
USA
USA

ASTRON APOGEE II

Price $2.00

TERRIFIC TWO STAGE PERFORMANCE!

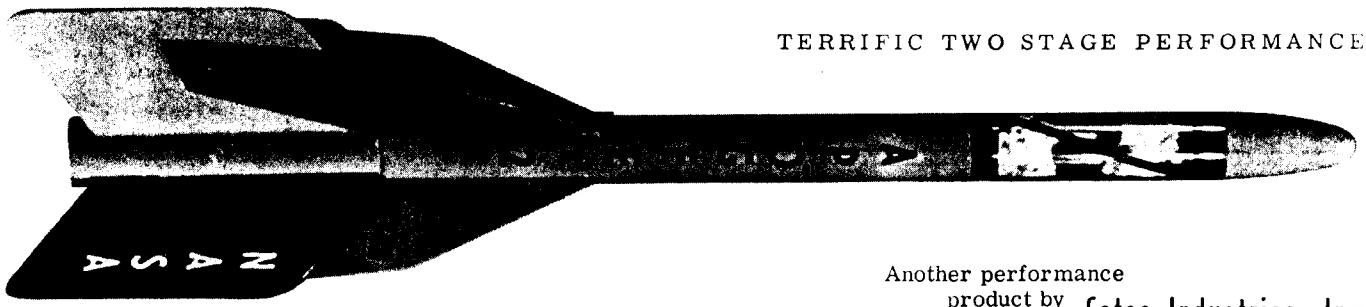
With transparent payload section
Flies to over 2000'

Estes Industries, Inc.

ASTRON APOGEE II

Rocket Kit #K-5 **Price $2.00**

TERRIFIC TWO STAGE PERFORMANCE!



With transparent payload section
Flies to over 2000'

Another performance product by **Estes Industries, Inc.**
BOX 227
PENROSE, COLORADO

Assembly Instructions

The Astron Apogee II is a high performance two stage pay'oad rocket capable of carrying small payloads to altitudes in excess of 2000 feet. The transparent payload section allows easy observation of the condition of the test subject before and after flight.

The rocket can be flown in either a single or two stage configuration, and with or without the payload section. The Astron Apogee II performs so well that it is highly competitive in altitude contests, and will give maximum acceleration for studies on selected specimens.

Your Astron Apogee II kit consists of the following parts as illustrated at right:

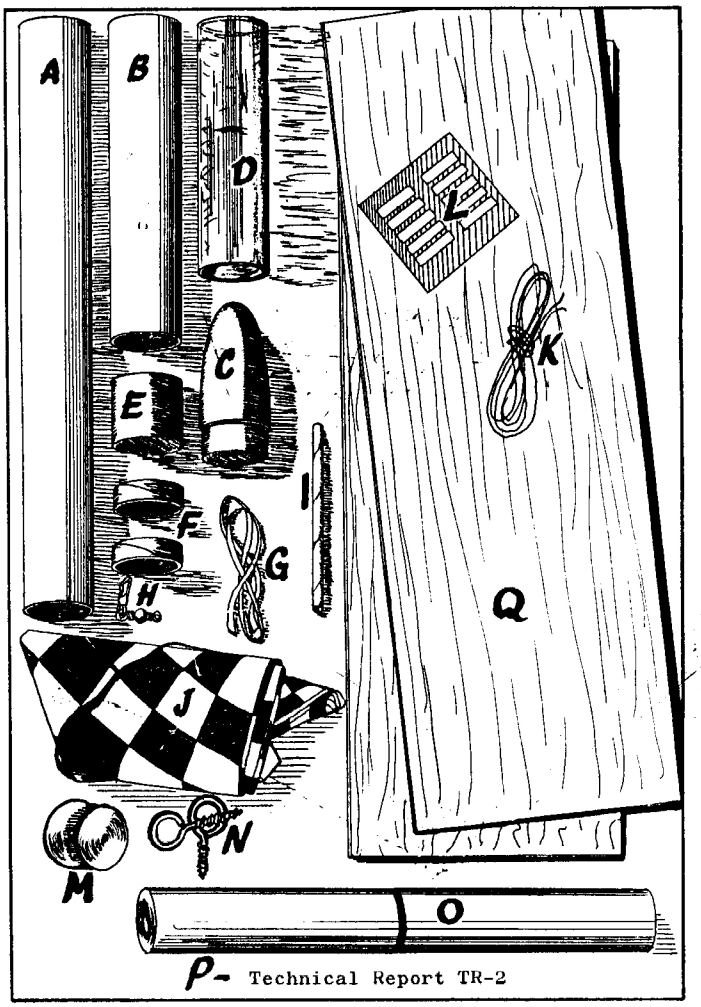
A) One 6-1/2" long body tube--Part #BT-20D
B) One 3-1/2" long body tube--Part #BT-20G
C) One balsa nose cone--Part #BNC-20B
D) One clear plastic payload tube--Part #PST-20J
E) One balsa nose block--Part #NB-20
F) Two paper engine blocks--Part #EB-20A
G) One shock cord--Part #SC-1A
H) One snap swivel--Part #SV-12
I) One launching lug--Part #LL-1B
J) One parachute--Part #PK-12A
K) 72" of shroud line cord--Part #SLT-12
L) Ten tape strips--Part #TD-2
M) Two nose cone weights--Part #NCW-1
N) Two screw eyes--Part #SE-2
O) Two reject engine casings--Part #EC-2
P) One technical report--Part #TR-2
Q) Two fin material--Part #BFS-20

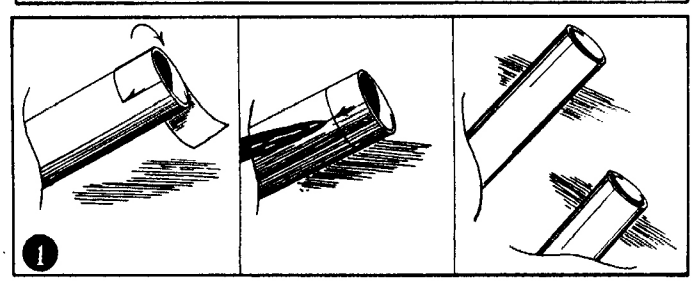
NOTE: The empty engine casings provided with the Astron Apogee II kit are ones which have been rejected as unsuitable for use in making an engine. They are for use only as a measuring device, and are not suitable for any other use. In addition to the materials included with your kit you will also need the following tools and supplies:

1) Single edge razor blade or modeling knife
2) Extra strong glue (white glue #WG-1 is recommended)
3) Fine and extra fine grit sandpaper
4) Ball point pen
5) Paint or dope

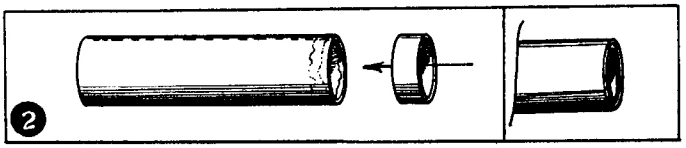
Read the entire assembly instructions before beginning work on your rocket. Then start construction, following each step in order, checking off each step as it is completed.

☐ (1) Cut out the body tube marking guide (fig. 7A), wrap it around the long body tube as shown in fig. 1, and mark four fin attachment points as shown. Repeat this operation with the short body tube.

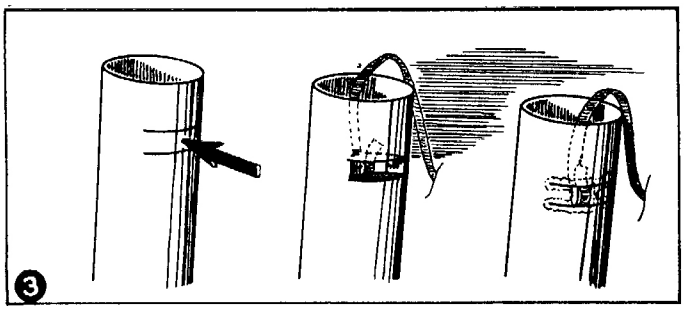




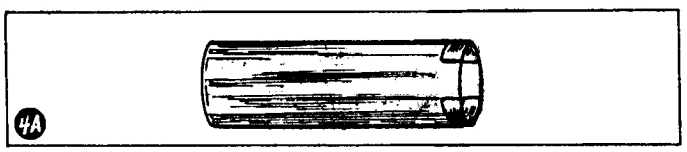
☐ (2) Apply glue to the inside of the short body tube to cover 1/4" at one end and press an engine block into the end of the tube. Wipe off all excess glue and set this part aside to dry. (See fig. 2.)

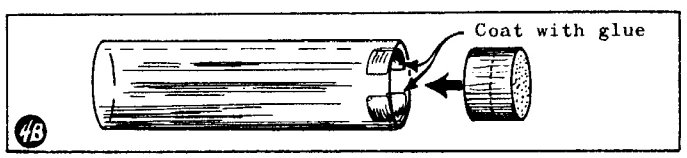


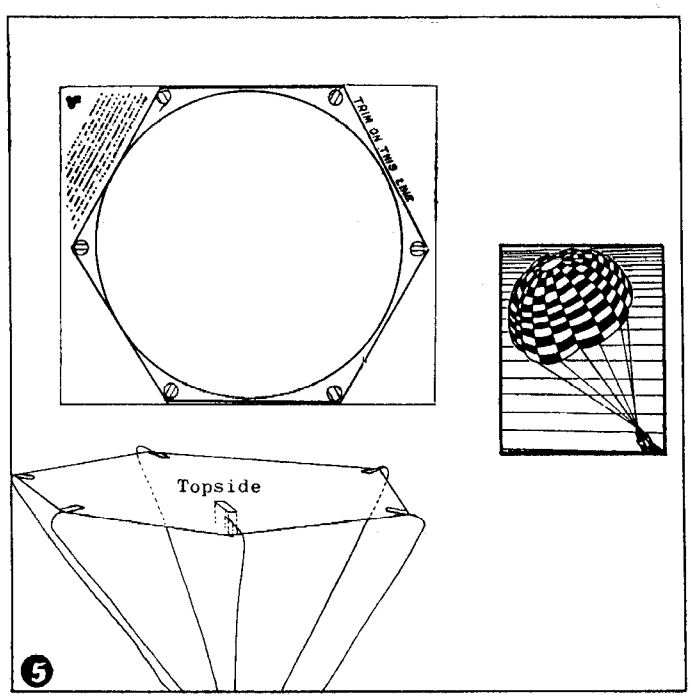
☐ (3) Cut two slits in the upper end (the end which does not have the fin attachment marks) of the long body tube as shown in fig. 3. Press the section between the slits inward and insert the shock cord through the slits. Push the caved-in portion of the tube back out and apply glue to the cut edges on the inside and the outside of the tube and over the shock cord itself.



☐ (4) Apply two tape strips to the inside of one end of the clear plastic payload section tube as shown in fig. 4A. These strips should be directly opposite each other and positioned with the long side of the strips exactly even with the end of the tube. Spread glue over the tape strips and slide the nose block into the tube to the position shown in fig. 4B.



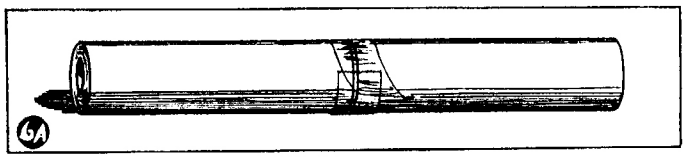




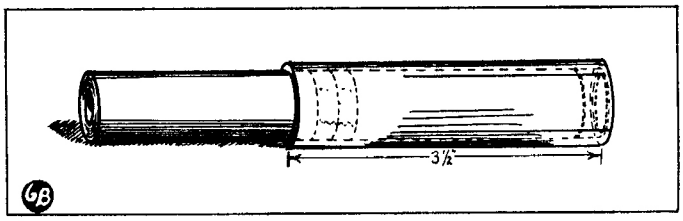
☐ (5) Cut the parachute out on the edge lines. Cut six 12 inch lengths of shroud line cord and attach the lines to the points marked on the 'chute for shroud line attachment using the tape strips as shown in fig. 5. (If you wish you may attach the shroud lines to the 'chute by tying as shown in the instructions printed on the 'chute itself.) Tie the free ends of the shroud lines together to finish the 'chute assembly.

☐ (6) Insert a screw eye into the base of the nose cone. Remove the screw eye, squirt glue into the hole, thread a nose cone weight onto the screw eye and replace the screw eye in the cone. Repeat this procedure with the screw eye for the nose block on the payload section. NOTE: Part or all of the nose cone weights may be eliminated if the rocket is balanced according to the procedures described in Technical Report TR-1.

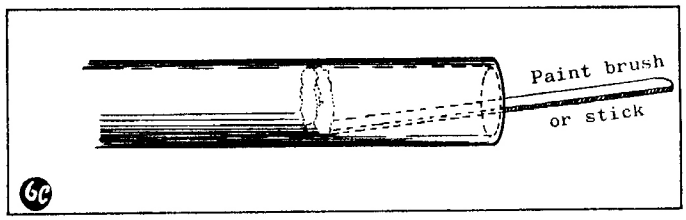
☐ (7) Tape the two engine casings together with celophane tape as shown in fig. 6A. Insert the unit into



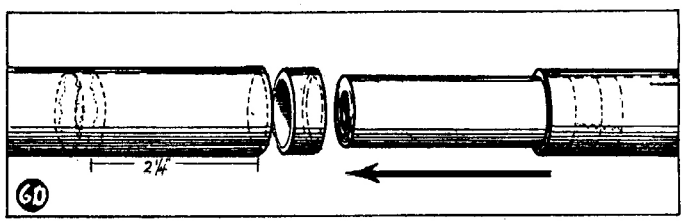
the booster body tube until the end of the casing is firmly against the engine block as in fig. 6B. Using



the end of your little finger or a brush, spread glue around the inside of the main body tube about 2" from the rear end as in fig. 6C. Insert the remaining engine

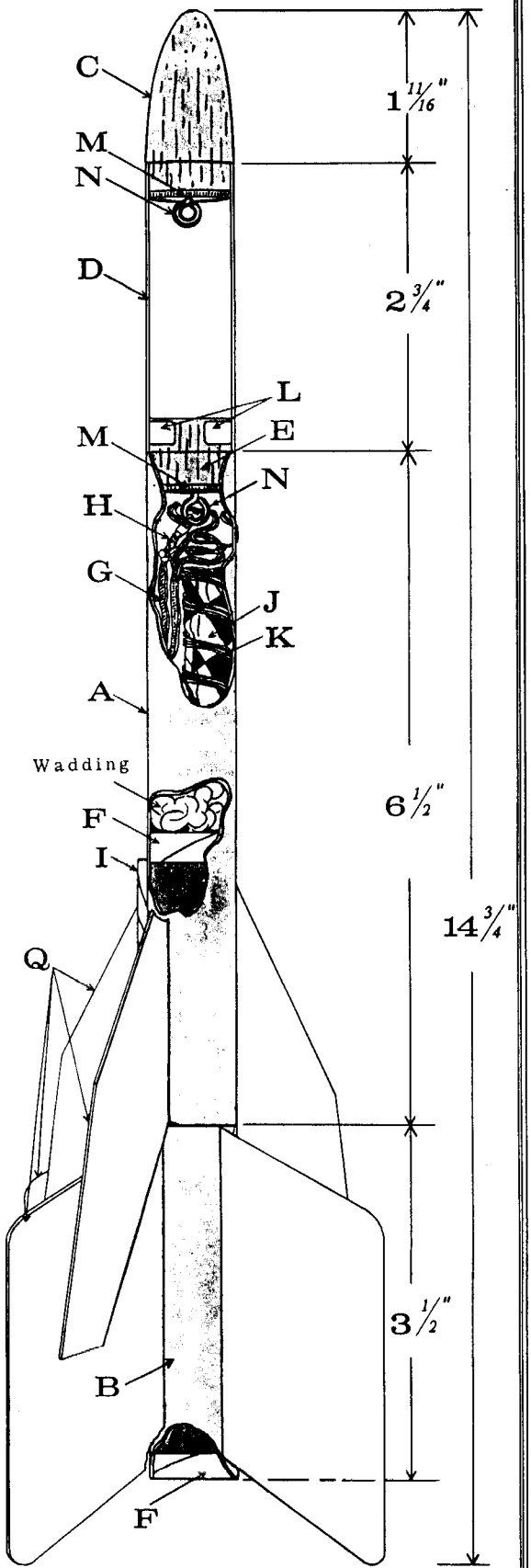


block into the end of the tube, and using the engine casings and booster body as a spacer, push the engine block into position 2-1/4" from the rear of the tube as in fig. 6D. Remove the engine casings immediately.



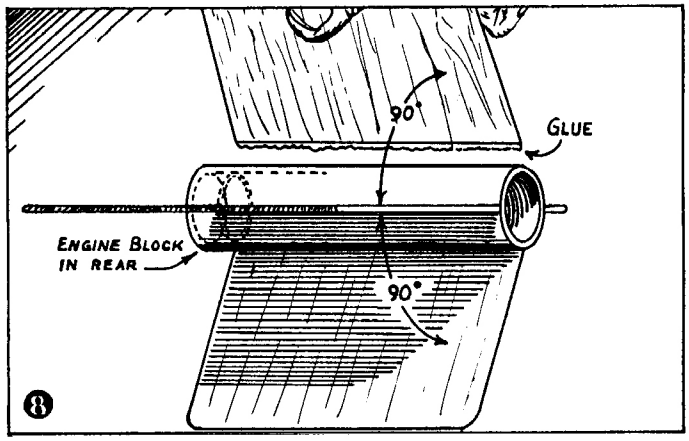
☐ (8) Cut out the fin patterns (fig. 7B). Lay the patterns on the balsa fin stock with the grain of the wood and the grain shown on the pattern matched perfectly. Trace out four copies of each fin and cut these out with a sharp knife or single edge razor blade. Sand the flat sides of each fin until smooth. Sand all edges of the fins except the edge which is to be attached to the body to a smooth, round contour. Sand the edge which is to be glued to the body so that it is perfectly square and flat.

☐ (9) Apply a line of glue along the proper edge of one of the upper stage fins and place it against the body exactly over one of the marks made in step (1). Align the fin by sighting along the body and adjusting it until the fin is parallel to the body and projects straight away from it. Repeat this procedure with the

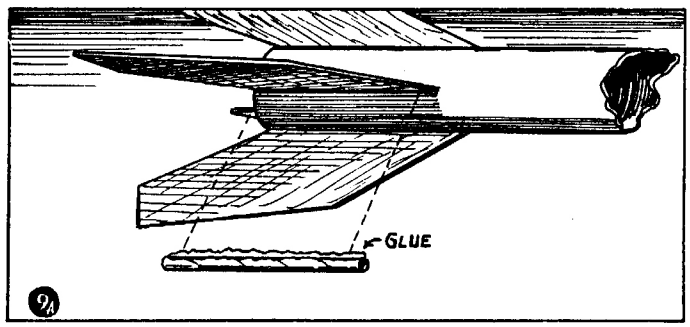


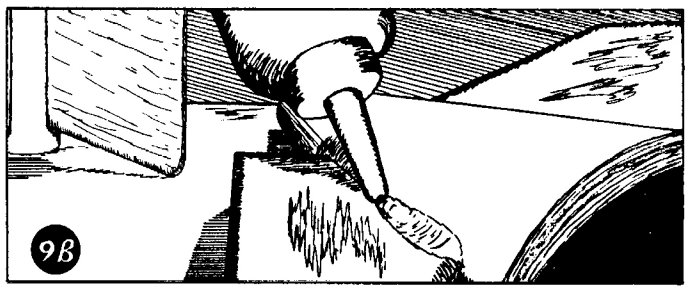
A	Long body tube	H	Snap swivel
B	Short body tube	I	Launching lug
C	Balsa nose cone	J	Parachute
D	Clear plastic payload tube	K	Shroud lines
		L	Tape strips
E	Balsa nose block	M	Nose cone weights
F	Paper engine block	N	Screw eye
G	Shock cord	Q	Fins

other three upper stage fins. Do not set the rocket on its fins while the glue is wet. Attach the lower stage fins in the same way the upper stage fins were attached. Be careful to get the booster fins on so that the forward edge of each fin is at the end of the tube away from the engine block (see fig. 8).

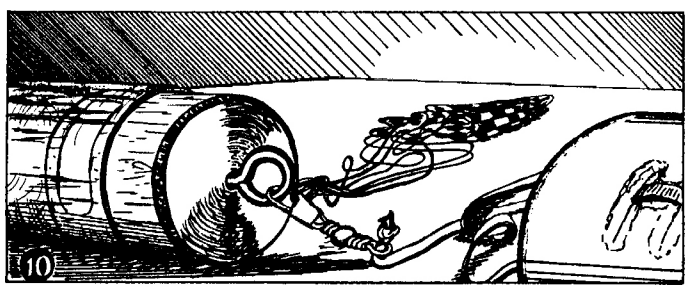


☐ (10) Glue the launching lug to the upper stage at the corner between a fin and the body as shown in fig. 9A. Be sure the lug is aligned to point exactly forward. While the glue is still soft, check again to be sure the fins are aligned properly. Let the glue harden, then apply a glue fillet to each fin-body joint as shown in fig. 9B. Wipe off any excess glue with your finger.





☐ (11) Tie a small loop in the free end of the shroud lines of the parachute. Pass the free end of the shock cord through the small loop in the snap swivel and knot securely. Open up the snap on the swivel, hook the loop on the parachute and the screw eye on the payload section onto the swivel, and lock it shut. Place the nose cone into the forward end of the payload section.



☐ (12) Protect all parts of the transparent plastic payload section which you do not wish to be painted by wrapping the tube with masking tape. Sand all balsa surfaces with extra fine sandpaper. Apply a coat of

sanding sealer or white enamel paint to the balsa, let dry, and sand again. Repeat until all surfaces look smooth and are smooth to the touch. Give the rocket at least one clean base coat of glossy white enamel or dope, then give it at least one bright final coat of red, fluorescent orange, cerise, or other extra bright color to make it more visible in flight.

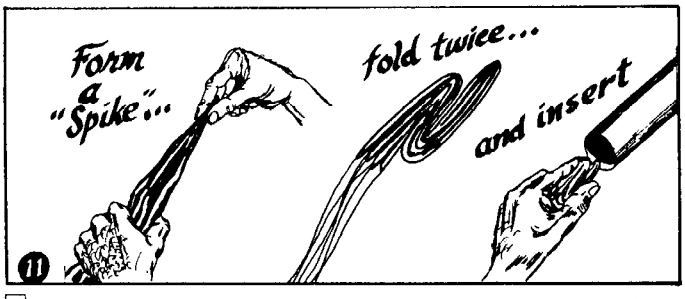
Flying the Astron Apogee II

Your Astron Apogee II is designed to fly with any combination of Series I and Series II upper stage and booster engines. It is important, however, to be sure to use the right engines in each stage. Use only engines with long delays such as the B.8-6, A.8-4, ¼A.8-4, etc. in the upper stage to allow the rocket to reach a maximum altitude and avoid damage to the recovery system. Use only engines with no delay such as the C.8-0, A.8-0, etc. in the lower stage. The rocket will not function correctly if engines with delay charges are used in the lower stage.

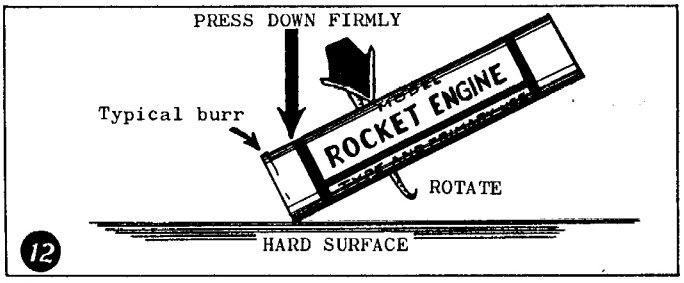
For top flexibility the Astron Apogee II is designed for fast conversion to a standard payload-less altitude model. When the rocket is to be flown without the payload section, simply unsnap the swivel, remove the payload section from the swivel, attach the swivel to the nose cone screw eye, and lock shut. Be sure the parachute remains attached to the swivel. Maximum recommended payload weight for the Astron Apogee II is 1 oz.

☑ Countdown Checklist ☑

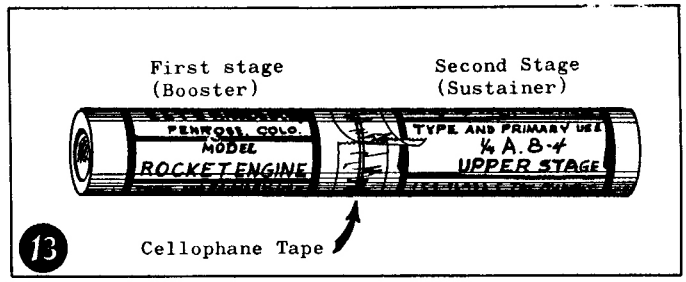
☐ -14- Pack flameproof recovery wadding or cotton into the body tube of the upper stage from the top. The wadding should rest against the engine block, extend forward in the tube for about 1-1/2", and seal tightly against the sides of the tube. Hold the parachute between two fingers at its center and pass the other hand down it to form a "spike" shape. Fold this spike in 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 payload section into place.



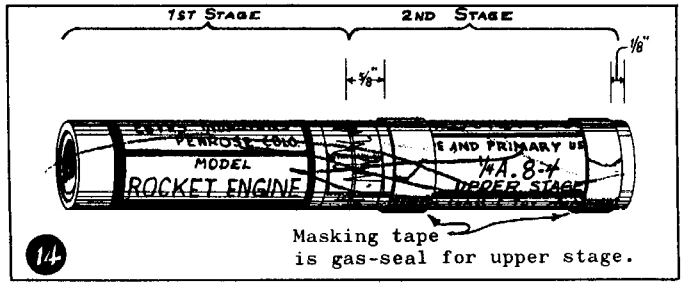
☐ -13- Select a booster and an upper stage engine. For first flights a ¼A.8-0 booster engine and a ¼A.8-4 upper stage engine are recommended. Remove any burrs from the ends of the engines by holding them against a smooth surface and turning as in fig. 12.



☐ -12- Position the engines with the nozzle of the upper stage engine against the top end of the booster engine and wrap a layer of celophane tape tightly around the joint as shown. Check again to be sure the engines are in their proper relative positions.



☐ -11- Wrap masking tape around the upper stage engine as in figure 14. This engine should make a tight friction fit inside the upper stage body tube. Insert the engine unit into position in the upper stage.



☐ -10- Apply enough masking tape to the booster engine to make the booster body tube fit tightly on it. Slide the booster into place. The rocket should now have the two stages joined.

☐ -9- Form a nichrome igniter and insert it into the booster engine nozzle as specified in the instructions which came with the engine.

☐ -8- Place the rocket on the launcher, clean and attach the micro-clips.

☐ -7- Clear the area, check for low flying aircraft, alert recovery crew and trackers.

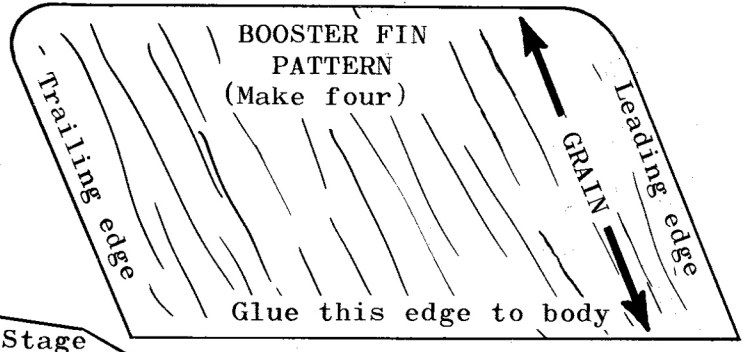
☐ -6- Arm the launch panel.

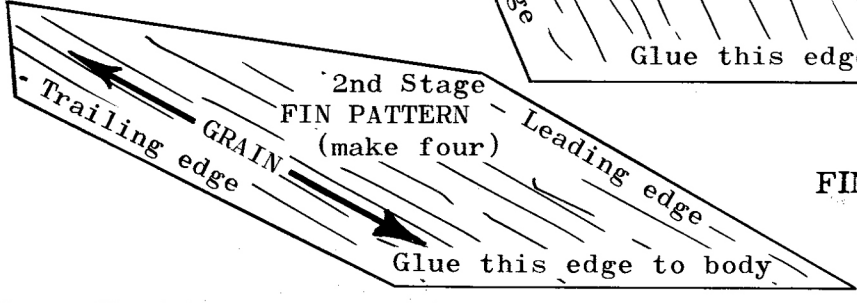
☐ -5- ☐ -4- ☐ -3- ☐ -2- ☐ -1-

LAUNCH!

7A

Cut out and wrap around the body tube.
Mark the tube at each arrow point.





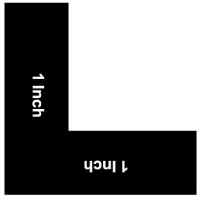
ESTES
A SUBSIDIARY OF DAMON
ESTES INDUSTRIES
PENROSE, COLO. 81240

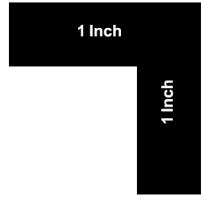
82,822

7B

FIN PATTERNS

SP-5





Estes

APOGEE II

- TWO STAGE
- HIGH PERFORMANCE LAUNCH VEHICLE
- CLEAR PAYLOAD SECTION

SKILL LEVEL 1 — Kit No. 1252 (M)

1–Beginner 2–Intermediate 3–Craftsman 4–Advanced 5–Expert

SPECIFICATIONS

Length 18.5" (47.0 cm) — Weight 0.5 oz. (17 g.)

Body Dia. 0.736" (18.7 mm) — Recovery: Parachute

RECOMMENDED ENGINES

UPPER STAGE 1/2A3-6 A3-3 B6-6 B6-6 B10-7 C6-7

Use 1/2A3-6 for first flights

BOOSTER 1/2A3-6 A3-3 B6-6 B6-6 C6-6

Use 1/2A3-6 for first flights. Engines and launcher not included.

ESTES INDUSTRIES