QUEST™ QUICK-KIT™ 15 TO 45 MIN.
Ready to launch in 15 to 45 minutes.

NIKE SMOKE™

No. 1607

ASSEMBLY INSTRUCTIONS

TOOLS YOU'LL NEED TO ASSEMBLE THIS ROCKET

Tube Type Plastic Cement

Hobby Knife

Nose Cone Tip
20203

Plastic Nose Cone Halves
20201/20202

White Shock Cord
50012

Yellow Shock Cord
50051

Body Tube
11500

Motor Housing
20700/20701

Fin
20829 (1)/20830 (3)

Display Stand
24208/24209

14" Parachute
28107

Gray Motor Mount Tube
10301

Gripper Tabs
00500

26" Shroud Lines
50100

Fin Locking Ring
20026

Fin

Motor Lock Ring
20027

Decal Sheet
3-01607-1030

UNITED STATES
UNITED STATES

PARTS NOT TO SCALE

1

White Elastic Shock Cord

Yellow Kevlar Shock Cord

A. Hold the Yellow and White Cords side by side with the ends even.

B. Tie an over-hand knot to join the cords.

C. Pass Yellow Cord through loop in Motor Housing.

D. Tie a double knot.

2

Plastic Cement

A. Position slot in Gray Motor Mount Tube over tab on Motor Housing.

B. Glue the two Motor Housing halves together.

C. Feed Yellow and White Cord through the Body Tube.

D. Apply glue around inside of Body Tube and insert Motor Housing until it seats against the Body Tube.

3

A. Test fit all four Fins into the slots.

Plastic Cement

B. Remove each one, add glue and replace.

Check Fin alignment

C. Twist Fin Locking Ring onto rear of Motor Housing.

4

Plastic Cement

B. Glue Nose Cone Tip in place.

A. Apply glue around inside edge of Nose Cone. Position halves together.

B. Tie White Cord to Nose Cone with a double knot.

5

A. Place one Gripper Tab on each of the six corners on Parachute.

B. Firmly squeeze each Gripper to the Parachute with your fingers.

C. Tie Shroud Line with a double knot.

D. Attach Parachute to eyelet in Nose Cone.

6

A. Grab Parachute at center - pull gently.

B. Fold.

C. Roll.

D. Insert rolled Parachute, then Shock Cord and slide Nose Cone into place.

PARACHUTE MUST SLIDE EASILY INTO THE TUBE.

7

A. Remove the self-adhesive decals one at a time.

B. Position on rocket.

C. Rub gently.

UNITED STATES

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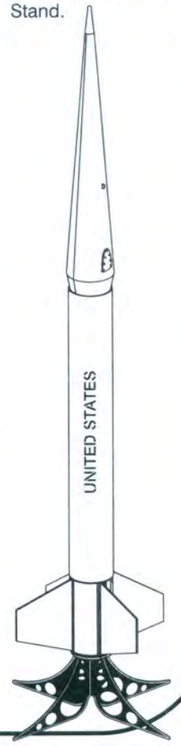
UNITED STATES

3-01607-1010

Displaying Your Rocket

A. Slide two halves of display stand together.

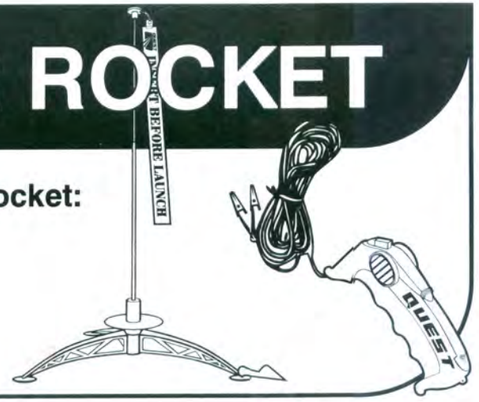
B. Slide Rocket Motor Mount onto Display Stand.



FLYING YOUR ROCKET

Supplies You Will Need to Launch Your Rocket:

Quest Launch Pad (No. 7610)
Quest Launch Controller (No. 7510)
Quest Parachute Recovery wadding (No. 7020)
Quest Rocket Motors Type A6-4, B6-4, C6-5.
Use A6-4 Motor for your first flights.

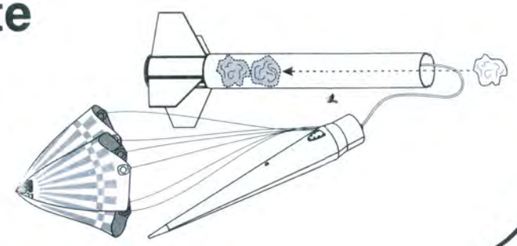


1 Pack Your Parachute

A. Remove Nose Cone and Parachute.

B. Crumple and insert THREE squares of Recovery Wadding.

C. Re-pack Parachute, Shock Cord, and replace Nose Cone. ***See Step 6 of Assembly Instructions for Parachute folding.***

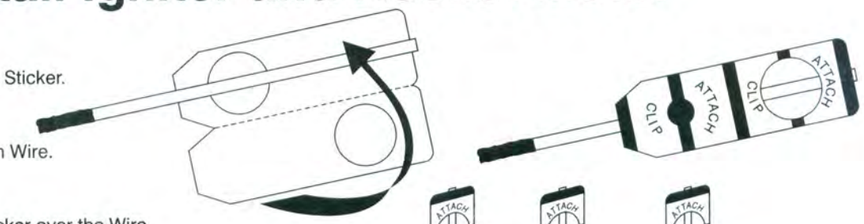


2 Install Igniter and Rocket Motor

A. Remove Tiger Tail Sticker.

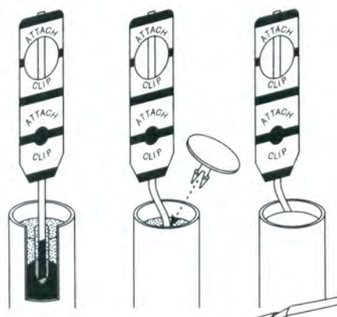
B. Center the Ignition Wire.

C. Fold Tiger Tail Sticker over the Wire.



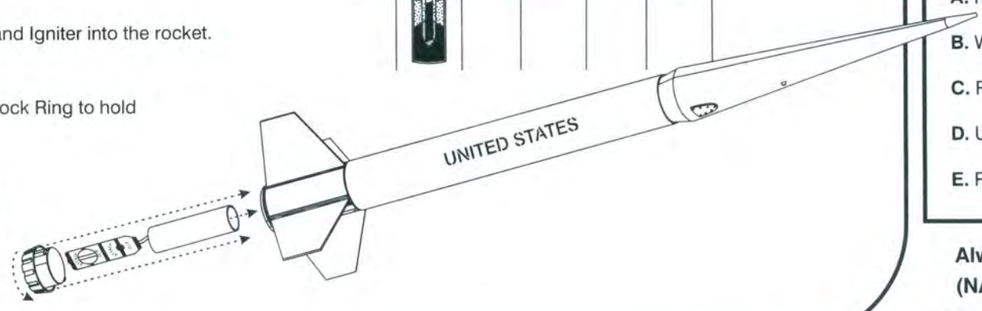
D. Place Igniter Assembly into Motor Nozzle as far as it will go.

E. Push in the plastic Tiger Tac.



F. Insert Rocket Motor and Igniter into the rocket.

G. Twist plastic Motor Lock Ring to hold Motor in place.



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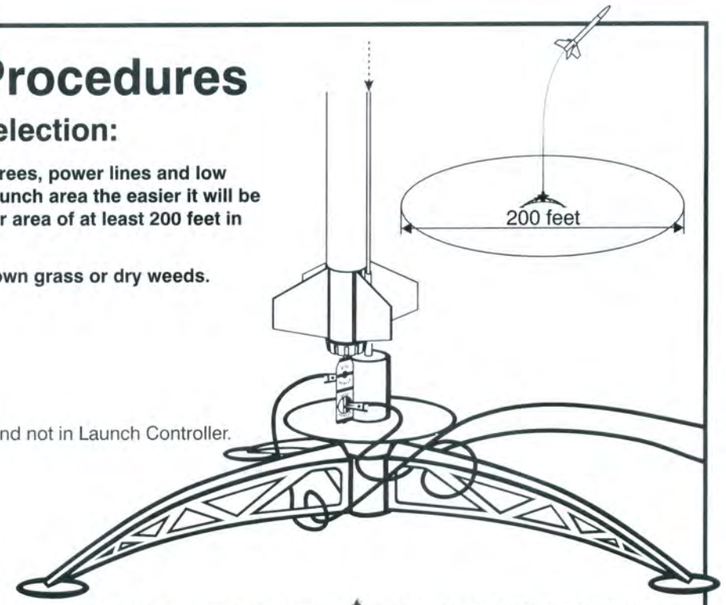
QUEST™
Manufactured by:
QUEST AEROSPACE
A Division of
MARVEL ENTERPRISES, INC.
Yuma, AZ 85364

3 Launch Procedures

Launch Site Selection:

- **Pick a large area away from tall trees, power lines and low flying aircraft. The larger your launch area the easier it will be to recover your rocket. A circular area of at least 200 feet in diameter is recommended.**
- **Launch area must be clear of brown grass or dry weeds.**



A. Remove Rod Safety Cap.

B. Be certain Safety Key is with you and not in Launch Controller.

C. Slide rocket down Launch Rod.

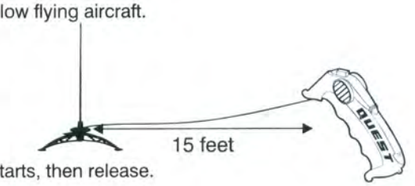
D. Attach one micro clip to each hole where the igniter is exposed. Be sure that the clips do not touch each other.

Count Down Procedure:

A. Move yourself and all spectators away from Rocket and Launch Pad as far as the wire will allow (15 feet).

B. Wind conditions should be gentle. Make sure the sky is clear of low flying aircraft.

C. Insert Safety Key to arm Launch Controller.



D. In a LOUD voice, begin count down: 5...4...3...2...1...LIFT OFF!
Press and hold the Launch button until the Rocket Motor starts, then release.

E. Remove the Safety Key from Launch Controller as soon as rocket lifts off.

F. Replace the Launch Rod Safety Cap between launchings.

Misfire Procedure:

If the rocket motor fails to ignite:

A. Remove the Safety Key.

B. Wait ONE MINUTE before approaching the Rocket. Carefully remove rocket.

C. Remove rocket motor and old igniter. Install a new Tiger Tail Igniter in the Motor and reinstall.

D. Use a small emery board or sandpaper to clean the inside surfaces of the micro clips.

E. Repeat the Launch Procedure and Count Down.

Always follow the National Association of Rocketry, (NAR) Model Rocket Safety Code while using your model rocket. It is printed on the back of the package panel.

Customer Service:
800 858-7302

SCALE DATA

NASA "NIKE—SMOKE" METEOROLOGICAL ROCKET

The Nike-Smoke sounding rocket is a single-stage solid-propellant sounding rocket (rocketsonde) that was developed by NASA in 1963 as an inexpensive vehicle to determine wind velocities up to an altitude of 75,000 feet. Costs were kept low by using a surplus Thiokol Nike-Ajax M-5 (X216A2) solid propellant booster. Thousands of these had been made to boost the U.S. Army's Nike anti-aircraft missiles in the 1950's. (Nike-Ajax was the ancestor of the Patriot missile.)

The payload was approximately 10 gallons (144 pounds) of titanium tetrachloride (TiC14) contained in a tank inside a 10-degree conical nose cone fabricated of Type 341 stainless steel. Ram air pressure from an inlet port at the nose tip pressurized the titanium tetrachloride tank, ejecting the chemical into the air during flight from an orifice on the side of the cone. Upon reaction with the moisture in the atmosphere, chlorides were formed which combined with the water vapor to form droplets of hydrochloric acid (HC1). This produced a persistent and reflective white trail which was photographed by two cameras approximately 10 miles from the launch site and 90 degrees apart in azimuth. Wind profiles were obtained by photographic triangulation techniques using time-lapse photographs.

Nike-Smoke was launched from a standard Nike-Ajax antiaircraft missile launcher at an angle of 80 degrees from thehorizontal (20 degrees from the vertical). No attempt was made to recover the vehicle which was allowed to impact in the ocean.

During the 1960 decade, 70 Nike-Smoke rockets were launched from NASA Wallops Station, Virginia and 55 were launched from Cape Canaveral, Florida. The Nike-Smoke proved to be an inexpensive and reliable method of determining upper wind profiles.

Weights:

Gross takeoff weight: 1560.7 pounds
Propellant weight: 764 pounds
Burnout weight: 796.7 pounds
M-5 Nike booster empty weight: 431 pounds
Fins: 69.2 pounds
Nose cone assembly: 152.5 pounds

Performance

Thrust: 48,700 pounds (216,715 newtons)
Burnout time: 3.5 seconds
Burnout altitude: 6,294 feet
Burnout acceleration: 47.2 g
Launch angle: 80 degrees
Apogee altitude: 75,200 feet
Apogee time: 65 seconds
Splash-down time: 147 seconds
Splash-down range: 56,500 feet

All Nike-Smoke rockets launched from NASA Wallops Station, Virginia were painted in standard NASA Wallops colors:
Body: Flat white
Three fins: Fluorescent red
Remaining fin: Fluorescent yellow
Lettering and nose tip: Flat black
One Nike-Smoke launched at NASA Wallops Station, perhaps a prototype, had a silver nose cone.
(Nike-Smoke scale data and photographs from the archives of G. Harry Stine.)

EXPERIMENTS WITH THE QUEST NIKE—SMOKE

The QUEST Nike-Smoke scale model can be used to compare computer analyses of flight trajectories against measured flight performance of the scale model because NASA data indicates a drag coefficient (Cd) of 0.45 during thrusting and 0.85 during coasting flight. The subsonic center of pressure of the full-size Nike-Smoke rocketsonde was calculated by NASA at 192.00 inches behind the nose tip.

*(**WARNING:** Do not attempt to duplicate scale operation by using titanium tetrachloride in your QUEST Nike-Smoke scale model The chemical is toxic and the model won't carry enough of it.)*