

FLYING  
MODEL ROCKET  
CATALOG



## HERE'S HOW TO USE YOUR ESTES CATALOG

Information for each rocket kit is provided on the page where the rocket is displayed. This information includes:

- Skill Level number recommends the modeling skill and experience necessary for a rocketeer to successfully construct the kit. Skill Level 1 kits are suggested for beginners, Skill Level 2 kits for experienced rocketeers, Skill Level 3 kits for advanced modelers and Skill Level 4 kits are recommended for the master modeler.
- Kit Name
- Special features and additional kit information including length, diameter and weight.
- Engines lists all recommended engines to fly the rocket. Engines are listed from least to most powerful. (1st Flt.) indicates which engine should be used to become familiar with your rocket's flight profile.
- Product number for kit which should always be used when ordering.
- Price of the kit (or see Price List.) **All prices in this catalog are subject to change without notice.**
- Average Shipping Weight for kits.

Kit Feature Symbols indicate the following kit features:

- |  |   |
|--|---|
|  Parachute & Size           |  Plastic Nose Cone |
|  Streamer Recovery          |  Balsa Nose Cone   |
|  Die-Cut Balsa Fins         |  Kit Decals        |
|  Fiber Fins                 |  Plastic Fin-Unit  |
|  Quick-Release Engine Mount |   |

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## Model Rocketry Is An Internationally Recognized Hobby With A Safety Record Of More Than 300 Million Successful Model Rocket Launchings.

### Estes Model Rocket Engines Are NAR Certified\*

\*Engines tested by the National Association of Rocketry met performance standards of NFPA 1122 and the NAR.

### Estes Model Rocket Engines Have Been Tested And Approved By:

- United States Government
- Truesdail Laboratories, Inc.
- Governments of West Germany, France, Great Britain, and Canada

### Estes Model Rocketry Products Meet The Standards And Requirements Established By:

- National Fire Protection Association
- U.S. Consumer Product Safety Commission
- U.S. Food & Drug Administration
- U.S. Department of Transportation

- Federal Aviation Administration
- U.S. Postal Service
- United Parcel Service
- American Insurance Association
- International Air Transport Association
- International Maritime Organization
- Air Line Pilots Association

### Model Rocketry Is Endorsed As A Safe And Rewarding Hobby By:

- Canadian Association of Rocketry
- Cub Scouts of America
- YMCA's
- USAF
- Boy Scouts of America
- National 4-H Clubs
- U.S.A.F.-J.R.O.T.C.
- Civil Air Patrol
- NASA
- Hobby Industry of America
- Colleges, Universities, Elem., Jr. High, & High Schools
- Future Astronaut Training Program
- Hundreds of Camp and Recreation Programs



SKILL LEVEL 1  
STARTER SET

THE PLACE TO START!

NOW WITH ASSEMBLED ELECTRON BEAM™ LAUNCH CONTROLLER

## ALPHA III™ FLYING MODEL ROCKETRY STARTER SET

SKILL LEVEL 1 Recommended for the Beginning Modeler. Includes easy-to-build Alpha III™ model rocket kit. Colored Parts - no painting required! Also includes Porta-Pad™ launch pad with blast deflector plate and 1/8" x 36" two-piece launch rod, assembled Electron Beam™ launch controller and three NAR certified model rocket engines, recovery wadding and igniters. *Requires 4 alkaline AA batteries, glue and finishing supplies-Not Included.* Ship. Wt. 3 lbs.

ENGINES: 1/2A6-2, A8-3 (1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1406



FULL ONE YEAR WARRANTY



Your Estes product is warranted against defects in materials or workmanship for one year from the date of the original purchase. Any Estes product, except computer software, which, because of a manufacturing mistake, malfunctions or proves to be defective within the one-year warranty period will be repaired or replaced, at Estes' option and at no charge to you, provided it is returned to Estes with proof of purchase.

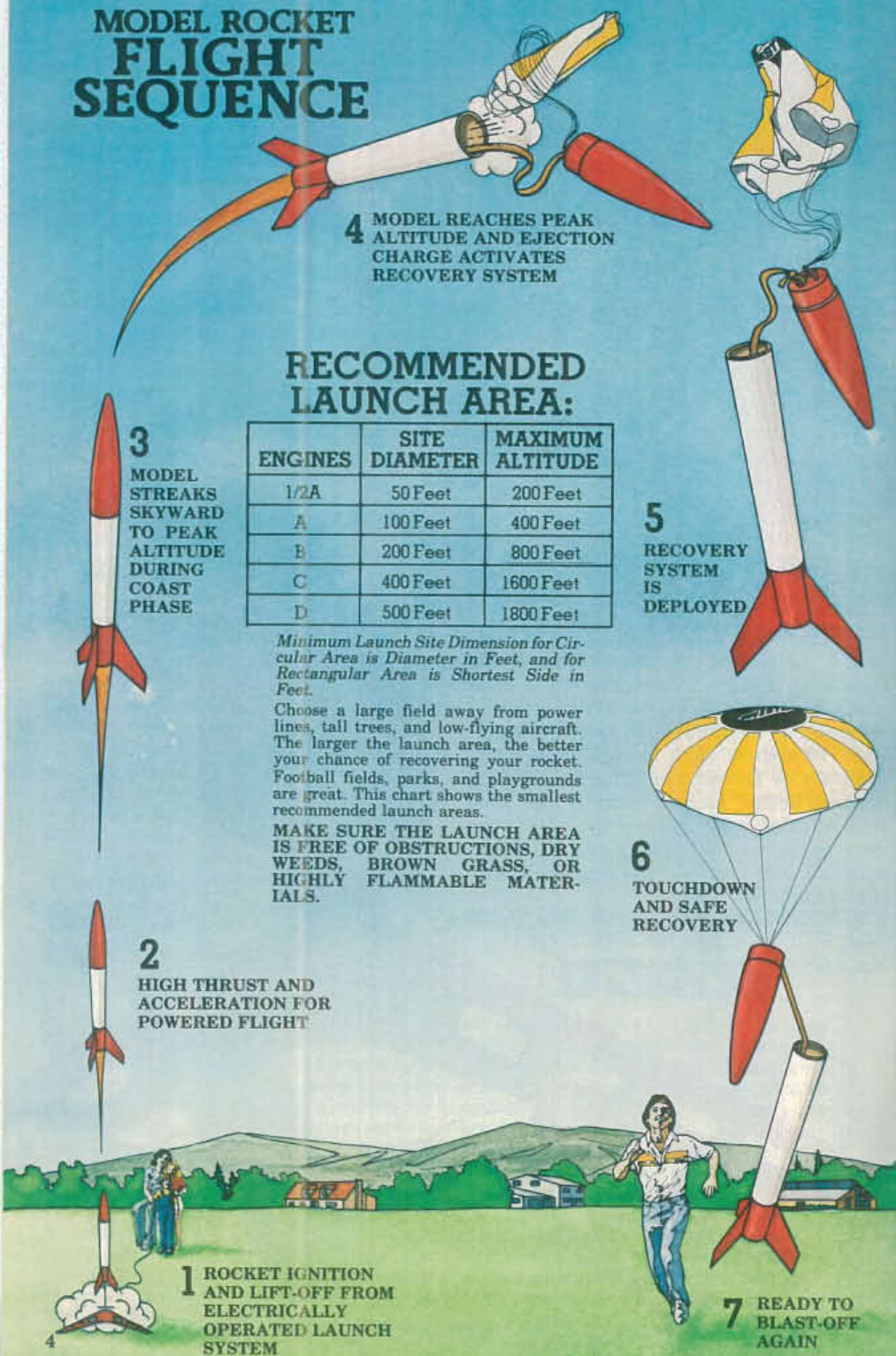
This warranty does not cover incidental or consequential damage to persons or property caused by the use, abuse, misuse, fail-

ure to comply with operating instructions or improper storage of the warranted product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

For repair or replacement under this warranty, please return the defective part of your Estes product with proof of purchase to: **Estes Industries, Customer Service Department, Penrose, Colorado 81240**

# MODEL ROCKET FLIGHT SEQUENCE



**4** MODEL REACHES PEAK ALTITUDE AND EJECTION CHARGE ACTIVATES RECOVERY SYSTEM

## RECOMMENDED LAUNCH AREA:

ENGINES	SITE DIAMETER	MAXIMUM ALTITUDE
1/2A	50 Feet	200 Feet
A	100 Feet	400 Feet
B	200 Feet	800 Feet
C	400 Feet	1600 Feet
D	500 Feet	1800 Feet

*Minimum Launch Site Dimension for Circular Area is Diameter in Feet, and for Rectangular Area is Shortest Side in Feet.*

Choose a large field away from power lines, tall trees, and low-flying aircraft. The larger the launch area, the better your chance of recovering your rocket. Football fields, parks, and playgrounds are great. This chart shows the smallest recommended launch areas.

**MAKE SURE THE LAUNCH AREA IS FREE OF OBSTRUCTIONS, DRY WEEDS, BROWN GRASS, OR HIGHLY FLAMMABLE MATERIALS.**

**3** MODEL STREAKS SKYWARD TO PEAK ALTITUDE DURING COAST PHASE

**2** HIGH THRUST AND ACCELERATION FOR POWERED FLIGHT

**1** ROCKET IGNITION AND LIFT-OFF FROM ELECTRICALLY OPERATED LAUNCH SYSTEM

**5** RECOVERY SYSTEM IS DEPLOYED

**6** TOUCHDOWN AND SAFE RECOVERY

**7** READY TO BLAST-OFF AGAIN

# SPACE SHUTTLE™

## FLYING MODEL ROCKETRY STARTER SET

**SKILL LEVEL 2** Recommended for the Experienced Modeler. Set includes beautiful scale model of America's space transport vehicle. All Space Shuttle names are included on the kit decal. Also included is the assembled Electron Beam™ launch controller, Porta-Pad™ launch pad, and three engines, plus igniters and wadding.

Over 10 inches high, the Space Shuttle™ can be launched to altitudes of 500 feet. The model returns to Earth via 18 inch parachute recovery.

Requires white glue, plastic cement, paint, finishing supplies, and 4 AA size alkaline batteries for operation-Not Included.

Ship. Wt. 3 lbs.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1441



# NAR/HIA MODEL ROCKETRY SAFETY CODE (EFF. 1-1-87)

- Construction**—My model rockets will be made of lightweight materials such as paper, wood, rubber, and plastic, without any metal as structural parts.
- Engines**—I will use only pre-loaded factory-made NAR Certified model 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.
- Recovery**—I will always use a recovery system in my 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.
- Weight Limits**—My model rocket will weigh no more than 1500 grams (53 oz.) at lift-off, and the engines will contain a total of no more than 125 grams (4.4 oz.) of propellant. My model rockets will weigh no more than the engine manufacturer's recommended maximum lift-off weight for the engines used or will use the engines recommended by the manufacturer for my rocket.
- Stability**—I will check the stability of my model rockets before their first flight, except when launching models of already proven stability.
- Payloads**—My model rockets will never carry live animals or payloads that are intended to be flammable or explosive.
- Launch Area**—I will launch my model rockets outdoors in a cleared area, free of tall trees, power lines, and buildings. I will ensure that people in the vicinity are aware of the pending rocket launch and are in a position to see the rocket's lift-off before I begin my audible 5-second countdown.
- Launcher**—I will launch my model rockets from a 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 launch 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. The launch device will have a jet deflector 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.
- 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 removable safety interlock in series with this firing switch. When launching, all persons will remain at least 15 feet away from any model rocket when igniting engines totalling 30 N-sec of total impulse or less and at least 30 feet when igniting engines totalling more than 30 N-sec total impulse. I will use only electrical igniters which will ignite my rocket engine within one second of actuation of the launching switch.
- 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 launcher. In the event of a misfire, I will wait one minute before allowing anyone to approach the launcher.
- 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.
- 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.
- Launch Angle**—I will not launch rockets so 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.
- Recovery Hazards**—If a model rocket becomes entangled in a power line or other dangerous place, I will not attempt to retrieve it.

As a member of the Estes Model Rocketry Program, I promise to faithfully follow all rules of safe conduct as established in the above code.

Signature \_\_\_\_\_



**IMPORTANT-CAUTION**  
The Lunar™ Launch Pad is Recommended For Rockets No More Than 16 Inches Long, or For Rockets With Body Tubes No Larger Than One Inch in Diameter. Rockets Should Weigh No More Than 1.5 Ounces Without Engines. Rockets Should Use Mini or Regular Size Engines Only, Not "D".  
The Lunar™ Launch Pad Should Be Used in Moderate (0-5mph) Breeze Conditions Only.

**SKILL LEVEL 1** Screaming Eagle™ rocket kit includes red plastic nose cone, blue plastic fin unit, and white body tube plus flights over 1200 feet and streamer recovery. Set also features unassembled Electron Beam™ launcher, Lunar™ launch pad and enough engines, wadding, and igniters for three exciting flights. *Requires 4 AA alkaline batteries, plastic cement, and glue-Not Included.* Ship Wt.: 2 lbs.  
ENGINES: 1/2A6-2, A8-3 (1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1417



## SCREAMING EAGLE™ FLYING MODEL ROCKETRY STARTER SET



## X-15™ ROCKET PLANE READY-TO-FLY MODEL ROCKET SET

**SKILL LEVEL 1** Set features black, plastic scale model of famous X-15 Rocket Plane. Flies to 300 feet and lands via 10 inch parachute. Also included is the heavy duty Porta Pad™ launch pad, unassembled Electron Beam™ launcher, plus 2 engines, igniters, and recovery wadding. *Requires 4 AA batteries-Not Included.* Ship Wt.: 3 lbs.  
ENGINE: A10-3T

No. 0716



### X-15™ Power Kit

Contains supplies for 5 more launches plus spare parachute. Ship Wt.: 1 lb.  
No. 1741



STARTER SET

# MODEL ROCKET ENGINES

**A** Letter indicates total impulse or total power produced by the engine. Each succeeding "letter" has twice the power of the previous letter. (Example: "B" engines have twice the power of "A" engines, etc.)

**8** Number shows the engine's average thrust in Newtons or the average push exerted by the engine. (4.45 Newtons = 1 lb.)

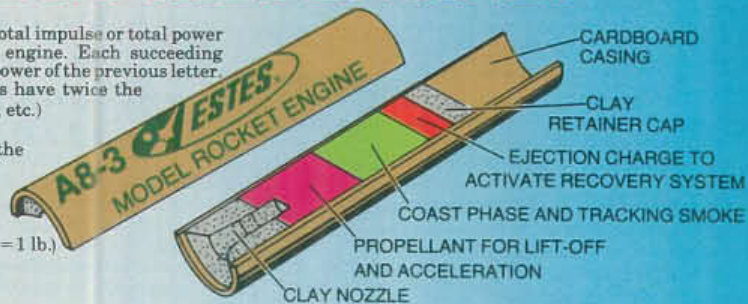
**Average thrust =**  
Newton-seconds  
divided by thrust  
duration.

**3** Number of seconds between the end of thrusting and the ejection charge.

The design and development of the Estes model rocket engine was the real beginning of the safe, educational and fun activity model rocketry has become.

Thirty years of Estes engineering has produced today's safety-proven model rocket engine. The pre-manufactured, solid-propellant engine provides thrust for lift-off and acceleration to high altitude, allows for a timed delay period to reach peak altitude while providing a smoke trail for easy tracking, and supplies ejection power for the recovery system to bring your rocket safely back to Earth.

Manufactured under strict, quality-controlled conditions within exacting tolerance limits, (More than 3% of all Estes engines are static-tested.) Estes engines comply with the codes of the National Fire Protection Association and are certified by the National Association of Rocketry.

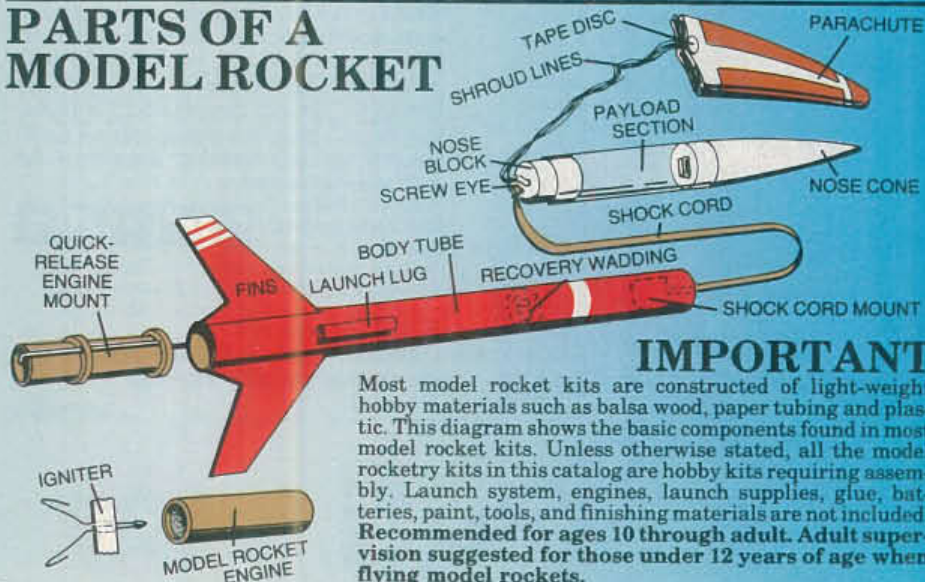


Estes model rocket engines have been proven consistent and reliable in more than 300,000,000 launches.



Unless otherwise specified, all model rocket kits in this catalog use only one of the three sizes of engines shown here. Kits with recommended engines ending with the letter "T" use only mini-engines. Kits where "D" engines are recommended use only the larger "D" size. All other kits use the regular size engines.

## PARTS OF A MODEL ROCKET



### IMPORTANT

Most model rocket kits are constructed of light-weight hobby materials such as balsa wood, paper tubing and plastic. This diagram shows the basic components found in most model rocket kits. Unless otherwise stated, all the model rocketry kits in this catalog are hobby kits requiring assembly. Launch system, engines, launch supplies, glue, batteries, paint, tools, and finishing materials are not included. Recommended for ages 10 through adult. Adult supervision suggested for those under 12 years of age when flying model rockets.

SKILL LEVEL 1  
STARTER

## SIZZLER™ FLYING MODEL ROCKETRY STARTER SET

**SKILL LEVEL 1** Recommended for the Beginning Modeler. Includes the 23 inch long Sizzler™ model rocket kit featuring parachute recovery and flights over 900 feet. Also included are the assembled Electron Beam™ Launch Controller and Porta-Pad™ Launch Pad with blast deflector plate, and 1/8" x 36" launch rod. Legs remove easily for compact storage. Flight Pak includes three NAR certified model rocket engines, recovery wadding and igniters. Requires 4 AA alkaline batteries, glue and finishing supplies. Not Included.

Ship. Wt.: 2 lbs.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1432



Includes State-of-the Art Launch Control Technology with Estes' ELECTRON BEAM™ Launch Controller.





## DELUXE™

### FLYING MODEL ROCKETRY STARTER SET

**SKILL LEVEL 1** Everything you need except batteries. Set includes Alpha™ rocket kit (See Page 22.), rugged Porta-Pad™ launch pad and assembled Electron Beam™ launch controller, plus enough launch supplies for three flights. Additional supplies include paint, glue, sandpaper, and paint brush. *Requires 4 alkaline AA batteries for operation - Not Included.* Ship. Wt. 3 lbs. **ENGINES:** 1/2A6-2, A8-3 (1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7. **No. 1407**



## NINJA™ FLYING MODEL ROCKETRY STARTER SET

**SKILL LEVEL 1** Set features the Ninja™ rocket kit, (See Page 18.), unassembled launch kit, (See Page 18.), Lunar™ launch pad, plus enough supplies for your first two launches. (*Requires white glue, plastic cement, paint, and 4 AA alkaline batteries-Not Included.*)

Ship. Wt. 1 lb. **ENGINES:** 1/2A3-4T (1st Flt.), A3-4T, A10-3T. **No. 1412**



The Lunar™ Launch Pad is Recommended For Rockets No More Than 16 Inches Long, or For Rockets With Body Tubes No Larger Than One Inch in Diameter. Rockets Should Weigh No More Than 1.5 Ounces Without Engines. Rockets Should Use Mini or Regular Size Engines Only, Not "D" Engines. The Lunar™ Launch Pad Should Be Used in Moderate (0-5mph) Breeze Conditions Only.



## DISCOVERY™

### FLYING MODEL ROCKETRY STARTER SET

**SKILL LEVEL 1** Recommended for the Beginning Modeler. Our most complete outfit. Over 2 feet tall, the Discovery™ launch vehicle features bright yellow plastic nose cone and fin unit, white body tube, two-color wrap-on decal and 12" parachute. Requires only minor assembly and no painting. Hitch-Hiker™ styrofoam glider is completely decorated. The Hitch-Hiker™ is carried aloft by the Discovery™ during lift-off and powered flight. Glider is then jettisoned from rocket at apogee for its glide back to Earth while rocket returns via parachute recovery. Also included is the new Electron Beam™ assembled launch controller, Porta-Pad™ launch pad with blast deflector plate, three high-performance model rocket engines, igniters and recovery wadding. *Requires white glue, plastic cement and 4 AA Alkaline batteries for operation - Not Included.* **ENGINES:** B6-4 (1st Flt.), B8-5, C6-5. **No. 1440**



## SKILL LEVEL 1

*Recommended for the Beginning Modeler.*

### ZIPPER™

**SKILL LEVEL 1** Out of sight flights are easy with this little performer. Kit includes plastic nose cone and die-cut fins. A streamer provides gentle landings on flights up to 1000 feet.

Length: 11.55" Dia. 0.736" Wt. 0.57 oz.

ENGINES: 1/2A6-2 (1st Flt.), A8-3, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7.

No. 1991



### YANKEE™

**SKILL LEVEL 1** Easy-to-build, yet performance that will rival any rocket. Capable of flights over 2,000 feet with 30" long streamer recovery.

Length: 11" Dia. 0.736" Wt. 0.42 oz.

ENGINES: 1/2A6-2, A8-3, A8-5 (1st Flt.), B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1381



### PULSAR™

**SKILL LEVEL 1** Excellent first choice for beginners uses low-cost mini-engines. Easy to assemble, Pulsar™ delivers super performance flights and returns to Earth via break-apart recovery. Can be flown over and over again.

Length: 9" Dia. 0.544" Wt. 0.25 oz.

ENGINES: 1/2A3-2T (1st Flt.), A3-4T, A10-3T

No. 0870



### MOSQUITO™

**SKILL LEVEL 1** The smallest of all Mini-Brutes combines fantastic performance with feather-weight recovery. Balsa and paper construction with simple spray paint decor makes for quick-and-easy assembly.

Length: 3.9" Dia. 0.541" Wt. 0.1 oz.

ENGINES: 1/2A3-4T (1st Flt.), A10-3T

No. 0801



### ZINGER™

**SKILL LEVEL 1** This sporty little flier with 18" streamer recovery will reach "awesome" altitudes up to 2000 feet.

Length: 10.25" Dia. 0.736" Wt. 0.3 oz.

ENGINES: A8-5 (1st Flt.), B4-6, B6-6, C6-7.

No. 1917



*Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 6 oz.*



## SKILL LEVEL 1

*Recommended for the Beginning Modeler.*

### GNOME™

**SKILL LEVEL 1** Red nose cone, white body tube, plus green fin unit and launch lugs make this kit a snap to construct. And streamer recovery makes it easy to find after awesome flights over 800 feet. This could be your favorite rocket! Length: 10.25" Dia. 0.544" Wt. 0.42 oz. ENGINES: 1/2A3-2T (1st Flt.), A3-4T, A10-3T. No. 0886



### LEPRECHAUN™

**SKILL LEVEL 1** Building this kit is easy. Painting it is fun. Launch it to 900 feet. The streamer brings it back safely flight after flight. Length: 8.2" Dia. 0.541" Wt. 0.4 oz. ENGINES: 1/2A3-4T (1st Flt.), A3-4T. No. 0887



### VECTOR™

**SKILL LEVEL 1** Features fast assembly, economical mini-engine power, break-apart recovery, and flight-after-flight fun. Length: 7.75" Dia. 0.544" Wt. 0.25 oz. ENGINES: 1/2A3-2T (1st Flt.), A3-4T, A10-3T. No. 0871



### SPARROW™

**SKILL LEVEL 1** Fun to build and fun to fly, this racy little bird features mini-engine power, fiber fins, three-color decal and break-apart recovery. Length: 10.75" Dia. 0.541" Wt. 0.39 oz. ENGINES: 1/2A3-2T (1st Flt.), A3-4T, A10-3T. No. 0872

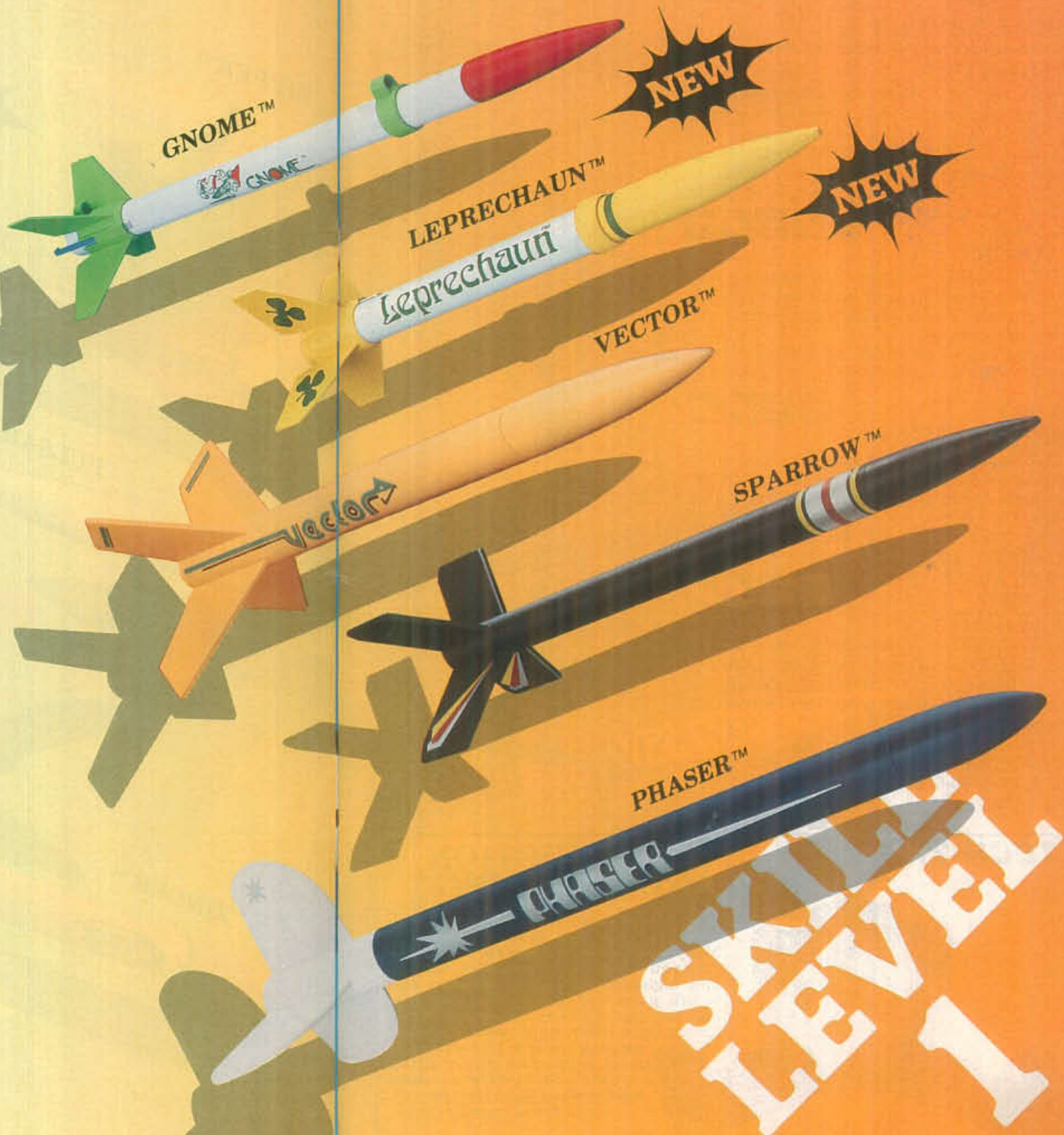


### PHASER™

**SKILL LEVEL 1** Out-of-sight flights! Nearly one foot tall, this high-performance sport model with elliptical fins flies over 1200 feet with a "C" engine. Recovery is easy with a bright 18" streamer. Length: 11.5" Dia. 0.736" Wt. 0.41 oz. ENGINES: A8-5 (1st Flt.), B4-6, B6-6, B8-5, C6-5, C6-7. No. 1984



*Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 8 oz.*





## SKILL LEVEL 1

Recommended for the Beginning Modeler.

### LIBERTY™

**SKILL LEVEL 1** Sport flier features red plastic nose cone and fin unit, plus huge patriotic kit decal. A 12 inch parachute returns it to Earth slow and easy from altitudes of 1000 feet or more. Length 16" Dia. 0.976" Wt. 1.38 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C5-3, C6-3, C6-5, C6-7.

No. 1989



### LASER™

**SKILL LEVEL 1** Super flier featuring fast assembly and high-tech appearance reaches altitudes of 1000 feet and returns safely via streamer recovery.

Length: 12.25" Dia. 0.736" Wt. 0.79 oz.

ENGINES: 1/2A6-2(1st Flt.), A8-3, B4-4, B6-4, C6-5

No. 1938



### SKINNY MINI™

**SKILL LEVEL 1** Long and lean, this mini-engine sport flier is almost 2½ feet tall. A 30" streamer provides gentle descents for flights over 700 feet.

Length: 29.4" Dia. 0.541" Wt. 0.53 oz.

ENGINES: 1/2A3-2T (1st Flt.), 1/2A3-4T, A3-4T, A10-3T.

No. 0880



### WIZARD™

**SKILL LEVEL 1** Simple and quick-to-assemble. One of the highest performing vehicles in Estes' fleet with its 1,600 foot altitude capability and huge 30" streamer recovery system that makes it easy-to-track.

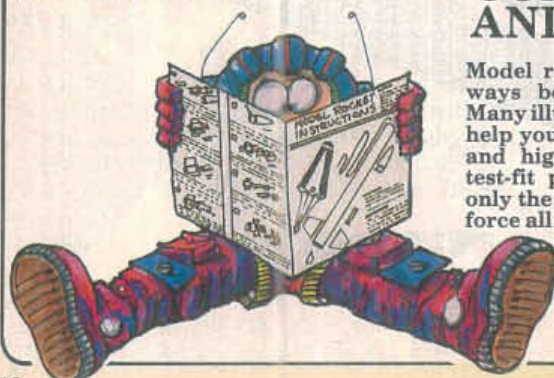
Length: 12" Dia. 0.736" Wt. 0.79 oz.

ENGINES: 1/2A6-2, A8-3 (1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1292



## TECH-TIP™



## CONSTRUCTION AND FINISHING

Model rocket kit instructions should always be read and followed carefully. Many illustrations and tips are included to help you build a more attractive, durable and higher-flying rocket. Measure and test-fit parts before applying glue. Use only the type of glue recommended. Reinforce all glue joints. Apply several coats of sanding sealer to fill balsa wood pores, sanding each layer till it is smooth. Spray on two or three light coats of paint for a smooth, even finish on your rocket.

NEW

LIBERTY™

LASER™

SKINNY MINI™

WIZARD™

WIZARD™

SKILL LEVEL 1

Engines, launch system, glue, and finishing supplies not included.  
Avg. Ship. Wt. 9 oz.

## SKILL LEVEL 1

Recommended for the Beginning Modeler.

### RELIANT™

**SKILL LEVEL 1** Excellent beginner's model features die-cut fiber fins, two-color decal, quick-release engine mount, flights to 1500 feet, and recovery via streamer.

Length 12.5" Dia. 0.736" Wt. 0.62 oz.

ENGINES: 1/2A6-2 (1st Flt.), A8-3, A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1986



### LONG SHOT™

**SKILL LEVEL 1** Almost 3½ feet tall, this easy-to-build rocket delivers exciting lift-offs to altitudes over 800 feet and descends via 12" parachute. Quality performance flight after flight. Length: 40.75" Dia. 0.976" Wt. 1.9 oz.

ENGINES: A8-3, B4-2, B4-4 (1st Flt.), B6-4, B8-5, C5-3, C6-3, C6-5.

No. 1980



### ASTRO™

**SKILL LEVEL 1** Over 1 foot tall, this super flier can reach 1000 feet. With fast assembly and streamer recovery, Astro™ is fun-to-fly over and over.

Length: 12.75" Dia. 0.736" Wt. 0.79 oz.

ENGINES: 1/2A6-2(1st Flt.), A8-3, B4-4, B6-4, C6-5

No. 1937



### NINJA™

**SKILL LEVEL 1** Dark and sleek, this model speeds to heights of 800 feet and lands gently via brightly colored streamer.

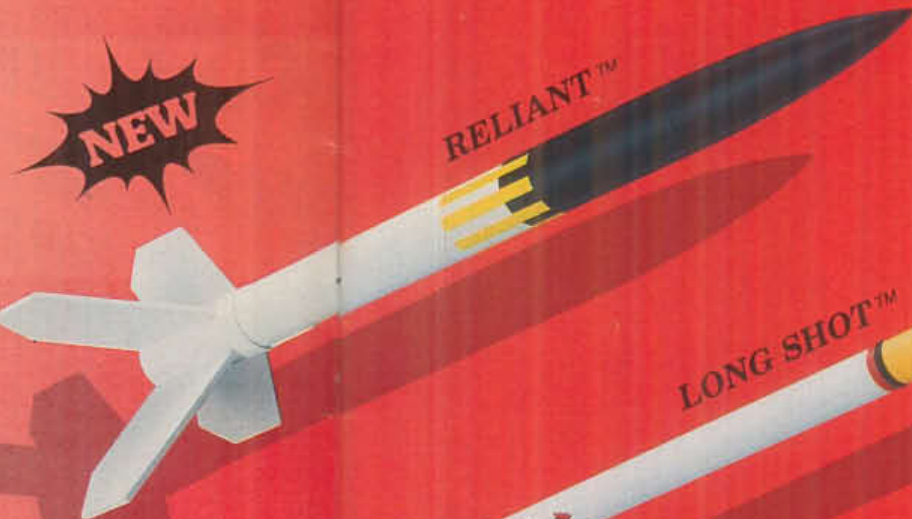
Length: 10.563" Dia. 0.736" Wt. 0.56 oz.

ENGINES: 1/2A3-4T (1st Flt.), A3-4T, A10-3T

No. 0882



Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 10 oz.



# SKILL LEVEL 1

## SKILL LEVEL 1

Recommended for the Beginning Modeler.

### SKY HOOK™

**SKILL LEVEL 1** An excellent kit for your second rocket. Easy-to-build with terrific performance flight-after-flight. Length: 12"

Dia. 0.765" Wt. 0.7 oz.

ENGINES: 1/2A6-2 (1st Flt.), A8-3, A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1208



### ECHO™

**SKILL LEVEL 1** Forward-swept, elliptical fins lend futuristic appearance to this high-performance sport model. Flights over 1000 feet with a "C" engine and recovery via streamer. Length: 10.5" Dia. 0.736" Wt. 0.47 oz.

ENGINES: A8-5 (1st Flt.), B4-4, B6-4, B8-5, C6-5, C6-7

No. 1950



### SPRITE™

**SKILL LEVEL 1** Assembles in minutes. Paint it and launch it. Flights to 800 feet and streamer recovery make this an ideal rocket for small flying fields. Length: 11.1"

Dia. 0.541" Wt. 0.43 oz.

ENGINES: 1/2A3-4T (1st Flt.), A3-4T.

No. 0885



### TRANSTAR CARRIER™

**SKILL LEVEL 1** Interstellar taxis may resemble this futuristic commercial starship with optional payload bay. On Earth this model rocket can be used to fly small payloads to altitudes over 750 feet. At apogee a 12" parachute is ejected for reliable recoveries time after time. Length: 19.25" Dia. 1.325" Wt. 1.9 oz.

ENGINES: A8-3, (1st Flt.), B4-2, B4-4, B6-2, B6-4, B8-5, C5-3, C6-3, C6-5.

No. 1982



Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 10 oz.

20



## SKILL LEVEL 1

*Recommended for the Beginning Modeler.*

### SUNBIRD™

**SKILL LEVEL 1** High performance sport model with sunny yellow paint scheme and red sunbird decal will reach altitudes up to 1200 feet. Length: 13" Dia. 0.736" Wt. 0.64 oz.

ENGINES: 1/2A6-2, A8-3(1st Flt.), B4-4, B6-4, B8-5, C6-3, C6-5,

No. 1936



### MINI MEAN MACHINE™

**SKILL LEVEL 1** Mini-powered version of our huge Mean Machine™ kit. Over 38 inches long and capable of flights over 700 feet.

Length: 38.5" Dia. 0.736" Wt. 1.06 oz.

ENGINES: 1/2A3-2T(1st Flt.), A10-3T.

No. 0865



### SIZZLER™

**SKILL LEVEL 1** High performance design for flights over 900 feet. A long bird that's great for demonstrations. Length: 23.5" Dia. 0.976" Wt. 1.41 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5

No. 1906



### ALPHA™

**SKILL LEVEL 1** The ideal kit for your first or second rocket. Swept-fin design makes it a really great performer. Features plastic nose cone and balsa fins. Length: 12.25" Dia. 0.976" Wt. 0.8 oz.

ENGINES: 1/2A6-2, A8-3 (1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1225



## ROCKET RECOVERY

**TECH-TIP™**



In parachute and streamer models, loosely crumple the recommended amount (about 2½ times the body tube dia.) of flame-resistant recovery wadding in your rocket's body tube to protect the recovery system from the engine's hot gases.

Lightly dust parachutes with talcum powder to prevent sticking. Fold parachutes to form a spike, fold again, and wrap loosely with shroud lines. Fold streamers in half, then roll up. Place parachute or streamer in body tube above wadding. Put nose cone and coiled shock cord into body tube. Wadding, parachute or streamer, and nose cone must not fit tightly. The engine's ejection charge must deploy the recovery system to return your model safely.



Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 10 oz.

# SKILL LEVEL 1

## SKILL LEVEL 1

*Recommended for the Beginning Modeler.*

### D.A.R.T.™

**SKILL LEVEL 1** Looks like a high-speed tracker for data acquisition and reconnaissance. Easy to build, fun to fly. Flights to 800 feet with a "C" engine are possible. A 12" parachute provides reliable recovery.

Length: 16" Dia.: 1.637" Wt. 1.76 oz.

ENGINES: A8-3 (1st Flt.), B4-2, B4-4, B6-2, B6-4, B8-5, C5-3, C6-3, C6-5.

No. 1981



### LANCER™

**SKILL LEVEL 1** Watch this racy sport flier leap to altitudes of 800 feet and descend beneath a brightly colored parachute. Plastic fin unit makes assembly quick so you can get outside to launch faster. Length: 18" Dia. 0.976" Wt. 1.31 oz.

ENGINES: 1/2A6-2 (1st Flt.), A8-3, A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1993



### DASHER™

**SKILL LEVEL 1** Superb sport flier features 1000 foot flights and forward swept fins. Parachute recovery and a quick-release engine mount will make this one of your favorite flying models. Length: 16.875" Dia. 0.976" Wt. 0.92 oz.

Wt. 0.92 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-3, C6-5.

No. 1992



### BLAZER™

**SKILL LEVEL 1** Excellent beginner's model features die-cut fiber fins, red decal, streamer recovery and 1000 foot flights with a "C" engine. No painting required! Length: 12.75" Dia. 0.736" Wt. 0.71 oz.

ENGINES: A8-3 (1st Flt.), A8-5, B4-4, B6-4, B8-5, C6-5, C6-7.

No. 1956



*Engines, launch system, glue, and finishing supplies not included.*

Avg. Ship. Wt. 10 oz.



# SKILL LEVEL 1

## SKILL LEVEL 1

*Recommended for the Beginning Modeler.*

### ALPHA III™

**SKILL LEVEL 1** Another great first or second kit. Plastic nose cone and fin assembly make for easy, quick assembly. This rocket will deliver outstanding performance flight-after-flight. Length 12.25" Dia. 0.976" Wt. 1.2 oz.

ENGINES: 1/2A6-2, A8-3 (1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1256



### MIGHTY MOE™

**SKILL LEVEL 1** Sleek appearance, and delta-shaped fins enable this mighty flier to achieve altitudes of 1000 feet or more. Safe returns via streamer recovery. Length: 13" Dia. 0.736" Wt. 0.44 oz.

ENGINES: A8-5 (1st Flt.), B4-6, B6-6, B8-5, C6-5, C6-7.

No. 1951



### BIG BERTHA™

**SKILL LEVEL 1** Big and burly with dramatic lift-offs, awesome flights, and huge 18" parachute recovery, this two foot tall model is everyone's favorite. Includes gigantic decal and die-cut fins.

Length: 24" Dia. 1.637" Wt. 2.2 oz.

ENGINES: A8-3, B4-2, B4-4, B6-2 (1st Flt.), B6-4, B8-5, C6-5.

No. 1948



### VIKING™

**SKILL LEVEL 1** Great first or second model can be built with 3, 4, or 5 die-cut fiber fins. You decide! Easy-to-build, no painting required and flights to 1000 feet! Length: 12.125" Dia. 0.736" Wt. 0.71 oz.

ENGINES: A8-3 (1st Flt.), A8-5, B4-4, B6-4, B8-5, C6-5, C6-7.

No. 1949



### SCOUT II™

**SKILL LEVEL 1** Updated version of Estes' first model rocket. Originally developed in 1959, Scout II™ teaches elementary balance and design principles. Pre-cut fins, balsa nose cone, kit decal, out-of-sight flights and tumble recovery make this model more fun to build and fly than ever. Length: 7" Dia. 0.765"

Wt.: 0.3 oz.

ENGINES: 1/2A6-2 (1st Flt.), A8-3, B4-4, B6-4, B8-5, C6-5.

No. 1959



*Engines, launch system, glue and finishing supplies not included.*

*Avg. Ship. Wt. 10 oz.*





### YANKEE CLIPPER™ Rocket Kit

High performance 17.5 inch long model rocket

Exclusive--Available only to Estes Space Program™ members

Dynamic red, white, and blue decor with great decals

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.



### ESTES SPACE PROGRAM™ CLOTH PATCH

Official club emblem on a beautiful cloth patch. Sew it on your favorite jacket, windbreaker, cap, or shirt. This colorful patch looks great anywhere. The patch is 2 x 3 inches in size.

### FULL-COLOR ISSUE OF MODEL ROCKET NEWS MAGAZINE

### DECAL SHEET

Full-color Estes Space Program™ emblems to use on your rockets. The decals for decorating your Yankee Clipper™ are provided on this sheet.

Many extra decals for making other rockets part of your official ESP™ fleet are also provided. Both large and small decals for use on your range box and elsewhere are also provided.

### MEMBERSHIP CERTIFICATE

Distinctive official membership certificate printed in three colors. Display it with pride! Looks beautiful on your wall. Official record for your achievements. Attach your official ESP™ Achievement Awards as you earn them.

### ESP™ MEMBERSHIP CARD

Official membership card identifies you as a member of the Estes Space Program™. Official card also provides a handy record of your ESP™ awards.

### ESTES SPACE PROGRAM™ STATIONERY

Special ESP™ stationery is included.

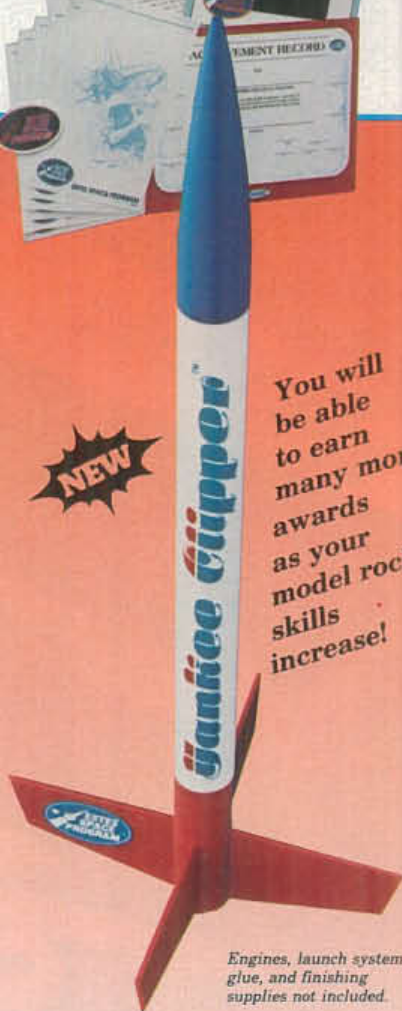
### ACHIEVEMENT AWARDS

These special ESP™ Achievement Awards are available only to Estes Space Program™ members. Earn these distinctive awards as you learn more about model rocketry. Build and fly the different types of rockets included in the program to prove your expertise. Display with pride the Achievement Awards you earn!

Four page letter welcomes you to the ESP™ and explains the first 5 awards you can earn.

Ship. Wt. 16 oz.

No. 1443



**NEW**

You will be able to earn many more awards as your model rocket skills increase!

Engines, launch system, glue, and finishing supplies not included.



# SKILL LEVEL 2

## TAKE REAL HIGH ALTITUDE PHOTOS!

Actual Astro Cam™ 110 Photos  
Courtesy Scott Branche,  
Scarsdale, NY



### ASTRO CAM™ 110 AERIAL CAMERA WITH DELTA II™ LAUNCH VEHICLE

**SKILL LEVEL 2** Experience the excitement of taking color photographs from hundreds of feet in the sky. Astro Cam™ 110's 1/500th second shutter speed is activated at ejection just prior to parachute deployment. Features include easy-assembly, acrylic lens, plastic housing, glass first surface mirror, and high performance design. Easy to operate and shoots one full-color 110 photo per flight. Delta II™ features white body tube and pre-colored plastic fin-unit for stability. No painting required. Uses Kodak Kodacolor 110 color print film, ASA 400, or equivalent-Not Included. *Film and developing are available locally.* Camera not sold separately. Use Delta II™ as launch vehicle. Other launch vehicles are not recommended. *Specifications - Camera with Launch Vehicle:* Length: 19.1" Dia. 1.34" Fin Span 4.75" Wt. 3.75 oz. *Camera Specifications:* Length: 6.5" Dia. 1.39" Wt. 1.36 oz. (without film). Wt. 1.76 oz. (with film) (*Engines, launch system, film, glue and finishing supplies not included.*) Ship. Wt. 14 oz.

ENGINES: C6-7 (1st Flt.)



No. 1327

## SKILL LEVEL 2

Recommended for the Experienced Modeler.

### FOX FIRE™

**SKILL LEVEL 2** In the not-so-distant future interplanetary fighter ships may resemble this fantastic model able to achieve altitudes over 1000 feet. Length: 13.6" Dia. 0.736" Wt. 0.69 oz. ENGINES: A8-3(1st Flt.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-3, C6-5, C6-7  
No. 1941



### MINI TRI PAK™

**SKILL LEVEL 2** Three unique rocket kits in one package - for one low price! Includes:

#### STAR SEEKER™

Interstellar speeder for short hops between galaxies. Mini-power boosts it near 1500 feet. The model breaks apart into two connected pieces for safe recovery.

Length: 6.9" Dia. 0.5" Wt. 0.26 oz.

ENGINES: 1/2A3-2T (1st Flt.), 1/2A3-4T, A3-4T, A10-3T.



#### STING RAY™

Two-stage mini performance. Out-of-sight flights to 2500 feet! Length: 8.4" Dia. 0.5" Wt. 0.33 oz.

ENGINES: Booster: A10-0T (1st Flt.)

Upper Stage: 1/2A3-2T (1st Flt.), 1/2A3-4T, A3-4T, A10-3T.



#### S.C.R.A.M.™

Military styled surface-to-air missile. Flights over 1000 feet. Break-apart recovery. Length: 7.3" Dia. 0.5" Wt. 0.29 oz.

ENGINES: 1/2A3-2T (1st Flt.), 1/2A3-4T, A3-4T, A10-3T.



#### MINI TRI PAK™

No. 0866

## RECOVERY SYSTEMS

### TECH-TIP™



Most recovery systems depend on drag (wind resistance) to slow the rocket. Each changes the model from a streamlined object to one which the air can "catch against" and retard its descent. Six main recovery methods are used by model rocketeers: 1. Featherweight Recovery 2. Tumble Recovery 3. Streamer Recovery 4. Parachute Recovery 5. Helicopter Recovery 6. Glide Recovery.



MINI TRI PAK™  
SKILL LEVEL 2

Engines, launch systems, glue, and finishing supplies not included. Avg. Ship. Wt. 11 oz.



## SKILL LEVEL 2

Recommended for the Experienced Modeler.

### FIREAERO™

**SKILL LEVEL 2** Soaring to altitudes of 1200 feet, this beautiful sport flier includes balsa die-cut fins, quick-release engine mount, plastic nose cone, kit decal, and returns to Earth via 12" parachute. Length: 18" Dia. 0.976"

Wt. 1.08 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4 C6-3, C6-5.

No. 1953



### HAWKEYE™

**SKILL LEVEL 2** Military styling, fiber fins, and three-color decal make this a fine addition to any model rocket collection. Mini-engine flights are out-of-sight! Length: 8.5" Dia. 0.541"

Wt. 0.42 oz.

ENGINES: 1/2A3-2T (1st Flt.), A3-4T, A10-3T.

No. 0873



### BULL PUP 12D™

**SKILL LEVEL 2** Scaled down version of U.S. Air Force air-to-air missile features three-color decal, 800 foot flights and recovery via 12" chute. Length: 15.625" Dia. 1.325" Wt. 1.8 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1972



### MINI SHUTTLE™

**SKILL LEVEL 2** Sport scale version of the space shuttle orbiter. Uses regular size engines. Length: 9.37" Dia. 1.63" Wt. 1.35 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1391



## TECH-TIP™ ROCKET STABILITY



Stable rockets fly straight, predictable flights. Always make sure your rocket passes the "swing test" before flight if you have any doubt about its design. Never fly a rocket which fails the "swing test". Form a loop by making an adjustable slip knot in the end of a 6-10' string. With the engine in place, move your rocket backward or forward in the loop until it is balanced. Tape the loop so it will stay at the model's balance point (center of gravity) and swing the rocket overhead in a circular motion. "Straight" flight indicates a stable rocket. If the model loops or flies erratically it is not stable. Sometimes this can be corrected by adding weight to the nose or adding area to the fins.



Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 12 oz.

# SKILL LEVEL 2

## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### MINI-SCALE COMBO™ PAK

**SKILL LEVEL 2** Two scale rockets in one package feature balsa nose cones, scale decals, die-cut fiber fins and break-apart recovery. Includes:

#### EXOCET™

Model of French ship-to-ship missile is capable of flights to 800 feet. Length: 9.5"

Dia. 0.541" Wt. 0.3 oz.

ENGINES: 1/2A3-2T (1st Flt.), 1/2A3-4T, A3-4T, A10-3T.



#### I.Q.S.Y. TOMAHAWK™

U.S. sounding rocket model delivers great performance with mini-engine power. Length: 10.9" Dia. 0.541" Wt. 0.25 oz.

ENGINES: 1/2A3-2T (1st Flt.), 1/2A3-4T, A3-4T, A10-3T.



#### MINI SCALE COMBO™ PAK

No. 0874

#### ARROW™

**SKILL LEVEL 2** This sporty model achieves flights to 900 feet and descends beneath a 12" chute. Over 1½ feet tall, the Arrow™ has 6 fins and a large two-color decal. Length: 18.75" Dia. 1.637" Wt. 2.23 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1983



#### MINI MARS LANDER™

**SKILL LEVEL 2** Vehicle for future Martian landings. Super detailing and exotic appearance will make this one of your favorite models. Length: 5.5" Dia. 1.637" Wt. 0.81 oz.

ENGINES: 1/2A3-4T, A3-4T (1st Flt.), A10-3T.

No. 0881

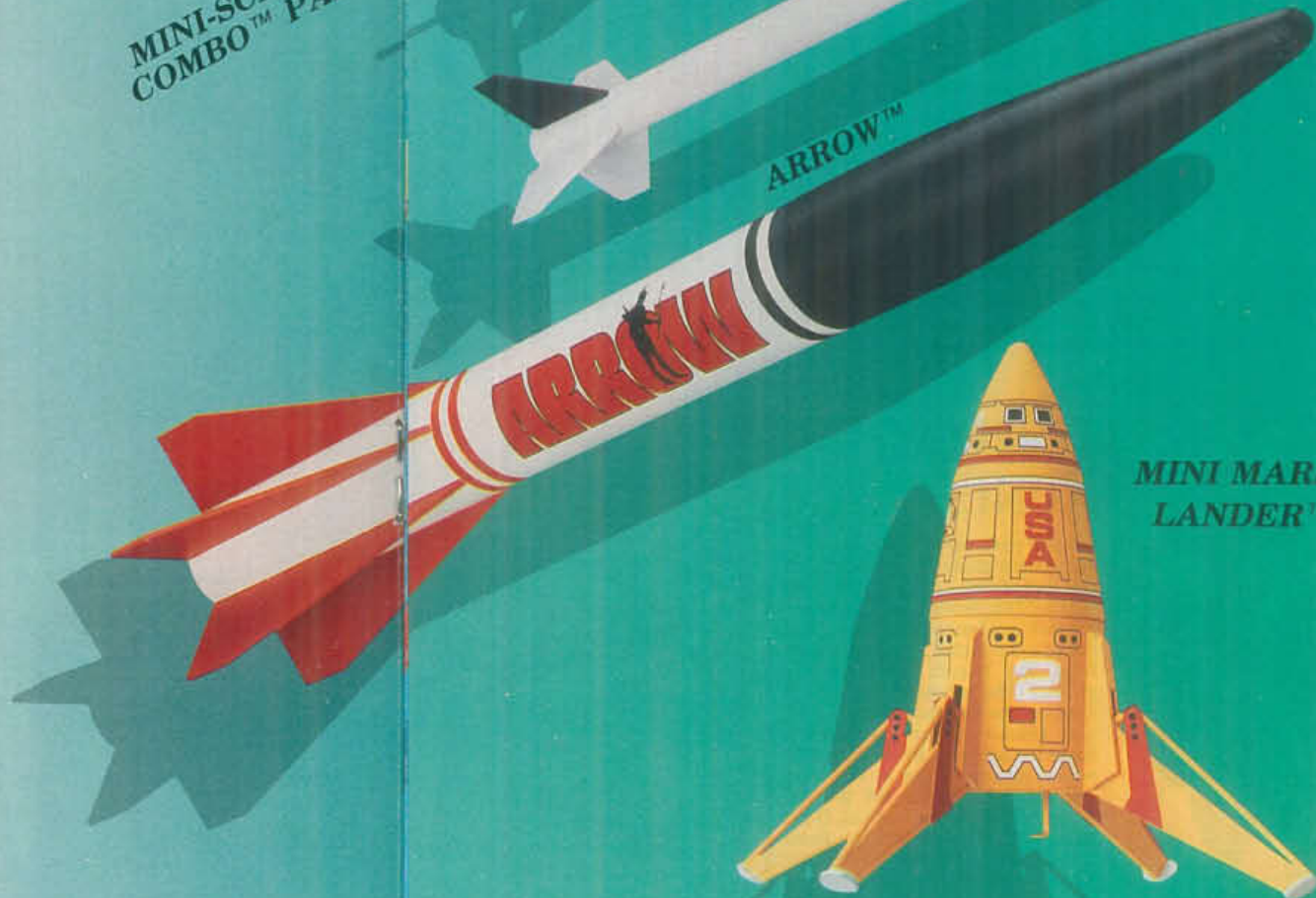


*Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 12 oz.*



*Photo Courtesy Societe Nationale Industrielle Aerospatiale (Product of France)*

MINI-SCALE  
COMBO™ PAK



EXOCET™

I.Q.S.Y. TOMAHAWK™

ARROW™

MINI MARS  
LANDER™

## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### CLIPPER™

**SKILL LEVEL 2** High, high flights! As the boosting lower stage exhausts the last of its fuel, it ignites the upper stage and falls away to tumble safely back to Earth. Lighter now the Clipper will climb to altitudes over 1000 feet before releasing a 30" streamer to slow its long descent. Length: 22.875" Dia. 0.976" Wt. 1.59 oz.

**ENGINES:** Upper Stage: A8-5 (1st Flt.), B4-6, B6-6, B8-5, C6-5, C6-7.

**Booster:** B6-0, (1st Flt.), C6-0.

No. 1979



### SENTINEL™

**SKILL LEVEL 2** Air-to-air missile decor lends a scale appearance to this large model. Powerful lift-offs add realism and the model's weight requires a big 18 inch parachute for reliable recovery. Length: 27.625" Dia. 1.637" Wt. 2.7 oz.

**ENGINES:** A8-3, B4-4 (1st Flt.), B6-4, C6-3, C6-5.

No. 1987



### SPACE SHUTTLE COLUMBIA™

**SKILL LEVEL 2** Beautiful semi-scale model of America's newest spaceship. Assembles easily with molded plastic nose cone and orbital maneuvering system pods. Spectacular flights over 500 feet with 18" parachute recovery. Makes a great display model too! Length: 10.7" Wing Span 8.125" Dia. 1.637" Wt. 1.98 oz.

**ENGINES:** A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1385



### TECH-TIP™ LAUNCH PADS



Launch pads serve many uses. The launch rod guides the rocket's first few feet of flight until the rocket is moving fast enough for the fins to provide guidance. The blast plate deflects the engine's hot gases away from the launch pad and the ground. The safety cap is always kept on the rod except during actual launch to prevent injuries. Some launch pads tilt to direct the rocket into the wind so the wind will return it. Never tilt the rod more than 30° from vertical. Don't launch if it's too windy. Some launch pads also accommodate Maxi™ Rods (#2244) for giant models.

*Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 12 oz.*



**NEW**

# SKILL LEVEL 2

## SKILL LEVEL 2

Recommended for the Experienced Modeler.

### EGGSPRESS™

**SKILL LEVEL 2** Egg loft sport rocket is great for contests, science fair projects, and "Eggsperiments"! This heavy duty vehicle can be flown with or without an "Eggload". The cargo bay is so big you can launch a large egg in it. And...there's an 18 inch parachute for "Eggstra" soft landings. However, if the 'chute doesn't open the Yolk's on you!

Length: 21.5" Payload Dia. 2" Wt. 2.51 oz.

ENGINES: Without Egg B4-2 (1st Flt.), B6-2, B8-5, C6-5.

With Egg C5-3 ONLY!

No. 1996



### STARBIRD™

**SKILL LEVEL 2** This sleek, interstellar spaceship traverses the galaxy, seeking, observing, and exploring the farthest reaches. Our model flies over 1100 feet and descends gently to Earth via 12" parachute.

Length: 19.5" Dia. 0.976" Wt. 1 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, C6-3, C6-5.

No. 1954



### NOVA PAYLOADER™

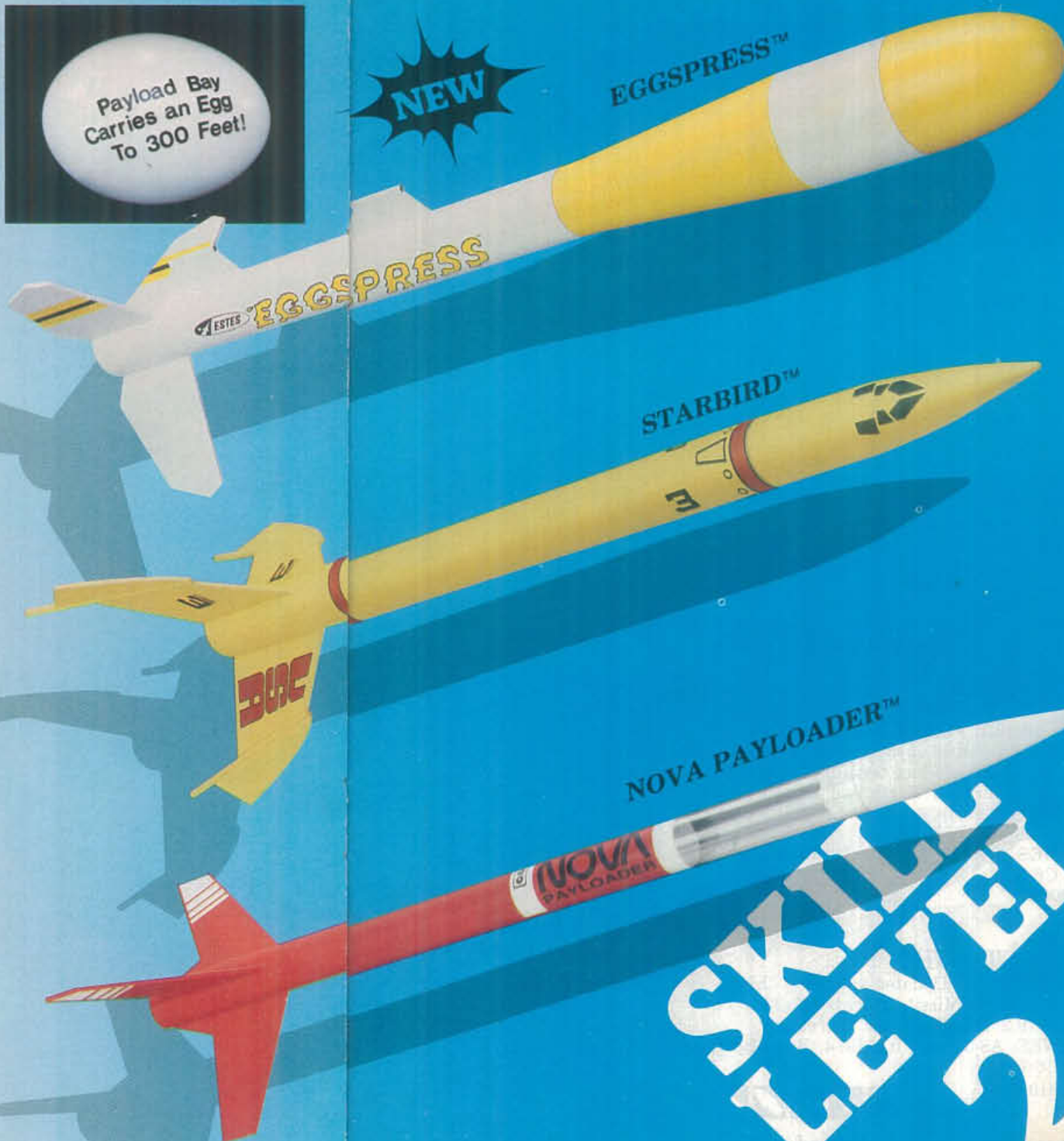
**SKILL LEVEL 2** Cargo carrier contains clear payload bay. Great for experiments and science projects. Flies to altitudes over 1000 feet high, deploys 12" recovery parachute, and descends slowly to the ground, ready to carry your next payload aloft. Length: 21.125" Dia. 0.976" Wt. 1.33 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1960



Engines, launch system, glue,  
and finishing supplies not included.  
Avg. Ship. Wt. 12 oz.



# SKILL LEVEL 2

## SKILL LEVEL 2

Recommended for the Experienced Modeler.

### DER V-3™

**SKILL LEVEL 2** A two foot rocket, comical decals, "D" power lift-offs, and a large recovery parachute add up to big, big fun! 3/16" Maxi Rod (#2244) required for launch. Length: 24" Dia. 2.6" Wt. 4.4 oz.

ENGINES: D12-3 (1st Flt.), D12-5

No. 1970



### GEMINI TITAN™

On March 23, 1965 astronauts Virgil I. (Gus) Grissom and John W. Young completed the first successful U.S. two-man orbital mission of a Gemini Spacecraft. Boosted into orbit by the powerful Titan launch vehicle, the Gemini capsule changed course three times during a flight lasting 4 hours, 52 minutes, and 31 seconds. They orbited Earth three times.

**SKILL LEVEL 2** Estes' 1/73rd scale model of NASA's Gemini-Titan (GT-3) is over 1½ feet tall, features plastic capsule and removable display nozzles. A clear plastic fin unit is attached for flights over 600 feet high. Recovery is via 12" parachute. Length: 19.375"

Dia. 1.637" Wt. 2.15 oz.

ENGINES: A8-3 (1st Flt.), B6-4, B8-5, C6-5

No. 1978



### VOYAGER™

**SKILL LEVEL 2** Resembles an experimental NASA aircraft. Perhaps this one will travel beyond the Earth on voyages not yet planned. Your model will produce test flights over 700 feet and return to Earth via an 18 inch parachute recovery system. Length: 17.25" Dia. 1.325" Wt. 1.68 oz.

ENGINES: A8-3, B4-4 (1st Flt.), B6-4, B8-5, C6-3, C6-5.

No. 2000



### HONEST JOHN™

**SKILL LEVEL 2** Updated version of this famous U.S. Army Missile. Flights to 1,000 feet. Length: 19.2" Dia. 1.325" Wt. 1.78 oz.

ENGINES: A8-3 (1st Flt.), B6-4, B6-6, B8-5, C6-5, C6-7.

No. 1919



Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 12 oz.



Photo Courtesy of NASA



## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### RANGER™

**SKILL LEVEL 2** Big and powerful, with two-color decal, and huge 18" recovery chute, Ranger™ achieves 1200 foot altitudes easily. Length: 22.125" Dia. 1.325" Wt. 1.6 oz.

ENGINES: D12-5 (1st Flt.), D12-7.

No. 1955



### MEGA SIZZ'™

**SKILL LEVEL 2** Huge sport flier lifts-off the pad with a mighty roar to climb over 1000 feet in seconds. Great decals, a quick-release engine mount, and an 18 inch parachute make this a very sharp model. A 3/16" Maxi™ Rod (#2244) is required for launch. Length: 34.25"

Dia. 1.637" Wt. 3.18 oz.

ENGINE: D12-5.

No. 1998



### MEAN MACHINE™

**SKILL LEVEL 2** Tallest rocket in the Estes fleet. "D" engine powered for spectacular flights over 800 feet. Over 6 feet long with giant 24" chute. Easy-to-assemble for a really great looking bird. Uses 3/16" launch rod.

Length: 78.75" Dia. 1.637" Wt. 5.8 oz.

ENGINE: D12-5

No. 1295



### SCORPION™

**SKILL LEVEL 2** High flying two-stage sport model with research vehicle styling. Easy-to-build and exciting to fly with all plastic fin units. Booster employs tumble recovery while upper stage streaks skyward to altitudes over 1,000 feet. Length: 26.5" Dia. 0.976" Wt. 1.8 oz.

ENGINES: Single Stage: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5,

Upper Stage: A8-5 (1st Flt.), B4-6, B6-6, C6-7.

Booster Stage: B6-0, (1st Flt.), C6-0.

No. 1333



*Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 12 oz.*



## SKILL LEVEL 3

Recommended for the Advanced Modeler.

### SR-71 BLACKBIRD™

The first SR-71 aircraft were delivered to Strategic Air Command in 1965 for reconnaissance work. Built almost entirely of titanium (as strong as, but lighter than steel), Blackbird weighs about 140,000 lbs., has a wingspan of 55 ft., and is 107 ft. long. Able to achieve speeds of more than 2,000 mph and altitudes of more than 80,000 ft., the craft carries a crew of two with a range of 2,000 or more miles. SR-71 is painted black or dark blue to reduce the heat from high-speed friction.

**SKILL LEVEL 3** Our nation's super high-altitude reconnaissance plane flies at ultra-sound speeds. So high-tech nearly all information about this plane is classified. The Estes scale model features the same state-of-the-art appearance. Over 1½ feet long SR-71 Blackbird™ flies to 900 foot altitudes and lands via 12" parachute. Length: 19" Dia. 0.976"

Wt. 3.2 oz.

ENGINES: B4-2(1st Flt.), B6-2, B6-4, B8-5, C6-5

No. 1942



### STEALTH™

**SKILL LEVEL 3** Radar invisible fighter from the future closes in on its opponents from seemingly nowhere. Outfitted with laser weaponry it seeks and destroys in ultimate silence. Our model can reach altitudes up to 900 feet. Length: 16.25" Dia. 1.125" Wt. 2.3 oz.

ENGINES: A8-3, B4-4 (1st Flt.), B6-4, C5-3, C6-3, C6-5.

No. 1929



### PHOENIX™

**SKILL LEVEL 3** Big semi-scale model of the famous Phoenix air-to-air supersonic missile. Impressive in the air and on display. Single "D" powered engine provides a slow, realistic lift-off and flights over 600 feet. A 3/16" Maxi™ Rod (#2244) is required for launch.

Length: 30" Dia. 2.60" Wt. 6.6 oz.

ENGINE: D12-3

No. 1380



Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 12 oz.



Photo Courtesy Lockheed - California Company

## SKILL LEVEL 3

*Recommended for the Advanced Modeler.*

### NASA X-15™

X-15 was one of a series of experimental rocket-powered aircraft used to research reentry from extreme altitudes, pilots' physiological behavior at super sonic speeds, and aerodynamic heating and skin friction. X-15 flew to an altitude over 67 miles high to a speed of Mach 6.7 on October 3, 1967.

**SKILL LEVEL 3** Our sport scale version of the famous rocket-powered X-15™ aircraft features plastic nose cone and canopy plus die-cut balsa fins. A 10 inch recovery parachute returns your NASA X-15™ rocket plane to Earth after each realistic flight. Length: 12.75" Dia. 1.637" Weight 1.71 oz.  
ENGINE: A10-3T.  
No. 0889



### X-16™

**SKILL LEVEL 3** Far in the future the Air Force may be flying this experimental model into Earth's outer atmosphere to test hyper velocity near space travel. Our version can fly to 1,000 feet.  
Length: 17.25" Dia. 0.976" Wt. 1.45 oz.  
ENGINES: A8-3 (1st Flt.), B4-4, B6-2 B6-4, B8-5, C6-5.  
No. 1933



### NIKE APACHE™

This two-stage, solid propellant vehicle is one of the United States' smallest and most used scientific research sounding rockets. The first stage is a US Army Nike M5E1. The second stage Apache is produced by Morton-Thiokol. A maximum length of 28 feet, allows Nike Apache to be fired from a transportable launcher, even from aboard a ship! This enables other nations to use Nike Apache, too. Delivering a combined thrust of 51,000 pounds and carrying nominal payloads of 60 pounds, Nike Apache is used for space research 50-150 miles above Earth.

**SKILL LEVEL 3** Scale (1 to 12.25) model of U.S. sounding rocket includes two-stage appearance, three-color decal, and 12" parachute recovery. Reaches altitudes over 900 feet. Length: 22.875" Nike Dia. 1.325" Apache Dia. 0.541" Wt. 1.55 oz.  
ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5, C6-7.  
No. 1957



*Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 12 oz.*

"G.H. Stine Archives, used with permission."





### SKILL LEVEL 3

*Recommended for the Advanced Modeler.*

#### INTERCEPTOR II™

**SKILL LEVEL 3** Futuristic concept of U.S. Air Force interceptor aircraft features large three-color decals, flights over 650 feet, and descents via 18" parachute.

Length: 25.75" Dia. 1.325" Wt. 2.9 oz.

ENGINES: A8-3, B4-4 (1st Flt.), B6-4, B8-5, C6-3, C6-5.

No. 1973



#### ARGOSY™

**SKILL LEVEL 3** Galactic deterrent of ever-threatening invasions, this strike fighter is equipped with laser weaponry, time warp drive and deionizing technology. Invisible on all known scanners, Argosy™ can strike and evade retaliation easily. Launch your model to 900 feet. Landings are smooth with a 12" parachute! Length: 18.5" Dia. 0.976"

Wt. 1.43 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, C5-3, C6-3, C6-5

No. 1988



#### HERCULES™

**SKILL LEVEL 3** Clear payload section highlights this two-stager. Sleek design that can be flown as a single or two-stage model. Flights over 2,500 feet!

Length: 21.6" Dia. 0.976" Wt. 1.84 oz.

ENGINES: Single Stage: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

Upper Stage: A8-5 (1st Flt.), B6-6, B8-5, C6-7.

Booster: B6-0, (1st Flt.), C6-0.

No. 1377



#### EXPLORER™

**SKILL LEVEL 3** Symbol of mankind's greatest dream, this great fusion-powered ship is free to explore the universe and beyond at speeds warping the light barrier. The ship, its crew, and on-board eco-system are protected from hostile environments by ion shields and powerful defense lasers. Our model will climb to altitudes over 900 feet and return to Earth via 18" parachute.

Length: 18.75" Dia. 1.637" Wt. 2.1 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

No. 1974



*Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 12 oz.*

48



**NEW**

**SKILL LEVEL 3**

### SKILL LEVEL 3

*Recommended for the Advanced Modeler.*

#### NIMBUS™

**SKILL LEVEL 3** Above the clouded atmosphere, this winged spaceship patrols the terrain boundaries. Our model soars to 850 foot altitudes and lands gently with a 12" parachute.

Length: 17.375" Dia. 0.976" Wt. 1.21 oz.

ENGINES: B4-4 (1st Flt.), B4-6, B6-4, B8-5, C5-3, C6-3, C6-5, C6-7.

No. 1971



#### COMANCHE - 3™

**SKILL LEVEL 3** Big three-stager with mighty "D" powered booster. Can be flown in single, two-stage or three-stage configurations. Incredible flights over 2,600 feet.

Length: 41" Dia. 0.976" Wt. 2.08 oz.

ENGINES: Single Stage: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5.

Upper Stage: A8-5 (1st Flt.), B4-6, B6-6, C6-7.

Second Stage: B6-0, (1st Flt.), C6-0.

Booster: D12-0

No. 1382



#### DRAGON FLY™

**SKILL LEVEL 3** U.S. record setting boost glider is an excellent competition model. Glide times of 60 seconds or more are possible.

Length: 11.5" Wing Span 10" Dia. 0.541"

Wt. 0.47 oz.

ENGINE: 1/2A3-2T

No. 0875



Scott Branche, Scarsdale, NY

*Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 12 oz.*



# SKILL LEVEL 3

### SKILL LEVEL 3

Recommended for the Advanced Modeler.

#### PATHFINDER™

**SKILL LEVEL 3** Over 3½ feet tall, this magnificent model resembles a real sounding rocket used in testing upper atmospheric conditions. A big 'D' engine is required to launch this rocket to altitudes over 800 feet. Two 12 inch parachutes are necessary to ensure recovery. A 3/16" Maxi™ Rod (#2244) is required for launch.

Length: 42.25" Dia. 1.637" Wt. 3.18 oz.

ENGINE: D12-5.

No. 1997



#### CORSAIR™

**SKILL LEVEL 3** Exiled to distant outlying planets, the galaxy's privateers fly their spaceships throughout the star systems, preying on slower freightliners. Dark and sleek, Corsair's design has evolved from the necessity to outmaneuver vengeful victims. The model features swept-wing design, flights to 700 feet, and descent via 12 inch parachute.

Length: 12.35" Dia. 0.976" Wt. 1.59 oz.

ENGINES: A8-3 (1st Flt.), A8-5, B4-4, B6-4, B8-5, C6-5.

No. 1999



#### RAM JET™

**SKILL LEVEL 3** This ducted jet rocket is launched from the air for long range use in the upper atmosphere. Lifting off to 800 feet, Ram-jet™ is recovered via 12 inch parachute system.

Length: 15.25" Dia. 1.325" Wt. 1.24 oz.

ENGINES: A8-3 (1st Flt.), B4-4, B6-4, B8-5, C6-5

No. 1994



A DAMON COMPANY

Engines, launch system, glue and finishing supplies not included.  
Avg. Ship. Wt. 12 oz.

### TECH-TIP™



### MODEL ROCKET COMPETITION AND CONTESTS



Contests are fun. See whose rocket flies the highest or stays in the air the longest. Find out who has the best looking model or whose scale model is most precise. Who can cause their rocket to land via parachute where they want it to land?

These contests are fun and educational. Compete with your friends or classmates. If you wish to compete in local, national or international events or set a national or world record, you should join the National Association of Rocketry, 2140 Colburn Dr., Skakopee, MN 55379. Your membership includes many benefits such as discounts, insurance, and a monthly subscription to American Spacemodeling Magazine.

NEW

PATHFINDER™

NEW

CORSAIR™

NEW

RAM JET™

RAM JET™

SKILL LEVEL 3

## SKILL LEVEL 4

Recommended for the Master Modeler.

### GEO SAT LV™

**SKILL LEVEL 4** Heavy-lift launch vehicle for large satellite payloads. Kit features simulated strap-on solid rocket boosters, see-through payload section with a highly detailed visible satellite, and an 18" parachute for reliable recovery. Realistic decor and 2 feet 4 inches of rocket make lift-offs impressive.

Length: 28" Dia. 1.637" Wt. 4.3 oz.

ENGINES: B4-4 (1st Flt.), B6-4, C6-3, C6-5.

No. 1977



### BLACK BRANT II™

An outgrowth of Black Brant I program, Black Brant II's payload capacity was increased to 6.2 cu. ft. by changing the nose cone's shape. The airframe, (17.2" dia. x 27' 8" tall), was stabilized by 3 fixed fins. Total fin span was 39". The motor delivered 16,000 pounds of thrust over a 25 second burn time. Total vehicle weight with propellant was 2,642 lbs. First flight was October, 1960.

Used by the Canadian Armament Research and Development Establishment for upper atmosphere research studies, Black Brant IIs were fired mostly in Canada's Northlands, carrying up to 150 pounds of payload to altitudes of 100 statute miles.

**SKILL LEVEL 4** Beautiful model of Canadian sounding rocket features a 1 to 13 scale ratio. This powerful D-engine model can fly well over 1200 feet. Length 24.875"

Dia. 1.325" Wt. 2.29 oz.

ENGINES: D12-5 (1st Flt.), D12-7.

No. 1958



### JUPITER-C™

The first U.S. Space Launch Vehicle was designed, built, and flown under the direction of Dr. Wernher von Braun. The thrust from Jupiter-C's four stages produced an orbital velocity of 18,000 mph.

Explorer I was the first U.S. Earth Satellite. The instrumentation was designed by Dr. James Van Allen. The satellite was constructed at Jet Propulsion Laboratory under the direction of Dr. William Pickering.

Jupiter-C/Explorer-1 lifted off from Cape Canaveral occurred at 10:48 P.M. EST January 31, 1958. The flight resulted in the discovery of the Van Allen Belts, one of the outstanding discoveries of the International Geophysical Year.

**SKILL LEVEL 4** Estes' model of this historic rocket is 1/35th scale. The Explorer-1 Satellite is included but should be removed for flight. Other features are realistic lift-offs and reliable recoveries via 18" parachute.

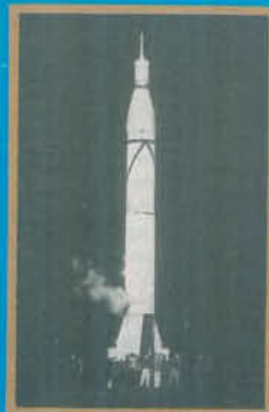
Length 24.5" Dia. 2.04" Wt. 3 oz.

ENGINE: C5-3 (1st Flt.)

No. 1976



Photo Courtesy: NASA



Engines, launch system, glue, and finishing supplies not included.

Avg. Ship. Wt. 12 oz.



## CRUSADER SWING-WING™

**SKILL LEVEL 4** Our model of this NASA advanced fighter concept will soar to 800 feet. The internal power pod is ejected at apogee and the rocket becomes a winged glider with glide times of 45 seconds or more. Pod descent is via recovery streamer. Length: 18" Wing Span 11.5" Dia. 1.637" Wt. 2.2 oz. ENGINES: B4-2 (1st Flt.), B6-2, C6-3. No. 1961



## SATURN V™

Engineers at the Army Ballistic Missile Agency in Huntsville, AL in 1957 proposed a large rocket named Juno V. In 1958 the project was approved. NASA was activated that same year. In 1959 the project was renamed Saturn and transferred to NASA. First successful flight of the Saturn V was on November 9, 1967.

The first stage of the Saturn V generated 7,500,000 pounds of thrust with its cluster of five F-1 engines burning kerosene and liquid oxygen. The second stage was powered by five J-2 engines producing a total of 1,000,000 pounds of thrust. The third stage used one J-2 engine to provide 200,000 pounds of thrust. Total thrust capability was 8,700,000 lbs. The third stage engine had a restart capability.

The Saturn V permitted weights of up to 280,000 pounds to be placed in Earth orbit. The Saturn V launched the nearly 100,000 pound Apollo 11 spacecraft into lunar trajectory which resulted in the first manned lunar landing in July 1969. The Apollo-Saturn V was 363 feet tall and weighed 6,000,000 lbs. fully fueled.

**SKILL LEVEL 4** This is the finest 1/100 scale model rocket of the Mighty Saturn V™ ever designed. Keith Niskern, designer of the first and most famous Saturn V™ model, has completely redesigned and refined the model.

Scaled from official NASA drawings, the finished model is 43 1/4 inches tall and lifts off to more than 100 feet with one powerful D12-3. The bottom section is lowered gently with two huge 24 inch parachutes and the upper section is recovered via special recovery harness and 18 inch parachute.

The internal structure has been redone to ease assembly and assure safer and more realistic recoveries. The balsa fins have been moderately overscaled for stable flight. No fin extensions or other alterations are required.

Improved and amplified detailing includes an Apollo capsule, escape tower, and main engine display nozzles which remove easily for flight. Truly a magnificent scale reproduction.

A 3/16" Maxi™ Rod (#2244) is required for launch. Length 43.25" Dia. 3.938" Wt. 10.2 oz.

ENGINE: D12-3 ONLY

No. 2001



Eleven times a Saturn V carried men to the moon. Six of these missions included a landing on the lunar surface. All returned safely.

Engines, launch system, glue, and finishing supplies not included. Avg. Ship. Wt. 14 oz.

May we have your attention please?

During 1988 Estes engines, igniters, and recovery wadding will begin to appear in the great new packaging shown on this page. Be sure to watch for it!

**IGNITERS:** Add increased reliability at lift-off with Estes Igniters. Features easy engine installation and is suitable for all Estes launch control systems. Unique four element design makes it the most dependable igniter made. (Six per pkg.) Ship Wt. 1 oz. No. 2301

**RECOVERY WADDING:** Provides protection from hot ejection gases for parachutes and streamers. Each package contains approximately 75 4½" squares—enough wadding for up to 25 flights. Instructions for installation are included on each package. Ship Wt. 6 oz. No. 2274

**BLAST-OFF™ FLIGHT PAK**  
Ideal engine assortment. Features 24 of the most popular Estes model rocket engines, plus Igniters and Recovery Wadding. Priced at an excellent savings. Includes six each A8-3, B6-4, C6-5, and C6-7 high performance model rocket engines, one pkg. Recovery Wadding, and 30 Igniters. Ship. Wt. 1 lb. 8 oz. No. 1672

### TECH-TIP™



### IGNITER INSTALLATION

Separate igniters by cutting the tape but do not remove it. Place the igniter deep inside the engine so it is touching the propellant. Use masking tape to firmly secure the igniter in place. The igniter must be touching the propellant when the electricity heats the igniter to cause ignition. Attach clean micro-clips as close to the igniter's center as possible. To avoid a short-circuit the micro-clips and igniter leads must not touch one another or any other metal. If igniter burns in two without igniting the engine, disarm controller, wait one minute and replace the igniter.

NEW ENGINE SELECTION



# MODEL ROCKET ENGINES

## REGULAR ENGINES

### SINGLE STAGE ENGINES GREEN LABEL

Prod. No.	Engine Type	Prices 3 for	Total Impulse		Time Delay (±15%)	Max. Lift Wt.	Max. Thrust	Thrust Duration	Initial Weight		Propellant Weight	
			lb-sec (1)	N-sec (2)					Oz.	G.	Oz.	G.
1593	1/2A6-2 <sup>s</sup>		0.28	1.25	2 sec.	2.5 oz.	46 oz.	0.20 sec.	0.53	15.0	0.055	1.56
1598	A8-3		0.56	2.50	3 sec.	4.0 oz.	48 oz.	0.32 sec.	0.57	16.2	0.110	3.12
1601	B4-2		1.12	5.00	2 sec.	4.0 oz.	48 oz.	1.20 sec.	0.70	19.8	0.294	8.33
1602	B4-4		1.12	5.00	4 sec.	3.5 oz.	48 oz.	1.20 sec.	0.74	21.0	0.294	8.33
1605	B6-2		1.12	5.00	2 sec.	4.5 oz.	48 oz.	0.83 sec.	0.68	19.3	0.220	6.24
1606	B6-4		1.12	5.00	4 sec.	4.0 oz.	48 oz.	0.83 sec.	0.71	20.1	0.220	6.24
1620	B8-5 <sup>s</sup>		1.12	5.00	5 sec.	5.0 oz.	5 lb.	0.60 sec.	0.68	19.3	0.220	6.24
1617	C5-3 <sup>s</sup>		2.25	10.00	3 sec.	8.0 oz.	5 lb.	2.10 sec.	0.90	25.5	0.450	12.70
1613	C6-3		2.25	10.00	3 sec.	4.0 oz.	48 oz.	1.70 sec.	0.88	24.9	0.440	12.48
1614	C6-5		2.25	10.00	5 sec.	4.0 oz.	48 oz.	1.70 sec.	0.91	25.8	0.440	12.48

### UPPER STAGE ENGINES or single stage engine if used in a very light rocket PURPLE LABEL

1599	A8-5		0.56	2.50	5 sec.	2.0 oz.	48 oz.	0.32 sec.	0.62	17.6	0.110	3.12
1604	B4-6		1.12	5.00	6 sec.	1.5 oz.	48 oz.	1.20 sec.	0.78	22.1	0.294	8.33
1607	B6-6		1.12	5.00	6 sec.	2.0 oz.	48 oz.	0.83 sec.	0.78	22.1	0.220	6.24
1615	C6-7		2.25	10.00	7 sec.	2.5 oz.	48 oz.	1.70 sec.	0.95	26.9	0.440	12.48

### BOOSTER ENGINES RED LABEL

1608	B6-0		1.12	5.00	none	4.0 oz.	48 oz.	0.80 sec.	0.58	16.4	0.220	6.24
1616	C6-0		2.25	10.00	none	4.0 oz.	48 oz.	1.68 sec.	0.80	22.7	0.440	12.48

Regular engines are 2.75 in. long and 0.690 in. dia. Ship Wt. of each package of engines is approximately 4 oz.

\*Series H engines have semi-core-burning grain with large propellant burning area for high initial thrust with short thrust duration.

## MIGHTY 'D' ENGINES

### SINGLE STAGE ENGINES GREEN LABEL

Prod. No.	Engine Type	Prices 3 for	Total Impulse		Time Delay (±15%)	Max. Lift Wt.	Max. Thrust	Thrust Duration	Initial Weight		Propellant Weight	
			lb-sec (1)	N-sec (2)					Oz.	G.	Oz.	G.
1666	D12-3		4.48	20.0	3 sec.	14 oz.	9 lb.	1.70 sec.	1.49	42.2	0.879	24.93
1667	D12-5		4.48	20.0	5 sec.	10 oz.	9 lb.	1.70 sec.	1.52	43.1	0.879	24.93

### UPPER STAGE ENGINES PURPLE LABEL

1668	D12-7		4.48	20.0	7 sec.	8 oz.	9 lb.	1.70 sec.	1.55	44.0	0.879	24.93
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### BOOSTER ENGINES RED LABEL

1665	D12-0		4.48	20.0	none	14 oz.	9 lb.	1.70 sec.	1.44	40.9	0.879	24.93
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'D' engines are 2.75 in. long and 0.945 in. dia. Ship Wt. of each package of 'D' engines is approximately 6½ oz.

## MINI ENGINES

### SINGLE STAGE ENGINES GREEN LABEL

Prod. No.	Engine Type	Prices 4 for	Total Impulse		Time Delay (±15%)	Max. Lift Wt.	Max. Thrust	Thrust Duration	Initial Weight		Propellant Weight	
			lb-sec (1)	N-sec (2)					Oz.	G.	Oz.	G.
1503	1/2A3-2T		0.28	1.25	2 sec.	2 oz.	28 oz.	0.36 sec.	0.198	5.6	0.062	1.75
1507	A3-4T		0.56	2.50	4 sec.	2 oz.	28 oz.	0.86 sec.	0.268	7.6	0.124	3.50
1511	A10-3T		0.56	2.50	3 sec.	5 oz.	48 oz.	0.26 sec.	0.277	7.9	0.133	3.78

### UPPER STAGE ENGINES PURPLE LABEL

1504	1/2A3-4T		0.28	1.25	4 sec.	1 oz.	28 oz.	0.36 sec.	0.212	6.0	0.062	1.75
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### BOOSTER ENGINES RED LABEL

1510	A10-0T		0.56	2.50	none	5 oz.	48 oz.	0.26 sec.	0.235	6.7	0.133	3.70
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Mini-Engines are 1.75 in. long and .500 in. dia. Ship Wt. of each package of mini-engines is approximately 2½ oz. Complete instructions and igniters are included with each package of Estes model rocket engines.

(1) Pound-seconds (Figures shown are optimum.)

(2) Newton-seconds (Figures shown are optimum.)

\*A Newton is the measurement of force required to move one kilogram of mass one meter per second. Avg thrust in Newtons ÷ thrust duration = Newton-seconds. Newton-seconds ÷ 4.45 = Pound-seconds.

## ASTRON™

### LAUNCH CONTROLLER

Heavy-duty launch controller features futuristic design and provides greater reliability with simplified assembly. Recommended for 6 or 12 volt power sources. No need to remove battery from car, simply connect launch system's battery clips to terminals. Features include arming lamp, safety key, launch button, battery clips, micro-clips, and 18 feet of launch cable. Ship Wt. 12 oz. No. 2212

### ELECTRON BEAM™ LAUNCH CONTROLLER

Years of experience and the latest product innovations are combined to bring you the best in launch control technology. Pre-assembly and pre-testing provides the most reliable launcher available. The new ELECTRON BEAM™ launch controller features Safety Key, Arming Light, and Launch Button for total launch control. Snap-open battery compartment makes changing batteries easy. Also included is 17 feet of launch wire with pre-soldered micro-clips. Colorful, sleek, and made of durable plastic, the ELECTRON BEAM™ is easy to hold in your hand and carry in your launch box. Requires only 4 AA alkaline batteries-Not Included. Use only with Estes Igniters (#2301). Length 6.75" Width 1.5" Depth 1.25" Ship Wt. 8 oz. No. 2220

### PORTA-PAD™ LAUNCH PAD

Designed for stability, the Porta-Pad is rugged enough to take the stress of countless launchings, yet is lightweight and compact enough for easy carrying and storage. Accommodates standard 1/8" rod (#2243) or heavy-duty 3/16" Maxi-Rod (#2244). Tilt adjustment allows you to compensate for wind direction. Ship Wt. 1 lb. 8 oz. No. 2217

The Electron Beam™ Launch Controller (#2220) or the Astron™ Launch Controller (#2212) are the recommended launch controllers for use with the Porta-Pad™ (#2217).

# LAUNCH SYSTEMS



**ELECTRON BEAM™ LAUNCH CONTROLLER**



**ASTRON™ LAUNCH CONTROLLER**



**PORTA-PAD™ LAUNCH PAD**

### LAUNCH CONTROLLERS

Battery-powered launch controllers provide the electricity necessary to heat the igniter for model rocket engine ignition. Removing the safety key disables the launch controller so the rocket cannot be launched accidentally. Insert the safety key only after the rocket is prepped, the micro-clips attached to the igniter in the engine, everyone has left the launch pad area, and you are ready for countdown. The continuity or arming light should glow after the safety key is inserted. At zero on the countdown, press and hold the launch button depressed until the rocket lifts off.



**TECH TIP™**

## LAUNCH SUPPLIES



**3/16" DIA. MAXI-ROD™:** Perfect for launching giant models and other large rockets. Fits Porta-Pad™ launch pad (#2217). Two-piece construction 36" long, light-weight aluminum launch rod. Includes Safety Cap & Key. Ship Wt. 12 oz. No. 2244

**1/8" DIA. TWO PIECE LAUNCH ROD:** Handy two-piece rod for launch pads. Parts slip together to make a 36" long rod. Rod has a diameter of 1/8". Includes Safety Cap & Key. Ship Wt. 6 oz. No. 2243

**LAUNCH ROD SAFETY CAP with UNIVERSAL SAFETY KEY:** For Launch Pad Safety! Includes plastic launch rod cap, safety key, and elastic cord. Fits all Estes launch control systems. Ship Wt. 4 oz. No. 2205

**MICRO-CLIPS:** Equip your launch system with the best. Spring-loaded solid steel clips connect launch system wires to igniters. Only 1.1 inches long. Attach to leads with or without solder. Ship Wt. 1 oz. No. 2247

**BLAST DEFLECTOR PLATE:** Slip-on metal deflector plate fits any launch pad using 1/8" or 3/16" rods. Protects launch pad base from rocket blast. Four-inch diameter. Ship Wt. 5 oz. No. 2241

**BATTERY CLIPS:** Hook-up to car batteries. Heavy-duty clips connect to terminals up to 1" in dia. With insulators. Ship Wt. 5 oz. No. 2245



# PUBLICATIONS

The more you know about model rocketry, the more you will enjoy it.

## THE ROCKET BOOK--A Guide To Building And Launching Model Rockets For The Space Age

by Robert L. Cannon and Michael A. Banks.

A useful reference on the theory and practice of model rocketry. Excellent illustrations. Helps you understand the Laws of Motion and related concepts. Soft, full-color cover. 224 pages. No. 2859 -

## THE LAWS OF MOTION AND MODEL ROCKETRY

The three laws of motion are explained in terms which are understandable. 12 pages. No. 2821 -

## INDUSTRIAL ARTS TEACHERS MANUAL FOR MODEL ROCKETRY

Very practical 52 page guide on basic model rocketry and its unique applications in the study of manufacturing, transportation, R & D, communication, and construction. No. 2810 -

## GUIDE FOR AEROSPACE CLUBS

The perfect source book for organizing and operating a successful model rocket club. 34 pages. No. 2817 -

## MODEL ROCKET CONTEST GUIDE

Use to plan model rocket contests. 18 pages. No. 2815 -

## PROJECTS IN MODEL ROCKETRY

Suggestions on how to plan, prepare, and present research projects. Ideas for about one hundred projects. 12 pages. No. 2831 -

## CAMP LEADER'S MODEL ROCKETRY MANUAL

Expanded guide for introducing model rocketry successfully into camp programs. 10 pages. No. 2822 -

## SECOND STAGE: ADVANCED MODEL ROCKETRY

by Michael Banks

Good source of information for advanced projects in model rocketry. No. 2861 -

## MODEL ROCKETRY--THE SPACE AGE TEACHING AID

A comprehensive teacher's guide for introducing model rocketry into the classroom or club. No. 2840 -

## ALPHA BOOK OF MODEL ROCKETRY

The ideal "first book" for beginners in model rocketry. 32 pages. No. 2820 -

## TECH-TIP™ PAYLOADS

Some model rockets have a special section used to carry cargo. This cargo or "payload" can be a camera, such as AstroCam™ 110, to take aerial photos of your launch site. For competition, try launching a raw egg and retrieving it--UNBROKEN! Please do not launch mice, gerbils, and other rodents as the tremendous acceleration and g forces of model rocket flight could be very frightening and harmful to them.

## MODEL ROCKET LAUNCH SYSTEMS

Photographs and clearly drawn schematics make the electrical theory of launchers easily understood. 20 pages. No. 2811 -

## THE CLASSIC COLLECTION

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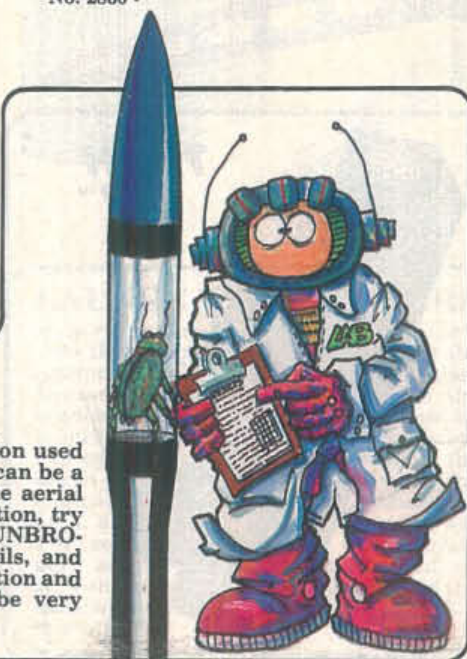
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## ASTROCAD: PERFORMANCE ANALYSIS FOR MODEL ROCKETRY

TEN programs for mathematical analysis of performance characteristics of model rockets. One disk (one side) for Apple II series computers. These programs, written by Michael Gasperi, are not tutorials. They are "problem solvers" and do not contain graphics. You provide the raw data, and the programs provide predicted performance. The programs are:

Apogee Determination	Aerodynamic Stability
Drag Prediction	Drag Estimation
Performance Prediction	Optimum Weight
Flight Simulation	Elliptical Fin Design
Model Rocket Design (two versions)	No. 9028

Programs written by Bob Cannon and Mike Dorffler. ©Copyright Estes Industries. 1986, 1987. All Rights Reserved.

Graphics created with BLAZING PADDLES by Baudville.

Animation created with TAKE 1 by Baudville. Apple is a registered trademark of Apple Computer, Inc.

All software products are on 5 1/4 inch disks for use on Apple II series computers. Both sides of each unnotched disk are used. A minimum of 64K of memory is required. A color monitor is recommended to secure the most enjoyment of the great graphics incorporated into these programs.

**GREAT COLOR GRAPHICS! INTERACTIVE TEXT TO MAXIMIZE LEARNING AND UNDERSTANDING! KEY CONCEPTS CLEARLY EXPLAINED AND ILLUSTRATED!**

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No. 9025

Model Rocket Flight Profile  
Parts of a Model Rocket  
Model Rocket Engines  
Model Rocket Engine Classification  
Model Rocketry Safety Code (1987 Revision)  
Safety Code Review (+ Bonus Program on Multi-Staging accessible only to those who make high scores)  
Tech Tip™ on Igniters and Igniter Installation

A great way to learn about model rocketry. A very entertaining way to discover key concepts important both about the what to do's of model rocketry as well as for understanding how model rockets operate.

## ALTI TRAK™ ALTITUDE FINDER

Track your rocket to the top of its flight and instantly lock-in its altitude on the AltiTrak™ altitude finder. Displays exact model rocket altitude on metric scale—no guessing! (Conversion table included for feet.) A precision instrument made of durable plastic. Easy-to-assemble and looks like futuristic laser pistol. How high did it go? Now you'll know! Ship. Wt. 15 oz.

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Skill Level 1

Educational, See-Thru Rocket with Recovery System, 10" Parachute, Engine Mount, and Cut-Away Engine! Perfect static demonstration model for workshops and presentations. Shows all internal components of a model rocket plus special cut-away version of C6-5 model rocket engine. Ideal for displays and exhibits. Length: 12.6" Dia. 0.976" Wt. 1.35 oz. Ship. Wt. 3 oz.

No. 1207

## FIN ALIGNMENT GUIDE™

Position and glue fins quickly and easily. Fits body tubes up to BT-101. Designed for either 3 or 4 finned rockets, aligning fins at 90° or 120° to each other. Easily assembled with slip-together plastic parts. Adjusts quickly with plastic fin position clips. Ship. Wt. 3 lbs.

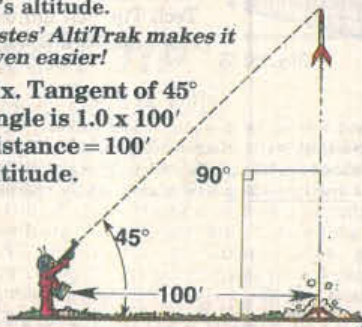
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## TECH-TIP™ ALTITUDE TRACKING

One way of figuring how high your rocket flies is by triangulation. Measure the distance between tracker and launch pad and the angle between horizontal and your model's peak altitude. Then using a table of tangents figure your rocket's altitude.

*Estes' AltiTrak makes it even easier!*

Ex. Tangent of 45°  
angle is 1.0 x 100'  
distance = 100'  
altitude.



## ACCESSORIES

## DESIGNER'S SPECIAL

Ideal parts assortment for the creative rocketeer. Develop your own R & D program. Over 75 pieces at an excellent savings! Ship Wt. 2 lbs.

### Body Tubes

- 2 BT-5
- 2 BT-20
- 2 BT-60
- 1 BT-65
- 1 BT-60

### Nose Cones

- 1 BNC-5E
- 1 BNC-5S
- 1 BNC-20B
- 1 BNC-20R
- 1 PNC-50KA
- 1 PNC-50YR
- 1 PNC-55AC
- 1 PNC-60-MS

### Fin Material

- 2 BFS-20
- 2 BFS-30
- 2 BFS-40

### Parachutes

- 1 PK-10
- 2 PK-12
- 1 PK-18
- 1 PK-24

### Recovery Equipment

- 3 Shock Cord 1/8" x 18"
- 1 Shock Cord 1/8" x 36"
- 1 Shock Cord 1/4" x 36"
- 1 Streamer Material 1" x 30"
- 6 Screw Eyes

### Miscellaneous

- 3 Engine Blocks (EB-20A)
- 3 Engine Holders (EH-3)
- 3 Engine Holders (EH-2)
- 1 Engine Mount (EH-2050)
- 1 Engine Mount (EH-2060)
- 1 Nose Block (NB-20)
- 1 Nose Block (NB-60)
- 1 Stage Coupler (JT-55C)
- 1 Stage Coupler (JT-60C)
- 1 Balsa Adapter (TA-2050A)
- 1 Multi-Purpose Paper Adapter Set (TA-1)
- 12 Launch Lugs (2-3/8" long)
- 1 Alpha Book of Model Rocketry
- 1 Fin Pattern Sheet No. 2
- 1 Fin Pattern Sheet No. 3

No. 1463

## EMERGENCY REPAIR KIT

A must for every range box. Features many essential materials for "on-the-spot" repair of your model rockets. Ship Wt. 8 oz.

- Sandpaper
- Screw Eyes
- White Glue
- Launch Rod Safety Cap
- Universal Safety Key
- Recloseable Pouch
- Recovery Wadding

- 12" Parachute
- 1/8" and 1/4" Shock Cords
- 144" Shroud Line
- Tape Discs
- Launch Lugs
- Shock Cord Mounts

No. 2233



## WIN \$75.00 IN FREE MERCHANDISE!!

Have an idea for an original design? Enter our Design of the Month Contest. Your design could be published in an issue of Model Rocket News Magazine. Simply follow the rules below.

1. All entries become the property of Estes Industries and cannot be returned.
2. Employees of Estes Industries and members of their immediate families are not eligible.
3. Any type of model rocketry design can be entered (rockets, boost-gliders, launching or recovery devices, etc.).
4. Designs should be new, original, and different, but they also need to be workable. The goal is to develop something new that other rocketeers can build and use successfully, too.
5. Entries will be judged on practicality, originality, neatness, completeness, and clarity. All plans must be flight tested and proven.
6. Your design entry should include a parts list and any instructions or diagrams you feel would be helpful.
7. Please do not send the actual model as it cannot be returned.
8. Photos of entries are greatly appreciated, but are not required.
9. You may send as many entries as you like.

## ENTER THE DESIGN OF THE MONTH CONTEST

10. New contest every month.
11. All designs reaching Estes Industries during the calendar month will be entered in that month's competition. (Date of receipt, not postmark, will determine the month in which a design will be entered.)
12. If two or more exceptional entries are received during any month, the judges may, at their discretion, make identical first-place awards or give additional honorable mentions.
13. Designs should be sent to the Design of the Month Contest, Estes Industries, Penrose, CO 81240. However, all plans sent to us which are not specifically addressed to another contest or department will be automatically placed in the Design of the Month Contest.
14. Each month the designer of the winning entry will receive a certificate entitling them to \$75.00 in merchandise and an award certificate suitable for framing. Award winners will be notified by mail.

GOOD LUCK!!!

## Using Estes Model Rocket Parts

Nearly all matching Estes parts have the same series description number. Those which do not feature an additional explanation as to where they can be used. Parts listing the same series description number are interchangeable with each other. For instance, a #20 body tube (BT-20) will mate with a #20A balsa nose cone (BNC-20A), or a #20B engine block (EB-20B). Further, a #2060 tube adapter (TA-2060) will adapt a BT-20 to a BT-60, and a #5055 centering ring (AR-5055) will center a BT-50 within a BT-55. By using balsa or paper adapters almost any combination of parts can be joined together. To order use both the product number and the series description number (name).

### ENGINE MOUNTS

Use Estes high performance engine mounts for your original designs. All engine mounts feature easy-to-assemble instructions and light weight components. Avg. Ship. Wt. 5 oz.

### NOSE CONES

Nose cone dimensions listed in columns 1, 2, and 3.



Engine Type	Prod. No.	Description	Price	Fits	Net Weight Oz.
For Regular Engines—A, B, & C type 0.69" x 2.75"	3150	EH-2050		BT-50	0.1
	3151	EH-2055		BT-55	0.14
	3152	EH-2060		BT-60	0.17
For "T" Mini-Engines .5" x 1.75"	3153	EM-520		BT-20	0.09
Special Purpose Quick-Change Conversion Mount—From "D" Engines to Regular Engines	3154	EM-2050		BT-50	0.19
For "D" type Engines 0.945" x 2.75"	3156	EM-5055/60		BT-55 or BT-60	0.3

Shape	No.	Prod. No.	Description BNC-Balsa PNC-Plastic	Price Each	Dimensions			Average Weight	Ship. Wt.
					1	2	3		
	1	70216	BNC-5V		3/4"	0.541"	1/4"	0.013 oz.	1 oz.
	2	70212	BNC-5E		1-3/8"	0.541"	1/4"	0.020 oz.	1 oz.
	3	70214	BNC-5S		1-1/2"	0.541"	1/4"	0.016 oz.	1 oz.
	4	70218	BNC-5W		2-7/8"	0.541"	1/4"	0.039 oz.	2 oz.
	5	70230	BNC-20B		1-11/16"	0.736"	5/16"	0.05 oz.	1 oz.
	6	70240	BNC-20R		2-3/4"	0.736"	3/8"	0.07 oz.	2 oz.
	7	70226	BNC-20AM		2-1/2"	0.736"	1/2"	0.06 oz.	2 oz.
	8	70241	BNC-20Y		1"	0.736"	3/8"	0.02 oz.	1 oz.
	9	70256	BNC-50J		1-3/8"	0.976"	1/2"	0.08 oz.	4 oz.
	10	70262	BNC-50K		2-3/4"	0.976"	1/2"	0.13 oz.	4 oz.
	10	71028	PNC-50KA		2-3/4"	0.976"	1/2"	0.13 oz.	4 oz.
	11	71001	PNC-50SP		5-11/16"	0.976"	1/2"	0.25 oz.	6 oz.
	12	70266	BNC-50Y		4-3/8"	0.976"	3/8"	0.16 oz.	6 oz.
	12	71009	PNC-50Y		4-3/8"	0.976"	3/8"	0.16 oz.	6 oz.
	13	71070	PNC-55AC		5-3/8"	1.325"	3/8"	0.32 oz.	6 oz.
	14	71038	PNC-55D		3-3/4"	1.325"	3/4"	0.36 oz.	4 oz.
	15	71020	PNC-60MS		3-1/8"	1.637"	5/8"	0.39 oz.	4 oz.
	16	71043	PNC-60AH		6-5/8"	1.637"	7/8"	1.0 oz.	6 oz.
	17	70300	BNC-70AJ		4-1/4"	2.217"	1"	0.85 oz.	6 oz.
	18	71035	PNC-80K		8-1/8"	2.555"	1-5/8"	1.68 oz.	8 oz.

### FIN STOCK

Top quality balsa sheeting for making fins for model rockets. For maximum strength, grain of wood should follow the leading edge of fin.

Prod. No.	Description	Price 3 for	Dimensions (in inches)	Weight in Oz. Net. Ship.	Major Use
32102	BFS-20		1/16x3x9	.130 4	High Performance
32106	BFS-20L		1/16x3x12	.173 6	High Performance
32108	BFS-30		3/32x3x9	.150 4	Sport Models
32110	BFS-30L		3/32x3x12	.200 6	Sport Models
32116	BFS-40		1/8x3x9	.200 4	Cluster Rockets
32118	BFS-40L		1/8x3x12	.265 6	Glider Wings

### BODY TUBES



Prod. No.	Description	Price Each	Length	Inside Diameter	Outside Diameter	Wall Thickness	Weight in Oz. Net. Ship.
<b>Spiral-Wound Paper Tube, for nose sections and strap-on payloads.</b>							
30302	BT-5		18"	0.515"	0.541"	0.013"	.219 11
<b>Spiral-Wound Paper Tube, for competition and sport models.</b>							
30316	BT-20		18"	0.710"	0.736"	0.013"	.288 11
<b>Spiral-Wound Paper Tube, for sport and high performance payload models.</b>							
30352	BT-50		18"	0.950"	0.976"	0.013"	.378 11
<b>Spiral-Wound Paper Tube, for sport and demonstration models.</b>							
30382	BT-55		18"	1.283"	1.325"	0.021"	.672 11
<b>Spiral-Wound Paper Tube, for sport and demonstration models.</b>							
30396	BT-60		18"	1.595"	1.637"	0.021"	.960 11
<b>Spiral-Wound Paper Tube, for monster models and tail rings.</b>							
30424	BT-70		17.5"	2.175"	2.217"	0.021"	1.300 14
30433	BT-80KD		14.2"	2.560"	2.600"	0.021"	.637 11

### ENGINE BLOCKS

Prod. No.	Description	Price 3 for	Outside Dia.	Inside Dia.	Length	Fits	Weight in Oz. Net. Ship.
3131	EB-20A		.708"	.65"	1/4"	BT-20	.009 1

### BALSA ADAPTERS

Adapters give flexibility for rocket design. Switch from one size body tube to another for payload capsules, parachute compartments, propulsion sections, etc. Any adapter can be hollowed to make a passage for ejection gases. All adapters have at least 1/2" mating surface on each end.

Prod. No.	Description	Price Each	Mates Tubes	Length	Taper Length	Weight in Oz. Net. Ship.
70002	TA-520		BT-5 to BT-20	1.75"	0.75"	0.04 1
70004	TA-550		BT-5 to BT-50	2.2"	1.0"	0.06 4
70006	TA-2050		BT-20 to BT-50	3.0"	2.0"	0.15 4
70010	TA-2055		BT-20 to BT-55	2.5"	1.5"	0.22 4
70012	TA-2060		BT-20 to BT-60	3.0"	2.0"	0.20 4
70014	TA-5055		BT-50 to BT-55	2.0"	1.0"	0.60 4
70016	TA-5060		BT-50 to BT-60	3.0"	2.0"	0.23 4
70028	TA-5560		BT-55 to BT-60	2.2"	1.0"	0.25 4
70034	TA-6070		BT-60 to BT-70	2.7"	1.5"	0.65 4

### STAGE COUPLERS

For multi-staging, joining body tubes, positioning adapter tubes, etc. Make perfect guides for cutting body tubes and sanding cut edges of body tubes, too. Ship Wt. for all is 3 oz. each.

Prod. No.	Description	Price Each	Outside Diameter	Inside Diameter	Length	Fits	Average Weight
30252	JT-5C		0.513"	0.455"	3/4"	BT-5	.020 oz.
30254	JT-20C		0.708"	0.650"	3/4"	BT-20	.027 oz.
30260	JT-50C		0.949"	0.920"	1"	BT-50	.051 oz.
30262	JT-55C		1.28"	1.25"	1.3"	BT-55	.088 oz.
30266	JT-60C		1.59"	1.55"	1-1/2"	BT-60	.124 oz.
30270	JT-70A		2.175"	2.115"	1-1/4"	BT-70	.140 oz.

### NOSE BLOCKS

Use these top quality feather-weight balsa nose blocks in payload sections and anywhere else a solid bulkhead is required. Precision turned for exact fit in body tubes.

Prod. No.	Description	Price Each	Outside Diameter	Length	Fits	Weight in Oz. Net. Ship.
70152	NB-20		0.710"	3/4"	BT-20	.014 1
70158	NB-50		0.950"	1"	BT-50	.040 4



## PARACHUTE KITS

Get the best in parachute recovery! Two-color printed plastic 'chutes give maximum visibility with easy track design. Lightweight, durable and easily folded. These 'chutes are very thin, allowing the most material to be packed into the least body space. Each kit comes complete

with 'chute material, tape discs, and shroud lines. Each weighs less than .3 oz. Ship Wt. 2 oz.

Prod. No.	Description	Parachute Diameter	Price Each
2262	PK-10	10 inches	
2264	PK-12	12 inches	
2267	PK-18	18 inches	
2271	PK-24	24 inches	

**TAPE DISCS:** Fasten shroud lines to plastic parachutes or streamers with these 3/4" dia. pressure sensitive Tape Discs. In sheets of 6 discs. (4 sheets per pkg.) Ship Wt. 1 oz.  
No. 2294

**STREAMER MATERIAL:** Bright orange, flame-resistant crepe paper streamers. In 7 1/2 foot lengths, enough for two to eight streamers. Specify size when ordering. Ship. Wt. 1 oz. 1" wide: Net Wt. 0.092 oz.  
No. 2341  
2" wide: Net Wt. 0.184 oz.  
No. 2343

**SCREW EYES:** Specify size when ordering. (6 per pkg.) Ship Wt. 1 oz.

**LARGE EYE:**  
1" long: 0.04 oz.  
No. 2280

**SMALL EYE:**  
3/4" long: 0.03 oz.  
No. 2279

**EXTRA SMALL EYE:**  
5/8" long: 0.01 oz.  
No. 2281

**AR-5055 CENTERING RINGS:** For centering a BT-50 body tube within a BT-55. Extra strong for "D" engine mounts. Weight 0.062 oz. ea. (4 per pkg.) Ship Wt. 2 oz.  
No. 3102

**AR-2050 CENTERING RINGS:** For centering a BT-20 body tube within a BT-50. Greater strength makes for use with high thrust engines. Weight per pair 0.285 oz. (10 per pkg.) Ship Wt. 2 oz.  
No. 3100

**LAUNCH LUGS:** Super-strength laminated launch lugs feature mylar plastic core for durability, paper outer layer for easy gluing. Inside diameter 5/32" fit 1/8" launch rod. Ship Wt. 1 oz.

1 1/4" long (12 per pkg.) 2 3/8" long (10 per pkg.)  
No. 2321 2322

**MULTI-PURPOSE SET:** Includes a total of 20 rings for positioning BT-5 in BT-20; BT-5, BT-20, BT-30 in BT-50; and BT-5, BT-20 and BT-50 in BT-60. Also three universal tapered shrouds and instructions. Ship Wt. 2 oz.  
No. 85013

**SHOCK CORD:** Specify width when ordering. Ship. Wt. 1 oz. 1/8" wide: Net Wt. 0.039 oz. No. 2276  
1/4" wide: Net Wt. 0.078 oz.  
No. 2277

Also 36" long for greater stretch on those larger birds. 1/8" wide: Net Wt. 0.078 oz.  
No. 85744

**SHROUD LINES:** Build reliable, durable, custom parachutes with this strong, hard surface shroud line cord. Comes in 70 yard spools. Ship. Wt. 5 oz.  
No. 2340

**TAPE STRIPS:** For top strength, low bulk and low weight, fasten shroud lines with these 1/4" x 3/4" tape strips, in sheets of 12 strips. (6 sheets per pkg.) Ship. Wt. 1 oz.  
No. 38412

**SNAP SWIVELS:** For quick changes and reduced tangling in your recovery systems, use these tiny 1" long snap swivels. Net Wt. 0.01 oz. (12 per pkg.) Ship Wt. 1 oz.  
No. 2292

**ENGINE HOLDER:** Flat spring steel design gives easy installation and low drag. Recommended for sport and demonstration models. (3 per pkg.) Ship Wt. 1.0z.  
For Regular and "D" engines.  
No. 3140

For Mini-Engines  
No. 3142

**RA-2050 RINGS:** 20 rings for centering and mounting BT-20 in BT-50. (20 per pkg.) Ship Wt. 2 oz.  
3110

**RA-2055 RINGS:** 10 rings for centering and mounting BT-20 in BT-55. (10 per pkg.) Ship Wt. 2 oz.  
No. 3111

**RA-2060 RINGS:** 10 rings for centering and mounting BT-20 in BT-60. (10 per pkg.) Ship Wt. 2 oz.  
3113

**MAXI™ ROD LAUNCH LUG:** 2" long, fits 3/16" diameter launch rod. (4 per pkg.)  
No. 2328

**DOWELS:** Extra-strong lightweight seasoned maple dowels. (8 per pkg.) Ship Wt. 5 oz.  
1/8" x 18" 1/12" x 12"  
No. 3190 No. 3191

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Screw Eyes	70
Sentinel™ Kit	36
Sequence of Flight	4
Shock Cord	70
Shroud Line	70
Sizzler™ Kit	22
Sizzler™ Starter Set	9
Skinny Mini™ Kit	16
Sky Hook™ Kit	20
Snap Swivels	70
Software, Computer	65
Space Shuttle™ Kit	56
Space Shuttle Columbia™ Kit	36
Space Shuttle™ Starter Set	5
Sparrow™ Kit	14
Sprite™ Kit	20
SR-71 Blackbird™ Kit	44
Stage Couplers	69
Starbird™ Kit	38
Star Seeker™ Kit	30
Starter Sets	3,5,7,9,10,11
Stealth™ Kit	44
Sting Ray™ Kit	30
Streamer Material	70
Sunbird™ Kit	22

## -T-U-V-

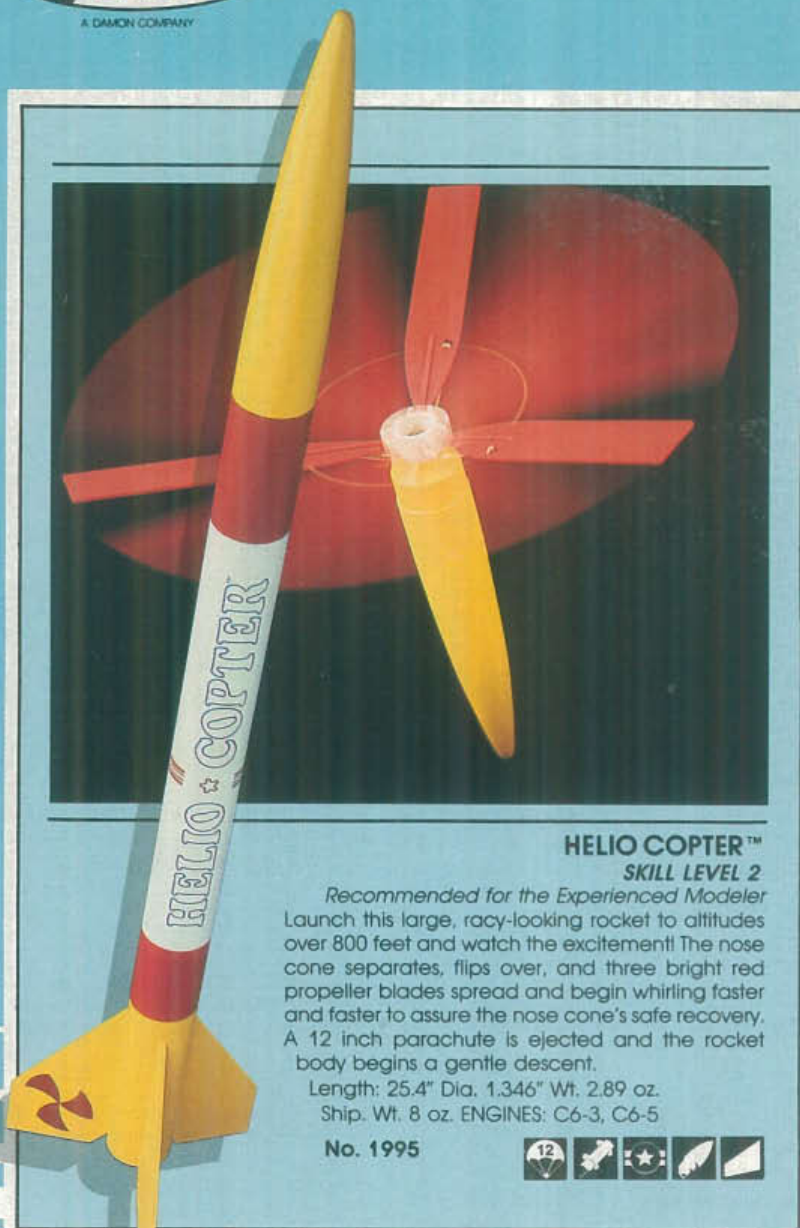
Tape Strips	70
Transtar Carrier™ Kit	20
Vector™ Kit	14
Viking™ Kit	26
Voyager™ Kit	40

## -W-X-Y-Z-

Wadding, Recovery	60
Warranty	2
Wizard™ Kit	16
X-15™ Ready-To-Fly Set	7
X-15™ Power Kit	7
X-16™ Kit	46
Yankee™ Kit	12
Yankee Clipper™ Kit	28
Zinger™ Kit	12
Zipper™ Kit	12



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## HELIO COPTER™

SKILL LEVEL 2

*Recommended for the Experienced Modeler*  
Launch this large, racy-looking rocket to altitudes over 800 feet and watch the excitement! The nose cone separates, flips over, and three bright red propeller blades spread and begin whirling faster and faster to assure the nose cone's safe recovery. A 12 inch parachute is ejected and the rocket body begins a gentle descent.

Length: 25.4" Dia. 1.346" Wt. 2.89 oz.

Ship. Wt. 8 oz. ENGINES: C6-3, C6-5

No. 1995



PN 2881

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