



A DAMON COMPANY

MODEL ROCKETRY FALL 1979

Inside
Pre-Release
1980 New Products
(pages 6 & 7)
Plus
BLACK HOLE
Space
Probe
(pages 4 & 5)



**INSIDE!
VALUABLE
BONUS COUPONS
Worth Up To \$34.60
In Discounts And Special Offers!!!
See Pages 20 & 21**

80

SUPPORT YOUR 1980 ★ UNITED STATES ★ MODEL ROCKETRY TEAM

From September 7 thru 12, 1980 at Lakehurst, New Jersey, the United States will sponsor the Fourth World Space Modeling Championships, "The Olympics of Model Rocketry".

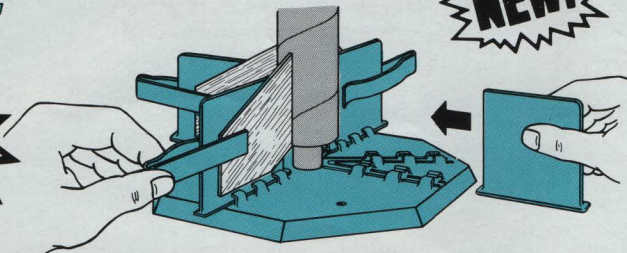


Get this "Official" meet patch now and display your support for our U.S. team. Dramatic Red, White and Blue cloth patch is 3-1/2" diameter. All net proceeds from patch sales go towards U.S. team and meet funding. Help our U.S. team "Bring Home The Gold For America".

Cat. No. 9020 Only \$3.50

FIN ALIGNMENT GUIDE

QUICK
EASY
ACCURATE



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. 6 oz.

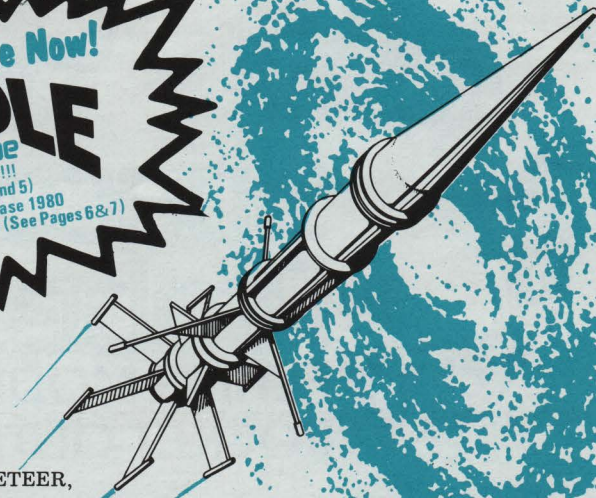
Cat. No. 2231 ONLY \$6.00

80

NEW! Available Now!

BLACK HOLE

Space Probe
Flying Model Rocket!!!
(See Pages 4 and 5)
Plus Pre-Release 1980
New Products (See Pages 6 & 7)



DEAR ESTES ROCKETEER,

Estes Industries began its 22nd year a few months ago. And when I look back, year after year during all that time, the people at Estes have kept pace in model rocketry with the real world of space exploration . . . with more and more exciting new products. We've worked hard to give you the best and most advanced line-up of models and accessories. Including the best of the science fiction models such as STAR WARS and BATTLESTAR GALACTICA. And who knows . . . the science fiction of today may be the real world of tomorrow . . . the wildest dream can come true.

We've done it again this Fall with an array of dramatic new products. Featuring, from the upcoming Walt Disney Production, The Black Hole . . . the Space Probe model rocket kit and a Black Hole Starter Outfit including the Space Probe and everything needed to launch it. (See pages 4 & 5.)

Earlier this year, the ASTROCAM 110 was introduced. The aerial camera that gives you a "birds-eye" photograph of any area you choose. Using standard 110 cartridge film available everywhere . . . and it can be processed at the same place you take all your films. (See pages 10 & 11.)

The ASTROCAM 110 contest, for the best aerial photograph from an ASTROCAM 110, gives you a chance to win a trip to Disneyland or Disney World for you and your family, all expenses paid. There's still time to enter. The contest runs until March 15, 1980. And you can enter as many times as you like. (See page 12.)

There's more. Five new model rocket kits and one entirely new Estes engine are being produced right now . . . CHALLENGER II, MAXI-ICARUS, SEA STRIKE "D", SCORPION, SKYBOLT . . . and the Super Long Delay D11-9 ENGINE for maximum coast time and peak altitudes. (See pages 6 & 7.)

There's also a brand new, easy-to-use FIN ALIGNMENT GUIDE to help you construct your kits as quickly and accurately as possible. For the simplest construction and the best flights, you need the right tools. The FIN ALIGNMENT GUIDE is a must for every serious rocketeer. (See page 2.)

On top of all this, we have again featured lots of Bonus Coupons on pages 20 and 21 for a variety of popular kit and engine special offers. These are bargains we want you to have . . . and we'll take a beating to do it. They're our way of saying thank you for being an Estes model rocketeer.

Well, enough talking. Time for you to open the pages of another adventure in Space. And don't miss MODEL ROCKET NEWS on pages 24 thru 31. It's provided especially for your information and enjoyment. From me to you, HAPPY HOLIDAYS!

Vern
Vern Estes

Unless otherwise stated, all the model rocketry kits in this catalog are hobby kits requiring assembly. Launch system, engines, glue, and finishing supplies are not included. Recommended for ages 10 to adult. Adult supervision suggested for those under 12 years of age when flying model rockets.

© 1979 Walt Disney Studios

SAVE \$1.50
ON ORDERS OVER
\$15.00 See Page 20
For Special Super
Bonus Coupon!

THE BLACK HOLE

Space Probe FLYING MODEL ROCKET OUTFIT

SKILL LEVEL 2 Recommended for individuals with some model building experience.

Space Probe Rocket can attain altitudes over 700 feet with "C" type engine. A 12" recovery parachute deploys automatically for a safe flight and gentle recovery every time.

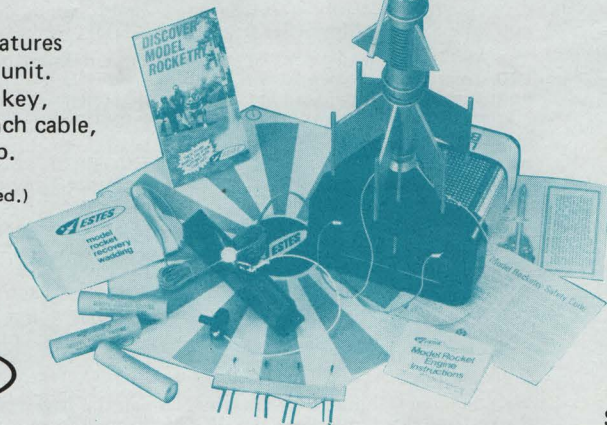
Space Probe Outfit includes (3) model rocket engines, parachute recovery wadding, and Solar Igniters for three exciting flights.

Space Probe Launcher features easy-to-assemble control unit. Includes safety interlock key, arming light, remote launch cable, and launch rod safety cap.

(Plastic launcher may be different color than pictured.)

Ship wt. 1 lb.
Cat. No. 1426

Only \$16.00



Now a spectacular motion picture from Walt Disney Studios.

RENDEZVOUS
WITH THE
ULTIMATE FORCE
IN THE
UNIVERSE...



Space Probe FLYING MODEL ROCKET

SKILL LEVEL 2
Recommended for individuals with some model building experience.

Features include die-cut balsa fins, quick-release engine mount, plastic nose cone and display nozzle, plus 12" parachute recovery.

Specifications:
Length: 25" (63.5 cm)
Diameter: .976" (24.8 mm)
Weight 1.59 oz. (45 g)

Recommended Engines: A8-3 (First Flight)
B4-4 B6-4 C6-5

Ship wt. 10 oz. Cat. No. 1350 Only \$7.00



Build and fly the first spaceship to travel beyond the universe!



A DAMON COMPANY

1980

SEA "D" STRIKE

SKILL LEVEL 3

Scale-like ship-to-air missile with two-stage super "D" engine power. High performance design for incredible 1,800 foot flights. Huge, four-color decal sheet for realistic military appearance. Features include die-cut balsa fins, plastic nose cone, tumble recovery booster, and 12" parachute recovery for upper stage.

SPECIFICATIONS:
Length 31" (78.75 cm)
Diameter 1.34" (34 mm)
Weight 3.35 oz. (95 g)
Recovery System 12" Parachute

RECOMMENDED ENGINES:
Single Stage D12-5 (First Flight) D12-7 D11-9
Two Stage D12-0 D12-7 D11-9
Cat. No. 1332
Only \$7.00

PRE-RELEASE NEW PRODUCTS

MaxiCarus

SKILL LEVEL 2

Huge super "D" engine powered payload model with large see-thru cargo section. Over 6 cubic inches or up to 80 grams of payload capacity. Includes heavy duty die-cut balsa fins, NASA style roll pattern decal, quick-release engine mount, and big 18" parachute for gentle recovery.

SPECIFICATIONS:
Length 29-3/4" (75.5 cm)
Diameter 1.64" (41.6 mm)
Weight 3.2 oz. (90 g)
Recovery System 18" Parachute

RECOMMENDED ENGINE:
D12-5

Cat. No. 1331
Only \$8.00

Challenger-II

SKILL LEVEL 2

High performance "D" engine powered sport model. Easy-to-assemble and fly in less than one hour. No painting required with black plastic fin unit, yellow plastic nose cone, and precolored white body tube. Features kit decals, quick-release engine mount, and 18" recovery parachute. Recommended high altitude launch vehicle for the AstroCam 110 Aerial Camera.

SPECIFICATIONS:
Length 24-1/4" (61.6 cm)
Diameter 1.34" (34 mm)
Weight 3.0 oz. (86 g)
Recovery System 18" parachute

RECOMMENDED ENGINES:
D12-7 D11-9
Cat. No. 1330
Only \$6.00

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, plastic nose, realistic two-color decals, and 12" recovery parachute. Booster employs tumble recovery while upper stage streaks skyward to altitudes over 1,000 feet.

SPECIFICATIONS:
Length 26.5" (67.3 cm)
Diameter .976" (24.8 mm)
Weight 1.8 oz. (52 g)
Recovery System 12" Parachute

RECOMMENDED ENGINES:
A8-3 (First Flight)
B4-6 B6-4 B6-6

A8-0 — A8-5 (First Flight)
B14-0 — B14-7
C6-0 — C6-7

Only \$5.00

RECOMMENDED ENGINES:
Single Stage
A8-5 B4-4
C6-5 C6-7
Two Stage
B6-0 B6-6
B4-6
Cat. No. 1333

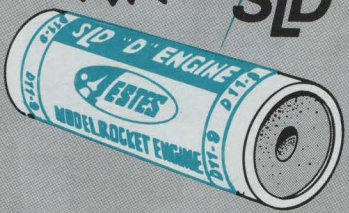
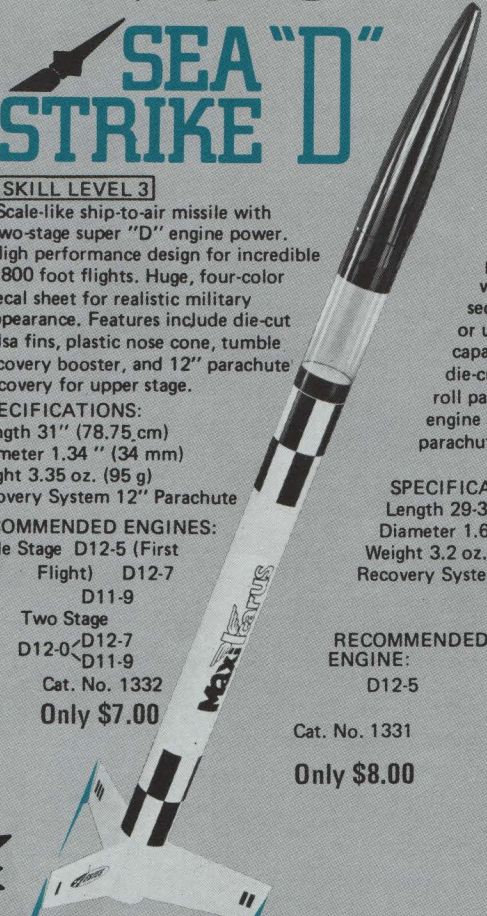
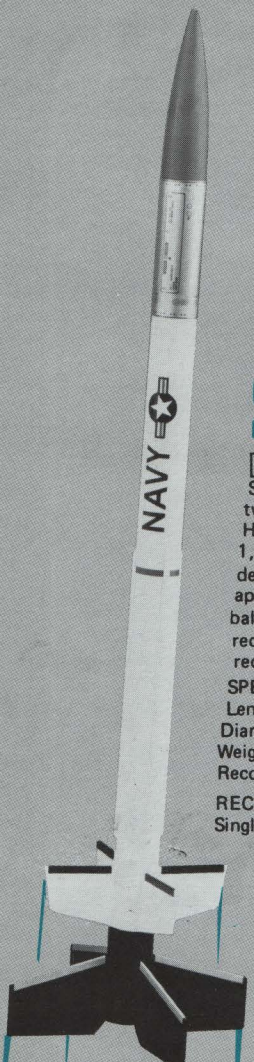
SKYBOLT

SKILL LEVEL 2

Super "D" engine powered high performance sport model. Spectacular flights over 1,000 feet plus dramatic recovery with 90" long fluorescent streamer. Easy-to-assemble and finish with die-cut balsa fins, plastic nose, and unique kit decals.

SPECIFICATIONS:
Length 23" (58.4 cm) Diameter 1.325" (33.6 mm)
Weight 1.75 oz. (50 g) Recovery System 90" Streamer

RECOMMENDED ENGINES:
D12-7 D11-9
Cat. No. 1334
Only \$4.00



SLD

Super Long Delay D11-9 ENGINE

This new super "D" rocket engine delivers a powerful "D11" thrust together with our longest 9 second delay. The "SLD" D11-9 allows your rocket maximum coast time to reach its peak altitude capability. Especially recommended for our "New" Challenger II rocket (#1330) when used as the high altitude vehicle for the AstroCam 110 Aerial Camera.

Cat. No. 1669

3 for Only \$3.95

ESTES ASTROCAM 110 AERIAL CAMERA™

Model Rocketry Outfit With Delta II Launch Vehicle

SKILL LEVEL 2

Suggested for individuals
with some model building experience.

FEATURES:

* The AstroCam 110, model rocketry's most advanced aerial camera. Shoots sharp, crisp, clear color 110 photos. . . one per flight. . . from hundreds of feet above. Easy-to-assemble and simple to operate.

* Delta II Launch Vehicle features two-color decals, 12' parachute, and special plastic fin-unit for smooth and stable flights, time-after-time. All parts are pre-colored. . . no painting required!

* Big Foot Launch System with giant two-foot print for maximum launch pad stability, 1/8" launch rod, blast deflector plate, and rugged girder construction. Plus handheld launch controller with continuity check light, safety key, ignition button, and 15 feet of launch cable.

Requires 4, inexpensive "D" size alkaline batteries for power (not included).

* Flight Pak includes three C6-7, high performance Rocket Engines plus Solar Igniters, Recovery Wadding and the Alpha Book of Model Rocketry.

* Uses Kodak Kodacolor 110 color print film, ASA 400, or equivalent - not included. Film and developing are available locally.

Cat. No. 1410.

Only \$35.00

Ship. wt. 3 lbs.



Actual "AstroCam 110" photo of Johnson Space Center, Houston, TX.

Available Now!



ESTES ASTROCAM 110™

Aerial Camera With DELTA II Rocket

Camera Specifications:

Length: 6.5" (16.5 cm)
Diameter: 1.39" (35.3 mm)
Weight: 1.36 oz. (38.5 g)
(Without Film)
Weight: 1.76 oz. (50 g)
(With Film)

Recommended
Engines: C6-5,
C6-7.



Skill Level 2

Experience the thrill and excitement of taking incredible color aerial photographs from hundreds of feet in the sky. As your rocket reaches apogee and begins its descent to Earth, the ejection charge of your rocket engine trips the AstroCam 110's 1/500th sec. shutter and "snap" . . . you have just taken a dramatic aerial photograph from far above. The "new" AstroCam 110 uses high speed Kodak Kodacolor 110 color print film - ASA 400, or equivalent. (Not Included.) Film and developing are available locally.

Special features include easy, quick-assembly, high quality acrylic lens, molded plastic housing, glass first surface mirror, and high performance aerodynamic design for minimum drag and maximum altitude. Simple to operate and shoots one, crisp, full color 110 photo per flight. Launch with C6-5 or C6-7 engine.

Delta II launch vehicle features specially designed, pre-colored plastic fin-unit for consistently smooth and stable flights. Plus white body tube, quick-release engine mount and great looking, two-color kit decals with dual roll patterns. No painting required! Returns to Earth via 12" dia. canopy parachute. Ship. wt. 14 oz.

Specifications - Camera with Launch Vehicle: Cat. No. 1327

Length: 19.1" (48.5 cm)
Diameter: 1.39" (35.3 mm)
Fin Span: 4.75" (12.0 cm)
Weight: 3.75 oz. (106.3 g)

(Launch System, engines, glue, and film are not included.)

Only \$17.00



Actual "AstroCam 110" photo of residential area of Canon City, CO.

Available Now!

Take Incredible "Color" Photos From Hundreds of Feet In The Sky!

FILM AND DEVELOPING AVAILABLE LOCALLY!





FIRST PRIZE:
WIN! A Fabulous All
 Expense Paid Trip
 for Four to **DISNEYLAND**
 Or **DISNEY WORLD ...**



10 SECOND PRIZES:



FORD MUSTANG II
 Radio-Controlled Car!

ANNOUNCING...

ESTES ASTROCAM 110 PHOTO CONTEST!

To celebrate the technological breakthrough which helped create the astounding
 ASTROCAM 110 — ESTES proudly announces the ASTROCAM 110 Photo Contest!

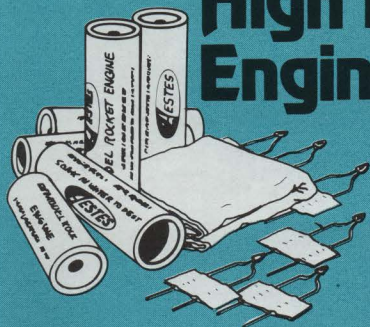
You can win a trip to Disneyland - or Disneyworld which includes transportation, deluxe lodgings,
 admission, rides and \$250 spending money! — plus other fabulous prizes — by entering a dramatic
 aerial photograph taken by your own amazing ASTROCAM 110. Not only will you delight your family
 and friends by photographing your neighborhood... surroundings... important buildings or historic
 sites in your area... from space — but you can also win a trip-to-remember... a rip-roaring Radio
 Controlled Car — or \$25.00 worth of ESTES merchandise!

To enter as many pictures as you like, see all the contest rules and details inside each
 AstroCam 110 Outfit (Cat. No. 1410) or AstroCam 110 Kit (Cat. No. 1327) — and get
 ready to send us your entries by Midnight, March 15, 1980!

GOOD LUCK!

20 THIRD PRIZES:

Win \$25.00 in FREE Estes merchandise!



**High Performance
 Engine Specials!**

**FLIGHT PAK
 SPECIAL**
SAVE \$1.60
 See Page 20 For Special
 Bonus Coupon

You get six B4-2 High Performance Model Rocket
 Engines, Plus Parachute Recovery Wadding and
 Igniters.

Ship. wt. 10 oz.

Cat. No. 7585

A \$4.60 Value Only \$3.00



**BLAST-OFF
 BONUS OFFER**
SAVE \$2.50
 See Page 20 For Special
 Bonus Coupon

Receive Three Each 1/2A6-0, B14-5,
 B14-7 and B14-0 High Performance
 Estes Engines Plus Igniters. A Total
 of One Dozen Popular Engines.

Cat. No. 7586

Big \$8.60 Value Only \$6.10



Half Price Hobby Knife Sale!

SAVE 50¢
 Precision X-ACTO
 Hobby Knife
NOW ONLY 49¢

Cat. No. 2673 Reg. 99¢
 Ship. Wt. 6 oz.

SAVE 87¢
 Heavy Duty X-ACTO
 Hobby Knife
NOW ONLY 88¢

Cat. No. 2689 Reg. \$1.75
 Ship. Wt. 7 oz.



SAVE \$3.00
Model Rocketry
Outfit™ Only \$14.00

See Page 20 For Special
 Bonus Coupon!

SKILL LEVEL 2

Suggested for
 individuals with
 some model building
 experience.

COLONIAL
VIPER™*

Flying
Model
Rocketry
Outfit

Experience the thrill
 and excitement of a
 "Colonial Warrior" and
 surprise the "Cylon
 Raiders" with **BATTLE-
 STAR GALACTICA™***
 Flying Model Rockets
 from ESTES. This
BATTLESTAR GALACTICA™*
 Model Rocketry Outfit
 features sport-scale
 Colonial Viper™*
 and complete launch
 control system, plus
 rocket engines, parachute
 recovery wadding, and
 Solar rocket igniters
 for 3 exciting flights.

The Colonial Viper™* is an
 easy-to-assemble sport-
 scale model with die-cut
 fins, quick release engine
 mount, and realistic
 Battlestar Galactica™*
 decals. With "C" type
 rocket engine your
 Colonial Viper™* will
 attain altitudes over
 600 feet and then
 gently return to Earth
 via 12" recovery
 parachute.

BATTLESTAR GALACTICA™*
 Launch Control System
 features futuristically
 designed hand-held
 launch controller with
 arming lamp, safety
 key, launch button,
 and 15 feet of launch
 cable with micro
 igniter clips. Plus
 sleekly designed
 launch pad with blast
 deflector plate and
 1/8" X 36" two-piece
 launch rod. Entire
 system sets up
 quickly for launch
 and disassembles
 easily for compact
 storage.

Flight Pak includes
 three N.A.R. safety
 certified model rocket
 engines, parachute
 recovery wadding,
 and high reliability
 Solar Igniters.

Recommended Engines:
 B6-4 or C6-5

Recommended 6 Volt Lantern Batteries:
 Burgess TW-1 N.E.D.A. Type #918
 Eveready #731 Ray-O-Vac #918

Shipping Wt. 1 lb.
 Cat. No. 1318

Reg. \$17.00

BATTLESTAR
GALACTICA™*



This **BATTLESTAR**
GALACTICA™* Model
 Rocketry Outfit
 requires 6 volt
 lantern battery,
 paint and glue
 not included.

FLYING MODEL
ROCKETS

Laser Torpedo™*

Skill Level 2

Envisioned by Estes designers to be the most powerful weapon carried aloft and deployed by the Colonial Viper™*. Especially effective against the Cylon's thermal mines placed in various forbidden stellar regions. Our version features futuristically shaped nose cone, die-cut fins, quick-release engine mount, and scale-like laser weapon decals. The Laser Torpedo™* will reach altitudes over 800 feet with "C" type rocket engine and returns to earth via 12" recovery chute.

Specifications:

Length 15" (38.1 cm)
 Diameter 0.976" (24.8mm)
 Weight 1.06 oz. (30 g)
 12" Parachute Recovery
 Ship. wt. 6 oz.

Recommended Engines:

1/2A6-2, A8-3 (First
 Flight) A8-5, B4-4,
 B6-4, and C6-5

Cat. No. 1311

Reg. \$6.50



SAVE \$1.50
Laser™
Torpedo™ Only \$5.00
 See Page 20 For Special
 Bonus Coupon!

SAVE \$1.50
COLONIAL
VIPER™* Only \$6.00
 See Page 20 For Special
 Bonus Coupon!

COLONIAL
VIPER™*
 Skill Level 2



Outstanding sport-scale
 model of the **BATTLESTAR**
GALACTICA™* primary
 attack craft. Backbone
 of Colonial defenses,
 the Colonial Viper™*
 is small, fast, and
 dead on target when
 encountering the
 treacherous Cylon
 Raiders™*. This
 sensational kit is
 easy-to-assemble
 with die-cut fins,
 plastic nose cone,
 quick-release engine
 mount, and realistic
 decals. Can attain
 altitudes over 600
 feet with "C" type
 rocket engine. The
 Colonial Viper™*
 deploys a 12" recovery
 parachute for a safe
 flight and gentle
 recovery time after
 time.

Specifications:

Length 11.75" (29.85cm)
 Diameter 0.976" (24.81mm)
 Fin Span 4.625" (11.75cm)
 Weight 2.01 oz. (57 g)
 12" Parachute Recovery
 Ship. wt. 6 oz.

Recommended Engines:
 B6-4 (First Flight) and C6-5

Cat. No. 1310

Reg. \$7.50

SAVE \$1.00
Flight Pak™*
 Only \$3.25
 See Page 20 For Special
 Bonus Coupon!



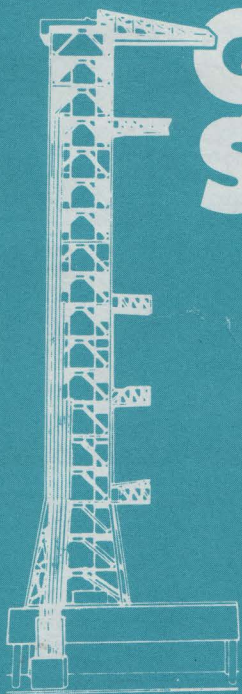
FLIGHT PAK

Features three B6-4
 and two C6-5 high
 performance rocket
 engines plus parachute
 recovery wadding and
 6 Solar rocket
 igniters.

Cat. No. 1319 **Reg. \$4.25**

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GANTRY SALE!



Drifter

Skill Level 3

Swept-fin design, low weight, and large 'chute capacity make this bird great for competition, test, or sport flying. Interchangeable chutes: 24" for competition and 12" for test and sport.

Specifications

Length 14.3" (36.3cm)
Diameter 0.976" (24.8mm)
Weight 1 oz. (28 g)
Shipping wt. 5 oz.

Recommended Engines

1/2A6-2 (First Flight) A8-3
B6-4 C6-5

Cat. No. 1214 ... ~~Reg. \$4.50~~

SAVE \$1.00
Drifter
NOW ONLY \$3.50
See Page 21 For Special Bonus Coupon!

SAVE \$1.50
LTV SCOUT
NOW ONLY \$6.25
See Page 21 For Special Bonus Coupon!

Over 3 Feet Tall!

SAVE \$3.00
RUSSIAN VOSTOK
Now Only \$2.00
See Page 20 For Special Bonus Coupon!

RUSSIAN VOSTOK

Skill Level 3

Dramatic semi-scale, profile model of the famous Russian space booster which carried man into space for the first time on April 12, 1961. Kit features include preprinted fins, quick-release engine mount, and realistic Russian decor. Big 18" parachute recovery makes for super-exciting flights. Nearly 20" long.

Shipping wt. 11 oz.

RECOMMENDED ENGINES

A8-3 B4-4
B6-4 (First flight)
C6-5

Cat. No. 1272

~~Reg. \$5.00~~

1/24 SCALE

LTV Scout

Skill Level 3

Since its first mission in 1960, Scout has been the launch vehicle for more than 90 missions, holding the record for consecutive successes among all NASA launch vehicles. This model is extremely detailed with many plastic parts and realistically decorated with two-color decals. Other features include molded plastic fins and adapter sections, quick-release engine mount and big 18" parachute recovery. Ship. Wt. 11 oz.

RECOMMENDED ENGINE

C6-5

Cat. No. 1287

~~Reg. \$7.75~~

CONDOR

Skill Level 3

Designed by Estes engineers as a futuristic orbital booster with recoverable shuttle for near-Earth missions, this exotic sports model will be an exciting addition to your model rocketry collection. Shuttle-like parasite glider gives flights up to 90 sec. while realistic booster is recovered via 12" parachute. Economically mini-engine powered, the Condor features great looking decals, die-cut balsa fins, quick-release engine mount, and molded plastic nose cone.

Specifications

Booster Length 18.25" (46.4 cm)
Booster Diameter 0.976" (24.8 mm)
Weight (Booster w/glider) 1.0 oz. (28.3 g)
Glider Wing Span 5.0" (12.7 cm)
Shipping wt. 12 oz.

Recommended Engines

1/2A3-2T (First Flight) A3-2T A3-4T

Cat. No. 0807

~~Reg. \$4.50~~

SAVE \$1.50
ON ORDERS OVER \$15.00
See Page 20 For Special Super Bonus Coupon

SAVE \$2.00
MARS LANDER
NOW ONLY \$8.00
See Page 21 For Special Bonus Coupon

MARS LANDER

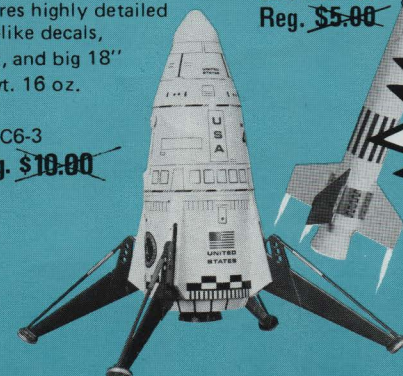
Skill Level 5

Planetary exploration and landing vehicle. Spring-loaded landing gear simulates realistic upright touch-down. Features highly detailed body panels, colorful scale-like decals, quick-release engine mount, and big 18" canopy 'chute. Shipping wt. 16 oz.

Recommended Engines

B4-2 (First flight) B6-2 C6-3

Cat. No. 1243 ... ~~Reg. \$10.00~~



SAVE \$1.00
CONDOR
NOW ONLY \$3.50
See Page 21 For Special Savings Coupon

SAROS

Skill Level 2

22.5" long high performance design for really high flights. Payload section plus plastic nose cone, adapter section, and fin unit. Embossed metallic fin rivet press-on with three-color decals. Quick-release engine mount and 12" parachute recovery.

Shipping wt. 8 oz.

Recommended Engines

A8-3 (First flight)
A8-5 B4-4
C6-5

Cat. No. 1254

~~Reg. \$5.00~~

SAVE \$2.25
SAROS
NOW ONLY \$2.75
See Page 20 For Special Bonus Coupon!

INTERPLANETARY VOYAGERS

Andromeda

Skill Level 3

Designed for journeys to distant planets this incredible "starship of the future" will perform interplanetary missions within the galaxy. This beauty is over 43" long with giant 18" parachute recovery and simulated hybrid fission-ion propulsion engines. Kit features include die-cut parts, highly detailed decals, and quick-release engine mount.

Recommended Engines B6-4 (First Flight) C6-5
Cat. No. 1273

Only \$8.00

43" Long!

FREE B6-4 MODEL ROCKET ENGINES (Pkg. of 3 with igniters) when you get any one of these far-out Interplanetary Voyagers See page 21 for Special Bonus Coupon!

GLEAMS LIKE A JEWEL HIGH UP IN SPACE!

INTERCEPTOR

Skill Level 3

Futuristic version of real interplanetary interceptor. 26" long with dramatic 18" parachute recovery, two big sheets of four-color decals, and quick-release engine mount. Plus all die-cut balsa parts and detailed plastic nose cone, wing pods and tail cone. Shipping wt. 12 oz.

Recommended Engines B4-2 B6-4 (First Flight) C6-5
Cat. No. 1250

Only \$9.00

SOLAR SAILER

Skill Level 3

Simulates one of the newest, most sophisticated space concepts for the 1980's.

Developed for low cost, long duration, deep space missions the real vehicle will use sunlight pressure to push it away from Earth at speeds up to 35,000 mph.

Our model features printed balsa fins, quick-release engine mount and realistic decals. Truly spectacular recovery with giant 24" aluminized mylar solar sail 'chute. Ship wt. 11 oz.

Recommended Engines B6-4 (First Flight) C6-5

Cat. No. 1297

Only \$8.00

STAR WARS

Flying Model Rockets

T.I.E. Fighter

Skill Level 3

Primary attack craft of the Imperial Forces commanded by Darth Vader. Kit features include highly detailed, pre-colored plastic cockpit and fuselage, quick-release engine mount and big 18" recovery 'chute. Special parachute recovery probe attaches quickly for flight and removes easily for display. Ship wt. 12 oz.

Recommended Engine C6-3

Cat. No. 1299

Only \$8.00

Skill Level 2

STAR WARS R2-D2 is 1/5 actual size and actually flies. Artoo "pops his top" in normal model rocket fashion to deploy an 18" dia. recovery parachute. Kit features include a molded plastic body dome and body skirt, a precisely detailed 4-color body wrap-on, quick-change engine mount and stabilizer leg-fins. Ship wt. 12 oz.

Recommended Engines B6-2 (First Flight) C6-3

Cat. No. 1301 Only \$7.00

X-WING Fighter

Skill Level 2

Scale model of the T-65 X-Wing Fighter piloted by Luke Skywalker. Great for demonstrations with flights over 300 feet plus 12" recovery 'chute. Highly detailed with authentic 3-color decals. Kit includes die-cut balsa wings, plastic fuselage, and quick-release engine mount. Small balsa fins have been added for Earth flight.

Recommended Engines B4-2 (First Flight) B4-4 B6-2 C6-3 C6-5

Ship wt. 16 oz.

Cat. No. 1298

Only \$8.00

SAVE \$1.50 ON ORDERS OVER \$15.00 See Page 20 For Special Super Bonus Coupon!

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MAXI-BRUTE X-WING Fighter

Over 16"
Wingspan and
Nearly 22"
Long

STAR WARS™

3 FREE SUPER-POWERED D 12-3 ENGINES (\$3.95 Value) when you purchase a Maxi X-Wing Fighter
SEE PAGE 21 FOR SPECIAL BONUS COUPON!

This giant X-WING Fighter is easy-to-assemble with fantastic detailing and authentic "Death Star" mission decor. By far the most dramatic "STAR WARS" model available for display. "D" engine powered for great performance too! Spectacular flights over 300 feet. Kit components include die-cut balsa parts and highly detailed plastic fuselage, engines and laser pods. Plus two big 18" recovery parachutes and attractive display stand. Small fins have been added for Earth flight and a 3/16" launch rod is recommended for lift-off.

Specifications:

Length 21 5/8" (54.9 cm)

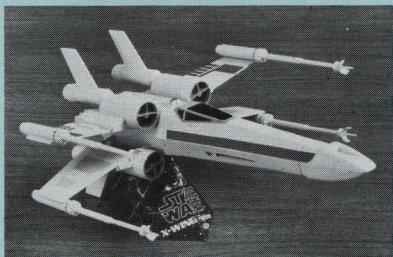
Wing Span 16 1/4" (41.3 cm)

Diameter 3 5/16" (83 cm)

Weight 11 oz. (312 g)

Ship wt. 2 lbs.

Recommended Engine: D12-3



Exact size
used by
STAR WARS
Special
Effects
Team

Cat. No.
1302

Only \$19.95

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TRACKING EQUIPMENT



NEW!

HOW HIGH DID IT GO?

SAVE 50¢

AltiTrak™
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AltiTrak™ 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.

Cat. No. 2232 ~~Only \$6.00~~

Join More Than 25,000 Estes Rocketeers Getting The Most Out Of Model Rocketry
BECOME A MEMBER OF THE

**estes
aerospace
CLUB TODAY!**

You'll discover membership in the Estes Aerospace Club opens up a whole new world of model rocket activities. Membership is permanent, and your membership kit includes:

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- **MEMBERSHIP CERTIFICATE** – Suitable for framing.
- **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!
- **RANGE BOX STICKERS** – Stick-ons for your multi-purpose range equipment.
- **EAC STATIONERY** – Distinctive stationery for notes and letters.
- **MODEL ROCKETRY TECHNICAL MANUAL** – Includes information on construction techniques, finishing, stability, tracking, recovery systems, multi-staging, and boost gliders, plus much, much, more.
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- **EAC PRODUCTS BULLETIN** – Outstanding offers for EAC kits and products available ONLY to members.

SAVE 50¢ SPECIAL EAC MEMBERSHIP ONLY \$3.50 See Page 21 For Special Bonus Coupon!



Join NOW! Become an Estes Aerospace Club Rocketeer TODAY!!

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Special EAC Membership Offer
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FALL 1979

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Offers From This Estes Catalog!

the Bonus coupon...send it in with your order and your check or money order for \$2.00 plus handling charge of \$1.00...and you will receive the Vostok for \$3.00 off the regular price. Be sure to enclose all Bonus Coupons used with the order form in your return envelope.

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Worth \$2.00
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Toward the purchase of an LTV SCOUT #1287
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(Pkg. of 3) **Worth \$2.05**
when you purchase any Interplanetary Voyager on pages 16 & 17.
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Toward the purchase of an ALTITRAK™ Altitude Finder #2232
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Worth \$1.00
Toward the purchase of a Designer's Special Model Rocketry Parts Assortment #1463
(See Page 22) Expires 4-1-'80

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ESTES Bonus Coupon

Worth \$1.00
Toward the purchase of a BIG FOOT™ Launch Control System #2208
(See Page 22) Expires 4-1-'80

#7603

ESTES Bonus Coupon

FREE C6-3 Model Rocket Engines
(Pkg. of 3) **Worth \$2.25**
when you purchase a SPACE SHUTTLE #1284
(See Back Cover) Expires 4-1-'80

A \$30.00 VALUE

SAVE \$1.00
Designers Special
NOW ONLY \$14.95
See Page 21 For Special
Bonus Coupon!

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Ideal parts assortment for the creative rocketeer. Develop your own R & D Program. Over 75 pieces at an excellent savings!

- | | |
|---------------------|--|
| Body Tubes | Recovery Equipment |
| 2 BT-5 | 3 Shock Cord 1/8" X18" |
| 2 BT-20 | 1 Shock Cord 1/8" X36" |
| 2 BT-50 | 1 Shock Cord 1/4" X36" |
| 1 BT-55 | 1 Streamer Material 1" X30" |
| 1 BT-60 | 6 Screw Eyes |
| Nose Cones | Miscellaneous |
| 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-50K | 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) |
| Fin Material | 1 Stage Coupler (JT-60C) |
| 2 BFS-20 | 1 Balsa Adapter (TA-2050A) |
| 2 BFS-30 | 1 Multi-Purpose Paper Adapter Set (TA-1) |
| 2 BFS-40 | 12 Launch Lugs (2-3/8" Long) |
| Parachutes | 1 Alpha Book of Model Rocketry |
| 1 PK-8 | 1 Fin Pattern Sheet No. 2 |
| 2 PK-12 | 1 Fin Pattern Sheet No. 3 |
| 1 PK-18 | |
| 1 PK-24 | |

Cat. No. 1463

Reg. \$15.95

Big Foot™

MODEL ROCKET LAUNCH CONTROL SYSTEM

The all new Estes Big Foot launch control system is capable of launching all Estes models including Maxi-Brutes. Futuristically designed launch platform features rugged plastic construction and enormous "two foot print" for maximum launch pad stability. Includes blast deflector plate, 1/8" X36" two-piece launch rod, swivel mount that is adaptable to either 1/8" or 3/16" launch rods, and legs which remove easily for compact storage. This launch control unit is newly engineered for simple, quick assembly and features safety key, continuity check light, ignition button and 15 feet of launch cable. Uses 4 inexpensive "D" cell batteries and Estes Solar igniters #2301 (not included). Ship wt. 2 lbs.

Cat. No. 2208 ... Reg. \$15.95

SAVE \$1.00
NEW BIG FOOT LAUNCH CONTROL SYSTEM
NOW ONLY \$14.95
See Page 21 For Special Bonus Coupon!

Requires four "D" cell batteries for power (not included).

USES INEXPENSIVE "D" CELL BATTERIES!

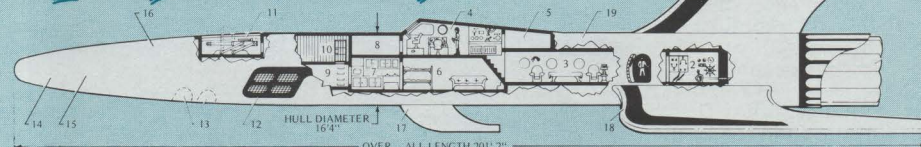


GALACTIC PIRATES™

"Blasting Off For Adventure In January 1980!"

(Not Available Until January 15th 1980, Please DO NOT Order Now.)

PATROL CRUISER EXCALIBUR "The Good Guy"



Sleek and powerful, the Excalibur is the pride of the Intergalactic Patrol. Never in history has a faster and more maneuverable craft been built.

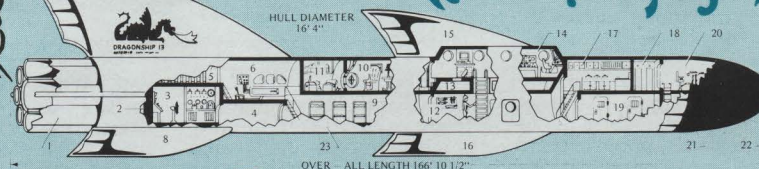
Hidden in the ship's nose, on a retractable carriage is a quad mounted, choke barrel, Hyper-Ballistic Vacuum Gun. This weapon is capable of penetrating Vadarnium armor and all but the most powerful of energy shields. Speeds in the Star-Fall category are possible and range is reported to be 63 Billion miles without refuelling. Cat. No. 1339 Only \$7.00

LEGEND

- Rocket Engines: 9 Standard @ 122,000 lb. thrust each. 1 Star-Fall @ 1,306,200 lb. thrust.
- Engine room with 20" Illanium Heat Shield at rear.
- Main Salon
- Bridge (control deck) with television & wireless radio equipment.
- Arsenal (weapons storage)
- Crew sleeping quarters.
- Galley (kitchen) with radar-range.
- Gyroscopic control equipment.
- Access tunnel to forward areas.
- Brig (prisoner compartment)
- Hyper-Ballistic Vacuum Gun, quad mounted, choke barrel, mounted on retractable carriage.
- Cooling radiators (for atmospheric travel).
- Anti-Gravity Ray landing brakes.
- Energy shield generator
- Ancillary Equipment Module (when coupled to energy shield generator, can produce short term invisibility).
- Refrigerated food storage compartment.
- Forward landing skid with anti-friction plate.
- Landing lights (2) with retractable covers.
- Compartment above salon contains compression tank for running water & generator for electric lights.

"FREE" Galactic Pirates Iron-On With All Orders Received On The Enclosed Order Form !!

"The Bad Guy" DRAGONSHIP 7



LEGEND

- Rocket Engines - Data incomplete.
- Lead Shield - Impregnated with Anti-Gravitum for weight reduction.
- Engine room
- Access tunnel - Fuel storage on either side.
- Magazine (ammunition storage) for Cannon.
- Control room for Twin Hydron-Stethode Cannon.
- Vertical inertia control fin.
- Rear landing skids (2), set at 26° to vertical.
- Crew quarters
- Captain-Major's cabin
- Treasure Room
- Crew ready room
- "Tween Decks" - guidance equipment and weapons storage.
- Bridge (control deck)
- Stabilization Fin - contains retractable steel teeth for ripping open hulls of enemy ships.
- Liquor locker on right side.
- Emergency Parachute Compartment (both sides) - contains 2-80 ft. parachutes for deployment in case of power loss.
- Dungeon (4 cells)
- Forward Weapons Deck - contains 4 short-range laser exciter cannon firing from concealed gun ports.
- Energy Shield Generator Room
- High voltage Electron Transfer energy shield.
- Flotation material beneath floor for landing on water.

Readed Dragonship of the Outlaw Galactic Pirate Confederacy. Dragonship 7, based on the asteroid Greb-Sing is an outstanding example of evil technical genius. The ship's Twin Hydron-Stethode Cannon furnish a firepower of the Seventh Magnitude. An Electron Transfer Energy Shield and several Close-Range Laser Exciter Cannon complete the armament. This alien marauder from deep space is aptly named and universally feared. Cat. No. 1345 Only \$6.00

NOTE: All data obtained from craft captured intact after crew mutiny on the planet Alumeum, August 24, 2312. Name: DRAGONSHIP 13 under command of Captain-Major Wing-Ding.

Get set to clear your launch pad for the incredible Galactic Pirates' Spaceships!

Vernon Estes Publisher
 Dane Boles Editor
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 Charlie Webb Photographer
 Rudl Mergelman Staff Artist
 Randy Ford Staff Artist
 Dale Claflin Staff Artist

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Apollo 11 and Beyond

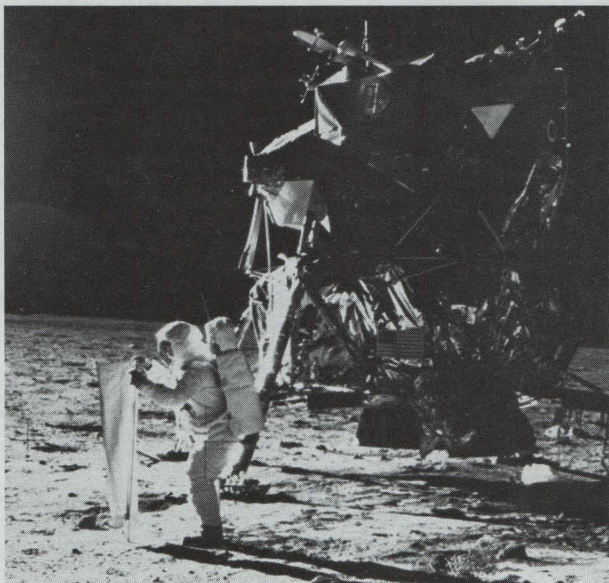
by Gregory P. Kennedy NAR # 12874 Assistant Curator, Astronautics, Smithsonian Institute

Ten years ago, during the flight of Apollo-11, men first walked on the moon. In the decade since, we have seen five more lunar landings, the first space stations, and the first international manned space flights. The second decade following Apollo-11 holds the promise of an operational space transportation system which will make flights into space an everyday occurrence.

Apollo-11 was launched on July 16, 1969, with astronauts, Neil Armstrong, Michael Collins, and Edwin ("Buzz") Aldrin aboard. At 9:32 AM, EDT, the 364-foot tall Saturn-V roared to life. Slowly, the thundering giant rose from its launch pad at the Kennedy Space Center in Florida. As it gained altitude its speed increased. The boost to orbit was flawless. The crew spent a brief time in orbit around the earth, then re-ignited the Saturn's third stage engine to propel themselves to their destination a quarter of a million miles away. Three days later they were orbiting the moon.

On July 20 Armstrong and Aldrin entered the lunar module Eagle, while Collins remained behind in the command module Columbia. The two spacecraft were separated, and Eagle began its descent to the lunar surface.

"Houston, Tranquility Base here. The Eagle has landed." With those words, Armstrong announced the successful landing at 4:17 PM.



"Buzz" Aldrin and Eagle during Man's first moon landing.
 — Photo Courtesy NASA.

Later that night Armstrong and Aldrin emerged from the frail-looking spindly-legged Eagle and spent 2-1/2 hours walking on the moon. They found the surface to be littered with rocks and craters. Everything was covered with a layer of fine, grey dust. A seismometer to measure moonquakes and a laser reflector were deployed. These two items would be used to obtain data after the astronauts' return to earth.

Like tourists everywhere, Armstrong and Aldrin took photographs and collected souvenirs. Their souvenirs were 56 pounds of lunar rocks and

soil. When their traverse on the moon's surface was over, they climbed back into Eagle for a well-deserved rest.

Lift-off from the moon, on July 21, was perfect. Within hours, Armstrong and Aldrin had rejoined Collins aboard Columbia. The service module's engine was ignited to place the spacecraft on a home-ward trajectory.

Following a three-day coast home, the Apollo-11 Command Module re-entered the earth's atmosphere and splashed down in the Pacific Ocean. Thus, one of humankind's most impressive technological feats—the first manned landing on the

moon—had reached a successful end. Five more lunar landings were made after Apollo-11.

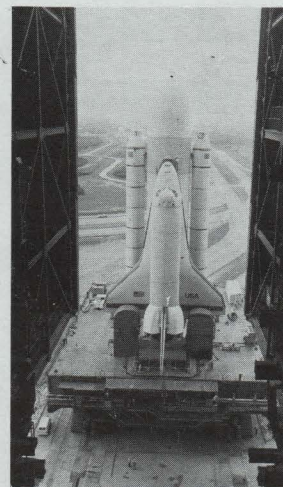
Apollo-12 demonstrated precision landing techniques. Astronauts Conrad and Bean touched down within 1000 feet of the unmanned Surveyor-3 which had landed in the moon's Ocean of Storms in 1967.

The Apollo-13 landing had to be aborted after an oxygen tank in the Service Module exploded. The Lunar Module Aquarius was used as a lifeboat for astronauts Lovell, Swigert, and Haise as they nursed their crippled spacecraft back to Earth.

Each of the four remaining Apollo flights added to our growing bank of knowledge about the moon. With each mission, man's abilities to work on the moon increased. Beginning with Apollo-15, an electric-powered car, the Lunar Roving Vehicle, was used to greatly expand the area which could be explored by the astronauts on the moon. Also beginning with Apollo-15, an array of scientific instruments was carried in the Service Module to conduct a detailed examination of the moon from orbit.

The last lunar landing, that of Apollo-17, was in December, 1972. The twelve Apollo astronauts who walked on the moon had brought back over 8 hundred pounds of the moon's rocks and soil to Earth. They had left scientific instruments behind which continued to return data about our nearest celestial neighbor for years afterwards. One of the greatest epochs in the history of exploration had reached its end.

However, the technology of the Apollo program and a great deal of its leftover hardware was destined to be used for our next step in the exploration of space: Skylab. Skylab was America's first space station. Fabricated from a Saturn-V third stage, the Skylab Orbital Workshop



"Enterprise" 1st Space Shuttle.
 — Photo Courtesy NASA.

(OWS) offered as much habitable volume as a small three-bedroom house on Earth. The planned scientific program was ambitious. Experiments included biomedical investigations, materials processing, solar observations, and remote sensing of the earth from space.

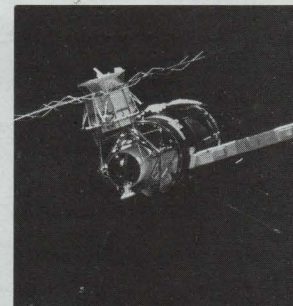
The workshop was launched by a Saturn-V on May 14, 1973. Shortly after launch, telemetry signals began to indicate that all was not well with the space station. The wrap-around micro-meteoroid shield had torn loose 63 seconds after launch, taking one of the two solar cell arrays (or "wings") with it. Worse still, the other wing was jammed by debris and would not deploy. Without the shield the body of the OWS was exposed to the sun's intense radiation, causing interior temperatures to soar.

The launch of the first crew was delayed until May 25 while procedures were developed to save the crippled giant. One of the first tasks facing astronauts Conrad, Weitz, and Kerwin after boarding Skylab was to unfurl a make-shift parasol to shield the OWS from the sun. After the parasol was deployed, temperatures inside the work-

shop began to drop. The next major concern was to free the jammed solar wing. On June 7, Conrad and Weitz succeeded in deploying the wing during an hours-long spacewalk. Skylab, through the courage and ingenuity of the astronauts and ground support personnel, had been brought back from the brink of disaster.

The first crew spent a total of 28 days in space. Two more visits to Skylab were made. The second crew spent 56 days living in the 85-ton space station, while the third and final crew spent 85 days in orbit above the earth.

During the Summer of 1975, the United States and the Soviet Union conducted the first international manned space flight. Three American astronauts in an Apollo spacecraft, docked with two Russian cosmonauts in a Soyuz. This was the last American manned space flight using expendable spacecraft and boosters.



Skylab in Orbit as seen from Apollo.
 — Photo Courtesy NASA.

During the first half of 1980, the Space Shuttle will make its first flight in space. Unlike previous manned spacecraft, the Shuttle Orbiter has wings and will glide in for a landing like an airplane. It will be reusable, which will greatly reduce the cost of spaceflights. After the Space Shuttle has undergone several flight tests, it will become the basis for an operational Space Transportation System, and flights into space will become routine occurrences.

APACHE-ARROW

WINNER APRIL 1979
DESIGN OF THE MONTH CONTEST
By: MILES CONKLIN, Highland, MI

SKILL LEVEL 2

PARTS LIST

A	2	Body Tube (BT-5)	3070
B	1	Nose Cone (BNC-5W)	8003
C	1	Fin Stock (BFS-20)	3164
D	2	Launch Lugs (LL-2A)	2321
E	1	Screw Eye (SE-3)	2281
F	1	Shock Cord (SC-3)	85744
G	2	Stage Coupler (JT-5C)	3050
H	1	Parachute (PK-8)	2261

ADDITIONAL MATERIALS

White glue, sanding sealer, spray paint, sandpaper, hobby knife, ruler, sharp pencil.

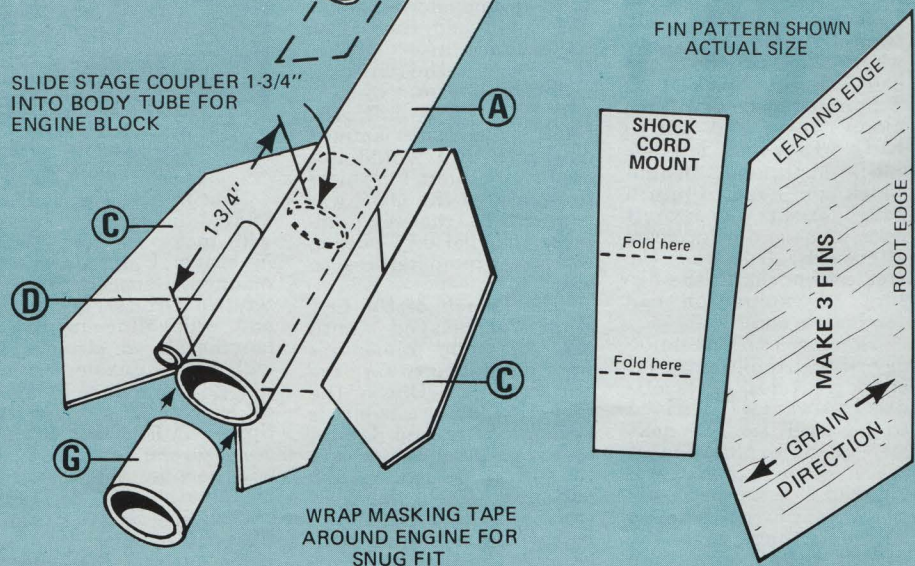
RECOMMENDED ENGINES

A3-4T (First Flight) A10-3T

PAINTING

Nose cone - Black
Body Tubes - Yellow
Multi-colored stripes around body tube above fins.

SLIDE STAGE COUPLER 1-3/4" INTO BODY TUBE FOR ENGINE BLOCK



WRAP MASKING TAPE AROUND ENGINE FOR SNUG FIT

the VIEW from up there

by Bob Cannon

Ever wondered what things looked like from above? If you were in a helicopter, airplane, or handy skyscraper, no problem! If not, you were left with your imagination to try to see a "bird's eye view" of the world.

Now there is a simple, inexpensive way to see the world the way an eagle sees it. The new Estes Astro-Cam 110 is an aerial camera which takes excellent color photos from about 107 meters (350 feet) or more in the air. The wide angle lens (33°) is in focus from 3.66 meters (12 feet) to infinity.

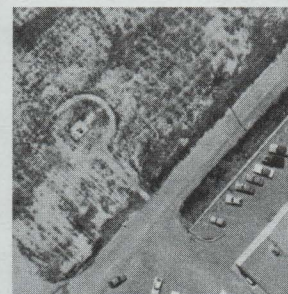
Seeing the world from above is fun, but it makes things look different. Familiar objects don't look the same any more. You must seek reference points to help you identify what you see. Since the Astro-Cam 110 takes pictures with the use of a mirror, everything on the color print is backward unless you ask that the prints be reversed when you take or send in the roll of film for development and printing.

ground). Oblique photos show more surface area and are often more beautiful, but vertical photos are easier to use in aerial photo interpretation.

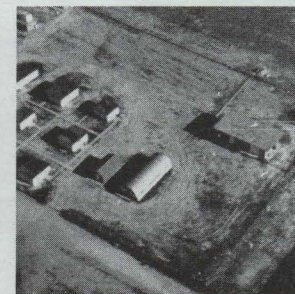
The amount of information which can be derived from an aerial photograph is enormous. The obvious information includes telling just what is photographed (houses, your house, your block, your barn, a local school, etc.). In addition, the time of day can often be determined by the length of shadows. This is harder with a photo of an unfamiliar area for which you do not immediately know which direction is north. Don't forget to allow for direction reversal left to right if your print was not reversed when the film was developed and printed.)

are no row crops or other signs of agriculture, the area is probably not cultivated. Since there is evidence of plowing, the area has been cultivated. In fact, the "rows" were produced by plowing the previous summer to control weeds. The straight and curved "path" is a "road" of yellow bricks to the launch pad. The launch pad is visible in the middle of the curve.

What time of day was this photo taken? Probably near noon as evidenced by the very short shadows. If you knew that the launch pad was east of the building, you could determine from shadows near the cars and the building that the photo was taken shortly before noon (sun east of overhead).



Vertical Aerial Photo of "Cape Estes", The Launch Pad For Tours At Estes Industries.



Oblique Photo of A Storage Area at Estes Industries.



Oblique Photo Looking West From Penrose, Colorado. (Note mountains on horizon.)

Pictures which are taken by aerial cameras are usually classified as either oblique (taken at an angle, camera not perpendicular to ground) or vertical (taken straight downward, camera perpendicular to

From the above photo can you tell if the area shown is a housing development, an industrial area, or at least partly "in the country". The lack of homes indicates that it is not immediately in a residential area. The parking lot with several cars indicates that the area is at least partly commercial, industrial, or a shopping center. The area with sparse weeds and grass indicates that at least part of the area is open. Since there

This photo was taken on the same roll of film as the prior photos. The photos were all taken the same day. East is to the right in this photo. (Was the picture taken before (earlier in the day) or after (later in day) the previous photo? (Earlier, longer shadows to left (west) of building.)

Many "indirect" facts can be determined by careful consideration of an aerial photo. If you have an aerial photo of a prairie dog colony and know the average number of prairie dogs in a family, and the

average number of entrances per burrow, you can make a good estimate of the number of prairie dogs in the colony or per acre of the colony. Counting the number and size of red ant colonies can allow you to compare relative seed productivity of two fields of grass. Variations in plant health can let you spot poorly watered or fertilized or poor soil areas of fields of crops or lawns. Many more such studies are possible. Not only are they fun and meaningful, they could make great Science Fair projects. Actual examination on the ground of the area in the photo is helpful in verifying the accuracy of the interpretation of the photo.

Using the C6-5 engines to launch the AstroCam 110 usually produces oblique photos. Use of the C6-7 engine generally yields vertical or nearly vertical photos. Photos with the C6-5 engine are usually taken at about 130 meters (426 feet) or higher. Pictures taken with the C6-7 engine are usually taken at 107 meters (351 feet) or higher (two seconds longer for aerial camera to descend before picture taken). Occasionally, the camera may take a nice "sky shot" because it failed to tip over at apogee.

Exact determination of height from which the aerial photograph was taken is possible by analysis of the photograph if the picture was taken vertically and the size of one object near the center of the picture is known.

It is easier to make all measurements for photo interpretation in metric units (millimeters and meters).

Using the photo of "Cape Estes", determine the height from which this photo was taken.

Make all measurements from the negative. Since you don't have this negative, the measurements are provided in this example.

Formula for determining height of camera at instant photograph was taken

$$H = \frac{OF}{I}$$

H=Height of camera above surface
O=Object size
I=Image size on negative
F=Focal length of lens
O=3.023 meters (9 feet 11 inches) or 3023. millimeters
I=0.5 millimeters
F=30.0 millimeters (a constant)
H=(3023. mm) (30.0 mm)

$$H = \frac{90790. \text{ mm}}{0.5 \text{ mm}}$$

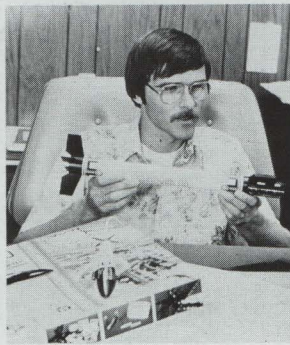
H=181380. mm or 181.38 m

The height of the camera at the instant the picture was taken was 181.38 m (594.9 feet).

Once you know the height from which the picture was taken, the formula can be modified to give the size of other objects near the center of the photo.

$$O = \frac{HI}{F}$$

Since the height (H) is known, only the size of the image (I) of the object under study need be determined and the formula solved to determine the size of the object. The focal length (F) is always 30.0 mm.



Mike Dorffler, Estes Engineer for the AstroCam 110.

The aerial photographs in this article were all taken by Mike Dorffler with an AstroCam 110 made from a kit taken off the assembly line on the first day the kit was packed. He took these photos on one roll of film the same day.

Stump Your Teacher Quiz

Question for your teacher:

Do model rockets have to have fins?

Answer:

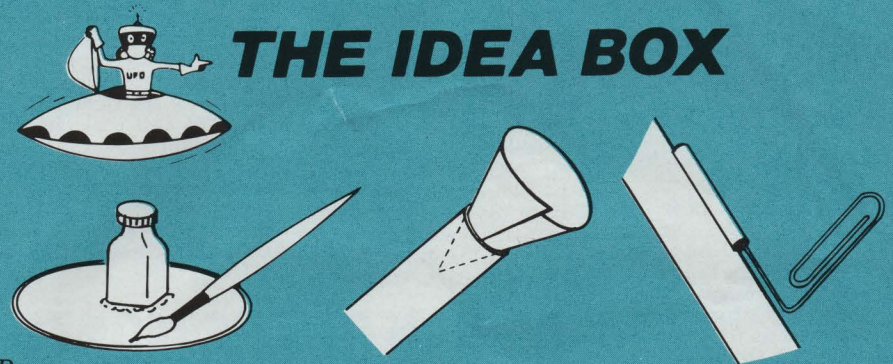
No. Model rockets do require some sort of aerodynamic guidance. This guidance is usually secured by causing the Center of Pressure (point at which all of the aerodynamic forces operating on the rocket appear to be centered) to be well back of the Center of Gravity (point at which all of the weight of the rocket appears to be concentrated) of the model rocket. This situation is usually secured through the use of fins, but other techniques such as conical body shapes are possible.

Question for your teacher:

What is the maximum thrust developed during launch by the Space Shuttle?

Answer:

Current designs call for each of the three orbiter engines to produce 420,000 pounds (2.1 million Newtons) of thrust and each of the strap-on boosters to produce 2,600,000 million pounds (11.6 million Newtons) of thrust. The total thrust produced at lift-off will be 6,610,000 pounds (29.5 million Newtons). The anticipated lift-off weight of the Space Shuttle with boosters and a typical payload is 4,400,000 pounds.



By:

Tim Brake, Albion, IL

Joel Heinitz, Iowa City, IA

To avoid spilled paint when painting your models, glue the bottom of the paint bottle to a coffee can lid. This prevents spills as well as catching drops off the brush.

When painting a model where the nose and body are different colors, a paper cone prevents paint from getting inside of the tube when painting.

Need to pick up a model with wet paint? Bend a paper clip as shown and slip bent end under launch lug and you can lift the model without touching the paint.

MRN and Free Goodies.. For You!!

Model Rocket News is now published four times a year-Winter, Spring, Summer, and Fall. We will, whenever possible, mail your MRN to you with our seasonal mailings in addition to including it with return mail-orders as long as our supplies last as an exclusive service for our mail-order customers.

To receive our seasonal mailings you must be an active Estes mail-order customer which requires you to have placed an order for Estes merchandise within the past four months.

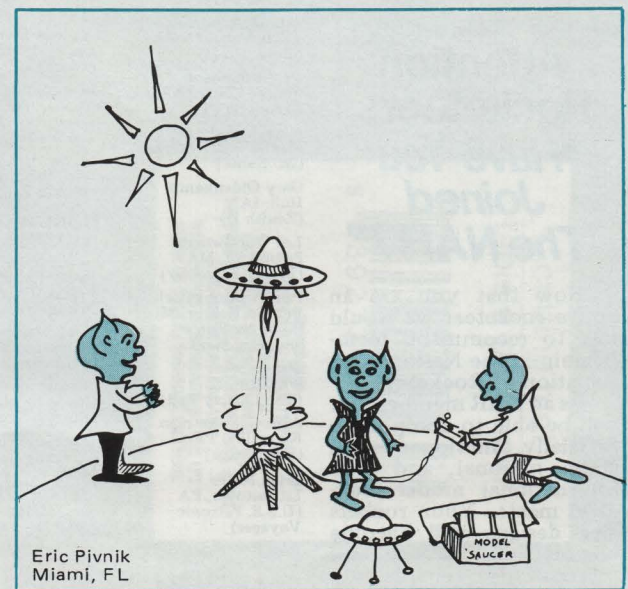
Additional Bonuses. . . All orders received on even numbered months, (February, April, June, etc.), will be returned with a "free" plan to help increase your Estes fleet. These new plans feature a variety

of designs from single-stage sport models to far-out exotic rockets you will be proud to display. All "free" plans can be constructed from the Estes hi-performance parts and accessories listed in our catalog.

All orders received on odd numbered months will be returned with a free

iron-on decal for your t-shirt, windbreaker, or range jacket. These iron-ons feature a variety of super-neat designs. You iron it on right at home to any surface containing 50% or more polyester.

Remember. . . these items are available only with return mail-orders!!!



Eric Pivnik
Miami, FL

Help Us Publish The Model Rocket News

Got any good ideas for MODEL ROCKET NEWS articles, technical information, cartoons, anecdotes, club news of unusual interest, etc? Then why not submit them to us for possible publication? Our constant aim is to make MRN a better, more interesting magazine, and you might be just the type of contributor we need.

If you send us photos, please make sure that you pack them between cardboard sheets so that they won't get creased in the mail. All contributions become the property of Estes Industries and cannot be returned. Address all material to: MRN Editor Estes Industries, Penrose, Colorado 81240.

Should your article or photos be used in MRN, we'll reward your efforts and talent with an Estes merchandise certificate, the amount of which will be determined by the MRN editorial staff.

Hope to hear from you soon!

Attention Rocketeers: "Have You Joined The NAR?"

Now that you are an active rocketeer we would like to recommend membership in the National Association of Rocketry.

As an NAR member you will be able to compete in officially sanctioned local, state, national, and even international model rocketry meets. Your rockets and designs will become eligible to set national and international records and most important, you will

be kept informed of happenings in model rocketry around the world. Flight insurance is available now too!

Also as a NAR member you will receive a monthly copy of Model Rocketeer, a magazine published as a service by the NAR for its members. It contains news of upcoming model rocketry and space events, man-

ufacturers news, modroc tips, designs and plans, news of the NAR, its members, and other people in the aerospace field. Also, it contains editorials, humor, and rocketry history.

For more information and a membership application write: NAR Headquarters, Dept. E-8, P.O. Box 725, New Providence, NJ 07974.

DESIGN OF THE MONTH WINNERS

WINNERS

Michael Hardman
Cary, NC
(Quasar)

Ken McClure
Upland, CA
(Cobra)

Dave Henry
Euclid, OH
(Tri-Finned Spacing Formula)

Kevin Bates
Troutdale, OR
(Rotor Rocket)

HONORABLE MENTIONS

Kirk Negaard
Hawthorne, CA
(Launch Control System)

Troy Davis
Princeton, MN
(Destroyer)

Scott Spangenberg
Erie, PA
(Cloud Buster)

Bob Meierjürgen
Little Valley, NY
(Romulan II)

Benjie Johnson
Spruce Grove, AB,
Canada (Rat)

Mark Lesko
Mayfield Heights, OH
(No Name)

Gary Oldenkamp
Hull, IA
(Zenith II)

Lee Woodworth
Pembroke, MA
(Flying Farce-Sar)

Paul Antonowitsch
Benton Harbor, MI
(U.S. Air Force Shooting Star)

Dan Lower
Wheaton, IL
(The Liberty Bell)

Alan C. Streetman
Knoxville, TN
(Dominator)

Brian Miller
Littlestown, PA
(U.S.S. Patronic Voyager)

Don Bruechert
Manitowoc, WI
(Solar Cell Launch Controller)

Tim Rood & Jeff
White
Ames, IA
(Arcturus IV)

Mike Aron
Needham, MA
(Manual Launcher)

Ray Munselle
Cedar Hill, TX
(Boost Glider)

WINNERS

Walter Lapovich
Torrance, CA
(Sandpiper)

Partick J. Percival
Bay Village, OH
(Planetary Assault Support Craft)

Dennis Gilbert
East Brunswick, NJ
(Star Tripper)

Dean Kavalkovich
Monroeville, PA
(Cyclone II)

Andrew Davidson
Oakland, ME
(Polaris LF-1)

Steve Lindsley
Tyndall AFB, FL
(Centurion II Launch Control)

Kevin Harms
Carrollton, IL
(Master Launcher III)

HONORABLE MENTIONS

Rusty Roach
Frisco, TX
(Voodoo)

Tony Clark
Arlington, TX
(Launcher System)

John Grosvenor
Roanoke, VA
(Rocket Stand)

Douglas Weerstra
Tlacotala Oaxaca
Mexico
(Mariner VIII)

John Gillio
San Jose, CA
(Saturn III)

Allan Hogue
Katy, TX
(Sky Ripper)

Milton J. Marasch
Plainview, MN
(Ark II)

Robby Doane
Lake Jackson, TX
(Centurion II)

Thomas Lemmons
Laverne, OK
(Yellow Jacket)

Dan Isidinger
St. Cloud, MN
(X-7)

Kerry Marsico
Palatine, IL
(Galaxy)

David Nuutinen
Thunder Bay "F"
ON Canada
(Candusa)

David Zitzkat
New Britain, CT
(Crusader)

Jim Denning
Hudson, CO
(Gemini I)

Scott Kerr
Grand Rapids, MN
(Darth Vader)

Richard K. Pautz
APO, NY
(Starburst)

Matthew P. Christian
Sacramento, CA
(Gamma Ray)

John Carlson
Cordova, AK
(Achilles' Arrow)

WINNERS

Monty Michael
Land O' Lakes, FL
(Mako)

David L. Sidebottom
Topeka, KS
(Launcher System)

Scott Huie
Troy, NY
(Parachute Ejection System)

HONORABLE MENTIONS

Devin Jones
Werserville, OH
(Nike Needle)

Kevin Schlier
Stroudsburg, PA
(WF-125 Banshee)

Art D'Ambrosio
Canton, MI
(O-Zone)

Ricky Wofford
Leesburg, FL
(Titan Imperial)

Scot Tolsen
Prospect Heights, IL
(Two-Stage Launch Pad)

Josh Woltz
Mercersburg, PA
(USC Starseeker II)

Tim Knight
Baton Rouge, LA
(Destroyer Rocket)

Robert Inscow
Newton, NC
(Space Probe)

Floyd E. White, Jr.
Jefferson, MD
(Star Warrior)

Clark Gerhart
Telford, PA
(Mach I Fighter)

Ron Eberts
Williamson, NY
(Night Hawk)

Thomas Payne, Jr.
Tappan, NY
(HoloFax)

Joel Frazin
Carmichael, CA
(Voyager 3)

October 1978

WINNERS

Mike Books
Aztec, MN
(Launcher System)

Doug Pisik
Deerfield, IL
(Launcher System)

Guy Letourneau
Andover, MA
(Cygnus X-1)

HONORABLE MENTIONS

Kenneth D. Griffin
Memphis, TN
(Apollo Avenger I)

Aaron Yeo
Littleton, CO
(Fury)

Karl Kugler
Germantown, WI
(No Name)

Iain Delaney
Oakville, ON,
Canada
(Battlestar:

Galactica
Colonial Viper)

David Todd Dean
Broken Box, NE
(ZX-1)

Doug W. Pasnik
Minneapolis, MN
(Space Trooper)

Dick Huey
Leland, MI
(Capricorn)

John McGurk
Cranford, NJ
(Protius III)

Send As Many Entries As You Like

Enter The MRN

Alien Creature Contest



Win \$50.00 In Free Rockets

Imagine the strangest creature you can from another planet, solar system, or galaxy. Make a sketch, and send it to us with the additional information requested in the rules below. Your alien creation could win you a \$50.00 merchandise certificate for first place or one of twenty-five \$10.00 merchandise certificates for runners-up. We would like to see the weirdest, freakiest, most far-out creepy creature you can think of. Really let your imagination go as this should be a really fun contest. Winning entries will be reproduced for all to see in a future issue of the MRN.

RULES:

1. You may enter as many times as you like.
2. Employees of Estes Industries or members of their immediate families are not eligible.
3. All entries become the property of Estes Industries and cannot be returned.
4. In addition to a sketch of

your creature, tell us his name, where he comes from and any other characteristics you can imagine such as diet, size, life style, intelligence, breathing substance, physical makeup, etc. Why does he look the way he does? This additional information need not be lengthy, just interesting.

5. Entries will be judged for creativity, uniqueness, completeness, weirdness, strangeness, and anything else we can think of! It really should be fun!!!

6. Deadline for receipt of entries is midnight April 15, 1980.

7. Decision of the judges is final.

8. Be sure to include your name, age, address, city, state, and zip code with each entry. Also, be sure to include your Skill Level.

9. Mail entries to:
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MRN Creature Contest
Penrose, Colorado 81240

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Estes model rocketry products are recommended for ages 10 to adult. Adult supervision is suggested for those under 12 years of age when flying model rockets.

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NOTE: All foreign orders require additional postage. Please write for more information on postage and mailing restrictions.

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ORDERS CONTAINING ENGINES CAN ONLY BE SHIPPED BY PARCEL POST AT THIS TIME.

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- Do you prefer Large or Small size models?
- Do you think Estes kits are generally Easy, Average or Difficult to assemble considering their recommended skill level?
- Are Estes kit instructions easy to follow? Yes No
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- What Skill Level of kits do you prefer to build?
 1 2 3 4 5
- My three favorite types of model rockets are (Mark 3 boxes):
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 Scale Model Maxi-Brute
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