

# Flying Model Rocket Catalog



A DAMON COMPANY

861P  
\$1.00

Featuring "New" Electron Beam Launch Controller, Page 61.  
Plus More Than 20 "New" Model Rocket Products.







**REAL  
ROCKET  
LIFT-OFFS!**

**FLIGHTS  
OVER  
2000 FEET!**



**ALPHA III  
FLYING MODEL  
ROCKETRY STARTER KIT**

*SKILL LEVEL 1 Recommended for the Beginning Modeler. Includes easy-to-build Alpha III model rocket kit. Pre-colored Parts - no painting required! Also includes Porta-Pad tripod launcher with blast deflector plate and 1/8" x 36" two-piece launch rod, pre-assembled Electron Beam Launch Controller and Flight Pak including three NAR safety-certified model rocket engines, parachute recovery wadding and Solar 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

**\$21.95**



**SKILL LEVEL 1  
STARTER KIT**

**THE PLACE TO START!**

NOW WITH

**NEW**  
PRE-ASSEMBLED ELECTRON BEAM™ LAUNCH CONTROLLER



**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 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, failure 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

**5** RECOVERY PARACHUTE IS DEPLOYED

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

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

**6** TOUCHDOWN & SAFE RECOVERY

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

**7** READY TO BLAST-OFF AGAIN!

# SKILL LEVEL 1 STARTER KIT



## CHALLENGER - 1 FLYING MODEL ROCKETRY STARTER KIT

**SKILL LEVEL 1** Recommended for the Beginning Modeler. Includes easy-to-assemble, high-performance Challenger-1 model rocket featuring orange plastic nose cone and fin unit. No painting required! Flights over 1000 feet. Also includes Challenger-1 launch control system with futuristically designed launch controller, 15 feet of launch cable, micro-clips, launch pad with blast deflector plate and 1/8" x 36" launch rod. Flight Pak includes three NAR safety-certified model rocket engines, parachute recovery wadding and reliable Solar Igniters for three exciting flights. (Requires 6 or 12 volt lantern battery and glue - Not Included). Ship. Wt. 1 lb.

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

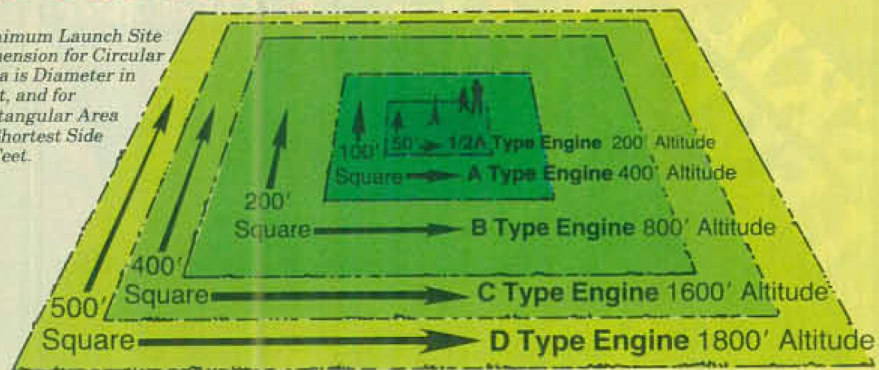
No. 1416  
\$14.95





## RECOMMENDED LAUNCH AREA:

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 diagram shows the smallest recommended launch areas. **MAKE SURE THE LAUNCH AREA IS FREE OF OBSTRUCTIONS, DRY WEEDS, BROWN GRASS, OR HIGHLY FLAMMABLE MATERIALS.**



## NAR/HIA MODEL ROCKETRY SAFETY CODE

- Construction**—My model rockets will be made of lightweight materials such as paper, wood, plastic and rubber, without any metal as structural parts.
- Engines**—I will use only pre-loaded factory-made NAR safety-certified model rocket engines in the manner recommended by the manufacturer. I will not change in any way nor 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.
- Weight Limits**—My model rocket will weigh no more than 453 grams (16 oz.) at lift-off and the engine will contain no more than 113 grams (4 oz.) of propellant.
- Stability**—I will check the stability of my model rockets before their first flight, except when launching models of already proven stability.
- Launching System**—The system I use to launch my model rockets must be remotely controlled and electrically operated, and will contain a switch that will return to "off" when released. I will remain at least 15 feet from any rocket that is being launched.
- Launch Safety**—I will not let anyone approach a model rocket on a launcher until I have made sure that either the safety interlock key has been removed or the battery has been disconnected from my launcher.
- Flying Conditions**—I will not launch my model rockets in high winds, near buildings, power lines, tall trees, low flying aircraft, or under any conditions which might be dangerous to people or property.
- Launch Area**—My model rockets will always be launched from a cleared area, free of any easy to burn materials, and I will only use flame resistant recovery wadding in my rockets.
- Jet Deflector**—My launcher will have a jet deflector device to prevent the engine exhaust from hitting the ground directly.
- Launch Rod**—To prevent accidental eye injury I will always place the launcher so the end of the rod is above eye level or cap the end of the rod with my hand when approaching it. I will never place my head or body over the launching rod. When my launcher is not in use I will always store it so that the launch rod is not in an upright position.
- Power Lines**—I will never attempt to recover my rocket from power lines or other dangerous places.
- Launch Targets & Angle**—I will not launch rockets so their flight path will carry them against targets on the ground, and will never use an explosive warhead nor a payload that is intended to be flammable. My launching device will always be pointed within 30 degrees of vertical.
- 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.

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 \_\_\_\_\_

SKILL LEVEL 1  
STARTER KIT

## DELUXE

### FLYING MODEL ROCKETRY STARTER KIT

**SKILL LEVEL 1** Recommended for the Beginning Modeler. Complete with everything you need including Alpha model rocket kit, construction supplies, finishing materials, Porta-Pad Launch Pad with blast deflector plate and two-piece 1/8" x 36" launch rod, pre-assembled Electron Beam Launch Controller, and Flight Pak with 3 high performance NAR safety-certified model rocket engines, Solar Igniters and parachute recovery wadding.

(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  
\$27.95



New —  
Pre-Assembled  
**ELECTRON BEAM™**  
Launch Controller  
Included!





# 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.)

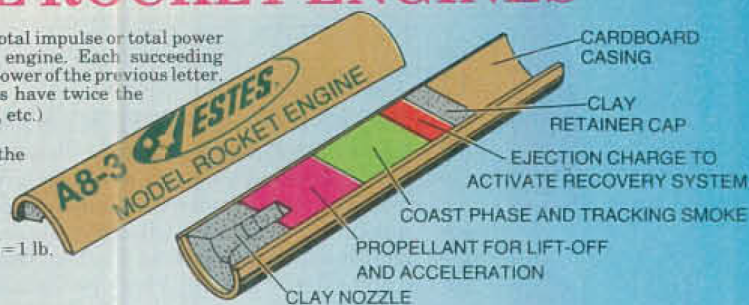
**Average thrust = Newton-seconds divided by thrust duration.**

**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.

Twenty-eight 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 "SAFETY AND CONTEST CERTIFIED" by the National Association of Rocketry.

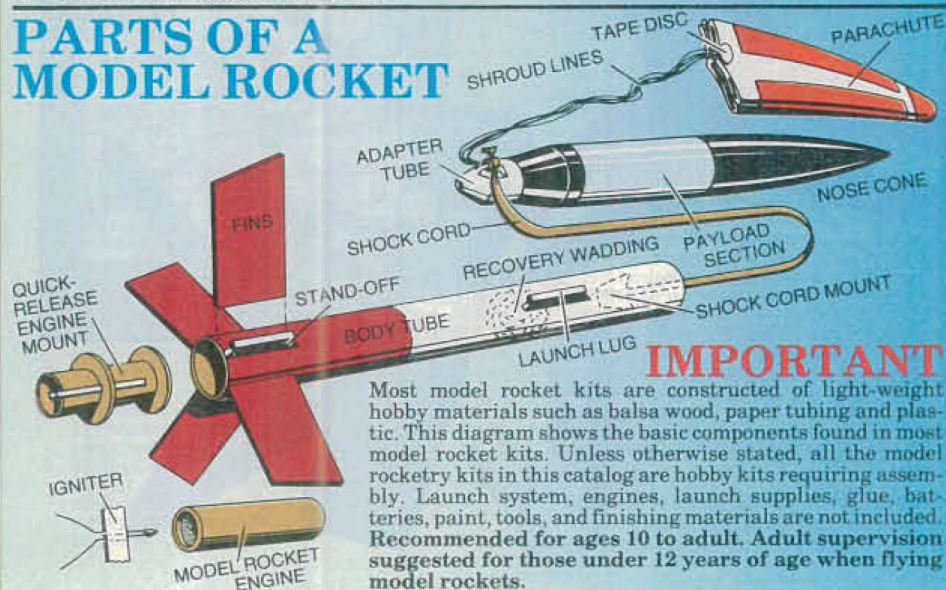


Estes model rocket engines have been proven consistent and reliable in more than 250,000,000 launchings.



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 to adult. Adult supervision suggested for those under 12 years of age when flying model rockets.

# SKILL LEVEL 1 STARTER

## SIZZLER FLYING MODEL ROCKETRY STARTER KIT

**SKILL LEVEL 1** Recommended for the Beginning Modeler. Includes the 23 inch long Sizzler model rocket kit featuring parachute recovery and flights over 500 feet. Also included are the pre-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 safety-certified model rocket engines, parachute recovery wadding and Solar 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

\$25.95



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




## 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

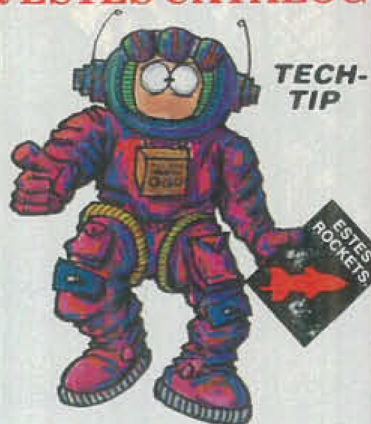
 Balsa Nose Cone

 Die-Cut Balsa Fins or Paper Parts

 Plastic Fins or Fin-Unit

 Kit Decals

 Quick-Release Engine Mount



Also, be sure to read your catalog thoroughly to find my Tech Tips. These tips will enable you to receive greater enjoyment in all your model rocketry activities. Keep 'em flying!

**Model Rocketry Is An Internationally Recognized Hobby With A Safety Record Of More Than 250 Million Successful Model Rocket Launchings.**

**Estes Model Rocket Engines Are Safety Tested And Contest Certified By:**

- U.S. National Association of Rocketry
- Canadian Association of Rocketry

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

- United States Department of Transportation
- Truesdail Laboratories, Inc.
- Canadian Department of Energy, Mines, and Resources
- Government of West Germany

**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
- Inter-Governmental Maritime Consultative Organization
- Air Line Pilots Association

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

- Cub Scouts of America
- Boy Scouts of America
- YMCAs
- National 4-H Clubs
- Civil Air Patrol
- NASA
- United States Air Force
- U.S.A.F.-J.R.O.T.C. Programs
- 15,000 Elementary, Jr. High, and High Schools
- Major Colleges and Universities
- Hundreds of Camp and Recreation Programs
- Hobby Industry of America



**JOIN THE ESTES  
AEROSPACE CLUB.  
SEE PAGE 28.**

**INTERESTED IN  
AERIAL PHOTOGRAPHY?  
SEE PAGE 29.**



**SKILL  
LEVEL 3  
OUTFIT**

## STEALTH ELITE FLYING MODEL ROCKETRY OUTFIT

**SKILL LEVEL 3** Recommended for the Advanced Modeler. This elite outfit for the advanced model builder features the futuristic Stealth fighter (see Page 44) capable of flights to 900 feet. Also included is the high-technology Power-Pulse™ Launch Controller, Porta-Pad Launch Pad with blast deflector and 1/8" x 36" launch rod, plus three NAR safety-certified model rocket engines, parachute recovery wadding and Solar Igniters. "The Modelers' Choice" to update your model rocketry fleet. (Requires 6 volt Polaroid™ Pola-Pulse™ P-100 battery, white glue, plastic cement, contact cement, paint and finishing supplies - Not Included.) Ship Wt.: 2 lbs. ENGINES: A8-3, B4-4 (1st Flt.), B6-4, C5-3, C6-3, C6-5.

No. 1436 \$26.95





## SKILL LEVEL 1

*Recommended for the Beginning Modeler.*

### COURIER

**SKILL LEVEL 1** Single Stage Performance. Scale-like appearance of two-stage sounding rocket. Flights over 1100 feet. Length: 12.13" Dia. 0.736" Wt. 0.53 oz.

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

No. 1911

\$3.95



### 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

\$2.95



### 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

\$2.49



### 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

\$1.49



### 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

\$2.49



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





## SKILL LEVEL 1

Recommended for the Beginning Modeler.

### STREAK

**SKILL LEVEL 1** Lightweight, wind-cheating design (1/8 oz. without engine). Great for contests and records. Features simple feather-weight recovery. Length: 5.6" Dia. 0.720" Wt. 0.1 oz.

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

No. 1204

\$2.95



### STAR DART

**SKILL LEVEL 1** High performance, mini-engine powered sport rocket. Flies over 1,000 feet and returns via streamer recovery. Very easy-to-assemble. Length 8.4" Dia. 0.541" Wt. 0.225 oz.

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

A3-4T, A10-3T

No. 0860

\$2.95



### 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

\$2.49



### 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

\$2.49



### SPIN FIN

**SKILL LEVEL 1** Unique spin-flight design creates dramatic curling smoke trail on its way up. Spectacular flights over 1,200 feet with 30" streamer recovery. Length: 11.6" Dia. 0.736" Wt. 0.6 oz.

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

No. 1355

\$3.95

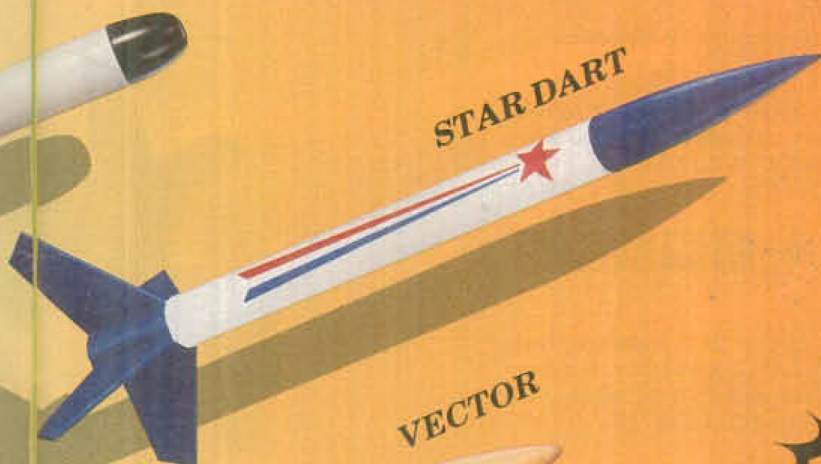


Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 8 oz.

STREAK



STAR DART



VECTOR



NEW

SPARROW



SPIN FIN

SPIN FIN



SKILL LEVEL 1



## SKILL LEVEL 1

Recommended for the Beginning Modeler.

### COUGAR

**SKILL LEVEL 1** High performance, sleek sport flier can attain altitudes over 1000 feet.

Length: 17.5" Dia. 0.976" Wt. 1.06 oz.

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

No. 1923

\$4.49



### 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

\$2.95



### BIG YANK

**SKILL LEVEL 1** Mini-engine powered sport flier. Easy-to-build and capable of flights over 400 feet. Length: 26.5" Dia. 0.736" Wt. 0.92 oz.

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

No. 0868

\$3.95



### 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

\$2.95



## TECH-TIP #1



## 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.

COUGAR

COUGAR

LASER

BIG YANK

BIG YANK

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.*

### ECLIPSE

**SKILL LEVEL 1** Reach altitudes over 600 feet with this great Mini-Brute sport flier. Very high performance design. Length: 12.1" Dia. 0.736" Wt. 0.51 oz.

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

No. 0846

\$5.49



### ASTRO BEE

**SKILL LEVEL 1** Reach altitudes over 1,200 feet with this sounding rocket style design. Length: 14.75" Dia. 0.976" Wt. 0.823 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. 1356

\$5.49



### 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

\$2.95



### STINGER

**SKILL LEVEL 1** A sleek sport performer capable of flights over 1000 feet. Easy-to-build and fun-to-fly. Length: 13.5" Dia. 0.976" Wt. 0.98 oz.

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

No. 1905

\$4.95



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





## 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

\$4.95



### 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

\$2.95



### MAVERICK

**SKILL LEVEL 1** This sleek sport performer features streamer recovery and flights over 1000 feet. Easy-to-build and fun-to-fly. Length: 16.5" Dia. 0.976" Wt. 1.13 oz.

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

No. 1904

\$4.95



### CYCLONE

**SKILL LEVEL 1** Flights over 800 feet make this one you'll want to add to your fleet. Unique decal and big size make it ideal for demos. Length: 16" Dia. 1.32" Wt. 1.48 oz.

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

No. 1907

\$5.95



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



Adam Gooder, St. Paul, MN





## 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, C6-7

No.1936

\$3.49



### 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

\$5.95



### 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

\$5.95



### 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.

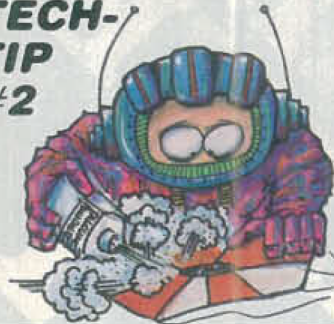
No. 1225

\$4.95



## ROCKET RECOVERY

**TECH-TIP**  
#2



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.*

### KADET

**SKILL LEVEL 1** Achieve flights over 1,000 feet with this super high flying sport model. Nearly indestructible with pre-colored plastic nose cone and fin-unit. Quick and easy-to-assemble. No painting required! Easy-track recovery with 30" fluorescent steamer. Length: 15" Dia. 0.98" Wt. 1.13 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. 1328

\$5.49



### MARAUDER

**SKILL LEVEL 1** Easy-to-build sport flier with large payload section. Flies cargo experiments to over 750 feet. Length: 20.4" Body Dia. 1.325" Payload Dia. 1.637" Wt. 2.3 oz.

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

No. 1922

\$5.95



### COMET

**SKILL LEVEL 1** High performance sport flier over 2 feet long. Quick and easy-to-assemble. Delivers great flights over 1,200 feet. Length: 24.25" Dia. 1.325" Wt. 1.8 oz.

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

No. 1368

\$6.49



### 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

\$2.95



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





## 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

\$5.95



### 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

\$3.49



### BIG BERTHA/Newly Updated!

**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. Newly updated with new decor, 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

\$6.95



### 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

\$2.49



### SCOUT II/Newly Updated!

**SKILL LEVEL 1** Updated version of Estes' first model rocket. Originally developed in 1959, Scout 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

\$2.49



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



SKILL LEVEL 1

NEW

NEW

NEW

NEW



# EAC

BECOME A MEMBER OF THE MOST EXCITING ROCKET CLUB ON EARTH!

## ESTES AEROSPACE CLUB



### THRUST BAR ACHIEVEMENT PROGRAM



**SKILL LEVEL 1**  
Recommended for the Beginning Modeler

**SKILL LEVEL 2**  
Recommended for the Experienced Modeler

**SKILL LEVEL 3**  
Recommended for the Advanced Modeler

**SKILL LEVEL 4**  
Recommended for the Master Modeler

### ESTES AEROSPACE CLUB

Join more than 25,000 Estes rocketeers getting the most out of model rocketry. The EAC Thrust Bar Achievement Program awards members with iron-on thrust bars & achievement certificates as they progress from one skill level to the next. Your membership includes:

**VIPER ROCKET KIT**  
Club's Exclusive High Performance Design.

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

**MEMBERSHIP CERTIFICATE CLUB EMBLEM**

Official iron-on patch. As you progress to higher skill levels, you receive additional iron-on "thrust" bars.

**DECAL SHEET**  
Identify your rockets as part of the EAC fleet!

**COPY OF MODEL ROCKET NEWS**

Features free plan designs, technical articles, contests, rocketeer contributions and more.



**RANGE BOX STICKERS**  
**EAC STATIONERY**  
**MODEL ROCKETRY TECHNICAL MANUAL**  
Includes information on construction techniques, finishing, stability, tracking, recovery systems, multi-staging, and boost gliders plus much, much more.

**JOIN NOW!**  
**BECOME AN ESTES AEROSPACE CLUB ROCKETEER TODAY!!**

Simply Check the EAC box on your order form and include your payment. Ship. Wt. 9 oz. Regular EAC Membership.

No. 1447 \$6.49



TAKE REAL HIGH ALTITUDE PHOTOS!

# SKILL LEVEL 2



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.*



No. 1327 \$28.95

ENGINES: B8-5, C6-5, C6-7 (1st Flt.)



## 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

\$3.95



### 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

\$5.95

### RECOVERY SYSTEMS

#### TECH-TIP #3



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.



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



## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### 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

\$2.49



### 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

\$4.95



### SEARCHER

**SKILL LEVEL 2** This sporty model features sounding-rocket styling, parachute recovery and superb flights to 1000 feet. Nearly two feet tall. Length: 21.25" Dia. 0.736" Wt. 0.7 oz.

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

No. 1945

\$5.49



### 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

\$4.95



## TECH-TIP ROCKET STABILITY

#4



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

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

\$5.49

#### MAGICIAN

**SKILL LEVEL 2** Large "D" powered model features fast assembly, starry decals, and heavy-duty swept-back fins for sky-high flights of 1000 feet. 12" parachute provides gentle descent. Length: 16.75" Dia. 1.325" Wt. 1.5 oz.

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

No. 1943

\$5.49



#### HITCH-HIKER GLIDER

**SKILL LEVEL 2** Sleek, delta-wing design and styrofoam construction provide impressive performances. "Hitchhikes" a boost on other larger models. Then, glides free at apogee for duration times of 30 seconds or more. Can be hand-launched, too! Perfect choice for your first glider. Length: 5.97" Wing Span 9.99" Wt. 0.21 oz.

No. 9050

\$1.95

Booster rockets must be 18" or longer, have four fins, and a minimum body tube diameter of .976". Minimum "B" engine power required.

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



Photo Courtesy Societe Nationale Industrielle Aerospatiale (Product of France)

**NEW**  
MINI-SCALE  
COMBO PAK





## SKILL LEVEL 2

Recommended for the Experienced Modeler.

### NASA PEGASUS

**SKILL LEVEL 2** Medium range research craft for NASA missions after the Space Shuttle. Flies over 850 feet. Length: 19.75" Dia. 1.325" Wt. 2.36 oz.

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

No. 1376

\$8.49



### FLYING SAUCER

**SKILL LEVEL 2** Unidentified flying objects have been seen by thousands throughout time. Our version resembles a description given by many. This far-out space model with bright "alien" decals blasts off slowly and then flips over at apogee. The saucer shape slows its descent and it settles to Earth on its spring-bounce recovery system. Length: 3.3" Dia. 7.65" Wt. 2.6 oz.

ENGINE: C6-0(1st Flt.)

No. 1947

\$7.95



### 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

\$9.95



## TECH-TIP LAUNCH PADS

#5



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.



# SKILL LEVEL 2



## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### HALLEY'S TAIL

**SKILL LEVEL 2** In honor of the comet's return, this superb sport flier features three-color chrome decals and 12" chute recovery. Capable of flights to 800 feet, Halley's Tail ejects a fun-flying "comet" with streaming "tail"! Length: 16.75" Dia. 0.976" Wt. 1.41 oz.

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

No. 1952



\$5.95

### HALLEY'S COMET

Named in honor of Edmund Halley, who first accurately predicted the comet's return, Halley's Comet visits the Sun every 75-76 years.

The comet is theorized to be a large, "dirty, snowball" made of water, ammonia, methane, and heavier particles that traverses the Solar System in an elliptical orbit. Approaching the Sun, the comet nucleus (approximately 3.1 miles in diameter) warms and begins to vaporize creating a coma ranging from 12,000 - 120,000 miles in diameter. Solar winds push expanding vapors into an even lengthening tail which may become 120,000,000 miles long! The tail always points away from the Sun.

Halley's closest approach to Earth this visit will be 40,000,000 miles in April 1986. Visible to the unaided eye from November, 1985 through April, 1986 except during perihelion (when it's on the opposite side of the Sun) in February, 1986.

### 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



\$4.95

### 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



\$5.95

38



Photo Copyright Mt. Wilson Observatory, 1910.

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



## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### TITAN II

**SKILL LEVEL 2** Semi-scale version of the Titan ICBM with flights to 750 feet. Model features removable display engine nozzles and detachable clear plastic fin-unit which must be added for flight. Length: 19.5" Dia. 1.595" Wt. 2.37 oz.

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

No. 1918

\$7.49



### NEPTUNE

**SKILL LEVEL 2** Nearly 1½ feet tall, Neptune features surface-to-air missile appearance, flights to 900 feet with a "C" engine and 12" parachute recovery. Length: 17.375" Dia. 1.325" Wt. 1.72 oz.

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

C6-5, C6-7

1935

\$5.95



### DER RED MAX

**SKILL LEVEL 2** Far-out super-fun model. Large stable design gives great sport performance. Length: 16.25" Dia. 1.637" Wt. 2.38 oz.

ENGINES: B4-2 (1st Flt.), B4-4, B6-2, B6-4, B8-5, C6-5, C6-7

No. 0651

\$8.95



### 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.

1919

\$6.49



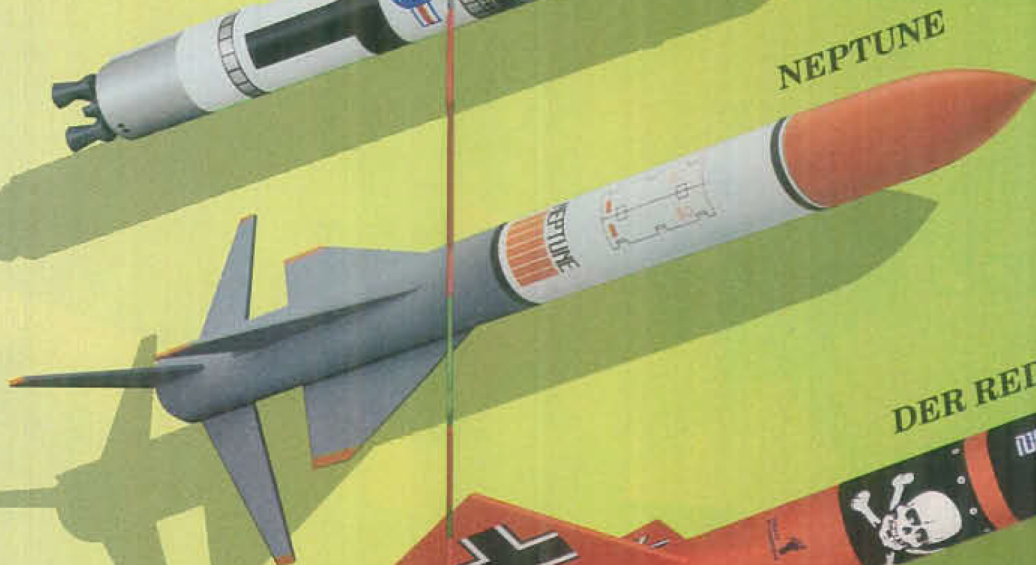
*Engines, launch system, glue and finishing supplies not included. Avg. Ship. Wt. 12 oz.*



A DAMON COMPANY



Photo Courtesy of NASA



SKILL LEVEL 2



## SKILL LEVEL 2

*Recommended for the Experienced Modeler.*

### DEFENDER

**SKILL LEVEL 2** "D" Powered high performance sport flier capable of flights over 1,200 feet. Length: 25" Dia. 1.325" Wt. 1.8 oz.

ENGINE: D12-5 (1st Flt.)

No. 1924

\$5.49



### 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

\$6.95



### 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

\$13.95



### 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.), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7.

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

Booster Stage: A8-0 (1st Flt.), B6-0, C6-0.

No. 1333

\$8.49



*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 ultrasound 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

\$10.95



### 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

\$6.95



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

ENGINE: D12-3 (1st Flt.)

No. 1380

\$13.95



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.*

### 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

\$5.95



### STARHAWK

**SKILL LEVEL 3** Light-years from here, eons from now, Starhawk keeps peace in another galaxy. Our model achieves flights of 1000 feet and gently descends with a 12" parachute. Length: 19.35" Dia. 0.976" Wt. 1.05 oz.

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

No. 1946

\$5.49



### 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

\$5.95



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



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



NIKE APACHE

NEW  
SKILL LEVEL 3



## SKILL LEVEL 3

*Recommended for the Advanced Modeler.*

### MARTE MK 2

**SKILL LEVEL 3** Our semi-scale model of the Italian air-to-ship missile will fly to 1000 feet with a single "C" engine and carry a payload, too! Length: 18.25" Dia. 0.736" Wt. 1.4 oz.

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

No. 1940

\$6.95



### DELTA WEDGE

**SKILL LEVEL 3** Exotic fighter capable of ultra-light speed passes through time-windows to evade or strike the enemy. Our model of this fighter can attain altitudes over 1,000 feet. Length: 16.5" Dia. 0.736" Wt. 1.52 oz.

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

No. 1931

\$4.95



### 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: A8-0(1st Flt.), B6-0, C6-0.

No. 1377

\$7.95



### D-REGION TOMAHAWK

**SKILL LEVEL 3** Our version of NASA's sounding rocket, Flight No. 12.08 G.T., is an excellent choice for your first scale model. Almost 3 feet tall, Tomahawk features large, easy-to-assemble parts and realistic flights to 800 feet. Recovery is via huge 18" parachute. A 3/16" Maxi-Rod recommended for launch. Length: 35.5" Dia. 1.637" Wt. 3.7 oz.

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

No. 1944

\$9.95



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





## SKILL LEVEL 3

Recommended for the Advanced Modeler.

### NEBULON WARRIOR

**SKILL LEVEL 3** Historic intergalactic warship model is high-lighted by unique vertical wing design and ominous decor. Flight altitudes of 800 feet are possible. Length: 16.5" Dia. 0.736" Wt. 1.3 oz.

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

No. 1939

\$6.49



### 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: A8-0 (1st Flt.), B6-0; C6-0.

Booster: D12-0 (1st Flt.).

No. 1382

\$7.95



### 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 (1st Flt.)

No. 0875

\$5.49



Scott Branche, Scarsdale, NY

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





## SKILL LEVEL 4

Recommended for the Master Modeler.

### BLACK BRANT II

An outgrowth of the 1950's 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 Canadair airframe, (17.2" dia. x 27' 8" tall), was aerodynamically stabilized by 3 fixed fins. Total fin span was 39". The motor contained 2,000 lbs. of solid propellant and delivered 16,000 pounds of thrust over a 25 second burn time. Total vehicle weight with propellant was 2,642 lbs.

The first two Black Brant IIs were launched in October 1960 at Fort Churchill, Canada. The next two were launched from Wallops Island, VA during November, 1961.

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. Complete with detailed plastic parts, three-color decal, huge 18" recovery parachute, and die-cut balsa fins, 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

\$7.95



### 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. Kit includes die-cut parts, balsa fins, plastic nose cone and sections, plus quick-release engine mount, and two-color decal. Length: 18" Wing Span: 11.5" Dia. 1.637" Wt. 2.2 oz.

ENGINES: B4-2 (1st Flt.), B6-2, C6-3.

No. 1961

\$7.95



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



Photo Courtesy: NASA



Seth White, Cleveland, OH



## SKILL LEVEL 4

Recommended for the Master Modeler.

### V-2

**SKILL LEVEL 4** Large semi-scale version of the World War II ballistic missile. The original German version stood 46 feet high, weighed over 14 tons and could travel as much as 200 miles at nearly 2,000 mph. 3/16" Maxi-Rod required for launch. Length: 22.4" Dia. 2.60" Wt. 4.9 oz.

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

No. 1926

\$10.95



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

### SOARING EAGLE

**SKILL LEVEL 4** Estes' first flex-wing glider. Goes up like a rocket, pod ejects and wings unfold. Glide times up to 2 minutes. Length: 23.6" Dia. 0.976" Wt. 2.42 oz.

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

No. 1373

\$9.49



### TECH-TIP

#6



### 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, 182 Madison Drive, Elizabeth, PA 15037. Your membership includes many benefits such as discounts, insurance, and a monthly subscription to American Spacemodeling Magazine.



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

# SKILL LEVEL 4



## SKILL LEVEL 4

Recommended for the Master Modeler.

### SPACE SHUTTLE

On a standard mission, the Orbiter will remain in orbit for 7 days, return to the Earth, land like an airplane, and be readied for another flight in 14 days. It can deploy and retrieve satellites and can place deep-space vehicles in their initial low-Earth orbit.

The Shuttle is comprised of the following three main units:

- Two solid rocket boosters (SRB's) which have a sea level thrust of 2,600,000 pounds each.
- The orbiter which is 121' long with a wing span of 79', weighs about 150,000 pounds without fuel. It has a payload bay 60' long and 15' in diameter. Payload capacity is 65,000 pounds.
- The external tank (ET) is 154' long and 28.6' in diameter. At lift-off the tank contains 1,550,000 pounds of liquid hydrogen and oxygen. These are in separate compartments of the tank and are fed to the orbiter's three main rocket engines which have a thrust of 470,000 pounds each. The tank is not reusable.

Maximum altitude of the Space Shuttle is 600 miles.

**SKILL LEVEL 4** Dramatic 1/162nd scale reproduction of America's newest space vehicle. Designed as a reusable near space transportation system with satellite deployment and retrieval capability. Delivers really spectacular flights. Semi-scale orbiter employs glide recovery just like the real thing while boosters and external tank return via 18" parachute recovery. Our model features special stabilizer fins for atmospheric flight which remove easily for display. Kit components include injection molded, vacuum-formed plastic and die-cut parts. Incredible display model with authentic NASA decor. Shuttle Length: 13.6" Dia. 2.04" Orbiter Length: 9.0" Orbiter Wingspan 7.1" Wt. 4.37 oz.

ENGINES: C5-3 (1st Flt.), C6-3.

No. 1284

\$17.95



### MERCURY REDSTONE

Between 1953 and 1958 Redstone had proven to be a reliable flight vehicle. Therefore, it was selected as the vehicle to carry the first American into sub-orbital flight. On May 5, 1961, Redstone lifted the Mercury capsule "Freedom 7" with Alan Shepard, Jr. inside to an altitude of 116.5 statute miles and traveled 302.8 miles down-range. The flight lasted 15 minutes and 22 seconds. Mercury-Redstone stood 83 feet tall, weighed (with fuel) 66,000 lbs. and delivered 78,000 lbs. of thrust.

**SKILL LEVEL 4** Historical 1/35 scale model of the Mercury sub-orbital rocket used to launch Alan Shepard into space flight May 5, 1961. Authentic detailing includes large decal and injection molded Mercury capsule and tower. Rocket and capsule each return to Earth via 12" chute recovery. Length: 28.75" Dia. 2.04" Wt. 3.0 oz.

ENGINE: C5-3 (1st Flt.).

No. 1921

\$12.95



Photo and STS DATA Courtesy of NASA



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



MERCURY REDSTONE



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

Avg. Ship. Wt. 12 oz.

SKILL LEVEL 4



# MODEL ROCKET ENGINES

Prod. No.	Engine Type	Prices 3 for	Total Impulse lb-sec (1)	n-sec (2)	Time Delay (±15%)	Max. Lift Wt.	Max. Thrust	Thrust Duration	Initial Weight Oz. G.	Propellant Weight Oz. G.
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## REGULAR ENGINES SINGLE STAGE ENGINES GREEN LABEL

1593	1/2A6-2	\$2.85	0.28	1.25	2 sec.	2.5 oz.	46 oz.	0.20 sec.	0.53 15.0	0.055 1.56
1596	A8-3	\$3.00	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	\$3.00	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	\$3.00	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	\$3.00	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	\$3.00	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*	\$3.15	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	\$3.25	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	\$3.25	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	\$3.25	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 OR BLUE LABEL

1599	A8-5	\$3.00	0.56	2.50	5 sec.	2.0 oz.	46 oz.	0.32 sec.	0.62 17.6	0.110 3.12
1604	B4-6	\$3.00	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	\$3.00	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	\$3.25	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

1600	A8-0	\$3.00	0.56	2.50	none	4.0 oz.	48 oz.	0.30 sec.	0.51 14.2	0.110 3.12
1608	B6-0	\$3.00	1.12	5.00	none	4.0 oz.	48 oz.	0.80 sec.	0.58 16.4	0.220 6.24
1618	C6-0	\$3.25	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 II 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

1666	D12-3	\$5.49	4.48	20.0	3 sec.	14 oz.	9 lb.	1.70 sec.	1.49 42.2	0.879 24.93
1667	D12-5	\$5.49	4.48	20.0	5 sec.	10 oz.	9 lb.	1.70 sec.	1.52 43.1	0.879 24.93

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

1668	D12-7	\$5.49	4.48	20.0	7 sec.	8 oz.	9 lb.	1.70 sec.	1.55 44.0	0.879 24.93
1669	D11-9	\$5.49	3.37	15.0	9 sec.	8 oz.	6.3 lb.	1.40 sec.	1.51 42.9	0.65 18.50

## BOOSTER ENGINES RED LABEL

1665	D12-0	\$5.49	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 6 1/2 oz.

Prod. No.	Engine Type	Prices 4 for	Total Impulse lb-sec (1)	n-sec (2)	Time Delay (±15%)	Max. Lift Wt.	Max. Thrust	Thrust Duration	Initial Weight Oz. G.	Propellant Weight Oz. G.
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## MINI ENGINES SINGLE STAGE ENGINES GREEN LABEL

1503	1/2A3-2T	\$3.00	0.28	1.25	2 sec.	2 oz.	28 oz.	0.36 sec.	0.198 5.6	0.062 1.75
1507	A3-4T	\$3.15	0.56	2.50	4 sec.	2 oz.	28 oz.	0.86 sec.	0.268 7.6	0.124 3.50
1511	A10-3T	\$3.15	0.56	2.50	3 sec.	5 oz.	48 oz.	0.26 sec.	0.277 7.9	0.133 3.78

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

1504	1/2A3-4T	\$3.00	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	\$3.15	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 x .500 in. dia. Ship Wt. of each package of mini-engines is approximately 2 1/2 oz.

Complete instructions and Solar Rocket 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 x thrust duration = Newton-seconds. Newton-seconds ÷ by 4.45 = Pound-seconds.

**SOLAR IGNITERS:** Add increased reliability at lift-off with Estes Solar 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  
\$1.49

## ASTRON IGNITERS:

Easy to use for reliable ignition every time. Recommended only for launch systems using 6 or 12 volt car batteries or 12 volt lantern batteries. (Patent No. 3,363,559). (Six per pkg.) Ship Wt. 1 oz.

No. 2225  
\$1.49

## RECOVERY WADDING:

Provides protection from hot ejection gases for parachutes and streamers. Each package contains approximately 75 4 1/2" squares—enough wadding for up to 25 flights. Instructions for installation are included in each package. Ship Wt. 6 oz.

No. 2274  
\$1.49

## BLAST-OFF FLIGHT PAK

Ideal engine assortment. Features 24 of the most popular Estes model rocket engines, plus Solar Igniters and Parachute Recovery Wadding. Priced at an excellent savings. Includes six each 1/2A6-2, A8-3, B6-4, and C6-5 high performance model rocket engines, one pkg. parachute Recovery Wadding, and 30 Solar Igniters. Ship Wt. 1 lb. 8 oz.

No. 1672  
\$17.95

## TECH-TIP

#7



## 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.



## ALTI TRAK™

**ALTITUDE FINDER** Skill Level 1  
Track your rocket to the top of its flight and instantly lock-in its altitude on the "new" 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.  
No. 2232

**\$8.95**

## PHANTOM

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

**\$4.95**

## 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.  
No. 2231

**\$10.95**



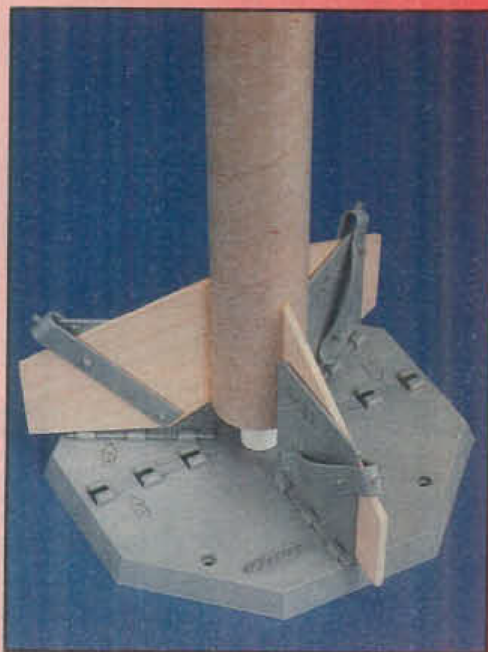
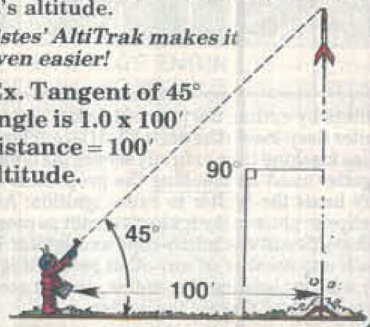
### TECH-TIP #8

#### 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.



# ELECTRON BEAM™

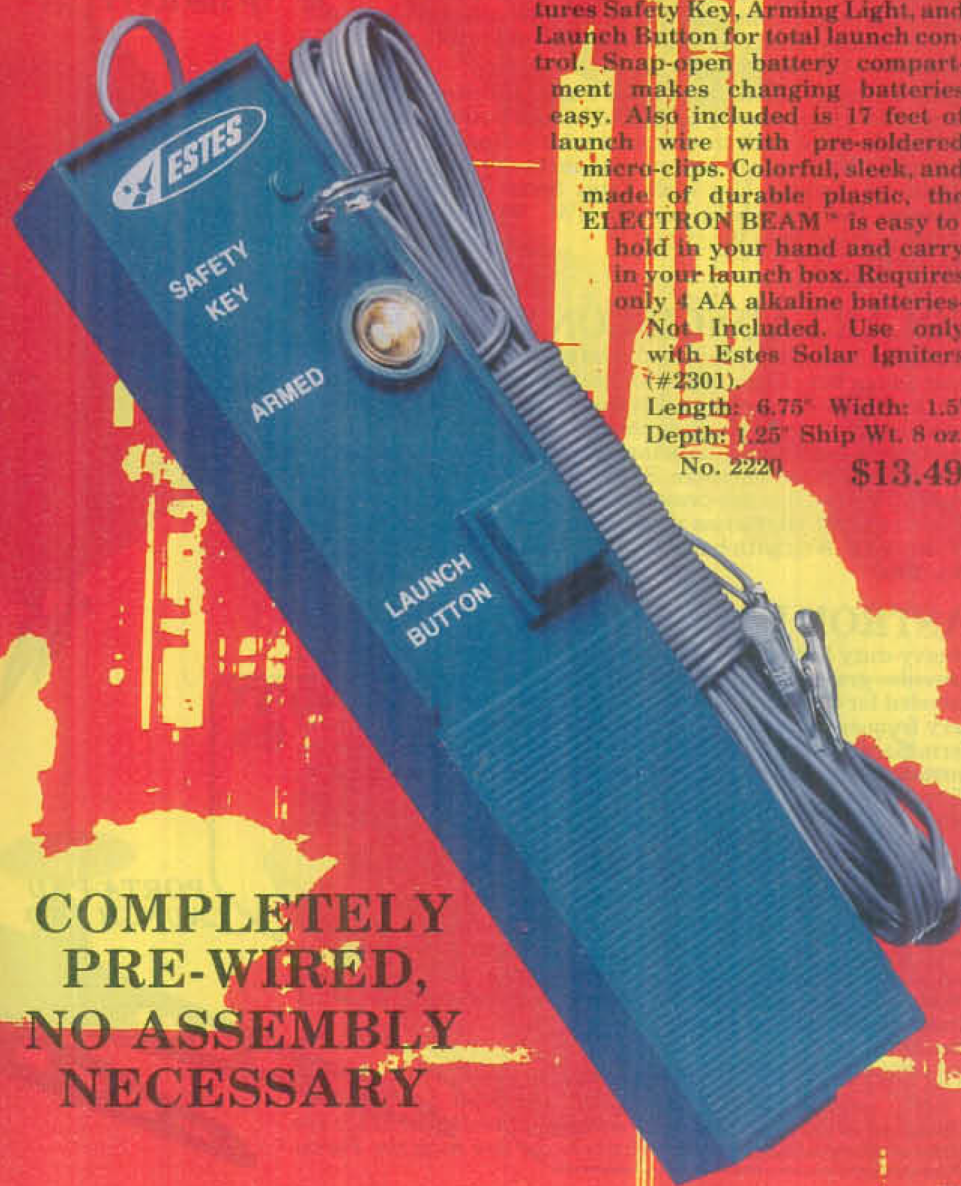
## LAUNCH CONTROLLER



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 Solar Igniters (#2301).  
Length: 6.75" Width: 1.5"  
Depth: 1.25" Ship Wt. 8 oz.  
No. 2220

**\$13.49**

**COMPLETELY  
PRE-WIRED,  
NO ASSEMBLY  
NECESSARY**





## POLAROID® POLAPULSE™ P-100 BATTERY

Revolutionary new, super thin, high performance, 6 volt battery. Measures only 3.7" high by 3" wide by 0.18" thick, yet packs the power for more than 150 launchings. Use with Power-Pulse Launch Controller (No. 2210) and Solar Igniters (No. 2301) Ship Wt. 4 oz.

No. 2211

\$4.49

## POWER-PULSE™ LAUNCH CONTROLLER

Slim line, launch controller uses 6 volt, Polaroid® Polapulse™ P-100 battery. Delivers consistent ignition performance for more than 150 launchings.

Made of rugged plastic, the Power-Pulse launch controller features safety key, arming light, and launch button, plus 15 feet of launch cable and pre-soldered micro-clips. Very easy-to-assemble. Battery can be removed instantly for use in other electronic devices. Use with Estes Solar Igniters (#2301). (Battery Not Included.) Length: 4<sup>7</sup>/<sub>8</sub>" Width: 3<sup>7</sup>/<sub>8</sub>" Depth: 1<sup>5</sup>/<sub>16</sub>" to 1<sup>3</sup>/<sub>16</sub>" Ship Wt.: 12 oz.

No. 2210

\$11.49

## SOLAR LAUNCH CONTROLLER

The Solar Launch Controller should be standard equipment in your range box. Launch control unit requires only 4 alkaline AA batteries for power. Advanced shape allows for perfect hand-held control. Unit is easily assembled and features safety key, continuity check lamp, ignition button and 15 feet of lightweight launch cable. System is constructed of durable plastic. Micro-clips are presoldered. Use with Estes Solar Igniters (#2301). (Batteries not included.) Length: 6.1" Ht. 2.4" Width 1.44" Wt. (with batteries) 7 oz. Ship Wt. 8 oz.

No. 2300

\$12.95

## 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

\$10.95

## 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

\$10.95

The Electron Beam™ Launch Controller (#2220), the Power-Pulse™ Launch Controller (#2210), the Solar Launch Controller (#2300) or the Astron Launch Controller (#2212) are the recommended launch controllers for use with the Porta-Pad (#2217).

62



POLAROID®  
POLAPULSE™  
P-100 BATTERY



POWER-PULSE™  
LAUNCH CONTROLLER

SOLAR LAUNCH  
CONTROLLER



ASTRON LAUNCH  
CONTROLLER



PORTA-PAD  
LAUNCH PAD



### TECH TIP #9



### 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. Countdown .5-4-3-2-1-0 . . .press and hold the launch button depressed until the rocket lifts off.



## STAR BATTLE™ WINDSOCK

Colorful "Star Battle™" is depicted on a large plastic windsock. This great addition to your model rocketry collection is ideal for checking wind direction and detecting thermals at the launch site. Hang outside to rustle in the breeze or suspend from the ceiling for fun inside decor. Completely assembled with bridle. (String Not Included.) Length: 42" Dia. 6.125" Wt. 2 oz.. Ship. Wt. 8 oz.

No. 122890 **\$1.99**

**3/16" DIA. MAXI-ROD:** Perfect for launching giant models and other large rockets. Fits Porta-Pad Tripod (#2217). Two-piece construction 36" long, light-weight aluminum launch rod. Collapsible for easy storage. Includes Safety Cap & Key. Ship Wt. 12 oz.

No.2244 **\$3.95**

**1/8" DIA. TWO PIECE LAUNCH ROD:** Handy collapsible two-piece rod for portable launchers. Pieces slip together to make a 36" long rod. Base rod has a diameter of 1/8". Includes Safety Cap & Key. Ship Wt. 6 oz.

No. 2243 **\$2.95**

**LAUNCH ROD SAFETY CAP with UNIVERSAL SAFETY KEY:** For Launch Pad Safety! Includes plastic launch rod cap, universal safety key, and elastic cord. Fits all Estes launch control systems. Ship Wt. 4 oz.

No. 2205 **\$ .95**

**MICRO-CLIPS:** Equip your launcher with the best. Spring-loaded solid steel clips connect lead wires to igniters. Easy-to-clean and highly conductive with flat contact surfaces. Only 1.1 inches long. Attach to leads with or without solder. (2 per pkg.) Ship Wt. 1 oz.

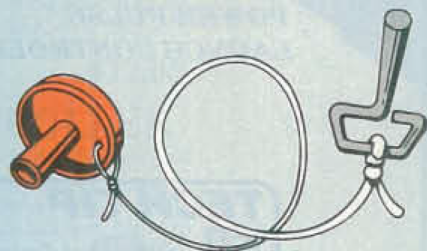
No. 2247 **\$ .95**

**BLAST DEFLECTOR PLATE:** Slip-on metal deflector plate fits any launcher using 1/8" or 3/16" rods. Protects launcher base from rocket blast. Four-inch diameter. Ship Wt. 5 oz.

No. 2241 **\$1.95**

**BATTERY CLIPS:** Hook-up to car batteries. Heavy-duty clips connect to terminals up to 1" in dia. With insulators. (2 per pkg.) Ship Wt. 5 oz.

No. 2245 **\$1.75**



**LAUNCH  
SUPPLIES**

## 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.

- |                     |                              |
|---------------------|------------------------------|
| <b>Body Tubes</b>   | <b>Recovery Equipment</b>    |
| 2 BT-5              | 3 Shock Cord 1/8" x 18"      |
| 2 BT-20             | 1 Shock Cord 1/8" x 36"      |
| 2 BT-50             | 1 Shock Cord 1/4" x 36"      |
| 1 BT-55             | 1 Streamer Material 1" x 30" |
| 1 BT-60             | 6 Screw Eyes                 |
| <b>Nose Cones</b>   | <b>Miscellaneous</b>         |
| 1 BNC-5E            | 3 Engine Blocks (EB-20A)     |
| 1 BNC-5S            | 3 Engine Holders (EH-3)      |
| 1 BNC-20B           | 3 Engine Holders (EH-2)      |
| 1 BNC-20R           | 1 Engine Mount (EH-2050)     |
| 1 PNC-50KA          | 1 Engine Mount (EH-2060)     |
| 1 PNC-50Y           | 1 Nose Block (NB-20)         |
| 1 PNC-55AC          | 1 Nose Block (NB-50)         |
| 1 PNC-60L           | 1 Stage Coupler (JT-55C)     |
| <b>Fin Material</b> | 1 Stage Coupler (JT-60C)     |
| 2 BFS-20            | 1 Balsa Adapter (TA-2050A)   |
| 2 BFS-30            | 1 Multi-Purpose Paper        |
| 2 BFS-40            | Adapter Set (TA-1)           |
| <b>Parachutes</b>   | 12 Launch Lugs (2-3/8" long) |
| 1 PK-10             | 1 Alpha Book of Model        |
| 2 PK-12             | Rocketry                     |
| 1 PK-18             | 1 Fin Pattern Sheet No. 2    |
| 1 PK-24             | 1 Fin Pattern Sheet No. 3    |

No. 1463 **\$23.95**



## 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             | 12" Parachute             |
| Screw Eyes            | 1/8" and 1/4" Shock Cords |
| White Glue            | 144" Shroud Line          |
| Launch Rod Safety Cap | Tape Discs                |
| Universal Safety Key  | Launch Lugs               |
| Recloseable Pouch     | Shock Cord Mounts         |
| Recovery Wadding      |                           |

No. 2233 **\$2.95**



## FUTURISTIC PARTS ASSORTMENT

Create your own interplanetary voyagers and space fighters with this selection of science-fiction-style parts. Over 50 parts! Includes special exotic fin patterns and design idea sheet. Ship Wt. 2 lbs.

- |                     |                            |
|---------------------|----------------------------|
| <b>Body Tubes</b>   | <b>Recovery Equipment</b>  |
| 1 BT-5              | 3 Shock Cord 1/8" x 18"    |
| 1 BT-20             | 1 Shock Cord 1/4" x 36"    |
| 2 BT-50             | 1 Streamer Material        |
| 2 BT-55             | 1" x 30"                   |
| <b>Nose Cones</b>   | <b>Miscellaneous</b>       |
| 1 PNC-50KA          | 1 Nose Block (NB-20)       |
| 1 PNC-50F           | 1 Nose Block (NB-50)       |
| 1 PNC-50SP          | 1 Multi-Purpose Adapter    |
| 1 PNC-50            | Set (TA-1)                 |
| 1 PNC-55B           | 1 Fin Pattern Sheet        |
| <b>Fin Material</b> | 1 Exotic Fin Pattern Sheet |
| 2 BFS-20            | 1 Design Idea Sheet        |
| 2 BFS-30            | 1 Mini Alpha Book of       |
| 1 BFS-40            | Model Rocketry             |
| <b>Parachute</b>    | 3 Engine Blocks (EB-20A)   |
| 1 PK-10             | 1 Stage Coupler (JT-50C)   |
| 2 PK-12             | 1 Stage Coupler (JT-55C)   |
| 1 PK-18             | 3 Engine Holders (EH-2)    |
| 1 PK-24             | 12 Launch Lugs (LL-2B)     |
|                     | 2 Engine Mounts (EH-2050)  |

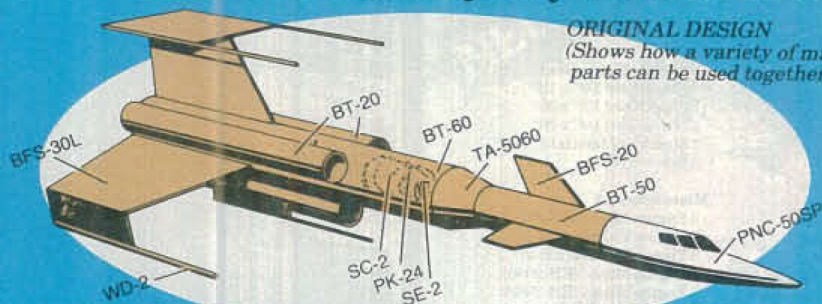
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# Build Your Own Design

## With Estes Quality Model Rocket Parts



**ORIGINAL DESIGN**  
(Shows how a variety of matching parts can be used together.)

Once you have constructed several model rocket kits and have become familiar with the basic Estes Technical Reports you will no doubt have a variety of ideas for unique designs of your own. In order to select the proper parts for your original design it is important for you to understand our system of parts description numbers.

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. Normally, parts listing the same series description number will be interchangeable with each other. For instance, a #20 body tube (BT-20) would mate with a #20A balsa nose cone (BNC-20A), a #20C payload section (PS-20C), 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. For ordering, be sure to use both the product number and the series description number (name).

**WIN \$75.00 IN FREE MERCHANDISE!**  
**ENTER THE DESIGN OF THE MONTH CONTEST**

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

- All entries become the property of Estes Industries and cannot be returned.
- Employees of Estes Industries and members of their immediate families are not eligible.
- Any type of model rocketry design can be entered (rockets, boost-gliders, launching or recovery devices, etc.).
- 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.
- Entries will be judged on practicality, originality, neatness, completeness, and clarity. All plans must be flight tested and proven.
- Your design entry should include a parts list and any instructions or diagrams you feel would be helpful.
- Please do not send the actual model as it cannot be returned.
- Photos of entries are greatly appreciated, but are not required.
- You may send as many entries as you like.
- New contest every month.
- 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.)
- 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.
- Designs should be sent to the Design of the Month, c/o MRNM Editor, Estes Industries, Inc. 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 Competition.
- 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!!!**



### 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	\$1.49
2264	PK-12	12 inches	\$1.49
2267	PK-18	18 inches	\$1.95
2271	PK-24	24 inches	\$1.95

**TAPE DISCS:** Fasten shroud lines to plastic parachutes or streamers with these 3/4" diameter sensitive Tape Discs. In sheets of 6 discs. (4 sheets per pkg.) Ship Wt. 1 oz. No. 2294 **\$1.55**

**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 **\$2.65**  
2" wide: Net Wt. 0.184 oz. No. 2343 **\$2.90**

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

**LARGE EYE:** 1" long; 0.04 oz. No. 2280 **\$1.45**

**SMALL EYE:** 3/4" long; 0.03 oz. No. 2279 **\$1.35**

**EXTRA SMALL EYE:** 5/8" long; 0.01 oz. No. 2281 **\$1.15**

**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 **\$1.65**

**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 **\$2.00**

**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.) **\$1.70** 2 3/4" long (10 per pkg.) **\$1.90**

**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 **\$1.75**

**SHOCK CORD:** Specify width when ordering. Ship. Wt. 1 oz. 1/8" wide: Net Wt. 0.039 oz. No. 2276 **\$0.90**

1/4" wide: Net Wt. 0.078 oz. No. 2277 **\$1.00**

Also 3/8" long for greater stretch on those larger birds: 1/8" wide: Net Wt. 0.078 oz. No. 85744 **\$1.05**

**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 **\$1.55**

**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 **\$1.75**

**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 **\$2.00**

**ENGINE HOLDER:** Flat spring steel design gives easy installation and low drag. Recommended for sport and demonstration models. (3 per pkg.) Ship. Wt. 1 oz. For Regular and "D" engines. No. 3140 **\$2.00**

For Mini-Engines. No. 3142 **\$1.70**

**RA-2050 RINGS:** 20 rings for centering and mounting BT-20 in BT-50. (20 per pkg.) Ship Wt. 2 oz. 3110 **\$1.55**

**RA-2055 RINGS:** 10 rings for centering and mounting BT-20 in BT-55. (10 per pkg.) Ship Wt. 2 oz. No. 3111 **\$1.60**

**RA-2060 RINGS:** 10 rings for centering and mounting BT-20 in BT-60. (10 per pkg.) Ship Wt. 2 oz. 3113 **\$1.65**

**MAXI-ROD LAUNCH LUG:** 2" long, fits 3/16" diameter launch rod. (4 per pkg.) No. 2328 **\$1.55**

**DOWELS:** Extra-strong lightweight seasoned maple dowels. (8 per pkg.) Ship Wt. 5 oz. 1/8" x 18" **\$1.40** 1/12" x 12" No. 3190 **\$1.40** No. 3191 **\$1.40**



## 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	\$1.60	1/16x3x9	.130	4	High Performance
32106	BFS-20L	\$1.85	1/16x3x12	.173	6	High Performance
32108	BFS-30	\$1.65	3/32x3x9	.150	4	Sport Models
32110	BFS-30L	\$1.90	3/32x3x12	.200	6	Sport Models
32116	BFS-40	\$1.70	1/8x3x9	.200	4	Cluster Rockets
32118	BFS-40L	\$1.90	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
Spiral-Wound Paper Tube, for nose sections and strap-on payloads.								
30302	BT-5	\$1.55	18"	0.515"	0.541"	0.013"	.219	11
Spiral-Wound Paper Tube, for competition and sport models.								
30316	BT-20	\$1.75	18"	0.710"	0.736"	0.013"	.288	11
Spiral-Wound Paper Tube, for sport and high performance payload models.								
30352	BT-50	\$1.75	18"	0.950"	0.976"	0.013"	.378	11
Spiral-Wound Paper Tube, for sport and demonstration models.								
30382	BT-55	\$2.05	18"	1.283"	1.325"	0.021"	.672	11
Spiral-Wound Paper Tube, for sport and demonstration models.								
30396	BT-60	\$2.15	18"	1.595"	1.637"	0.021"	.960	11
Spiral-Wound Paper Tube, for monster models and tail rings.								
30424	BT-70	\$2.70	17.5"	2.175"	2.217"	0.021"	1.300	14
30433	BT-80KD	\$2.50	14.2"	2.560"	2.600"	0.021"	.637	11

## ENGINE BLOCKS

Prod. No.	Description	Price 3for	Outside Dia.	Inside Dia.	Length	Fits	Weight in Oz. Net	Ship
3131	EB-20A	\$1.40	.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	\$1.65	BT-5 to BT-20	1.75"	0.75"	0.04	1
70004	TA-550	\$1.75	BT-5 to BT-50	2.2"	1.0"	0.06	4
70006	TA-2050	\$1.55	BT-20 to BT-50	3.0"	2.0"	0.15	4
70010	TA-2055	\$1.90	BT-20 to BT-55	2.5"	1.5"	0.22	4
70012	TA-2060	\$2.70	BT-20 to BT-60	3.0"	2.0"	0.20	4
70014	TA-5055	\$2.70	BT-50 to BT-55	2.0"	1.0"	0.60	4
70016	TA-5060	\$3.20	BT-50 to BT-60	3.0"	2.0"	0.23	4
70028	TA-5560	\$3.30	BT-55 to BT-60	2.2"	1.0"	0.25	4
70034	TA-6070	\$3.05	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	\$1.05	0.513"	0.455"	3/4"	BT-5	.020 oz.
30254	JT-20C	\$1.05	0.708"	0.650"	3/4"	BT-20	.027 oz.
30260	JT-50C	\$1.05	0.949"	0.920"	1"	BT-50	.051 oz.
30262	JT-55C	\$1.05	1.28"	1.25"	1.3"	BT-55	.088 oz.
30266	JT-60C	\$1.05	1.59"	1.55"	1-1/2"	BT-60	.124 oz.
30270	JT-70A	\$1.55	2.175"	2.115"	1-1/4"	BT-70	.140 oz.

## NOSE BLOCKS

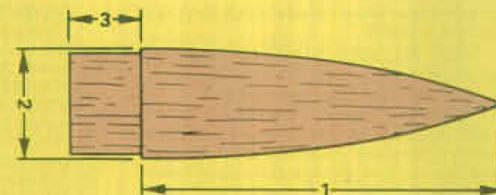
Use these top quality feather-weight balsa nose blocks in payload sections and anywhere else a solid bulkhead is required. Precision turned for exact fit in body tubes.

Prod. No.	Description	Price Each	Outside Diameter	Length	Fits	Weight in Oz. Net	Ship
70152	NB-20	\$1.20	0.710"	3/4"	BT-20	.014	1
70158	NB-50	\$1.40	0.950"	1"	BT-50	.040	4

## NOSE CONES

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

In "Description" column BNC stands for balsa nose cone and PNC for plastic nose cone.



Shape	No.	Prod. No.	Description	Price Each	Dimensions			Average Weight	Ship. Wt.
					1	2	3		
	1	70216	BNC-5V	\$1.55	3/4"	0.541"	1/4"	0.013 oz.	1 oz.
	2	70212	BNC-5E	\$1.55	1-3/8"	0.541"	1/4"	0.020 oz.	1 oz.
	3	70214	BNC-5S	\$1.55	1-1/2"	0.541"	1/4"	0.016 oz.	1 oz.
	4	70218	BNC-5W	\$1.75	2-7/8"	0.541"	1/4"	0.039 oz.	2 oz.
	5	70230	BNC-20B	\$1.65	1-11/16"	0.736"	5/16"	0.05 oz.	1 oz.
	6	70240	BNC-20R	\$1.75	2-3/4"	0.736"	3/8"	0.07 oz.	2 oz.
	7	70226	BNC-20AM	\$1.70	2-1/2"	0.736"	1/2"	0.06 oz.	2 oz.
	8	70241	BNC-20Y	\$1.60	1"	0.736"	3/8"	0.02 oz.	1 oz.
	9	71000	PNC-50	\$2.30	3-7/8"	0.976"	5/8"	0.59 oz.	4 oz.
	10	70256	BNC-50J	\$1.75	1-3/8"	0.976"	1/2"	0.08 oz.	4 oz.
	11	70262	BNC-50K	\$1.95	2-3/4"	0.976"	1/2"	0.13 oz.	4 oz.
	11	71028	PNC-50KA	\$1.65	2-3/4"	0.976"	1/2"	0.13 oz.	4 oz.
	12	71001	PNC-50SP	\$2.30	5-11/16"	0.976"	1/2"	0.25 oz.	6 oz.
	13	70266	BNC-50Y	\$2.30	4-3/8"	0.976"	3/8"	0.16 oz.	6 oz.
	14	71070	PNC-55AC	\$2.70	5-3/8"	1.325"	3/8"	0.32 oz.	6 oz.
	15	71075	PNC-55AO	\$2.75	4-3/8"	1.325"	3/4"	0.43 oz.	4 oz.
	16	71038	PNC-55D	\$2.70	3-3/4"	1.325"	3/4"	0.36 oz.	4 oz.
	17	71020	PNC-60MS	\$2.35	3-1/8"	1.637"	5/8"	0.39 oz.	4 oz.
	18	71043	PNC-60AH	\$3.40	6-5/8"	1.637"	7/8"	1.0 oz.	6 oz.
	19	70300	BNC-70AJ	\$3.75	4-1/4"	2.217"	1"	0.85 oz.	6 oz.
	20	71035	PNC-80K	\$3.55	8-1/8"	2.555"	1-5/8"	1.68 oz.	8 oz.

## 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.

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	\$1.70	BT-50	0.1
	3151	EH-2055	\$1.70	BT-55	0.14
	3152	EH-2060	\$1.70	BT-60	0.17
For "T" Mini-Engines, .5" x 1.75"	3153	EM-520	\$1.65	BT-20	0.09
Special Purpose Quick-Change Conversion Mount—From "D" Engines to Regular Engines	3154	EM-2050	\$1.75	BT-50	0.19
For "D" type Engines 0.945" x 2.75"	3156	EM-5055/60	\$2.25	BT-55 or BT-60	0.3

**NEW**



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

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**TECH-TIP #10  
 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, or an insect, so you can study the effects of acceleration on a living organism. 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.

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**THE CLASSIC COLLECTION**

Available in one volume--"Rocket Stability"; "Multi-Staging"; "Altitude Tracking"; "Rear Engine Boost Gliders"; "Building A Wind Tunnel"; "Cluster Techniques"; "Front Engine Boost Gliders"; "Model Rocket Engines"; "Is That Parachute Too Big?"; "The Fine Art of Payload Launching"; "Recovery Techniques".

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The planned sequence of activities through three levels of skill guides a model rocketeer on his path to becoming an expert.

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Explains a method by which aerodynamic drag and other effects can be taken into account in predicting rocket peak altitudes.

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Gives examples of ways to minimize aerodynamic drag and improve performance.

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**ELEMENTARY MATHEMATICS OF MODEL ROCKET FLIGHT**

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Handy guide for construction and flight of model rockets. Good tips on "scratch building", launch systems, tracking, staging, boost-gliders, and more.

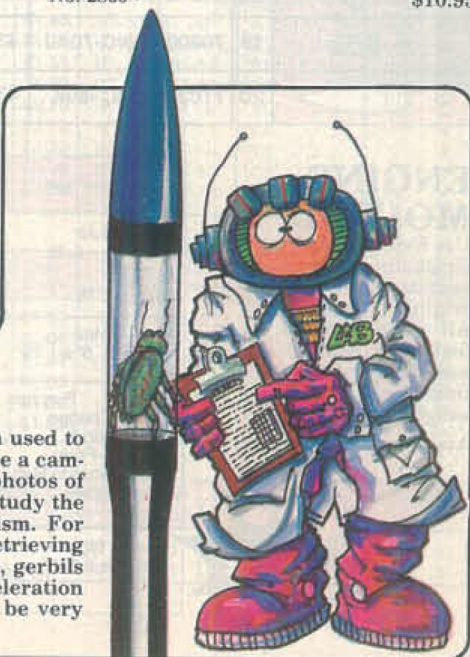
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**1986 CATALOG INDEX**

Adapters	-A-	68	Mini-Shuttle Kit	32
Alpha Kit	22	Mini-Tri Pak Kit	30	
Alpha III Kit	26	Mosquito Kit	12	
Alpha III Starter Kit	3	-N-O-		
AliTrak	60	NASA Pegasus Kit	36	
Astro Kit	18	Nebulon Warrior	50	
AstroBee Kit	18	Neptune Kit	40	
AstroCam 110 Kit	29	Nike Apache Kit	46	
Astron Igniters	59	Nose Blocks	68	
Astron Launch Controller	62	Nose Cones	69	
	-B-	Nova Payloader Kit	38	
Battery Clips	64	-P-Q-R-		
Big Bertha Kit	26	Parachute Kits	67	
Big Yank Kit	16	Phantom Kit	60	
Black Brant II Kit	52	Phoenix Kit	44	
Blast Deflector Plate	64	Polaroid P-100 Battery	62	
Blast-Off Flight Pak	59	Porta-Pad Launch Pad	62	
Blazer Kit	24	Power-Pulse Launch Controller	62	
Body Tubes	68	Publications	70	
	-C-	Pulsar Kit	12	
Centering Rings	67	Ranger Kit	42	
Challenger 1 Starter Kit	5	Recovery Wadding	59	
Comanche-3 Kit	50	Red Max Kit	40	
Comet Kit	24	Rocket Engines	58	
Cougar Kit	16	-S-		
Courier Kit	12	Safety Code	6	
Crusader Swing-Wing Kit	52	Scorpion Kit	42	
Cyclone Kit	20	Scout II Kit	26	
	-D-E-F-	S.C.R.A.M. Kit	30	
Defender Kit	42	Screw Eyes	67	
Delta Wedge Kit	48	Searcher Kit	32	
Deluxe Starter Kit	7	Shock Cord	67	
Design Contest	66	Shroud Line	67	
Designer's Special	65	Sizzler Kit	22	
Discovery Starter Set	72	Sizzler Starter Kit	9	
Dowels	67	Sky Hook Kit	20	
Dragon Fly Kit	50	Snap Swivels	67	
D-Region Tomahawk	48	Soaring Eagle Kit	54	
Echo Kit	20	Solar Igniters	59	
Eclipse Kit	18	Solar Launch Controller	62	
Electron Beam Launch Controller	61	Space Shuttle Kit	56	
Emergency Repair Kit	65	Space Shuttle Columbia Kit	36	
Engine Blocks	68	Sparrow Kit	14	
Engine Holders	67	Spin Fin Kit	14	
Engine Mounts	69	SR-71 Blackbird Kit	44	
Engines, Rocket	58	Stage Couplers	68	
Estes Aerospace Club	28	Star Battle Windsock	64	
Exocet Kit	34	Starbird Kit	38	
Fin Alignment Guide	60	Star Dart Kit	14	
Fin Stock	68	Starhawk Kit	46	
Fireaero Kit	32	Star Seeker Kit	30	
Flying Saucer Kit	36	Stealth Kit	44	
Fox Fire Kit	30	Stealth Elite Outfit	11	
Futuristic Parts Assortment	65	Stinger Kit	18	
	-G-H-I-	Sting Ray Kit	30	
Halley's Tail Kit	38	Streak Kit	14	
Hawkeye Kit	32	Streamer Material	67	
Hercules Kit	48	Sunbird Kit	22	
Hitch-Hiker Glider Kit	34	-T-U-V-		
Honest John Kit	40	Tape Discs & Strips	67	
I.Q.S.Y Tomahawk Kit	34	Titan II Kit	40	
	-J-K-L-	Vector Kit	14	
Kadet Kit	24	Viking Kit	26	
Laser Kit	16	V-2 Kit	54	
Launch Lugs	67	-W-X-Y-Z-		
Launch Rods	64	Warranty	2	
Launch Rod Safety Cap	64	Windsock	64	
	-M-	Wizard Kit	16	
Magician Kit	34	X-16 Kit	46	
Marauder Kit	24	Yankee Kit	12	
Marte MK 2 Kit	48	Zinger Kit	12	
Maverick Kit	20			
Maxi Rod	64			
Mean Machine Kit	42			
Mercury Redstone Kit	56			
Micro-Clips	64			
Mighty Moe Kit	26			
Mini-Mean Machine Kit	22			
Mini-Scale Combo Kit	34			

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