



GEO SAT LV™

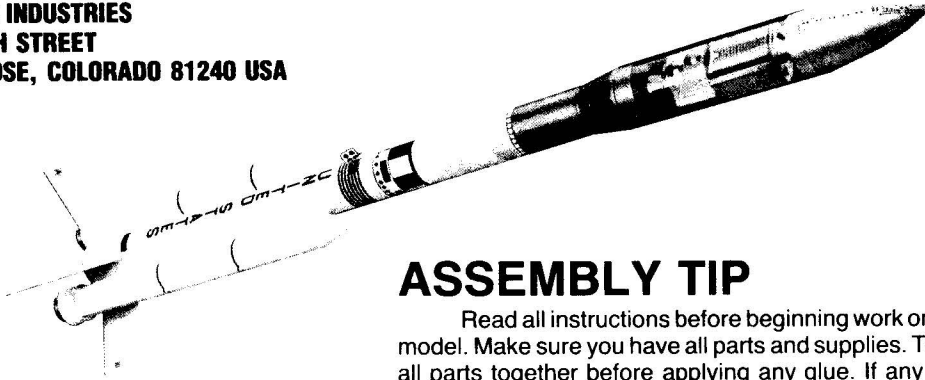
Flying Model Rocket #1977

#1977



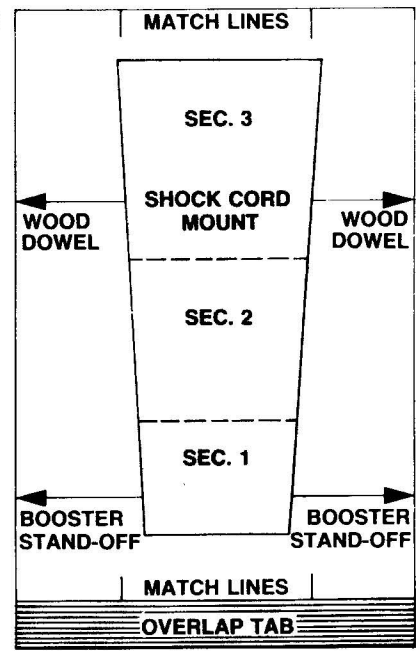
A DAMON COMPANY

ESTES INDUSTRIES
1295 H STREET
PENROSE, COLORADO 81240 USA



ASSEMBLY TIP

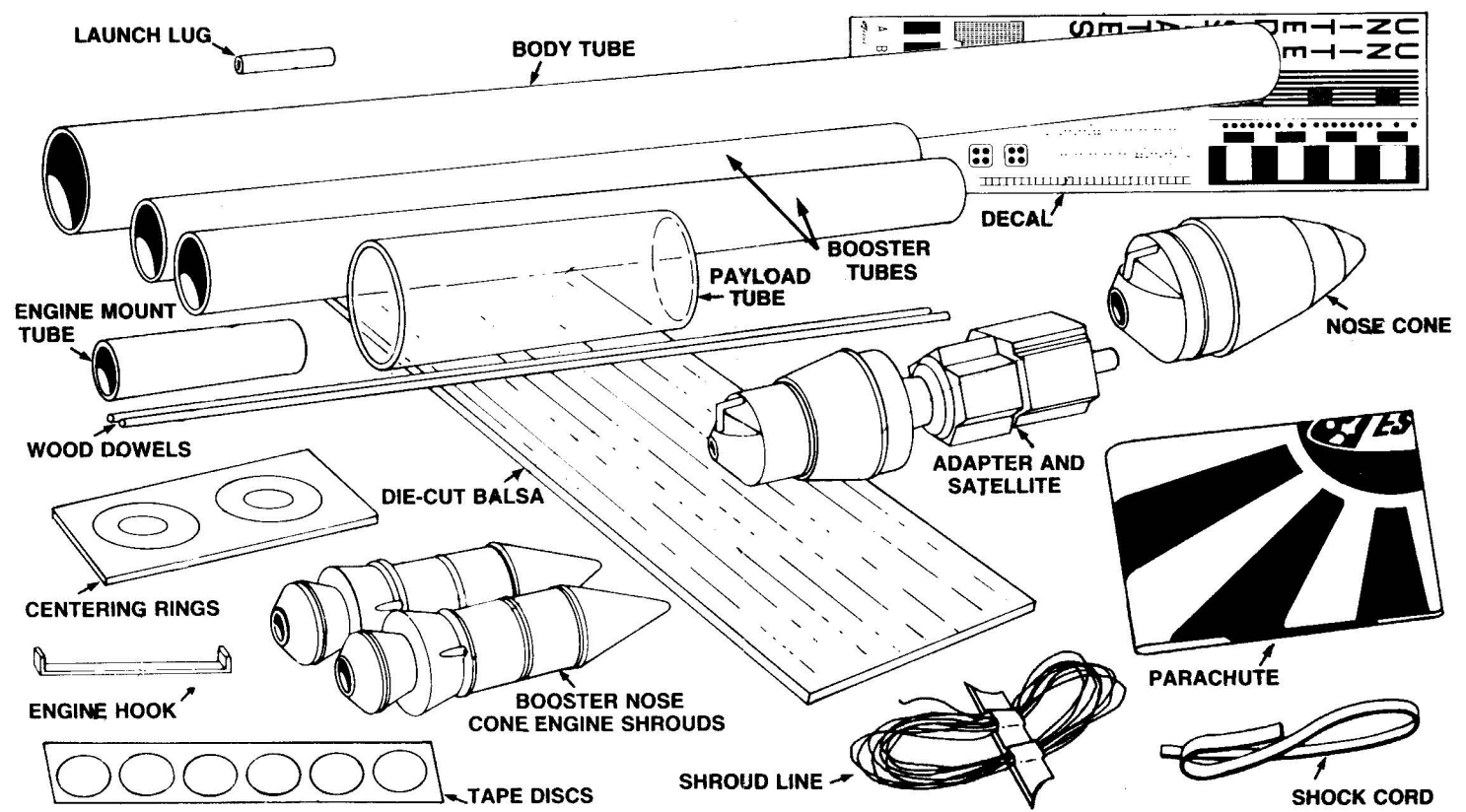
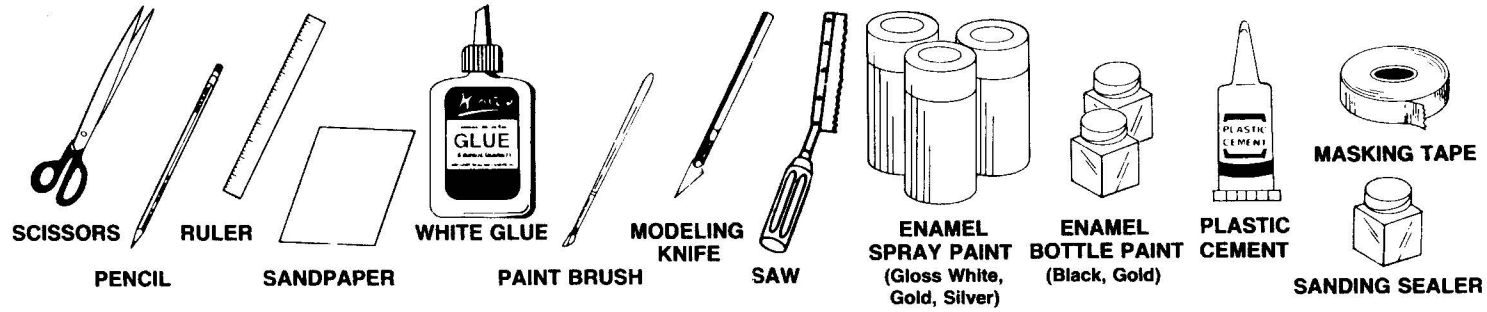
Read all instructions before beginning work on your model. Make sure you have all parts and supplies. Test-fit all parts together before applying any glue. If any parts don't fit properly, sand as required for precision assembly.



BOOSTER TUBE MARKING GUIDE

PARTS AND SUPPLIES

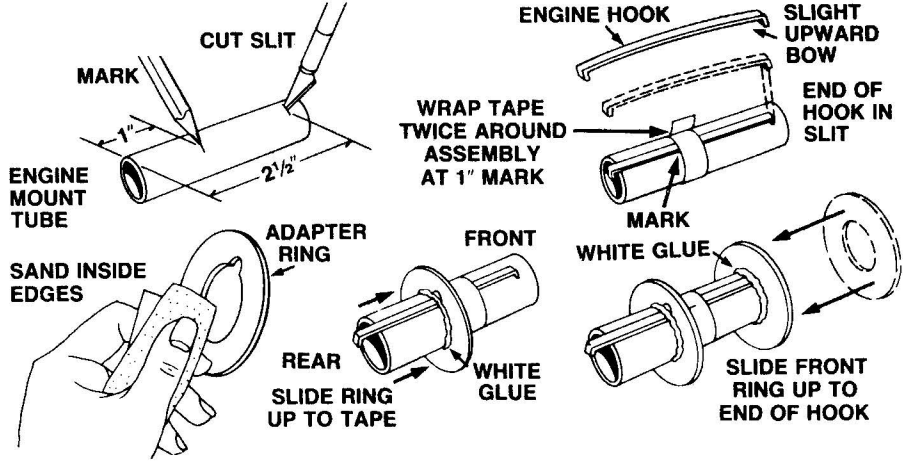
Locate the parts shown below and lay them out on the table in front of you. In addition to the parts included in the kit you will also need:



ROCKET ASSEMBLY

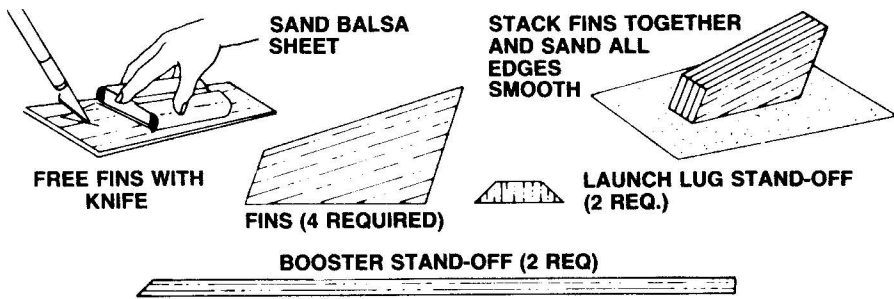
1

- Mark engine mount tube 1 inch and 2½ inches from one end.
- Cut 1/8 inch long slit at 2½ inch mark.
- Insert one end of engine hook into slit.
- Wrap masking tape around assembly twice at 1 inch mark.
- Slide slotted adapter ring onto rear of tube and up to masking tape. Slot fits over engine hook. Glue both sides of ring/tube joint.
- Slide remaining ring over front of tube and down to end of engine hook. Glue both sides of ring/tube joint. Set assembly aside to dry.



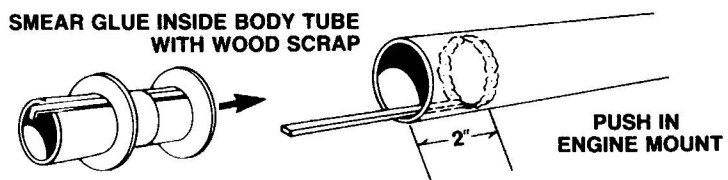
2

- Fine sand die-cut sheet. Carefully remove fins and stand-offs by freeing edges with sharp knife.
- Stack fins and stand-offs together. Sand all edges smooth.



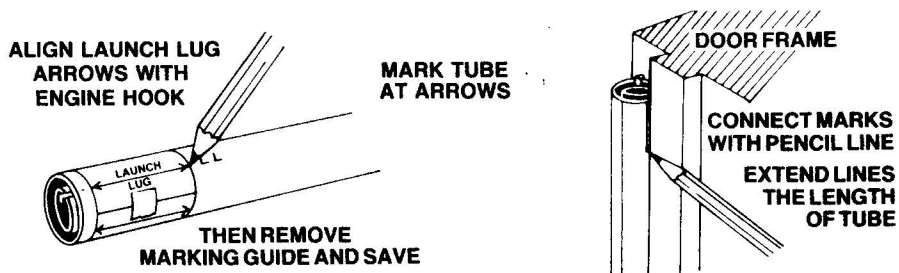
3

- Using a piece of scrap balsa, smear glue inside body tube 2 inches from one end.
- Push engine mount in until tube ends are even. Engine hook must extend from end of body tube.



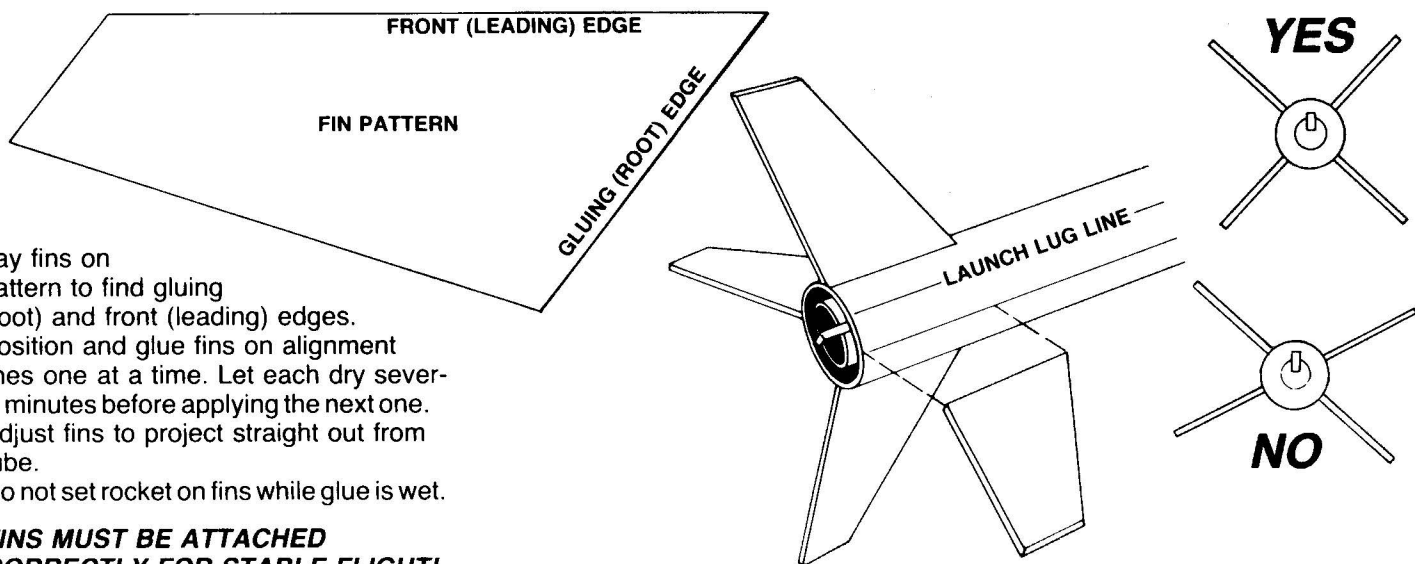
4

- Cut out body tube marking guide from back of panel.
- Wrap guide around the tube and tape. Mark tube at arrows. Remove guide.
- Draw straight lines connecting each pair of marks.
- Extend launch lug line full length of tube.



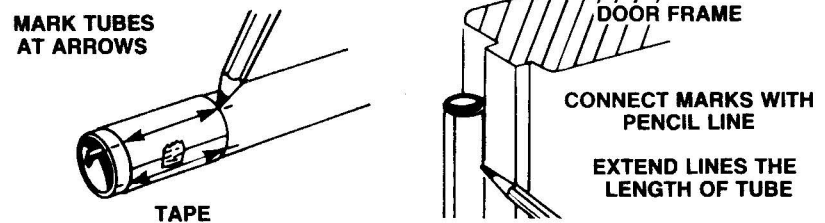
5

- Lay fins on pattern to find gluing (root) and front (leading) edges.
- Position and glue fins on alignment lines one at a time. Let each dry several minutes before applying the next one.
- Adjust fins to project straight out from tube.
- Do not set rocket on fins while glue is wet.

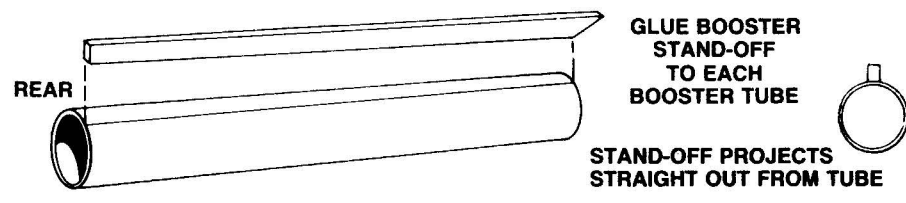


**FINS MUST BE ATTACHED
CORRECTLY FOR STABLE FLIGHT!**

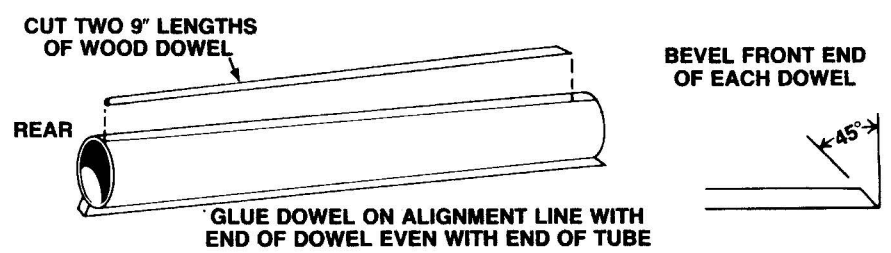
- 6**
- Cut out booster tube marking guide from front of instructions.
 - Wrap guide around each booster tube and tape. Mark tube at arrows. Remove guide and save it for use in Step 14.
 - Draw straight lines connecting each pair of marks and extend lines forward the length of the tubes.



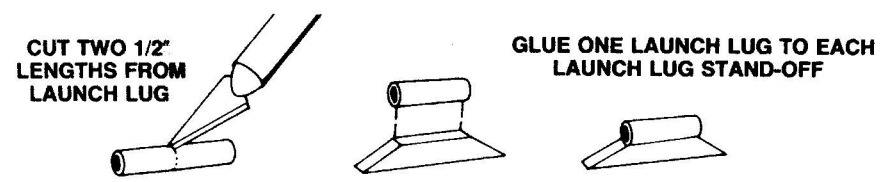
- 7**
- Position and glue booster stand-off on alignment line of each of the two booster tubes.
 - Adjust each stand-off to project straight out from tube.



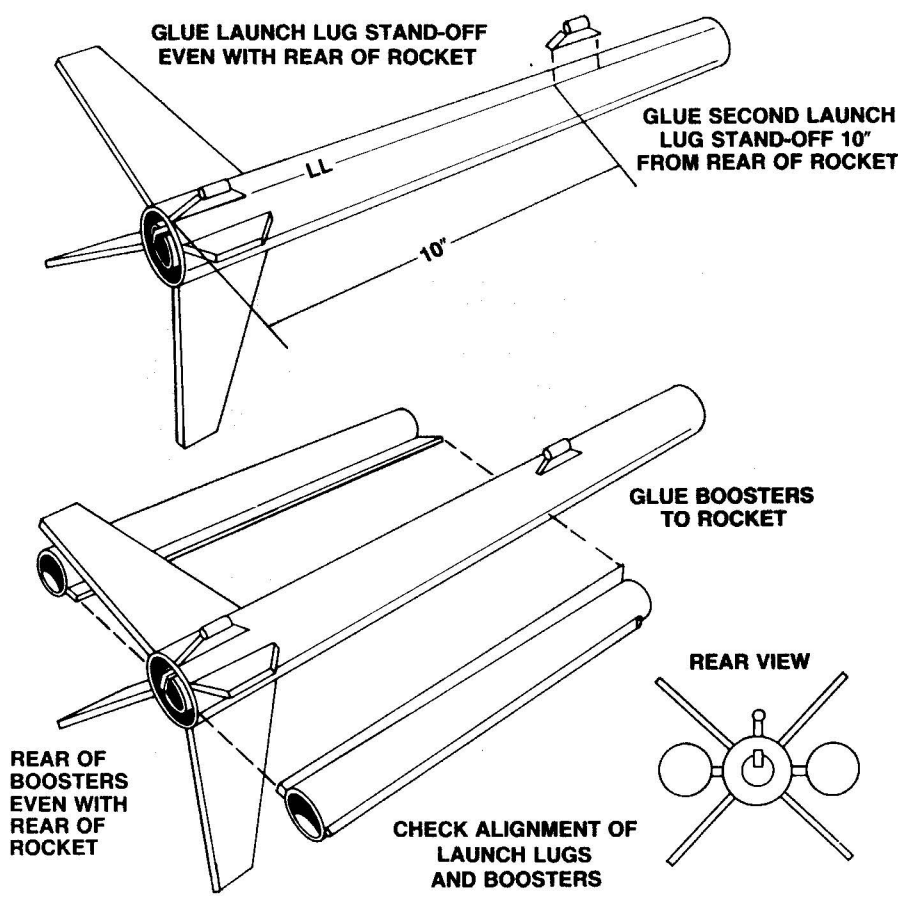
- 8**
- Cut two 9 inch long pieces from wood dowels.
 - Cut the front of each wood dowel at a 45° angle as shown.
 - Glue one dowel to each booster tube with non-beveled end of dowel even with rear edge of tube.



- 9**
- Cut launch lug into two equal 1/2 inch lengths.
 - Glue one launch lug to each launch lug stand-off. Be sure to center launch lug on stand-off.

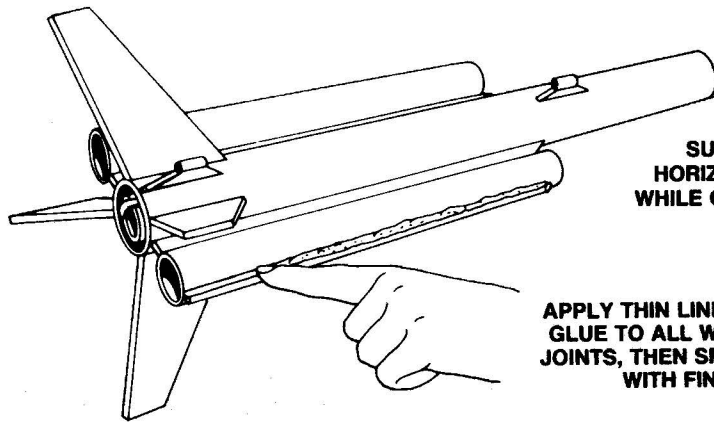


- 10**
- Glue one launch lug stand-off centered on launch lug line on rocket body with end of stand-off even with rear edge of body tube.
 - Glue other launch lug stand-off 10 inches from rear of rocket body tube.
 - Be sure stand-offs are centered on launch lug line so they are in alignment with each other.
 - Position and glue boosters to rocket body on their alignment lines. Let first one dry several minutes before adding the second one.



11

- A. Apply a glue reinforcement to each fin/body tube joint and each side of launch lug stand-offs and booster stand-offs.
- B. Support rocket as shown until glue dries.

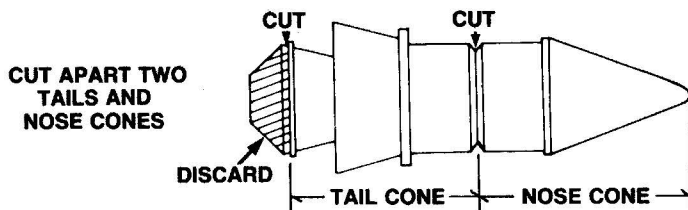


**SUPPORT
HORIZONTALLY
WHILE GLUE DRIES**

**APPLY THIN LINE OF WHITE
GLUE TO ALL WOOD/TUBE
JOINTS, THEN SMOOTH OUT
WITH FINGER.**

12

- A. Cut apart the two tail cones and nose cones. Cut off end piece and discard.
- B. Sand rear edges of tail cones flat and clean.
- C. If excess plastic at rear of tail cone exists, remove it with a modeling knife.



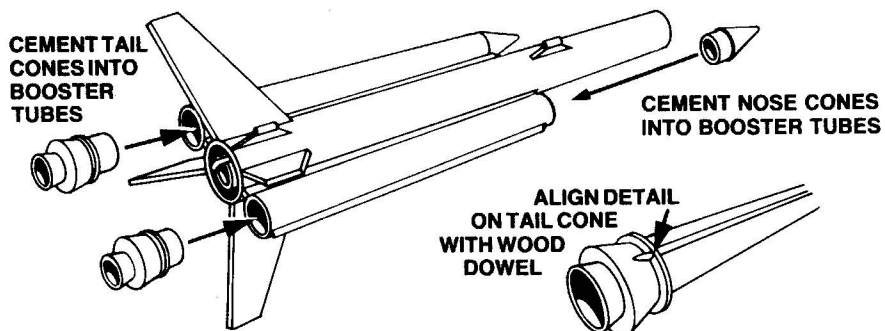
**CUT APART TWO
TAILS AND
NOSE CONES**

DISCARD

TAIL CONE **NOSE CONE**

13

- A. Run a bead of tube-type plastic cement around inside front of booster tubes.
- B. Slide nose cones into tubes with smooth motion until nose cones are seated against tubes.
- C. Cement tail cones to rear of booster tubes in same way.



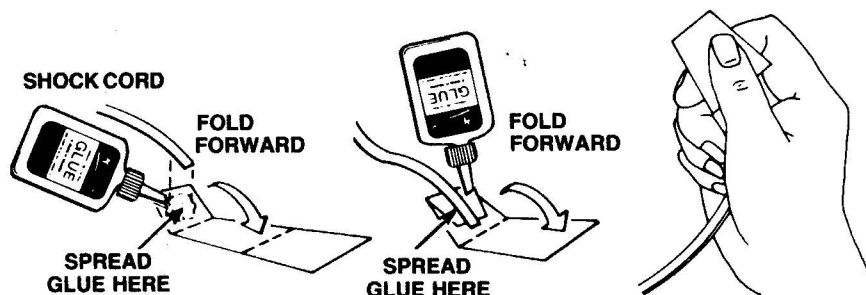
**CEMENT TAIL
CONES INTO
BOOSTER
TUBES**

**CEMENT NOSE CONES
INTO BOOSTER TUBES**

**ALIGN DETAIL
ON TAIL CONE
WITH WOOD
DOWEL**

14

- A. Cut shock cord mount from booster tube marking guide from front of instructions.
- B. Crease on dotted lines by folding. Spread glue on section 1 and lay end of shock cord into glue. Fold over and apply glue to back of first section and exposed part of section 2. Lay shock cord as shown and fold mount over again.
- C. Clamp unit together with fingers until glue sets.



SHOCK CORD

**FOLD
FORWARD**

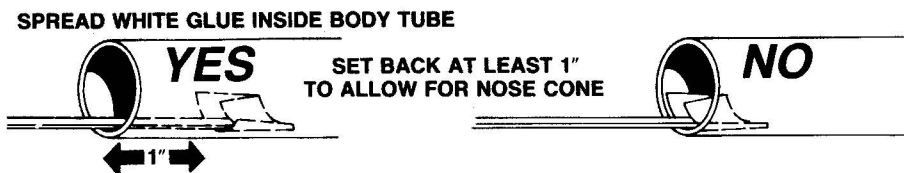
**FOLD
FORWARD**

**SPREAD
GLUE HERE**

**SPREAD
GLUE HERE**

15

- A. Apply glue to inside front of body tube to cover an area no less than 1 inch to 2 inches from end. The glued area should be same size as shock cord mount.
- B. Press mount firmly into glue as shown.
- C. Hold until glue sets.



SPREAD WHITE GLUE INSIDE BODY TUBE

YES

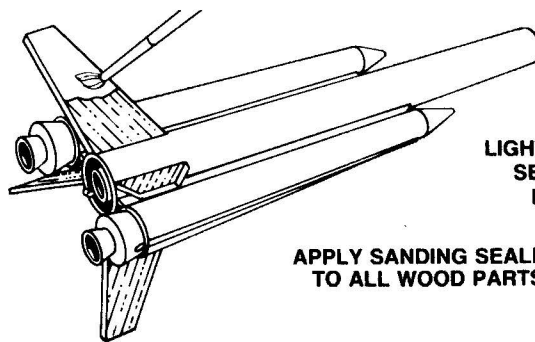
**SET BACK AT LEAST 1"
TO ALLOW FOR NOSE CONE**

NO

1"

16

- A. Apply sanding sealer to all wood parts with small brush.
- B. When sealer is dry, lightly sand all sealed surfaces.
- C. Repeat sealing and sanding until wood grain is filled and smooth.

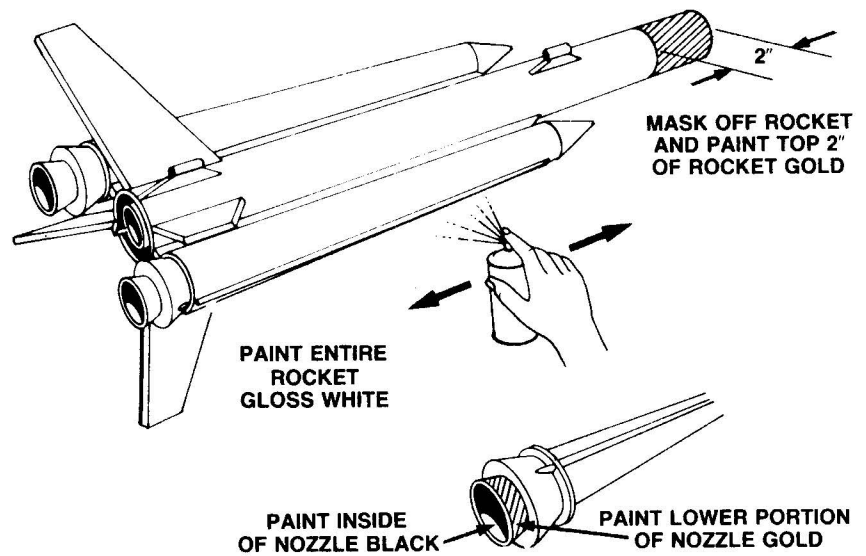


**LIGHTLY SAND AFTER
SEALED PARTS
HAVE DRIED**

**APPLY SANDING SEALER
TO ALL WOOD PARTS**

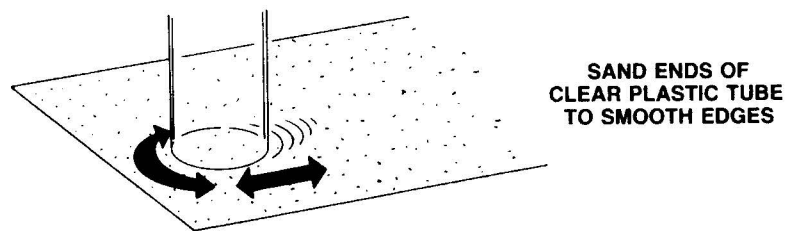
17

- A. When sanding sealer and glue are completely dry, paint model with gloss white enamel.
- B. Follow instructions on spray can for best results.
- C. Let dry overnight. Mask off rocket and paint top 2 inches of rocket with gold enamel. Paint nozzles as shown.
- D. Remove mask from rocket as soon as paint has set.



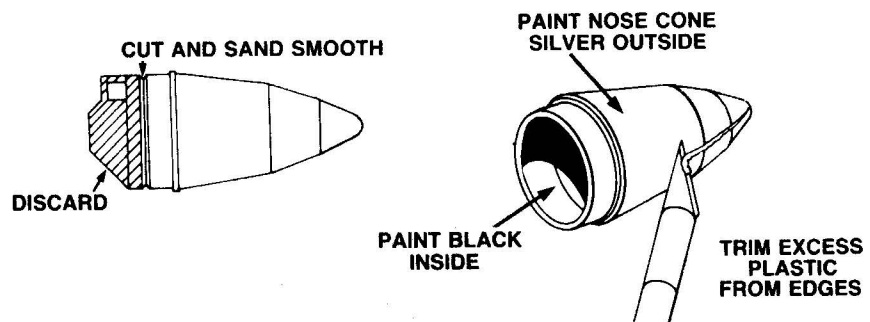
18

- A. Remove any excess plastic with modeling knife or fine sandpaper.
- B. Sand both ends of clear payload tube flat.



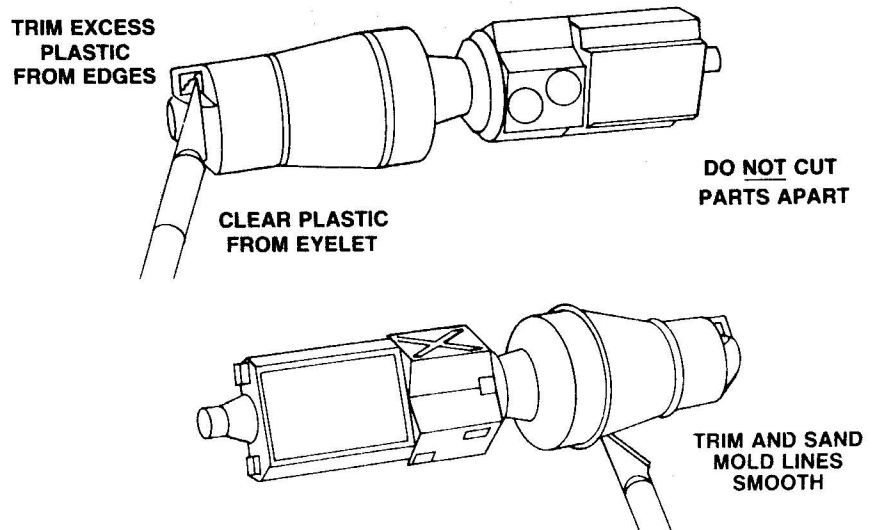
19

- A. Cut off end of nose cone and discard.
- B. Sand end of nose cone flat and smooth.
- C. Trim or sand any excess plastic from around sides of nose cone.
- D. Wipe nose cone inside and outside with damp cloth to remove oil and dirt.
- E. Paint outside of nose cone silver enamel and inside of nose cone black.



20

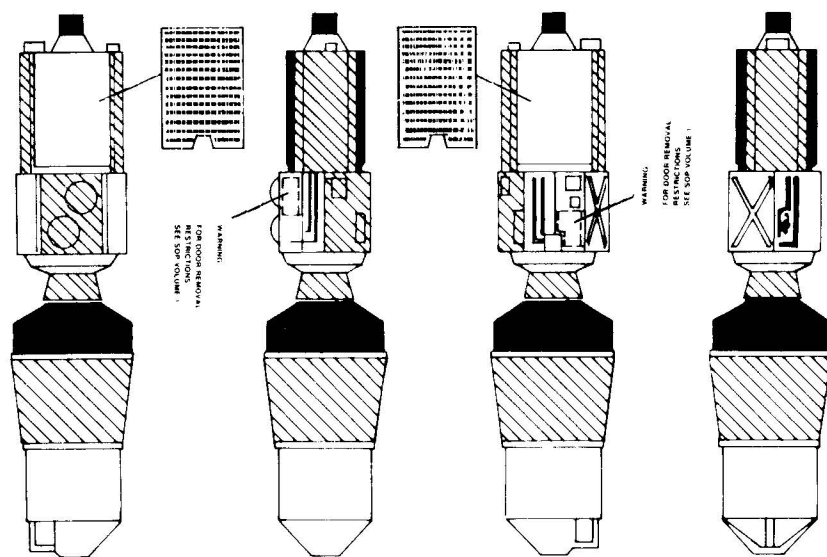
- A. DO NOT CUT ADAPTER AND SATELLITE APART.
- B. Trim and sand any excess plastic from around the sides of adapter and satellite.
- C. Use a sharp knife to remove any excess plastic from the inside of the molded eyelet at rear of adapter.



21

PAINT SATELLITE GLOSS WHITE AS BASE COAT

- Wipe adapter/satellite with a damp cloth to remove oil and dirt.
- Paint adapter/satellite with gloss white enamel.
- Allow paint to dry overnight before continuing.
- Mask satellite and adapter and paint as shown.
- When paint is thoroughly dry apply decals as shown. Trim all excess clear from around decals. SEE "FINISHING YOUR ROCKET" SECTION FOR INSTRUCTIONS ON HANDLING DECALS.



■ BLACK ▨ GOLD □ SILVER

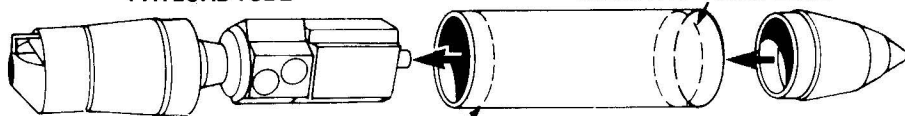
APPLY DECALS AS SHOWN

22

- After decals and paint are completely dry, assemble satellite, clear payload section, and nose cone together.
- Make sure nose cone and adapter are a tight fit with clear payload section. Apply tape to adapter or nose cone shoulder for a tight fit.
- As an optional step, paint clear payload section as shown to cover "joints" with nose cone and adapter sections.

SATELLITE SECTION AND NOSE CONE SHOULD FIT SNUGLY INTO CLEAR PAYLOAD TUBE

(OPTIONAL) PAINT OUTSIDE SURFACE OF CLEAR PAYLOAD SECTION SILVER 3/8" FROM EDGE

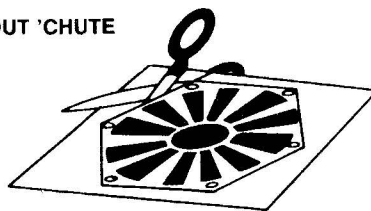


(OPTIONAL) PAINT OUTSIDE SURFACE OF PAYLOAD SECTION GOLD 3/8" FROM EDGE

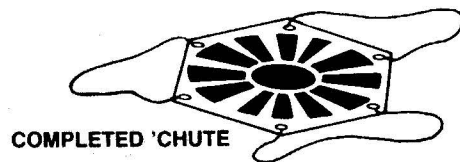
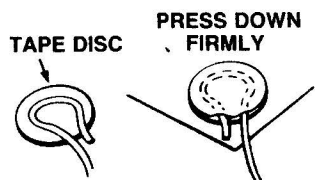
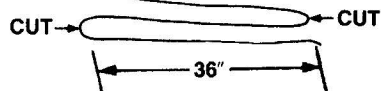
23

- Cut out parachute on edge lines.
- Cut three 36 inch lengths of shroud line.
- Form small loops with shroud line ends and press onto sticky side of tape discs.
- Attach tape discs with line ends to top of parachute as shown.
- Firmly press tape discs into place until both tape discs and parachute material are molded around shroud line loops.
- Pass shroud line loops through eyelet on payload/adapter. Pass parachute through loop ends and pull lines against the adapter.
- Tie free end of shock cord to adapter eyelet.

CUT OUT 'CHUTE

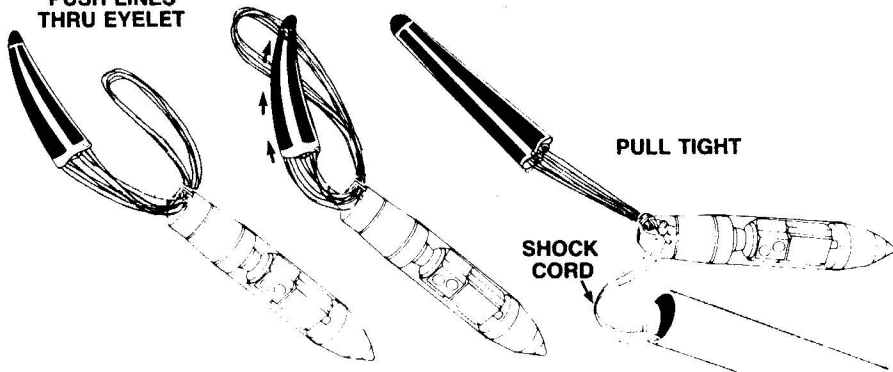


THREE LENGTHS OF SHROUD LINE



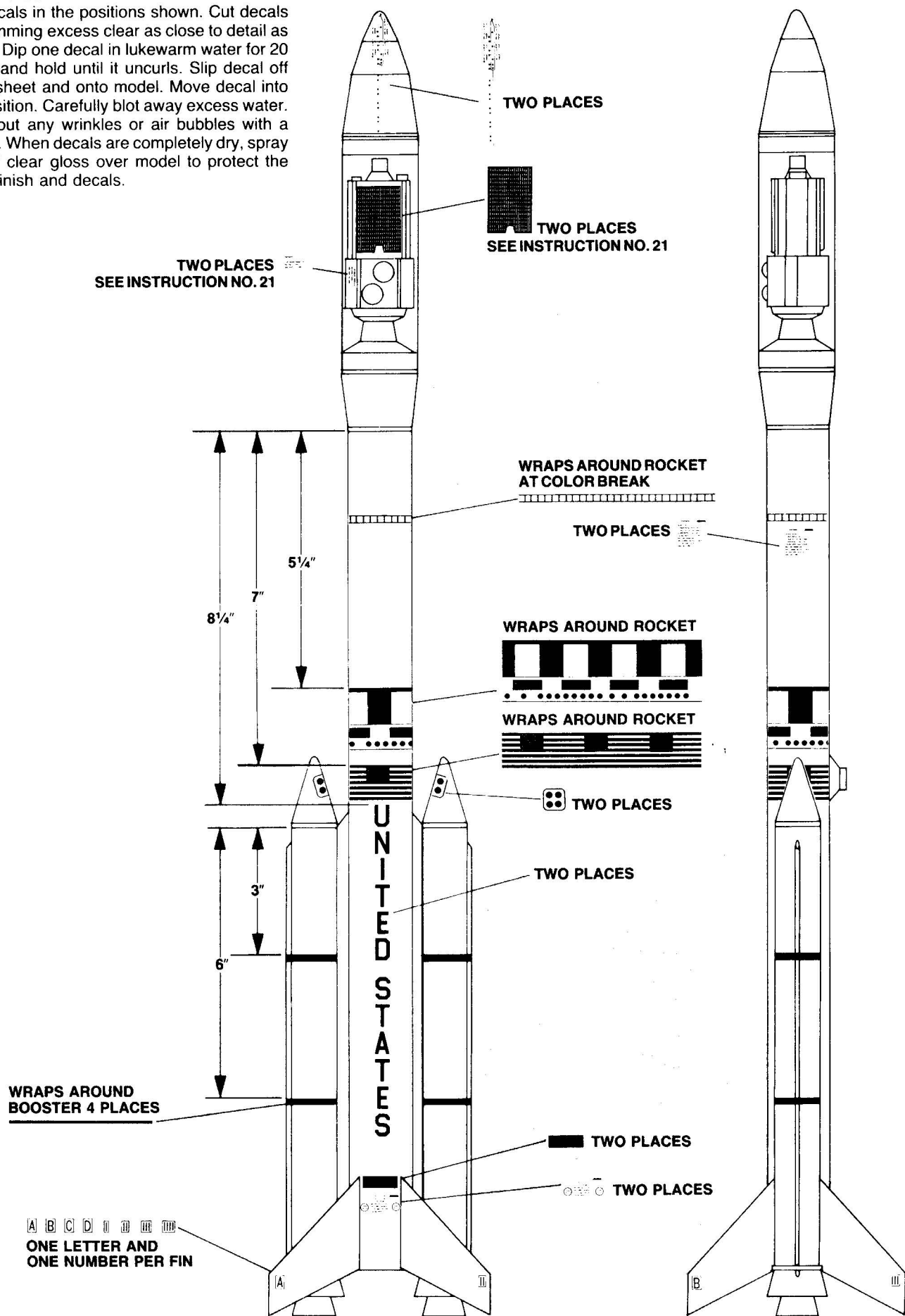
PASS 'CHUTE THRU LOOP

PUSH LINES THRU EYELET

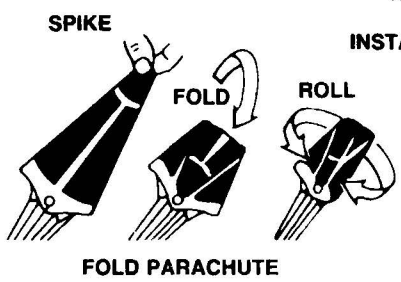
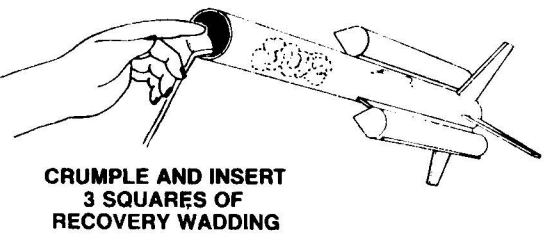


FINISHING YOUR ROCKET

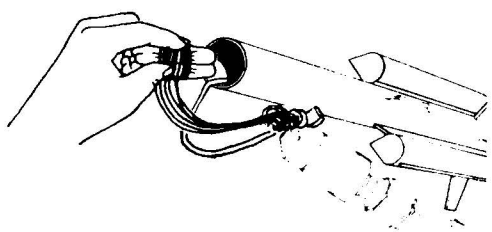
Apply decals in the positions shown. Cut decals apart, trimming excess clear as close to detail as possible. Dip one decal in lukewarm water for 20 seconds and hold until it uncurls. Slip decal off backing sheet and onto model. Move decal into exact position. Carefully blot away excess water. Smooth out any wrinkles or air bubbles with a soft cloth. When decals are completely dry, spray a coat of clear gloss over model to protect the model's finish and decals.



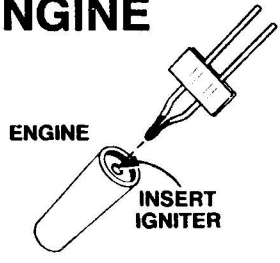
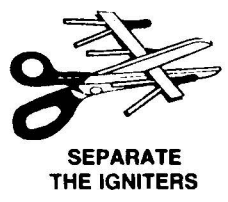
ROCKET PREFLIGHT



**WRAP LINES LOOSELY AROUND 'CHUTE
INSERT PARACHUTE IN ROCKET
INSTALL PAYLOAD SECTION IN PLACE**



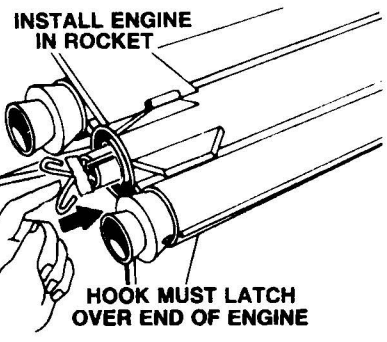
PREPARE ENGINE



IGNITER TIP MUST TOUCH PROPELLANT DEEP INSIDE NOZZLE OPENING



APPLY AND FIRMLY PRESS TAPE DISC OR MASKING TAPE IN PLACE



LAUNCH SUPPLIES

To launch your rocket you will need the following items:
 —Estes Electrical Launch System and Launch Pad
 —Estes Recovery Wadding (No. 2274)
 —Recommended Estes Engines: B4-2, B6-2, C5-3, or C6-3
 Use a B4-2 engine for your first flight to become familiar with your rocket's flight pattern.
 Use only Estes products to launch this rocket.

FLYING YOUR ROCKET

Choose a large field away from power lines, tall trees, and low flying aircraft. Try to find a field at least 250 feet square. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great.

Launch area must be free of dry weeds and brown grass.
 Launch only during calm weather with little or no wind and good visibility.
 Don't leave parachute packed more than a minute or so before launch during cold weather [colder than 40° Fahrenheit (4° Celsius)]

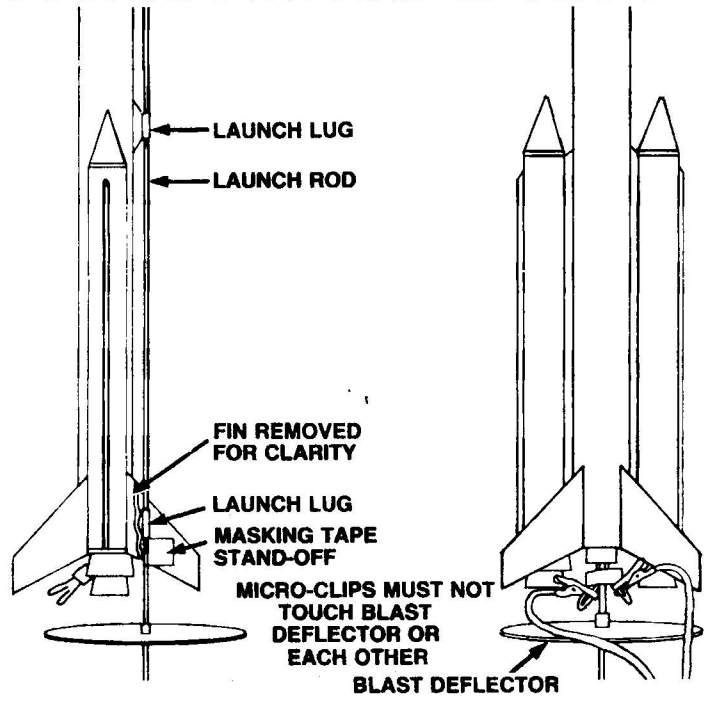
MISFIRES

Failure of the rocket engine to function properly is nearly always caused by a failure to install the igniter correctly. This failure permits the igniter to heat and burn into two pieces without igniting the engine.

FOR YOUR SAFETY AND ENJOYMENT

Always follow the NAR-HIA* MODEL ROCKETRY SAFETY CODE while participating in any model rocketry activities.

COUNTDOWN AND LAUNCH



- 5 REMOVE SAFETY KEY to disarm the launch controller.
- 4 Remove safety cap and slide launch lugs over launch rod to place rocket on launch pad. Make sure the rocket slides freely on the launch rod.
- 3 Attach micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the metal blast deflector. Attach clips as close to protective tape on igniter as possible.
- 2 Move back from your rocket as far as launch wire will permit (at least 15 feet).
- 1 INSERT SAFETY KEY to arm the launch controller.

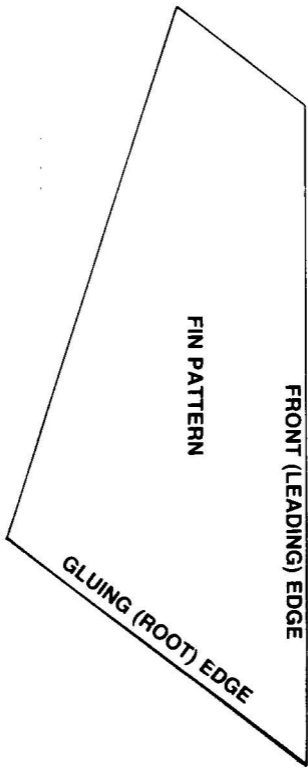
LAUNCH!!! PUSH AND HOLD LAUNCH BUTTON UNTIL ENGINE IGNITES
 Remove safety key—Replace cap on rod.

1 Inch

1 Inch

1 Inch

1 Inch



1 Inch

1 Inch

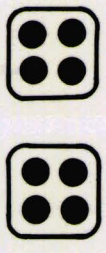
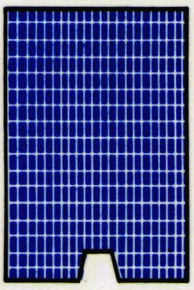
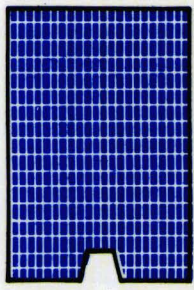
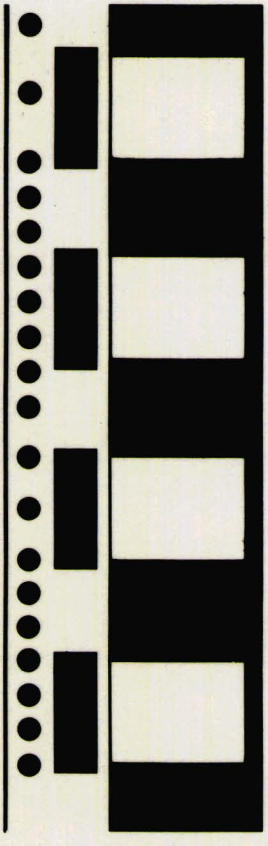
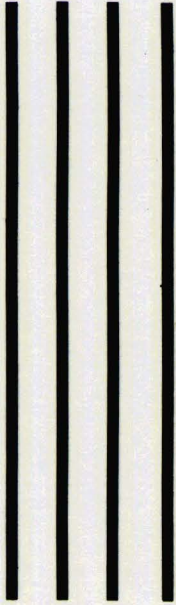
1 Inch

1 Inch

UN-IT-ED STATES
UN-IT-ED STATES

WARNING:
 FOR DOOR REMOVAL
 INSTRUCTIONS
 SEE SOP VOLUME 1

WARNING:
 FOR DOOR REMOVAL
 RESTRICTIONS
 SEE SOP VOLUME 1

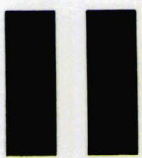


INSTALL SCREWS
 PRIOR TO FLIGHT

INSTALL SCREWS
 PRIOR TO FLIGHT

INSTALL SCREWS
 PRIOR TO FLIGHT

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 PRIOR TO FLIGHT

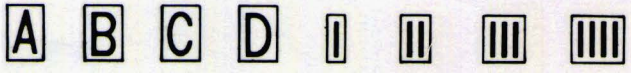


WARNING:
 WHEN VEHICLE IS
 HORIZONTAL, WITH AN
 SUPPLEMENTED ONE OF THE
 LAUNCHER THIS DOOR
 MAY BE REMOVED
 PROGRAMS, BOTH OTHER
 PROGRAMS, BOTH OTHER
 PROGRAMS, BOTH OTHER
 AND SECURED

WARNING:
 WHEN VEHICLE IS
 HORIZONTAL, WITH AN
 STRIKE KIT, THE LAUNCHER
 LAUNCHER THIS DOOR
 MAY BE REMOVED
 PROGRAMS, BOTH OTHER
 PROGRAMS, BOTH OTHER
 AND SECURED

ACCESS BIT:
 THIS DOOR MUST
 BE OPENED &
 HOISTING ON THE
 LAUNCHER

ACCESS BIT:
 THIS DOOR MUST
 BE OPENED &
 HOISTING ON THE
 LAUNCHER



ESTES INDUSTRIES PN 37294



Flying Model Rocket

Geo Sat

WITH SATELLITE LAUNCH VEHICLE

FLYING MODEL ROCKET

INCLUDES:

- 1x LAUNCHER
- 1x MODEL ROCKET
- 1x SATELLITE LAUNCH VEHICLE
- 1x 1/2" DIA. BATTERY
- 1x 1/2" DIA. MOTOR
- 1x 1/2" DIA. NOSE CONE
- 1x 1/2" DIA. FINNAGE
- 1x 1/2" DIA. BASE



Launch the rocket high into the air and watch it fly over 100 feet high. The rocket is made of lightweight plastic and is easy to assemble. It is a great gift for children and adults alike.

