

# FLIGHT SYSTEMS, INC.

**Model**

**Rocketry**

**1996**



# FLIGHT SYSTEMS, INC.

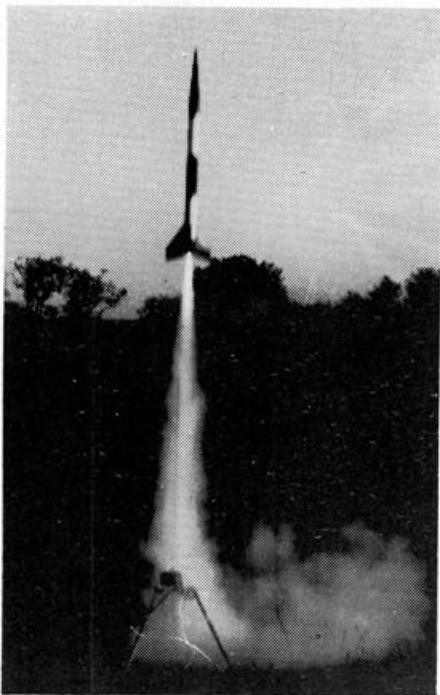
## Rockets:

### Introduction

Flight Systems, Inc. model rocketry offers a way to become a part of the technological space age. Flight Systems model rockets are high performance solid fuel rockets capable of flights to extreme altitudes. By using the reliable commercially produced FSI thrusters, unlimited scientific experiments can be performed. FSI thrusters are excellent research tools and aid in gaining a thorough understanding of aerodynamics and jet propulsion principles as well as basic physics and meteorology. Many schools incorporate the use of model rockets into their science departments to create interest and demonstrate the principles of rocket flight. They are an excellent teaching aid. When operated in compliance with the Model Rocket Safety Code, they offer a very safe way to enjoy the thrilling sensation of launching a real solid fuel rocket.

Flight Systems, Inc. model rockets can reach altitudes of many thousands of feet. They should be launched in a relatively open area that is free from overhead obstructions. Model rockets should be launched and operated under adult supervision in such a manner that does not create a hazard to persons, property or aircraft.

Model rocketry using premanufactured items has an excellent safety record. LET'S ALL KEEP THAT RECORD IN TACT! REMEMBER - Model Rockets are not toys. They are scientific research vehicles and should be handled and treated as such. Follow the safety rules as you would with any other activity or sport.



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## • IMPORTANT •

### Model Rocket Safety Code

Presentation of the National Association of Rocketry  
and Hobby Industries of America

- 1. Construction** - My model rockets will be made of lightweight materials such as paper, wood, rubber, and plastic without any metal or other hazardous material as structural parts.
- 2. Engines** - I will use only pre-loaded factory-made NAR certified rocket engines in the manner recommended by the manufacturer. I will not alter or dismantle model rocket engines or their ingredients in any way, or attempt to reload these engines.
- 3. Recovery** - I will always use a recovery system in my model rockets that will return them safely to the ground so that they may be flown again. I will use only flame resistant recovery wadding in my rockets.
- 4. Weight Limits** - My model rockets will weigh no more than 1500 grams (53 ounces) at liftoff and the engines will contain a total of no more than 125 grams (4.4 ounces) of propellant. My model rockets will weigh less than the engine manufacturer's recommended maximum liftoff weight for the engines used, or I will use engines recommended by the manufacturer for my rockets.
- 5. Stability** - I will check the stability of my model rockets before their first flight, except when launching models of already proven stability.
- 6. Payloads** - My model rockets will never carry live animals, or payloads that are intended to be flammable or explosive.
- 7. Launch Area** - I will launch model rockets outdoors in a cleared area, free of tall trees, power lines, and buildings. I will ensure that people in the launch area are aware of the pending rocket launch and are in a position to see the rocket's liftoff before I begin my audible five-second count down.
- 8. Launcher** - I will launch my model rockets from a launch rod or other device which provides rigid guidance until the rocket has reached a speed adequate to ensure a safe flight path. To prevent accidental eye injury, I will always place the launcher so that the end of the rod is above eye level or will cap the end of the rod when approaching it. I will cap or disassemble my launch rod when not in use and will never store it in an upright position. My launcher will have a jet

deflector device to prevent the engine exhaust from hitting the ground directly. I will always clear the area around my launch device of brown grass, dry weeds, and other easy-to-burn materials.

**9. Ignition System** - The system I use to launch my model rockets will be remotely controlled and electrically operated, and will contain a launching switch that will return to "off" when released. The system will contain a removeable safety interlock in series with the launching switch. All persons will remain at least 15 feet from the model rocket when I am igniting engines totalling 30 Newton-seconds or less of total impulse and at least 30 feet from the model rocket when I am igniting engines totalling more than 30 Newton-seconds total impulse. I will use only electrical igniters that will ignite my rocket engine(s) within one second of actuation of the launching switch.

**10. Launch Safety** - I will not let anyone approach a model rocket on a launcher until I have made sure that the safety interlock has been removed or the battery has been disconnected from the ignition system. In the event of a misfire I will wait one minute before allowing anyone to approach the launcher.

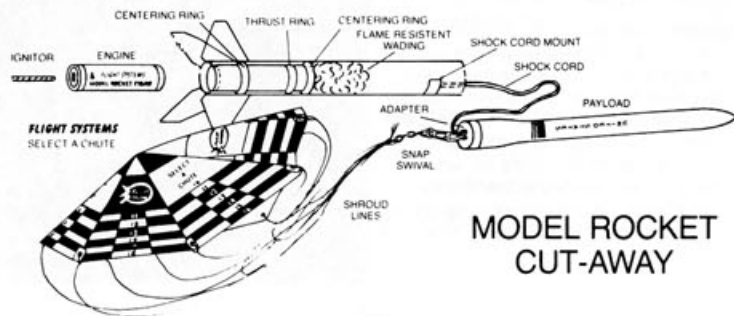
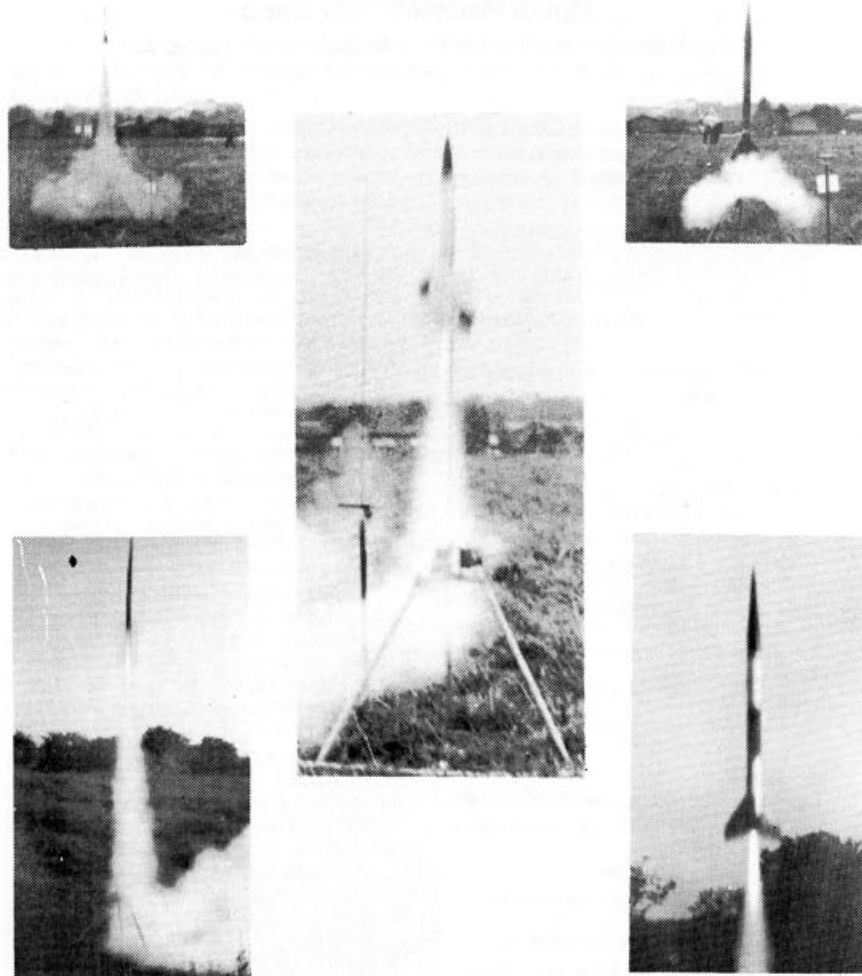
**11. Flying Conditions** - I will launch my model rocket only when the wind is less than 20 miles per hour and under conditions where the model will not fly into clouds, fly near aircraft in flight, or be hazardous to people or property.

**12. Pre-Launch Test** - When conducting research activities with unproven designs or methods I will, when possible, determine their reliability through pre-launch tests. I will conduct launchings of unproven designs in complete isolation from persons not participating in the actual launching.

**13. Launch Angle** - I will not launch model rockets so that their flight path will carry them against targets. My launch device will be pointed within 30 degrees of vertical. I will never use model rocket engines to propel any device horizontally.

**14. Recovery Hazards** - If a model rocket becomes entangled in a power line or other dangerous object, I will not attempt to retrieve it. (Revised January 1, 1987)

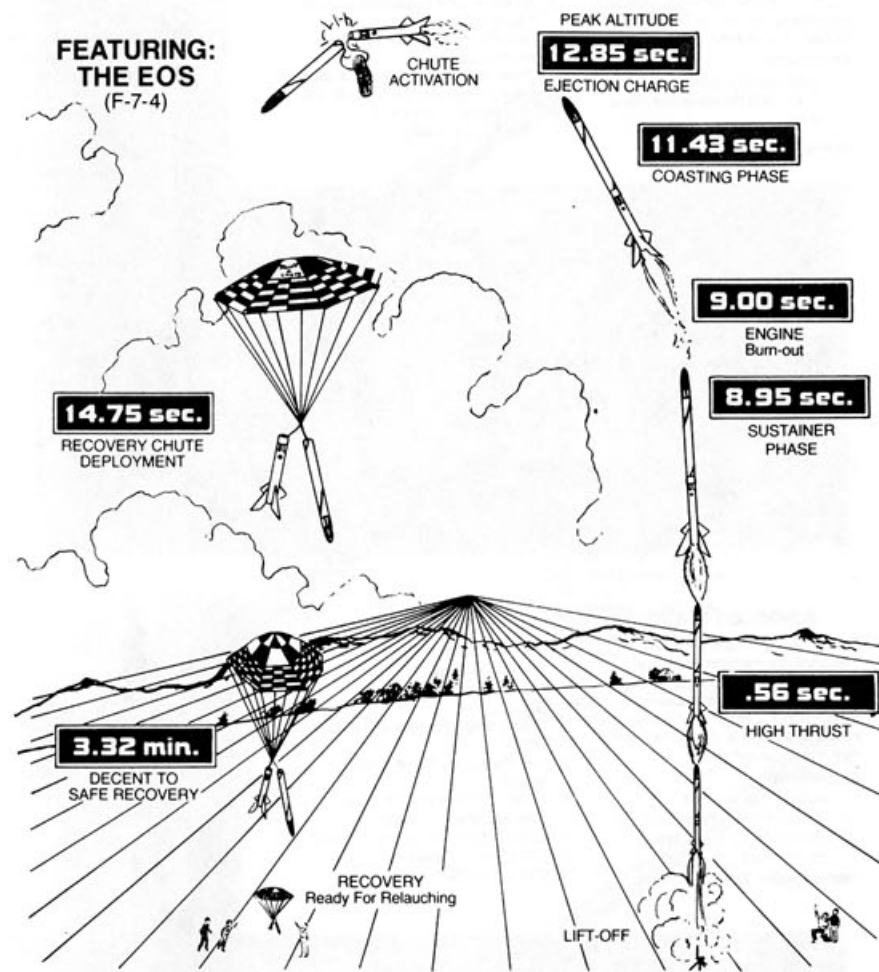
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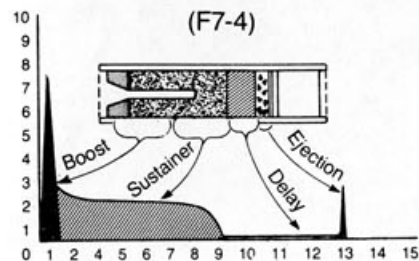
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Flight Sequence – Lift-Off, High Thrust and Recovery



## MODEL ROCKET ENGINE TIME VERSUS THRUST CURVE (F7-4)



## MODEL ROCKET KIT SKILL LEVEL

The skill level numbers given with each kit description recommend the skills and experience necessary to successfully build the rocket kit.

SKILL LEVEL NO.	DESCRIPTION	LEVEL
1	Very Simple	Beginner
2	Fairly Easy	
3	Average	Intermediate
4	Challenging	
5	Extremely Challenging	Advanced

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