



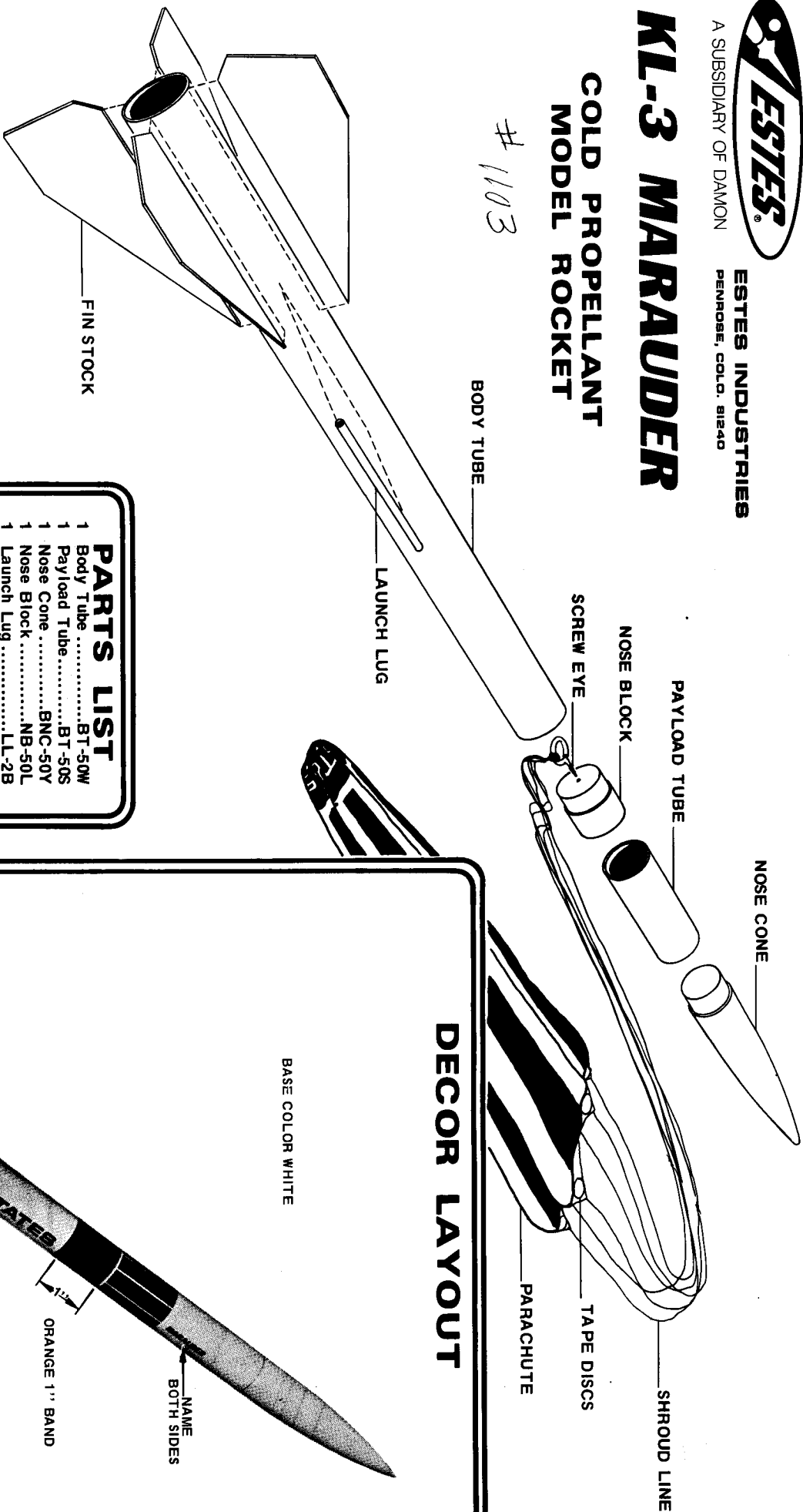
A SUBSIDIARY OF DAMON

ESTES INDUSTRIES
PENROSE, COLO. 81240

KL-3 MARAUDER

COLD PROPELLANT MODEL ROCKET

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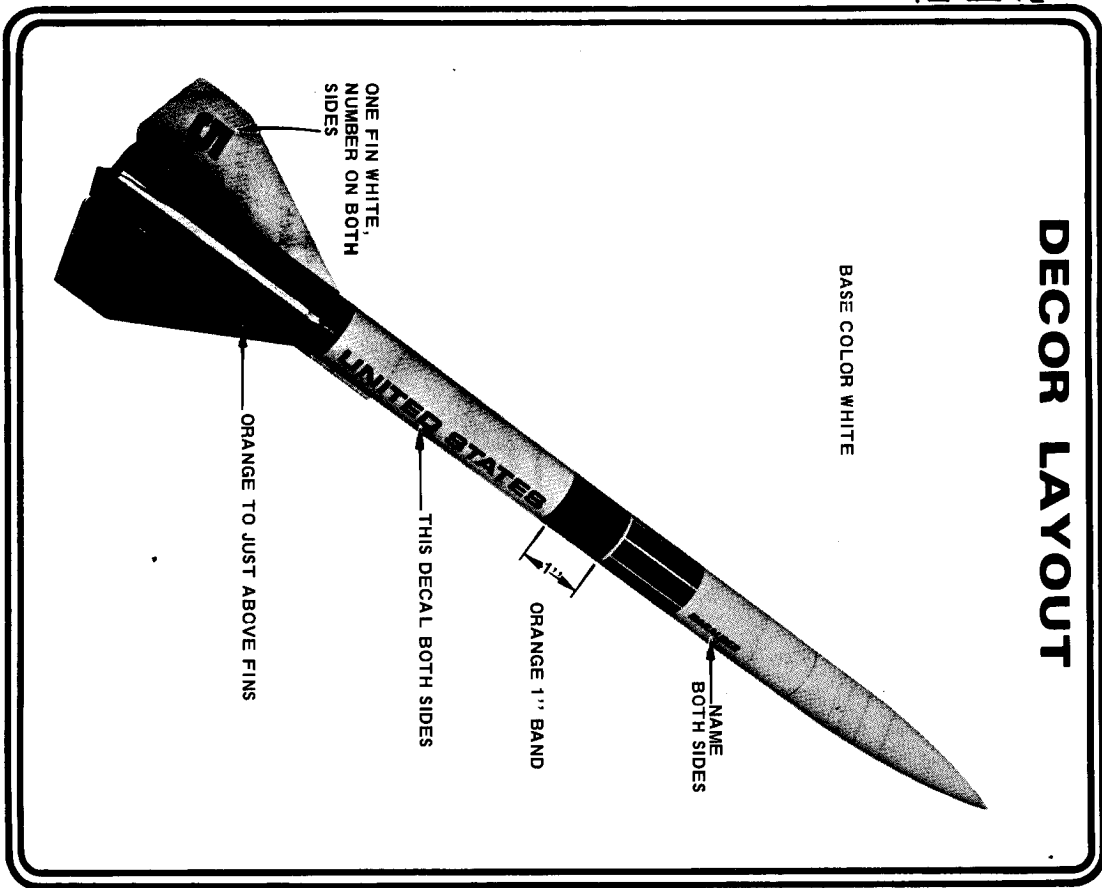


PARTS LIST	
1 Body Tube.....	BT-50W
1 Payload Tube.....	BT-50S
1 Nose Cone.....	BNC-50Y
1 Nose Block.....	NB-50L
1 Launch Lug.....	LL-2B
1 Fin Stock.....	BF-L3
1 Parachute.....	PK-12A
1 Shroud Line.....	SLT-7Z
1 Tape Strips/Discs.....	TD-3F
1 Screw Eye.....	SE-2
1 Decal.....	KD-L3

ADDITIONAL TOOLS AND MATERIALS REQUIRED

Sharp modelling knife
Ruler
Pencil
Brush
Sandpaper: coarse and extra fine

Sanding Sealer
Spray Paint
Masking Tape
White Glue



1 Cut out fin marking guide.

Wrap around body tube and hold with masking tape.

NOTE: Use pencil only.

Mark at arrow points.

2 Remove guide.

Using door sill or drawer, extend lines length of tube.

3 Fine sand both sides of the die cut fin sheet.

Remove the fins from the sheet.

Sand round.

Leave square.

Rub a line of glue into root edge of each fin and allow to dry.

4 Position and glue the fins next to the alignment lines, aligning them straight away from the body tube.

Apply a glue fillet to both sides of each fin.

Allow to dry.

5 Glue the launch lug next to its alignment line so the rear of the launch lug is 2-3/4" from the rear of the body tube.

6 Glue the large end of the nose block into one end of the payload tube.

Slide the nose cone into the other end.

7 Be sure all glue has dried hard and clear.

Brush on sanding sealer. Let dry.

Sand with extra fine sandpaper. Repeat as necessary to completely fill pores in wood.

Smooth out.

8 Spray paint for best results. Roll up old magazine for rocket holder. Shake can before spraying.

First coats are light, dry mist coats.

Hold can straight up and spray in long smooth "strokes". Shake can periodically.

Masking tape and paper protect model from second color spray.

Let dry completely between each coat.

To obtain gloss, final coat should be slightly heavier.

NOTE: Apply final coat with "wet" look.

9 Peel decal from backing. For accurate positioning as shown on decal layout, dip decal in mild soap solution.

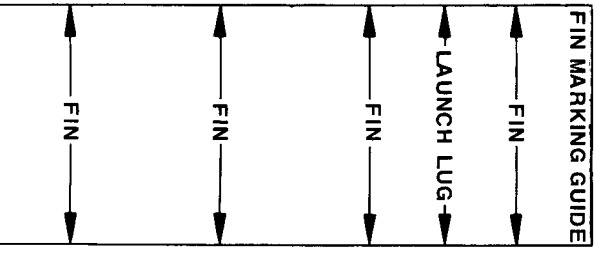
Apply decal to model.

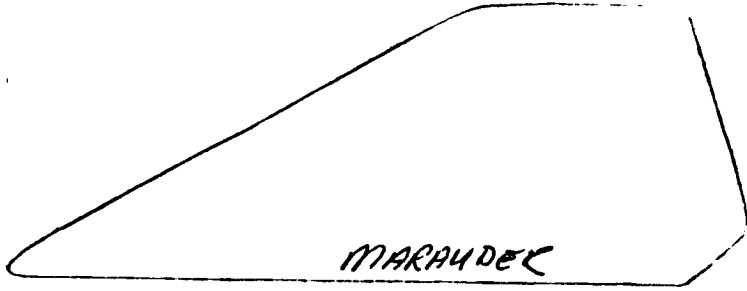
Smooth out any bubbles with a dry rag.

10 Insert screw eye, remove, squirt glue into hole, and replace.

Assemble parachute following instructions printed on parachute.

Connect parachute to screw eye.





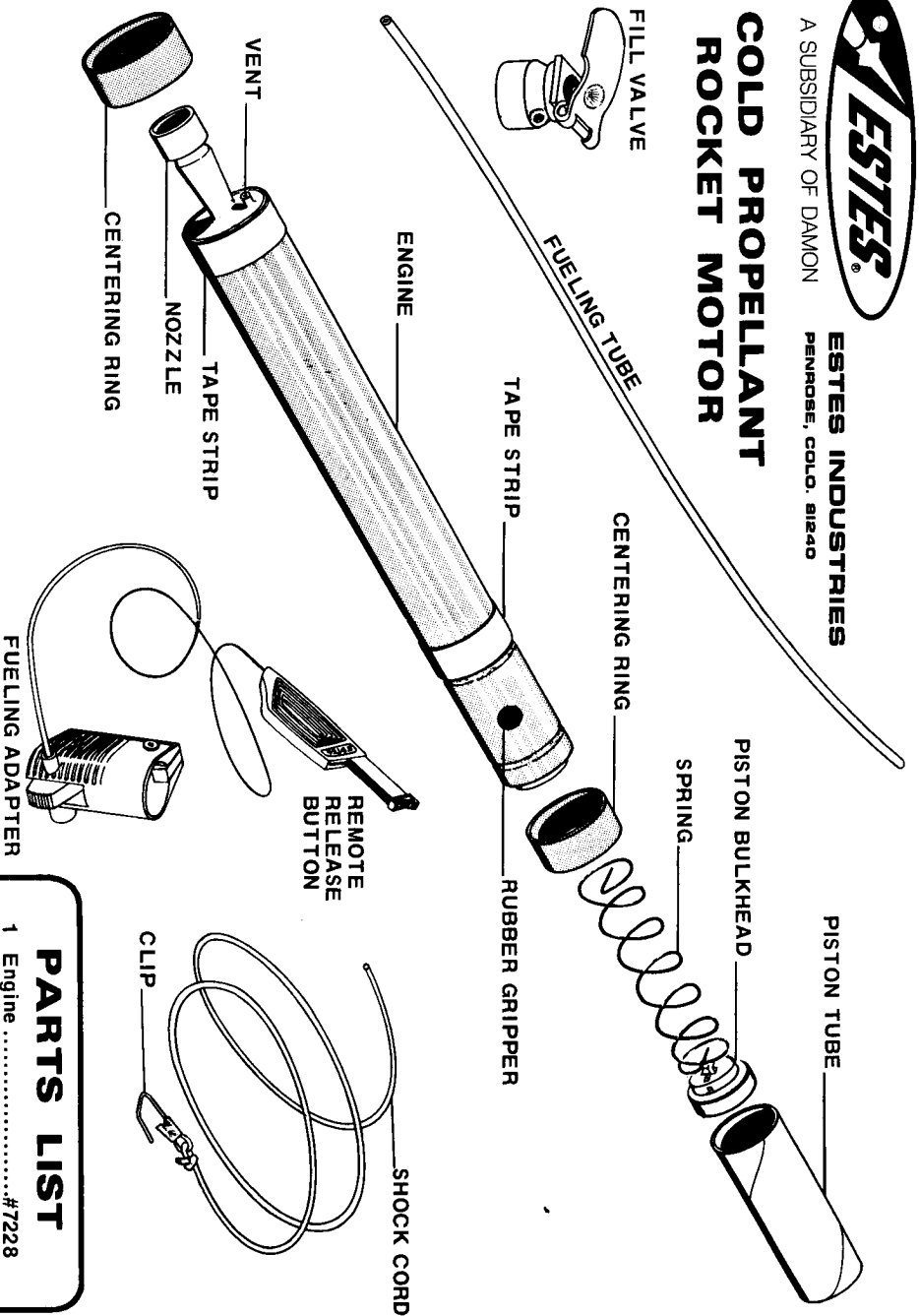
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A SUBSIDIARY OF DAMON

ESTES INDUSTRIES
PENROSE, COLO. 81240

COLD PROPELLANT ROCKET MOTOR



ASSEMBLY INSTRUCTIONS

1 Insert spring thru bulkhead and loop. Tie loop to shock cord free end.

2 Measure 1/4" inside piston tube. Piston tube slides easily inside rocket body tube. Smear ring of glue below mark. Debur end with sandpaper. Put spring through tube, slide bulkhead down to glue ring. Add second ring of glue above bulkhead. Slide bulkhead up to mark.

3 Place tape strips around engine. Ring. Glue. Glue centering rings onto engine. Allow to dry completely.

DESCRIPTION

Your Estes cold propellant motor uses a non-flammable, odorless aerosol for propellant (RP-100, or Freon-12*), consequently it may be flown even in places which have strict fireworks codes. Be sure, however, to fly it in places with adequate open space for safe recovery.

The engine is loaded through the nozzle by means of a fueling adapter. A latch in the adapter holds the nozzle, and releases it when the remote button is pressed. Pressure from the fuel expands rubber grippers which hold the piston tube and ejection spring compressed in place over the front of the engine. When the fuel is exhausted, the pressure slowly escapes, releasing the piston which ejects the parachute forward out of the rocket. A built-in timer provides about 2 seconds delay from "burnout" (end of thrust) to release of the parachute.

The entire engine unit (engine, ejection spring, and piston) slips in or out of your rocket. You may use one engine unit to power a variety of appropriately designed rockets, or convert your rockets eventually to solid propellant power with a conversion adapter available from Estes.

For display of your rocket, we recommend removing the piston and spring; the engine can be inserted or removed, as desired.

*DuPont trademark

PARTS LIST

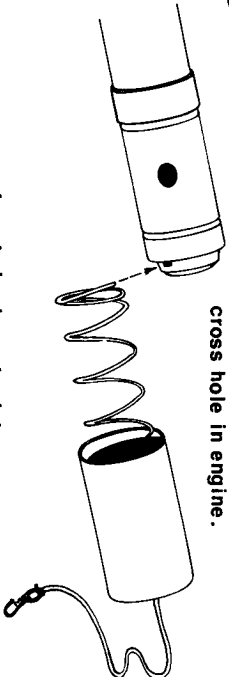
- 1 Engine#7228
- 1 Spring#7241
- 1 Piston Bulkhead.....#7246
- 1 Piston Tube#BT-48B4
- 2 Centering Rings.....#JT-50B
- 2 Tape Strips#TH-1
- 1 Shock Cord.....#SC-4B
- 1 Fueling Adapter#7250
- 1 Clip#SV-2
- 1 Fill valve#7027
- 1 Fueling tube#72100

SPECIFICATIONS

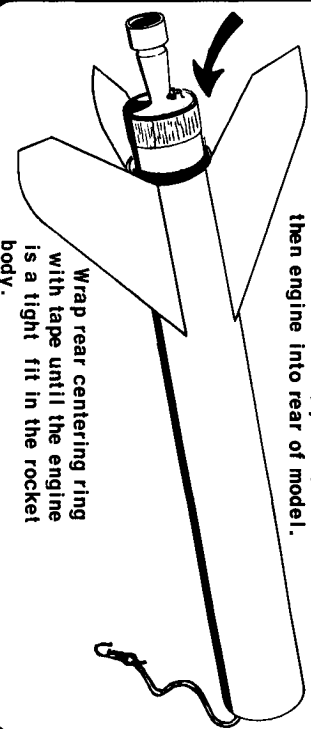
- Length-engine only: 18.7 cm. 7.275"
- Diameter: 2.25 cm 0.885"
- Thrust:.....3.1 Newton0.7 lb.
- Total Impulse: ... 2.50 Newton-Sec. 0.560 lb./sec.
- Delay:..... 2 seconds
- Weight, complete: . 32.7 gm . . 1.16 oz.

4

Insert spring through cross hole in engine.



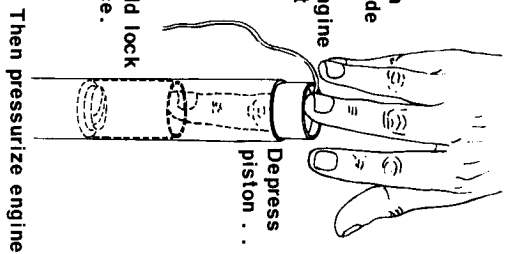
Insert shock cord, piston, then engine into rear of model.



Wrap rear centering ring with tape until the engine is a tight fit in the rocket body.

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Press piston all the way down (full length of middle finger) inside body tube, hold down while pressurizing engine with a 2-second burst of propellant.



Piston should lock down in place.

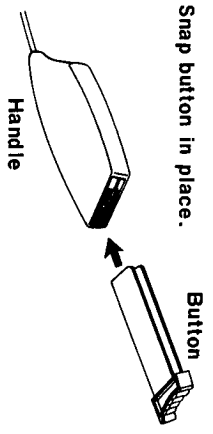
Then pressurize engine

OPERATIONAL NOTES

1. Do not attempt to fly with RP-100 propellant below 45° F. Poor performance would result.
2. Allow engine to warm up 10 minutes between flights for best performance.
3. Do not invert engine while full or while fueling it. This will affect delay time to release.
4. Do not fuel engine outside of rocket body. Rubber grippers might be damaged if exposed.
5. RP-100 safety hints:
 - a. Keep can cool — below 120° F.
 - b. Do not puncture propellant can.
 - c. Keep RP-100 away from open flame.
 - d. Exhaust is extremely cold, do not allow it to hit you directly.
 - e. Exhaust is quite powerful, do not direct it near fragile objects.

5

Snap button in place.

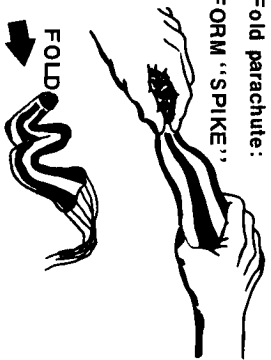


Button

Handle

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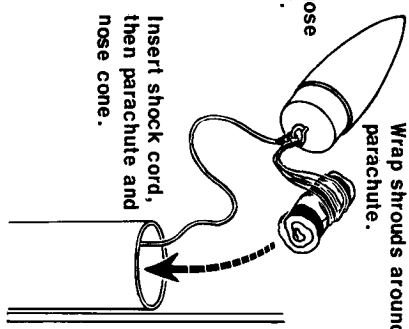
Attach clip to screw-eye in nose cone assembly.



Fold parachute: FORM "SPIKE"

FOLD

Wrap shrouds around parachute.

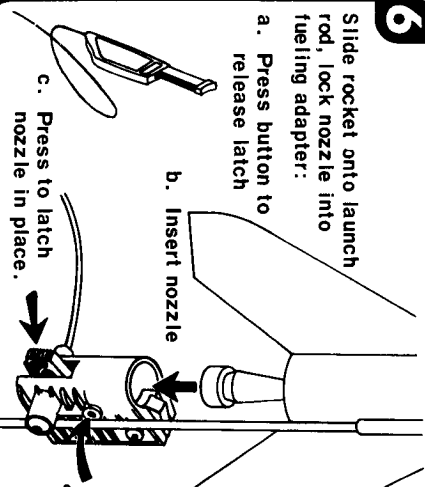


Insert shock cord, then parachute and nose cone.

NOTE: PARACHUTE AND NOSE CONE MUST FIT LOOSELY SO SPRING CAN PUSH THEM OUT AT DEPLOYMENT

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Slide rocket onto launch rod, lock nozzle into fueling adapter:

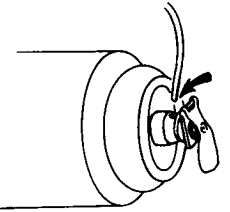


a. Press button to release latch

b. Insert nozzle

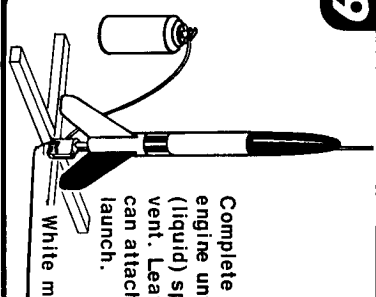
c. Press to latch nozzle in place.

Insert hose into fueling adapter and fill valve.



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Complete fueling of engine until white mist (liquid) sprays from vent. Leave propellant can attached during launch.



White mist when full

Get back with release cable fairly straight. Press button to launch rocket.

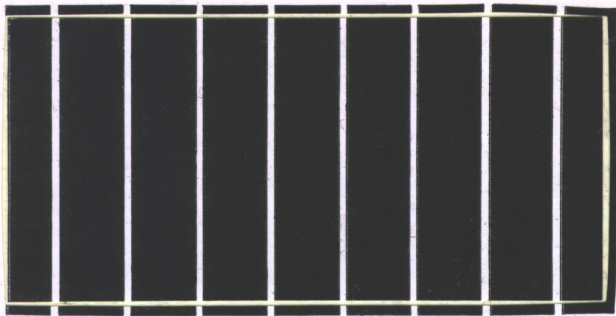
PROBLEM

SOLUTION

Sticky sliding of piston tube.	De-burr piston tube rear end with sandpaper.
Nose cone fails to eject.	De-burr front end of rocket body tube with fine sandpaper. Loosen fit of nose cone in tube.
Chute fails to come out after nose cone comes off.	Parachute jammed in tube; wrap chute more tightly for loose fit in body tube.
Model achieves only relatively low altitude.	Engine not full; fuel until liquid sprays out of vent. Engine too cold. Propellant too cold. Launch rod needs cleaning.
Model fails to release from fueling adapter.	There may be some dirt between the adapter and the nozzle; check operation of latch.
Engine slides forward in body tube during launch.	Use more tape around rear centering ring.

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