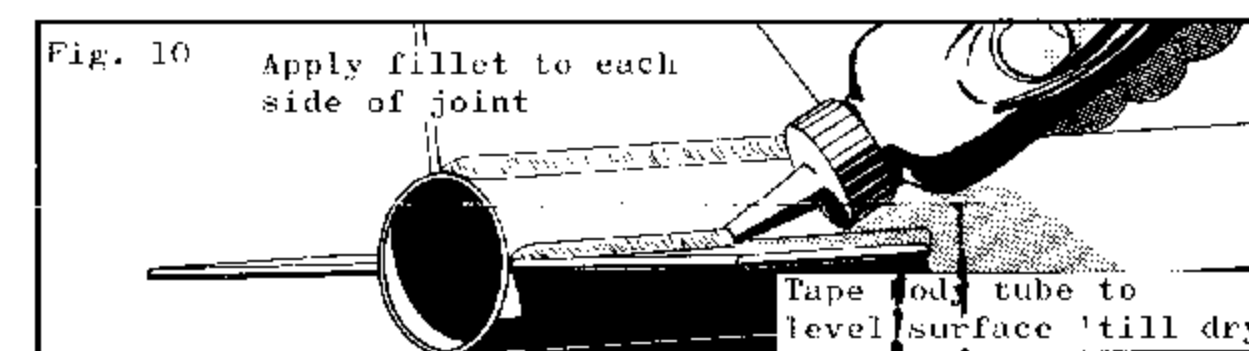
(8) Cut two 3/8" wide slits in the forward end of the body as shown in fig. 8. Cave in the section between the slits and hook the shock cord through the slits as shown. For an extra secure attachment, knot the inside end of the shock cord. Press the caved-in portion of the tube outward until it is round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



(9) Cut out the parachute on its edge lines as indicated on the plastic. Cut six 12" lengths of shroud line cord and attach one shroud line to each point of the parachute with a tape strip as shown in fig. 9. Tie the free ends of the lines together.



(10) Apply a glue fillet to each of the fin-body joints and to the launching lug support as shown. The fillets should be smooth and bubble-free. Support the rocket horizontally while the glue dries.

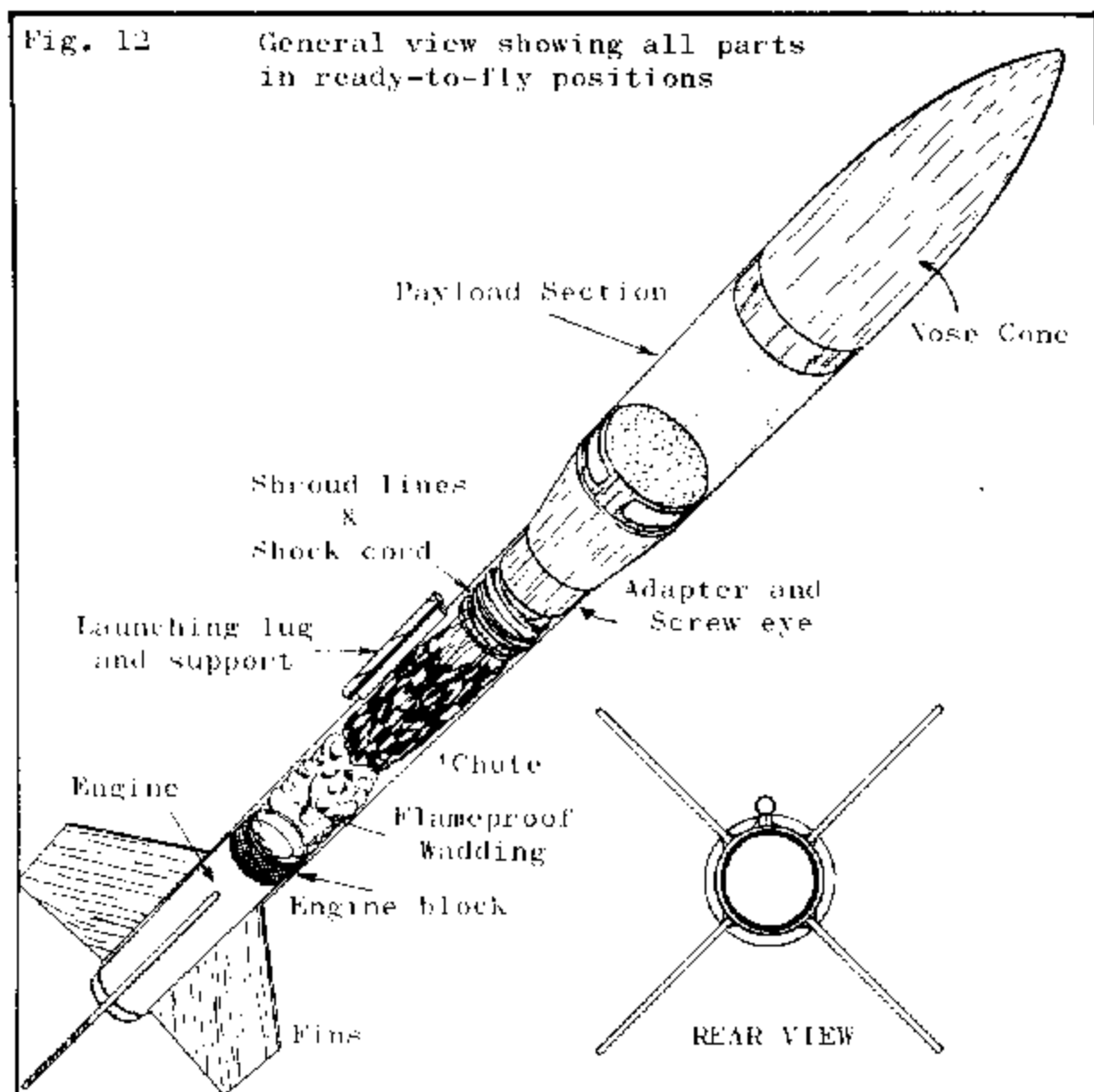


(11) Connect the shock cord, parachute and screw eye as

apply still another coat until all the pores in the balsa are filled and the surfaces look and feel smooth. Protect all parts of the transparent plastic payload section which you do not want painted by wrapping the tube with masking tape. Give the rocket a clean base coat of glossy white paint or dope, let dry and follow with a high visibility color such as red, fluorescent orange, cerise, etc. to aid in tracking and retrieving.

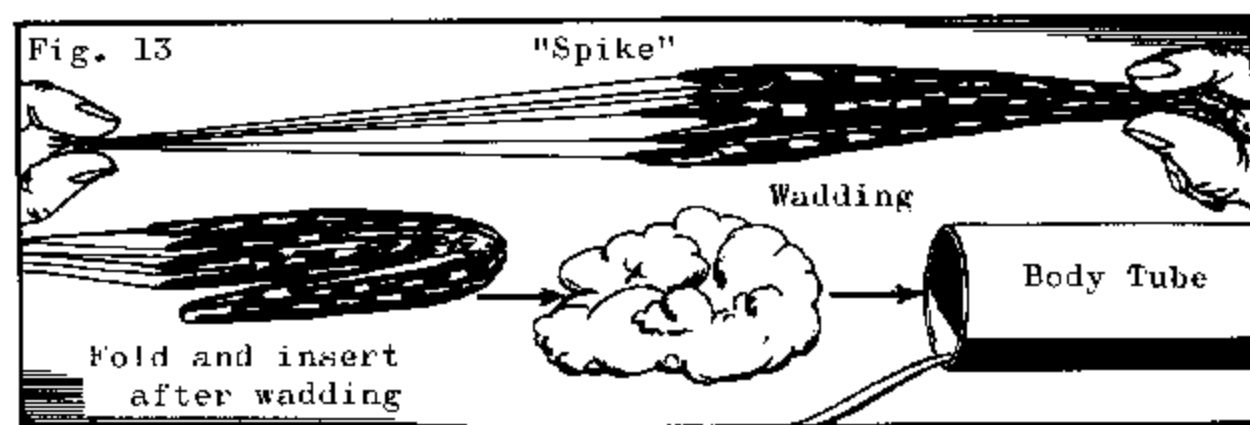
## General Information

The maximum recommended payload weight for the Astron X-Ray is 1 oz. with Series I engines and 2 oz. with Series II engines. Any single stage engine from either Series I or II may be used. For the first flight an A8-3 is recommended. The launching rod used with this model must be at least 36" long. Follow the countdown procedure given below to eliminate mistakes and obtain top performance.



## Countdown Checklist

-14- Pack flameproof recovery wadding into the body tube from the top. The wadding should fill the tube for a distance of about 1-1/2 inches and seal tightly along the sides of the tube. Hold the parachute between two fingers at its center and pass the other hand down it to form a "spike" shape. Fold this spike in two or three sections as shown in the illustration. Push the folded parachute down into the tube on top of the wadding and pack the shroud lines and shock cord in on top of the parachute. Slide the adapter into place.

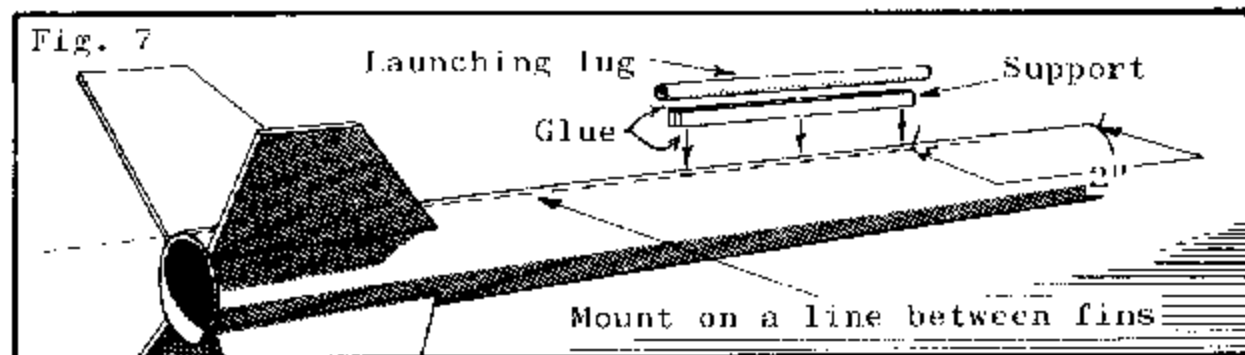


-13- Select an engine. Use an A8-3 for the first flights. For later flights, 1/2A6-2, B6-4, C6-5 and B14-5 engines may also be used. Install an electrical igniter in the engine as directed in the instructions which came with the engine.

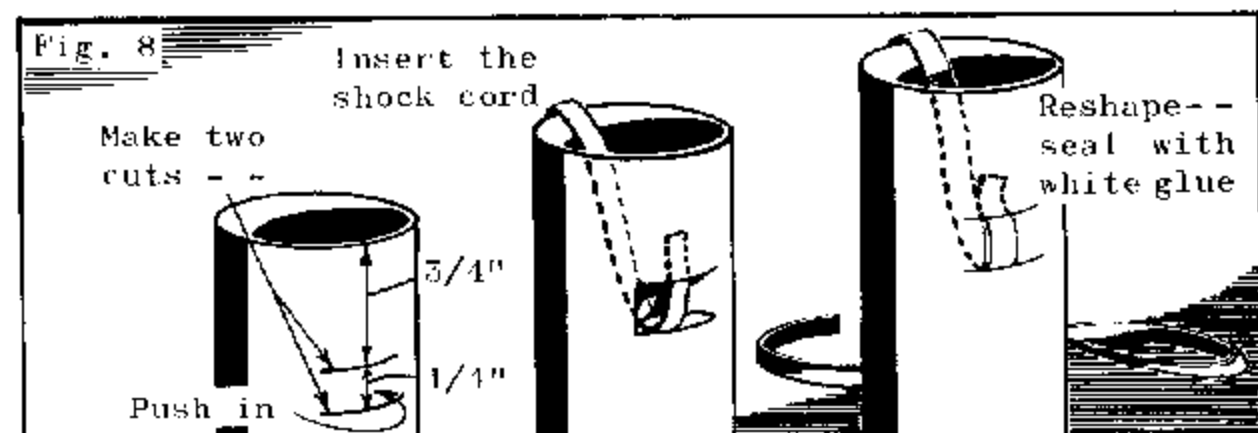
-12- Wrap the engine with masking tape until it makes a tight fit in the rocket body tube. This fit must be tight so the engine will not blow out when the ejection charge is activated. Insert the engine into the body so the rear of the engine projects 1/4" from the rear of the rocket.

-11- Load the payload into the payload section. When a heavier payload is being flown, a layer of masking tape should be wrapped around the nose cone-tube joint to prevent the payload from coming loose at ejection. When a small, heavy payload is installed, the extra space inside the tube should be filled

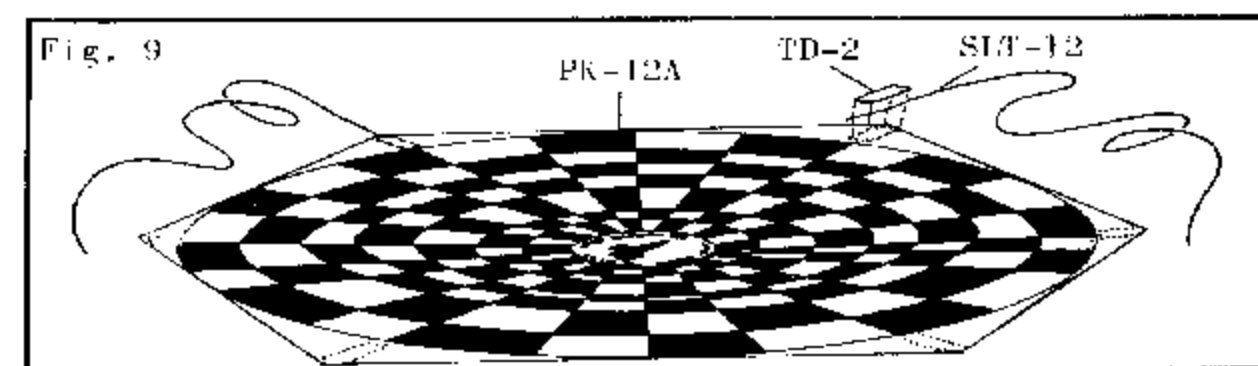
(7) Glue the launching lug to one edge of the launching lug support as shown. Glue the other edge of the support to the rocket body 2" from the front of the tube along a line which will pass between two of the fins. Align the assembly so it is perfectly parallel to the rocket body.



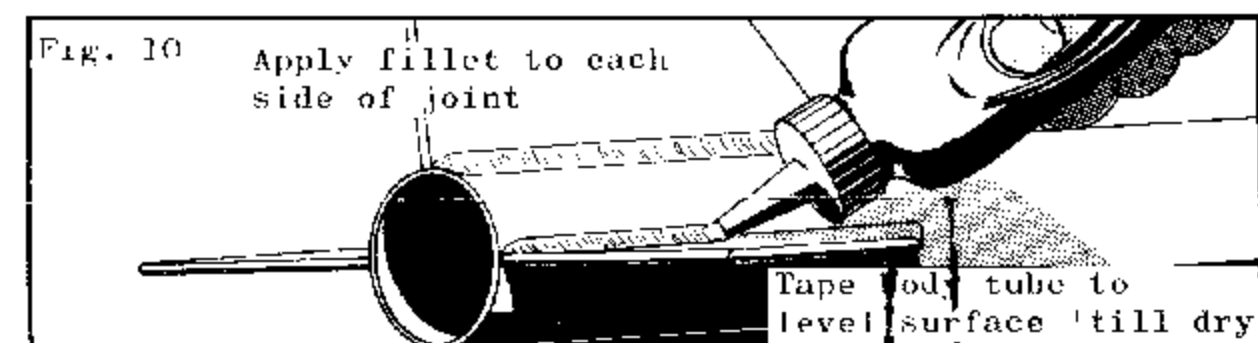
(8) Cut two 3/8" wide slits in the forward end of the body as shown in fig. 8. Cave in the section between the slits and hook the shock cord through the slits as shown. For an extra secure attachment, knot the inside end of the shock cord. Press the caved-in portion of the tube outward until it is round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



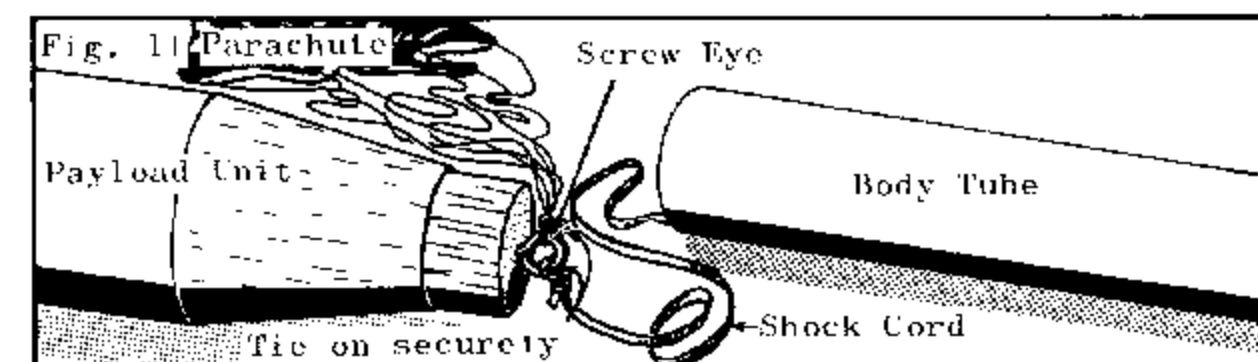
(9) Cut out the parachute on its edge lines as indicated on the plastic. Cut six 12" lengths of shroud line cord and attach one shroud line to each point of the parachute with a tape strip as shown in fig. 9. Tie the free ends of the lines together.



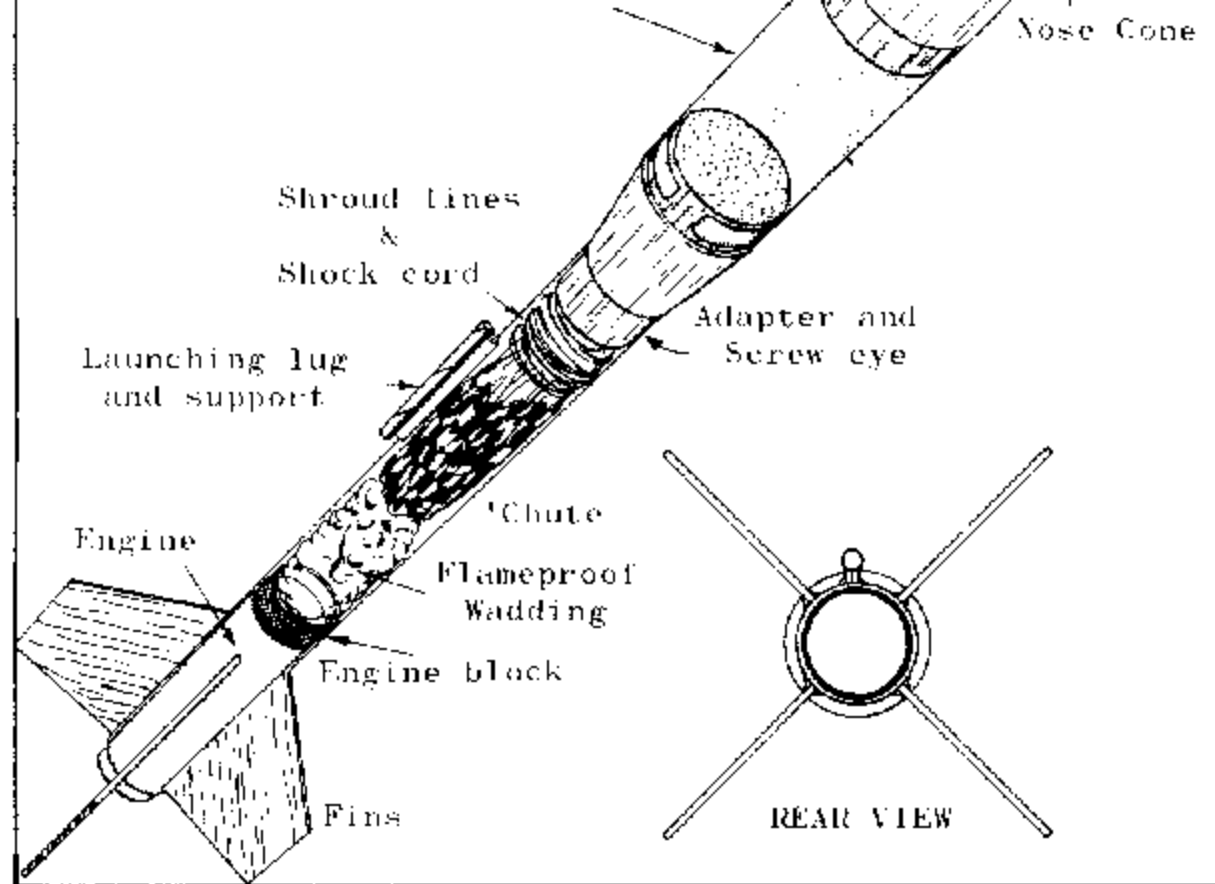
(10) Apply a glue fillet to each of the fin-body joints and to the launching lug support as shown. The fillets should be smooth and bubble-free. Support the rocket horizontally while the glue dries.



(11) Connect the shock cord, parachute and screw eye as shown in fig. 11. Push the parachute into the body tube, packing the shroud lines and shock cord over it. Push the base of the adapter into the forward end of the body tube. Place the nose cone on the forward end of the payload section (if it is loose, wrap its base with masking tape until it makes a tight fit).

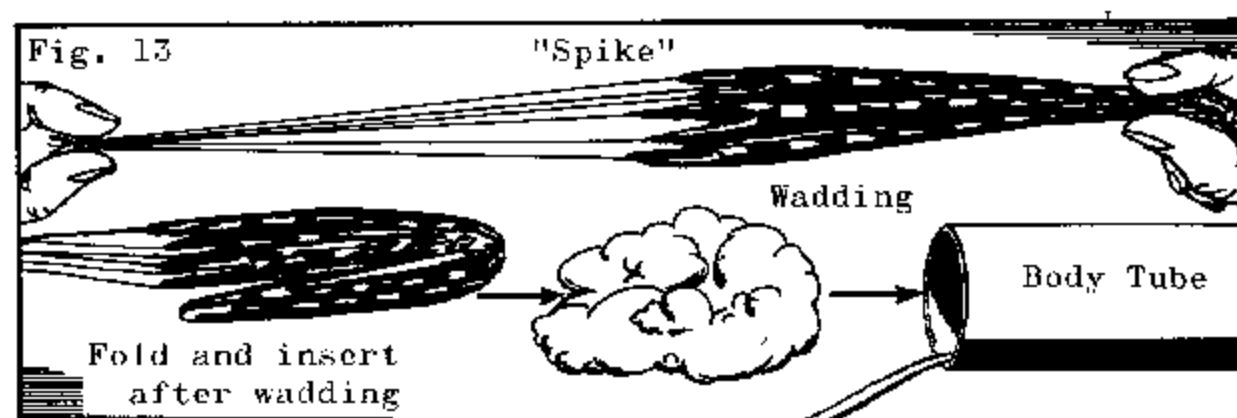


(12) Before finishing let all the glue on the outside of the rocket dry so it is hard and clear. Cover all balsa surfaces with a coat of sanding sealer. Let it dry completely and sand lightly with extra fine sandpaper. Apply a second coat, sand and



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-11- Load the payload into the payload section. When a heavier payload is being flown, a layer of masking tape should be wrapped around the nose cone-tube joint to prevent the payload from coming loose at ejection. When a small, heavy payload is installed, the extra space inside the tube should be filled with foam padding or wadding to keep it from bouncing around.

-10- Remove the safety interlock or key from the launch control panel. (If a simple spring switch is used, install the protector around the spring.) Carry the key or interlock on the person of the launch control officer.

-9- Place the rocket on the launcher. Check to be sure the panel is disarmed. Clean the micro-clips and attach them to the igniter.

-8- Clear the launch area, alert the recovery crew and trackers.

-7- Check for low flying aircraft and unauthorized persons in the recovery area.

-6- Arm the launch panel.

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