

RECOVERY PARACHUTES

PLASTIC

6" Black (15.2 cm)
Product Number: 2262
MSRP \$3.99

9" Yellow (22.9 cm)
Product Number: 2268
MSRP \$4.99

12" Orange (30.5 cm)
Product Number: 2264
MSRP \$4.99

15" Purple (38.1 cm)
Product Number: 2265
MSRP \$5.99

18" Blue (45.7 cm)
Product Number: 2267
MSRP \$5.99

24" Red (61 cm)
Product Number: 2271
MSRP \$6.99

NYLON

Sturdy sewn fabric chutes designed for your largest, heaviest rockets

Hemmed edge

Shroud lines are sewn into nylon

24" (61 cm) Nylon Parachute
Product Number: 2261
MSRP \$14.99

30" (76.2 cm) Nylon Parachute
Product Number: 2273
MSRP \$19.99

LAUNCH EQUIPMENT

In order to safely and successfully launch your rocket time after time, you'll need the essentials which are launch base, launch rod, blast plate and launch controller. Different sized launch bases and launch rods are used to accommodate different sized rockets.

Perfect for beginners and smaller rockets!



Porta-Pad® II & Electron Beam® Launch Controller

Product Number: 2222

Quick assembly - no glue or tools required! Launch rod angle is adjustable. Comes complete with blast deflector, standoff, two-piece 1/8 in. (3 mm) launch rod and safety cap. Can accommodate a 3/16 in. (5 mm) Maxi™ launch rod - not included. Launch controller comes assembled with safety key and 15 ft. (4.6 m) of cable. Requires 4 new 1.5V AA alkaline batteries - not included.

MSRP \$39.99

(Sold Separately)

Porta-Pad® II Launch Pad

Product Number: 2215

MSRP \$24.99

(Sold Separately)

Electron Beam® Launch Controller

Product Number: 2220

MSRP \$29.99



E Launch Controller

Product Number: 2230

Comes assembled with safety key and 30 ft. (9.7 m) of cable. Requires 4 new 1.5V AA alkaline batteries - not included.

MSRP \$35.99

Porta-Pad® E Launch Pad

Product Number: 2238

Quick assembly - no glue or tools required. Launch rod angle is adjustable. Includes a three-piece 1/4 in. (6 mm) launch rod, but can accommodate a 3/16 in. (5 mm) Maxi™ launch rod - not included.

MSRP \$33.99

Designed for launching larger rockets!



Blast Deflector Plate

Product Number: 2241

Replaces that worn-out deflector. For use with 2215 Porta-Pad® II

MSRP \$7.99

Two Piece Launch Rod

1/8 in. (3 mm)

Product Number: 2243

Replacement rod ideal for most rockets.

MSRP \$8.99

Two Piece Maxi™ Launch Rod

3/16 in. (5 mm)

Product Number: 2244

Launch rod with extra strength and length for larger rockets.

MSRP \$14.99

BUILDING TOOLS

Now you can make exact, easy measurements when attending to your fleet of Estes model rockets. Tube marking guides and fin alignment tools help make your hobby rocket endeavors fast, efficient and fun! These are must-have items for the advanced model rocket enthusiast.



The Tube Marking Guide Allows for Accurate and Consistent Fin Placement When Building Your Rocket.

Ultimate™ Tube Marking Guide

Product Number: 2228

Accurately mark your body tubes for a variety of rocket-assembly purposes!

MSRP \$12.99

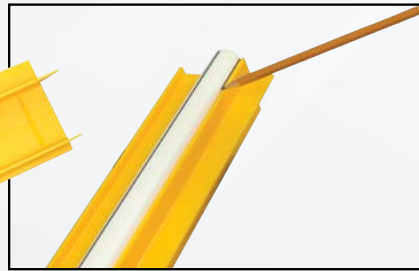


Tube Marking Guide

Product Number: 2227

The tube marking guide is an easy way to mark your fin and launch lug placement. The marking guide is a must for any rocket builder!

MSRP \$13.99



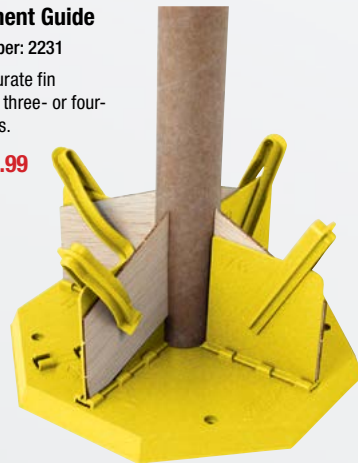
The Ultimate Tube Marking Guide Helps Mark Body Tubes of All Different Sizes.

Fin Alignment Guide

Product Number: 2231

Fast and accurate fin alignment for three- or four-finned rockets.

MSRP \$23.99



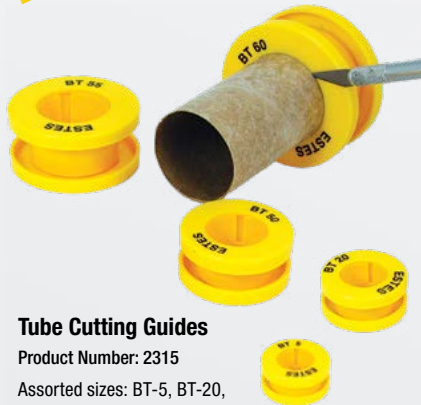
Never misalign rocket fins again!

Tube Cutting Guides

Product Number: 2315

Assorted sizes: BT-5, BT-20, BT-50, BT-55, and BT-60 (hobby knife not included).

MSRP \$13.99



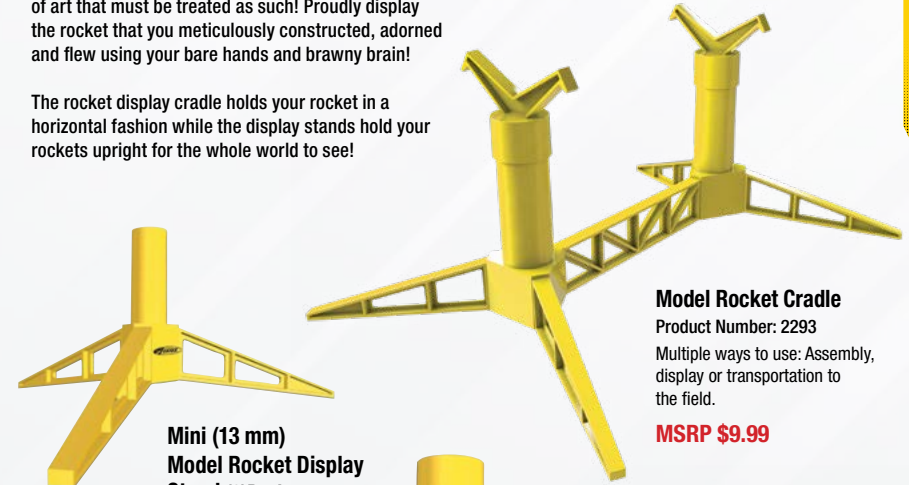
ROCKET DISPLAYS

Proudly display your rockets and craftsmanship with Estes Display Stands and Rocket Cradles!



In the world of hobby rocketry, models become works of art that must be treated as such! Proudly display the rocket that you meticulously constructed, adorned and flew using your bare hands and brawny brain!

The rocket display cradle holds your rocket in a horizontal fashion while the display stands hold your rockets upright for the whole world to see!



**Mini (13 mm)
Model Rocket Display
Stand (3)Pack**

Product Number: 2290

MSRP \$8.99

Model Rocket Cradle

Product Number: 2293

Multiple ways to use: Assembly, display or transportation to the field.

MSRP \$9.99

**Standard (18 mm)
Model Rocket Display
Stand (3)Pack**

Product Number: 2291

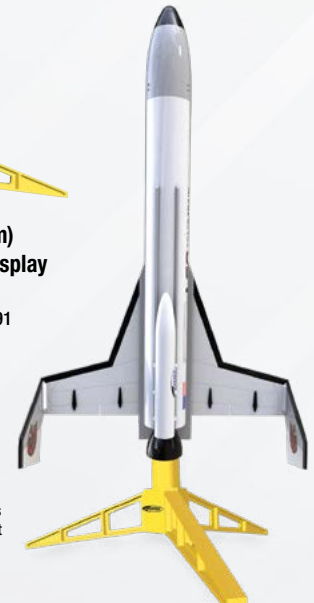
MSRP \$8.99

**Large (24 mm)
Model Rocket Display
Stand (3)Pack**

Product Number: 2292

MSRP \$8.99

Estes Rocket Display Stands come in various sizes and hold different sized rockets upright.



ROCKET PARTS

Model rockets are constructed using various essential parts. Nose cones streamline a rocket's ascent. Nose cone weights help stabilize a rocket's trajectory. Payload sections allow the rocketeer to view their cargo.



Nose Cone Assortment

Each package of nose cones may contain a variety of shapes. Some are one piece, others two piece. All have eyelets for shock cord and shroud line attachments. (3173 shown)

NC-5	Assortment (5)Pack	3160	MSRP \$ 5.99
NC-20	Assortment (4)Pack	3161	MSRP \$ 5.99
NC-50	Assortment (5)Pack	3162	MSRP \$ 9.99
NC-55	Assortment (4)Pack	3163	MSRP \$ 8.99
NC-56	Assortment (4)Pack	3164	MSRP \$ 8.99
NC-60A	Assortment (3)Pack	3165	MSRP \$ 9.99
NC-80B	Assortment (1)Pack	3168	MSRP \$ 4.99
Sci-Fi	Assortment (5)Pack	3173	MSRP \$18.99

Body Tube Packs

High quality spiral wound paper tubes. Use tube couplers to connect tubes of the same diameter. Outer diameters listed. (not all body tube sizes shown)

BT-5	0.54 in./14 mm diameter	• 18 in./45.7 cm long	(4)Pack	3084	MSRP \$ 8.99
BT-20	0.74 in./19 mm diameter	• 18 in./45.7 cm long	(4)Pack	3085	MSRP \$ 8.99
BT-50	0.98 in./25 mm diameter	• 18 in./45.7 cm long	(3)Pack	3086	MSRP \$ 8.99
BT-55	1.33 in./34 mm diameter	• 18 in./45.7 cm long	(3)Pack	3087	MSRP \$ 9.99
BT-60	1.64 in./42 mm diameter	• 18 in./45.7 cm long	(3)Pack	3089	MSRP \$ 9.99
BT-80	2.60 in./66 mm diameter	• 14 in./36.1 cm long	(2)Pack	3090	MSRP \$ 9.99



Payload Section Assortment (Clear - BT-20, BT-50, BT-60)

Product Number: 3171

MSRP \$19.99



Centering Ring Assortment (BT-5 through BT-50)

Product Number: 3175

MSRP \$7.99



Clay Nose Cone Weights

Product Number: 3180

MSRP \$6.99

ROCKET PARTS

Engine Hook Accessory Pack

Product Number: 3143

Hooks fit mini engines (x2), regular and D engines (x3) and E12 engines (x2).

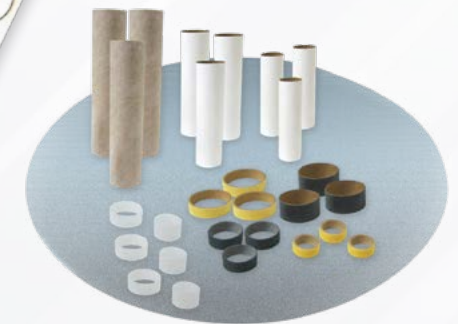
MSRP \$5.99



Laser Cut Centering Ring & Shroud Templates (2 ea.)

Product Number: 3179

MSRP \$8.99



Engine Mount Assorted Parts (3 ea.)

Product Number: 3181

Engine mounts for mini-engines, standard engines, and D engines.

MSRP \$8.99



D & E12 Engine Mount Kit

Product Number: 3159

Heavy duty engine mounts for D and E12 engines. Fits BT-55, BT-60 and BT-80 tubes.

MSRP \$11.99

ROCKET PARTS



29 mm Pro Series II Engine Retainer Set (2 sets)

Product Number: 9750

MSRP \$9.99



24 mm Engine Retainer Set (2 sets)

Product Number: 9751

MSRP \$8.99



18 mm Engine Retainer Set (2 sets)

Product Number: 3187

MSRP \$7.99



Mini (13mm) to Standard (24 mm) Engine Adapters

Product Number: 2316

Two simple steps transform a mini-engine into a standard size. Insert a mini-engine into the adapter, and insert the adapter into a rocket. 3 adapters per pack. Reusable. (Engines not included).

MSRP \$6.99



Standard (18 mm) to Large (24 mm) Engine Adapters

Product Number: 2317

Two simple steps transform a standard engine into a 24 mm size. Insert a standard engine into the adapter, and insert the adapter into a rocket. 3 adapters per pack. Reusable. (Engines not included).

MSRP \$6.99

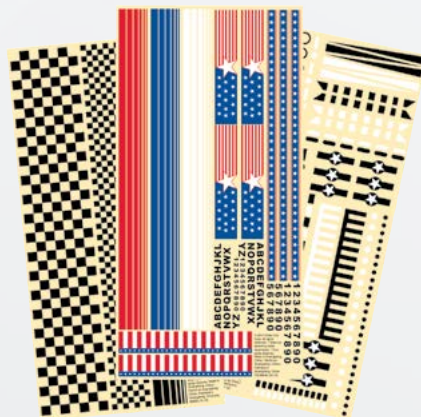


Launch Lug Pack

Product Number: 2320

Contains 4 each: 1/8 in. x 2 3/8 in. (3 mm x 60 mm), 1/8 in. x 1 1/4 in. (3 mm x 32 mm), 3/16 in. x 2 in. (5 x 51 mm) and 1/4 in. x 1 in. (6 mm x 25 mm) launch lugs.

MSRP \$6.99



Waterslide Decal Set

Product Number: 3170

MSRP \$13.99

ROCKET PARTS



Tube Couplers (2 ea.) (BT-5, BT-20, BT-50)

Product Number: 3176

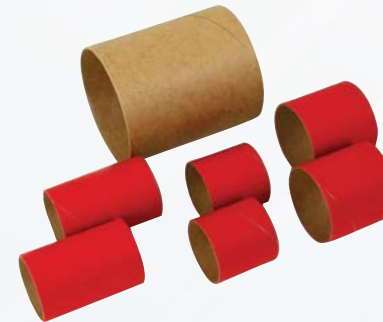
MSRP \$4.99



Tube Couplers (2 ea.) (BT-55, BT-60)

Product Number: 3177

MSRP \$5.99



Tube Couplers Assortment Pack

Product Number: 3196

Includes two couplers for BT-55, BT-56 and BT-60; One for BT-80.

MSRP \$7.99



Tube Couplers (2 ea.) (BT-80)

Product Number: 3178

MSRP \$4.99

Standard Engine Mount Kit

Product Number: 3158

Fits BT-50, BT-55 and BT-60 tubes. Can also be used to make a conversion mount for lightweight D powered rockets.

MSRP \$7.99



INTRODUCING THE UNIVERSAL ASTROCAM™

**FITS MOST ESTES
ROCKETS!**

- Records HD Video & Audio on a 16GB Memory Card
- Easily Download Video to Your Computer Via USB 2.0
- Up to 90 Minutes of Recording Time
- Includes Camera, Holder & Reusable Strap That Easily Attaches to Your Rocket

*Enlarged to show detail



Actual images from the Universal AstroCam



NEW!

Universal Astrocam™

Product Number: 2208
Weight: 0.43 oz. (12.2 g)

MSRP \$49.99

DESIGNER'S SPECIAL

Challenge your imagination & take your skills to the next level!



**Contains over 100 parts so you can design
and build the rockets of your dreams!**

Experiment with your own designs. Includes enough parts to build at least 8 complete rockets. Just add some glue and your imagination!

Designer's Special™

Product Number: 1980

MSRP \$95.99



Designs shown are for inspiration only and may include other imaginative parts not included in your Designer's Special.



ENGINES

Our world famous model rocket engines have made model rocketry safe since 1958!

Estes model rocket engines have been proven safe, consistent and reliable in more than 500 million launches. Thousands of Estes engines are static-tested at the factory for reliability and adherence to performance specifications. All engines comply with the code requirements of the National Fire Protection Association, California Fire Marshal, and are certified by the National Association of Rocketry.



ENGINE CODES

LETTER = TOTAL IMPULSE

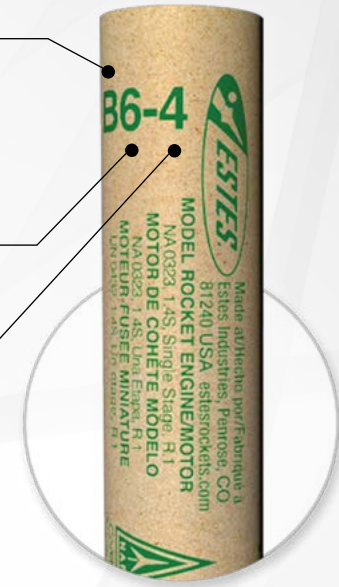
This letter is the total power (in Newton-seconds) produced by the engine. Each succeeding letter has up to twice the total power as the previous letter. (Example: 'B' engines have up to twice the power of 'A' engines, which results in approximately twice the altitude the rocket will reach.)

FIRST NUMBER = AVERAGE THRUST

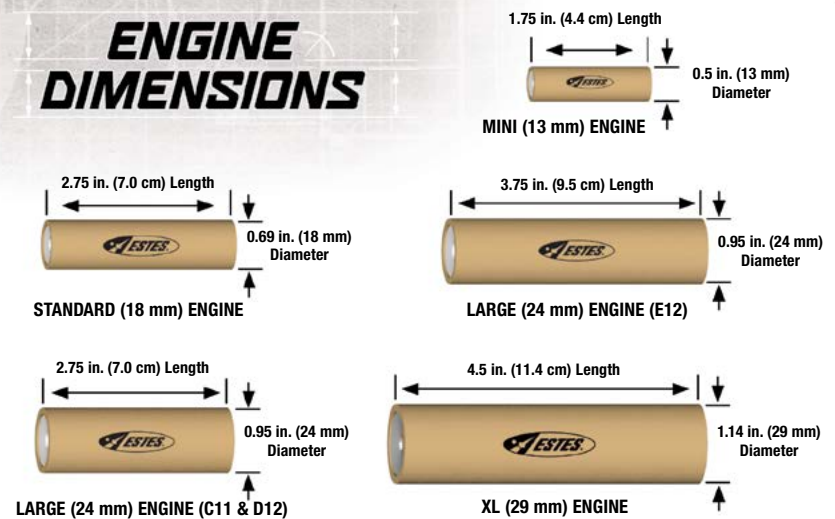
This number shows the engine's average thrust push or how fast the engine powers the rocket to go. The higher the number, the faster the speed. It is measured in Newtons (4.45 Newtons = 1lb.).

SECOND NUMBER = TIME DELAY

This number gives you the time delay in seconds between the end of the thrust phase and the ignition of the ejection charge. Engine types ending in '0' have no time delay or ejection and are used for booster stages and special purposes only. Engines ending in 'P' have no time delay or ejection charge and the forward end is plugged.



ENGINE DIMENSIONS



Each Engine Type is Color Coded

- **Single Stage - Green**
- **Booster - Red**
Booster engines contain no delay or ejection charge.
- **Upper Stage - Purple**
Upper stage engines can be used as single stage engines in lightweight rockets.
- **Plugged - Blue**
Plugged engines are used for rocket-powered racers and contain no delay or ejection charge.

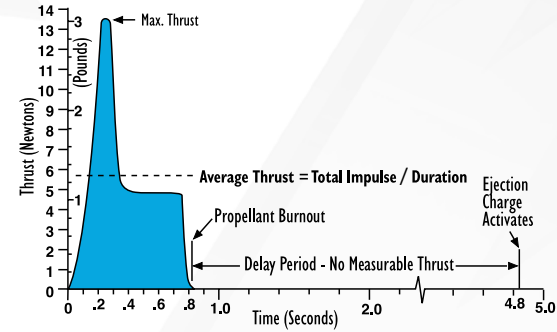


ENGINE TYPES - PERFORMANCE CHART

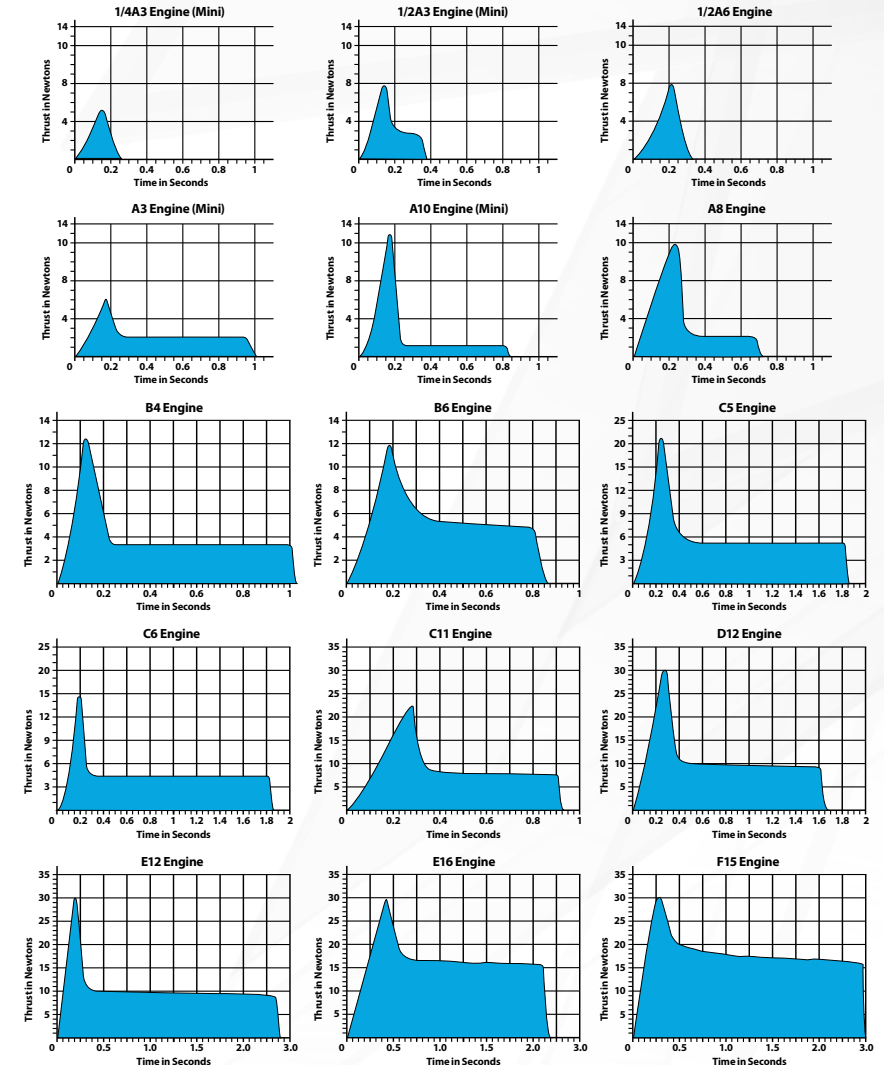
ENGINE TIME / THRUST CURVES

Prod. No.	Engine Type	Total Impulse	Time Delay*	Est Max Lift Wt		Max Thrust		Thrust Duration	Initial Weight		Propellant Weight		Diameter	QTY Per Pack	Retail Price Per Pack
		N-sec	Sec	oz	g	Newtons	Lbs	Sec	oz	g	oz	g			
SINGLE STAGE ENGINES															
1502	1/4A3-3T	0.625	3	1.0	28	4.90	1.1	0.25	0.21	5.9	0.05	1.3	13	4	\$11.29
1503	1/2A3-2T	1.25	2	2.0	57	8.30	1.9	0.30	0.23	6.4	0.07	1.9	13	4	\$11.29
1506	A3-2T	2.50	2	2.0	57	6.80	1.5	0.60	0.28	8.0	0.12	3.3	13	4	\$11.29
1507	A3-4T	2.50	4	2.0	57	6.80	1.5	0.60	0.28	8.0	0.12	3.3	13	4	\$11.29
1508	A3-6T	2.50	6	2.0	57	6.80	1.5	0.60	0.28	8.0	0.12	3.3	13	4	\$11.29
1511	A10-3T	2.50	3	3.0	85	13.00	2.9	0.80	0.29	8.1	0.12	3.5	13	4	\$11.29
1593	1/2A6-2	1.25	2	2.0	57	8.90	2.0	0.30	0.48	13.6	0.10	2.7	18	3	\$11.29
1598	A8-3	2.50	3	3.0	85	10.70	2.4	0.50	0.55	15.5	0.14	4.1	18	3	\$11.29
1601	B4-2	5.00	2	4.0	113	13.20	3.0	1.10	0.66	18.6	0.27	7.6	18	3	\$11.99
1602	B4-4	5.00	4	3.5	99	13.20	3.0	1.10	0.68	19.2	0.27	7.6	18	3	\$11.99
1605	B6-2	5.00	2	4.5	127	12.10	2.7	0.80	0.61	17.3	0.23	6.5	18	3	\$11.99
1606	B6-4	5.00	4	4.0	113	12.10	2.7	0.80	0.63	17.8	0.23	6.5	18	3	\$11.99
1617	C5-3	10.00	3	8.0	227	20.40	4.6	1.85	0.83	23.6	0.39	11	18	3	\$12.99
1613	C6-3	10.00	3	4.0	113	15.30	3.4	1.60	0.83	23.4	0.43	12.2	18	3	\$12.99
1614	C6-5	10.00	5	4.0	113	15.30	3.4	1.60	0.85	24.0	0.43	12.2	18	3	\$12.99
1522	C11-3	10.00	3	6.0	170	22.10	4.9	0.80	1.13	32.1	0.44	12.4	24	2	\$9.99
1523	C11-5	10.00	5	5.0	142	22.10	4.9	0.80	1.18	33.4	0.44	12.4	24	2	\$9.99
1566	D12-3	20.00	3	14.0	396	32.90	7.4	1.60	1.57	44.5	0.85	24.2	24	2	\$13.49
1567	D12-5	20.00	5	10.0	283	32.90	7.4	1.60	1.61	45.7	0.85	24.2	24	2	\$13.49
1692	E12-4	30.00	4	17.0	482	30.60	6.9	2.70	2.16	61.2	1.30	36.9	24	3	\$26.49
1693	E12-6	29.50	6	14.0	397	29.60	6.7	2.70	2.23	63.2	1.30	36.9	29	3	\$26.49
1651	F15-4	49.61	4	21.0	595	25.26	5.7	3.45	3.59	101.5	2.12	60	29	2	\$29.99
1652	F15-6	49.61	6	17.0	482	25.26	5.7	3.45	3.66	103.7	2.21	60	29	2	\$29.99
1696	E16-4	33.68	4	20.0	566	26.44	5.9	2.09	2.86	81.0	1.41	40	29	2	\$25.49
1697	E16-6	33.68	6	16.0	453	26.44	5.9	2.09	2.92	82.7	1.41	40	29	2	\$25.49
UPPER STAGE ENGINES															
1504	1/2A3-4T	1.25	4	1.0	28	8.30	1.9	0.30	0.23	6.6	0.07	1.9	13	4	\$11.29
1599	A8-5	2.50	5	2.0	57	13.30	3.0	0.50	0.55	15.7	0.14	4.1	18	3	\$11.29
1607	B6-6	5.00	6	2.5	71	12.10	2.7	0.80	0.64	18.2	0.23	6.5	18	3	\$11.99
1615	C6-7	10.00	7	2.5	71	15.30	3.4	1.60	0.85	24.3	0.43	12.2	18	3	\$12.99
1524	C11-7	10.00	7	4.0	113	22.10	4.9	0.80	1.19	33.8	0.44	12.4	24	2	\$9.99
1568	D12-7	20.00	7	8.0	226	32.90	7.4	1.60	1.62	46.0	0.85	24.2	24	2	\$13.49
1694	E12-8	29.80	8	12.0	340	31.80	7.1	2.70	2.24	63.5	1.30	36.9	24	3	\$26.49
1653	F15-8	49.61	8	15.0	425	25.26	5.7	3.45	3.69	104.4	2.12	60	29	2	\$29.99
1698	E16-8	33.68	8	14.0	396	26.44	5.9	2.09	2.99	84.7	1.41	40	29	2	\$25.49
BOOSTER STAGE ENGINES															
1510	A10-0T	2.50	NONE	4.0	113	13.00	2.9	0.80	0.24	6.8	0.12	3.5	13	4	\$11.29
1600	A8-0	2.50	NONE	3.0	85	13.30	3.0	0.30	0.47	13.5	0.14	4.1	18	3	\$11.29
1608	B6-0	5.00	NONE	4.0	113	12.10	2.7	0.80	0.55	15.7	0.23	6.5	18	3	\$11.99
1616	C6-0	10.00	NONE	4.0	113	15.30	3.4	1.60	0.76	21.4	0.43	12.2	18	3	\$12.99
1521	C11-0	10.00	NONE	6.0	170	22.10	4.9	0.80	1.03	29.2	0.44	12.4	24	2	\$9.99
1565	D12-0	20.00	NONE	14.0	396	32.90	7.4	1.60	1.43	40.4	0.84	23.8	24	2	\$13.49
1691	E12-0	28.80	NONE	16.0	454	31.30	7.0	2.60	2.05	58.1	1.30	36.9	24	3	\$26.49
1650	F15-0	49.61	NONE	19.0	539	25.26	5.7	3.45	3.32	94.0	2.12	60	29	2	\$29.99
1695	E16-0	33.68	NONE	18.0	509	26.44	5.9	2.09	2.58	73.2	1.41	40	29	2	\$25.49
PLUGGED ENGINES - FOR USE WITH ROCKET-POWERED RACERS															
1505	A10-PT	2.50	NONE	3.0	85	13.00	2.9	0.80	0.26	6.83	0.13	3.5	13	4	\$11.29

*Delays have a tolerance of +/- 10% or one second, whichever is greater. The data listed above is from randomly chosen production samples. There are four mini-engines per package. All other engines are two or three per package. NOTE: The 'T' designates a mini-engine. All Estes engines come complete with starters and starter plugs. The Estes starter plug makes engine ignition extremely reliable.



- Time/thrust curves are representative of random production samples.
- Graphs are not drawn to the same scale.



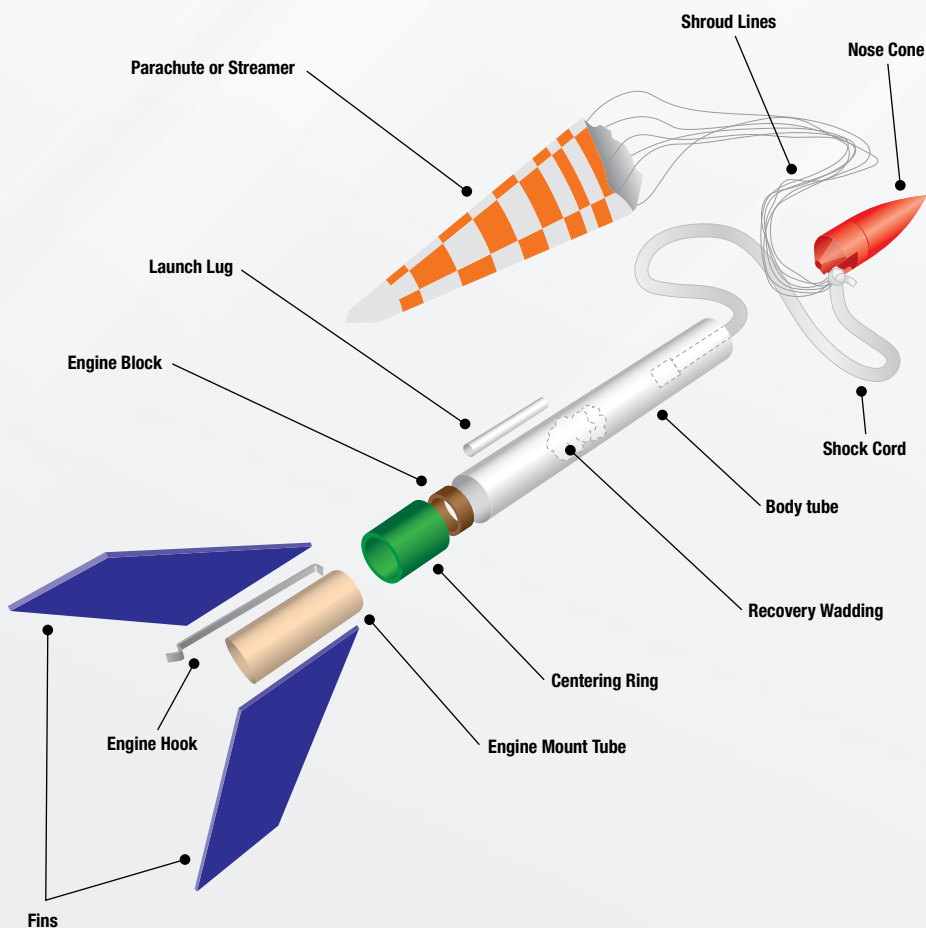
MODEL ROCKET BASICS

What is a Flying Model Rocket?

Estes flying model rockets are safe activity kits designed of lightweight materials such as paper tubing, balsa wood and plastic. Fins attached to the body tube help provide guidance and stability. An engine mount assembly holds the engine in place during rocket flight in most models.

How Does a Model Rocket Work?

The Estes model rocket is propelled into the air safely by an electrically ignited model rocket engine. After its acceleration, the rocket continues upward emitting tracking smoke as it coasts. At the rocket's peak altitude (also called apogee), a recovery device, such as a parachute or streamer, is deployed to return the rocket gently to earth. The rocket can then be prepared for another flight.



This diagram shows the basic components found in most model rocket kits. Model rocketry is recommended for ages 10 to adult. Adult supervision is suggested for those under 12 years of age.

LAUNCH SITE BASICS

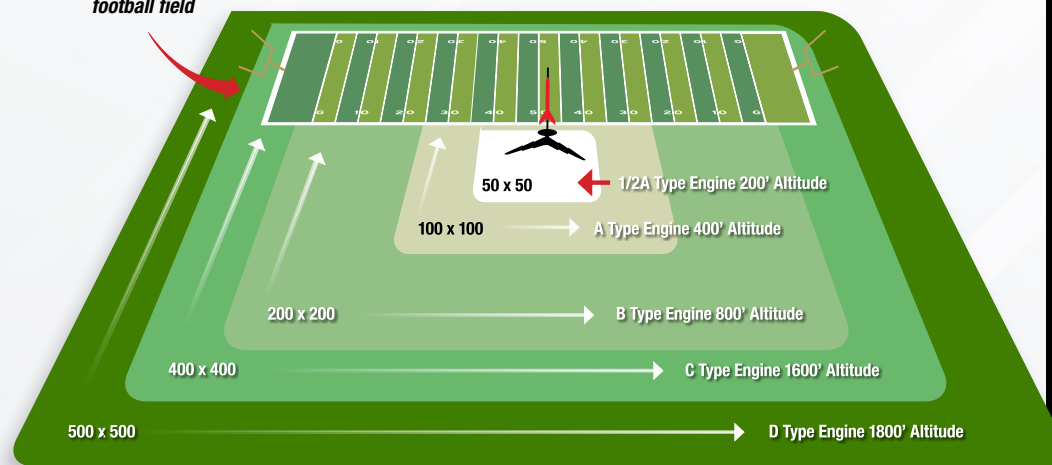
Where to Safely Launch Model Rockets

The chart below tells you what size field to use for each size engine. For launch information, look at the "NAR Model Rocket Safety Code" (Pg. 100). You should always check with your local city government for any special regulations that may apply to your area. Generally speaking, you can fly most Estes model rockets in a clear area the size of a football field or soccer field. Launch in little or no wind, and make sure there is no dry grass close to the launch pad or in the flying field. Each engine size is designated by a letter and is up to twice as powerful as the letter before it. See the engine section (Pgs. 90-93) of this catalog for more information.

LAUNCH SITE DIMENSIONS

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00 – 1.25	1/4 A, 1/2 A	50 X 50
1.26 – 2.50	A	100 X 100
2.51 – 5.00	B	200 X 200
5.01 – 10.00	C	400 X 400
10.01 – 20.00	D	500 X 500
20.01 – 40.00	E	1000 X 1000
40.01 – 80.00	F	1000 X 1000

Size of an American football field



Recommended Launch Site 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, buildings, tall trees and low flying aircraft. The larger the launch area, the better your chance of recovering your rocket. Make sure the launch area is free of obstructions, dry weeds, brown grass or highly flammable materials. Football fields, parks and playgrounds are great. Launch only during calm weather with little or no wind and good visibility. The diagram above, shows the smallest recommended launch areas.

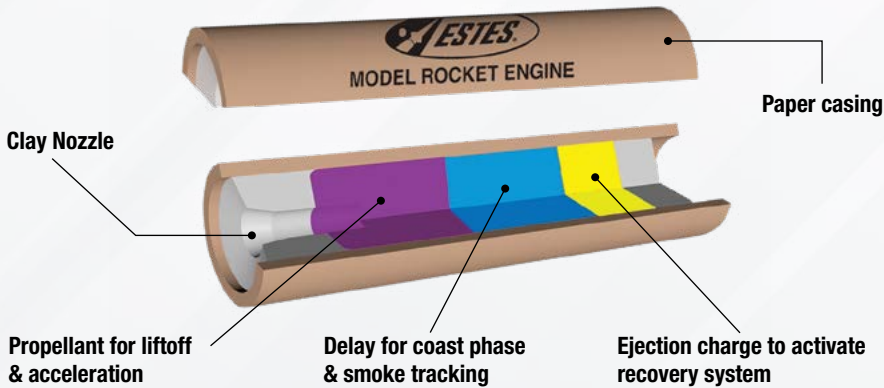
ENGINE BASICS

What is a Model Rocket Engine?

Estes model rocket engines are used to safely launch a model rocket into the air. They are factory-assembled and comply with the safety requirements of the National Association of Rocketry. They are single use and range in power from A to F sizes. The engine is started using an electrical launch system that is powered by alkaline batteries.

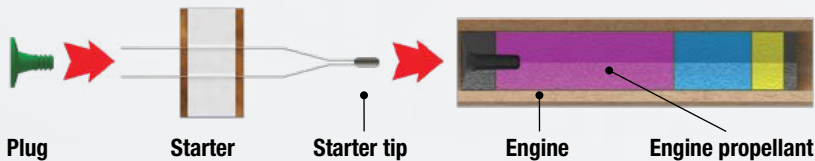


Components of a Model Rocket Engine

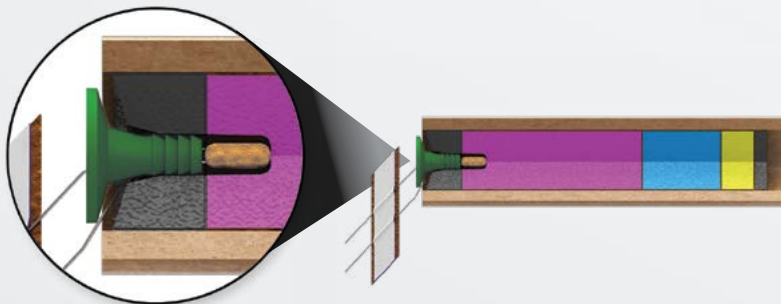


How to Prepare Your Rocket Engine for a Safe Launch

- 1 Use the plug to secure the starter into the engine nozzle of your rocket engine.

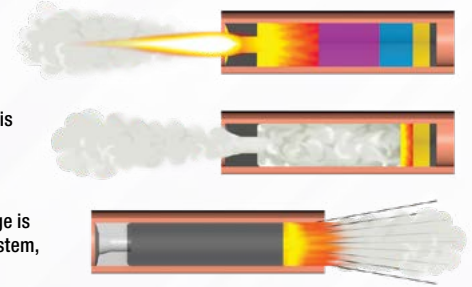


- 2 Make sure the starter is inserted into the engine nozzle and touches the propellant, then insert the plug.

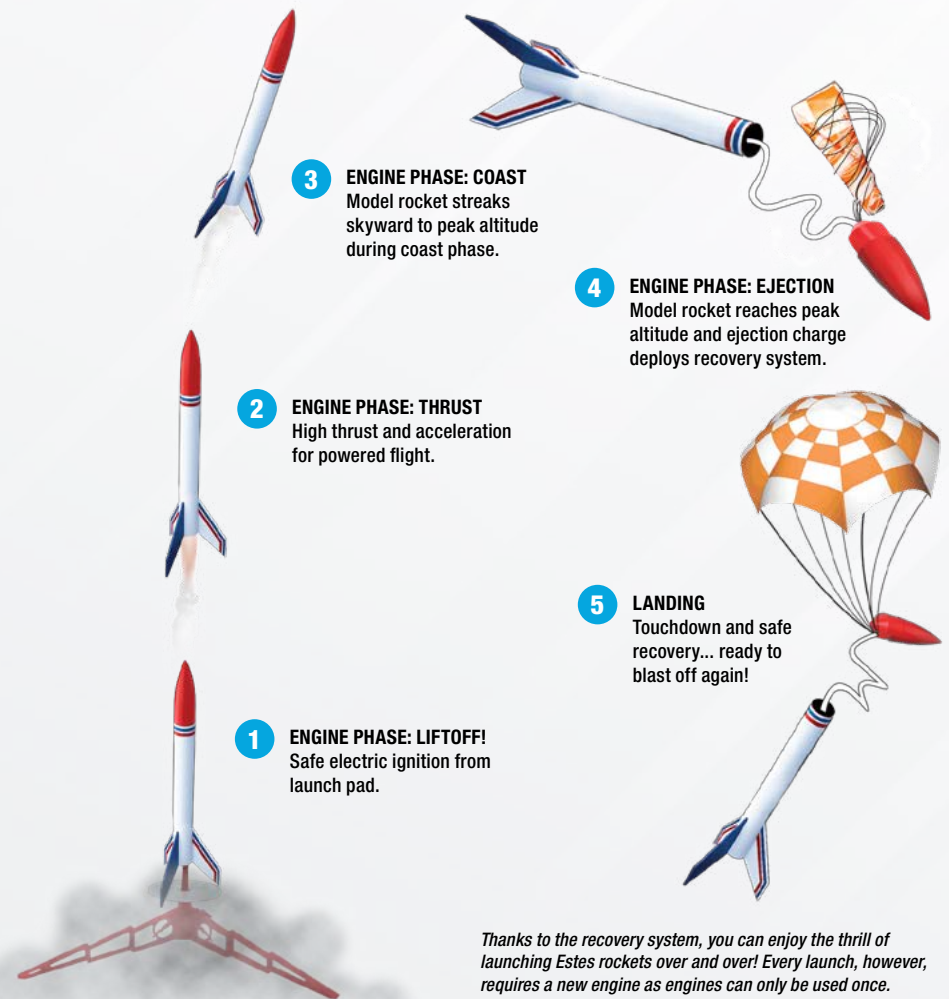


How Does a Model Rocket Engine Work?

- 1 When the engine is started, it produces thrust and boosts the rocket into the sky.
- 2 After the propellant is used up, the delay is activated, producing tracking smoke and allowing the rocket to coast.
- 3 After the delay is used, the ejection charge is activated, which deploys the recovery system, such as a parachute or streamer.



Model Rocket Engine Phase & Flight Sequence



Thanks to the recovery system, you can enjoy the thrill of launching Estes rockets over and over! Every launch, however, requires a new engine as engines can only be used once.



Estes encourages membership in the
NATIONAL ASSOCIATION OF ROCKETRY
<https://www.nar.org>

MODEL ROCKET SAFETY CODE

(Basic Version - Effective August 2012)

1. Materials. I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.

2. Motors. I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

3. Ignition System. I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

4. Misfires. If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

5. Launch Safety. I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 15 feet away when I launch rockets with D motors or smaller, and 30 feet when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance. When conducting a simultaneous launch of more than ten rockets I will observe a safe distance of 1.5 times the maximum expected altitude of any launched rocket.

6. Launcher. I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.

7. Size. My model rocket will not weigh more than 1500 grams (53 ounces) at liftoff and will not contain more than 125 grams (4.4 ounces) of propellant or 320 N-sec (71.9 pound-seconds) of total impulse.

8. Flight Safety. I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.

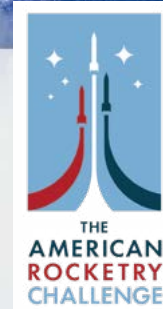
9. Launch Site. I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 20 miles per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

LAUNCH SITE DIMENSIONS

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00-1.25	1/4A, 1/2A	50
1.26-2.50	A	100
2.51-5.00	B	200
5.01-10.00	C	400
10.01-20.00	D	500
20.01-40.00	E	1000
40.01-80.00	F	1000
80.01-160.00	G	1000
160.01-320.00	Two Gs	1500

10. Recovery System. I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.

11. Recovery Safety. I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.



ESTES IS A PROUD SPONSOR OF THE AMERICAN ROCKETRY CHALLENGE

The American Rocketry Challenge (TARC) is the world's largest rocket contest with nearly 5,000 students nationwide competing each year. The contest gives middle and high school students the opportunity to design, build and launch model rockets and hands-on experience solving engineering problems.

Visit rocketcontest.org for more information.

GET INVOLVED TODAY!

Here you'll find respected groups and institutions who support the development of young people. Like Estes, many of these organizations provide their own unique learning opportunities for students, youth leaders and teaching professionals. Together, we strive to create an environment rich with resources to keep your students interested, inquisitive and inspired. Please take a moment to visit their sites today.



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girlscouts.org



scouting.org

INDEX

Accessories

Altimeter 2246	77	Launch Lug Pack 2320	88	PS II Recovery Wadding 3556	66
Altitrak 2232	78	Lifetime Launch System 2310	77	PS II Shock Cord Pack 3172	66
Astrocam 2208	90	Mini AltiTrak 2226	78	Recovery Parachutes	82
Blast Deflector Plate 2241	83	Mini Engine Adapters 2316	88	Recovery Wadding 2274	81
Body Tube Packs	86	Model Rocket Cradle 2293	85	Shock Cords & Mounts Pack 2278	81
Centering Ring, Shroud Template 3179	87	Model Rocket Display Stands	85	Standard Engine Mount Kit 3158	89
Centering Ring Assortment 3175	86	Model Rocket Starters 2303	81	Standard Engine Adapters 2317	88
Clay Nose Cone Weights 3180	86	Nose Cone Assortments	86	Tube Coupler Assortment Pack 3196	89
Clear Payload Assortment 3171	86	Plugs for Large Engines 2252	81	Tube Couplers (BT-5, -20, -50) 3176	89
D and E12 Engine Mount Kit 3159	87	Plugs for Mini Engines 2250	81	Tube Couplers (BT-55, -60) 3177	89
Designer's Special 1980	91	Plugs for Standard Engines 2251	81	Tube Couplers (BT-80) 3178	89
E Launch Controller 2230	83	Porta-Pad II Launch Pad 2215	83	Tube Cutting Guides 2315	84
Electron Beam Launch Controller 2220	83	Porta-Pad E Launch Pad 2238	83	Tube Marking Guide 2227	84
Engine Hook Accessory Pack 3143	87	Pro Series II E2X Booster 9752	66	Two-Piece 1/8 in. Launch Rod 2243	83
Engine Mount Parts Assortment 3181	87	Pro Series II Engine Retainer Set 9750	88	Two-Piece 1/16 in. Maxi Launch Rod 2244	83
Engine Retainer Set 18mm 3187	88	PS II Engine Adapter Set 9753	66	Ultimate Tube Marking Guide 2228	84
Engine Retainer Set 24mm 9751	88	PS II Launch Base 3552	67	Waterslide Decal Set 3170	88
Fin Alignment Guide 2231	84	PS II Launch Controller 2240	67		

Engines

All Engines Packs (See Chart)	94
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Engine Bulk Packs

1/2A3-4T Engines 1788	76	B6-4 Engines 1783	76	C6-5 Engines 1789	76
A8-3 Engines 1781	76	Blast-Off Flight Pack 1672	76		
B6-0 & B6-6 Engines 1784	76	C11-3 Engines 1726	76		

Launch Sets

Alpha III 1427	9	Rascal & HiJinks 1499	11	Tandem-X 1469	11
Flash 1478	10	Riptide 1403	10	Taser 1491	9
Journey 1441	10	Space Corps Centurion 5324	8		

Rocket Education Bulk Packs

Alpha Bulk Pack 1756	75	Generic E2X Bulk Pack 1764	72	Star Hopper Bulk Pack 1721	73
Alpha III Bulk Pack 1751	72	Gnome Bulk Pack 1749	73	Viking Bulk Pack 1755	74
AVG Bulk Pack 1753	74	Green Eggs Bulk Pack 1718	75	Wizard Bulk Pack 1754	74
Firestreak SST Bulk Pack 1794	73	Orbis 3D Bulk Pack 1706	75		

Rockets

220 Swift 0810	21	Expedition 7249	43	Phantom Blue 2483	15
3 Bandits 2435	15	Explorer Aquarius 7253	42	Protostar 7260	40
Airborne Surveillance Missile 7257	25	Firehawk 0804	12	Quinstar 7241	36
Alpha 1225	20	Firestreak SST 0806	14	Red Nova 7266	25
Alpha III 1256	12	Generic E2X 2008	13	SA-2061 Sasha 7271	63
Anniversary Saturn V 2160	61	Ghost Chaser 7300	27	Saturn 1B 7251	58
Antar 7310	39	Gnome 0883	12	Saturn Skylab 1973	58
AstroCam 7308	17	Goblin 7237	22	Sidekick 7287	24
Athena 2452	13	Green Eggs 7301	26	Solo 7288	34
Baby Bertha 1261	21	Space Corps 7280	37	Space Corps Centurion 7291	51
Big Bertha 1948	22	Hex-3 7263	20	Space Corps Corvette Class 7281	52
Big Daddy 2162	62	Hi-Flier 2178	19	Space Corps DARC-1 7307	51
Black Brant II 7243	57	Hi-Flier XL 3226	63	Space Corps Lunar Scout 7290	52
Blue Origin New Shepard 2198	53	Illusion 7299	13	Space Corps Vesta Intruder 7212	50
Blue Origin New Shepard BK 7315	53	Indicator 7244	19	Space Crater 7265	27
BOSS - Bill Simon Rocket	38	Interceptor 1250	41	Spirit 2492	16
Boosted Bertha 1946	31	Leo Space Train 7285	41	Star Hopper 7303	14
Bull Pup 12D 7000	56	Little Joe I 7255	57	Star Orbiter Pro Series II 9716	65
Cadet 2021	16	Low-Boom SST 7289	24	Starship Octavius 7284	42
Checkmate 7276	33	Luna Bug 0816	18	Super Big Bertha Pro Series II 9719	64
Chiller 2495	14	Majestic Pro Series II 9707	65	Super Orbital Transport 9719	43
Citation Patriot 0652	22	Mean Machine 1295	23	Super Mars Snooper 7309	40
Comanche-3 7245	32	Mercury Redstone 4 1921	56	Supernova 7248	27
Crossfire ISX 7220	21	Mini Honest John 2446	59	Tazz 7282	36
Der Big Red Max 9721	66	Mini Mean Machine 0865	23	Terra GLM 7292	15
Der Red Max 0651	20	Mongoose 2092	30	Twin Factor 7250	32
Destination Mars Longship 7296	47	Mosquito 1345	20	U.S. Army Patriot M-104 2056	59
Destination Mars MAV 7283	47	Multi-Roc 1329	33	Viking 1949	25
Destination Mars Leaper 7297	46	NASA SLS 2206	60	Wizard 1292	19
Doorknob Pro Series II 9720	64	Nike-X 7259	25	Xtreme 7306	18
Double Ringer 7279	35	Orange Bullet 7295	39	Yankee 1381	18
Dragonite 2169	16	Phantom 1207	77		

Starter Sets

AstroCam 5325	6	Athena X 5322	7	Rocket Science 5302	7
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ESTES WARRANTY STATEMENT

Estes model rocket products are warranted against defects in materials or workmanship for one year from the date of the original purchase. If the Estes product, because of a manufacturing mistake, malfunctions or proves to be defective within the one-year warranty period, it will be repaired or replaced, at Estes' option and at no charge to you.

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 products. 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 contact us at EstesRockets.com or by mail at Estes Industries, LLC, Customer Service Department, 1295 H Street, Penrose, Colorado 81240-9698. For customer service, call (719) 372-5214.

WARNING: This product can expose you to silica, which is known to the state of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

All Estes model rocket engine packaging carries this warning.

WARNING: Drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the state of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to www.P65Warnings.ca.gov/wood.

Estes Rockets that contain wood parts/components carry this warning.

Prices and availability are subject to change without notice. Color of product may vary.

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