

MODEL ROCKET NEWS

M A G A Z I N E

DEDICATED TO AND PUBLISHED FOR ESTES ROCKETEERS, AMERICA'S FUTURE IN SPACE

GIANT ROCKET SALE PAGE 14
FREE ROCKET PAGE 9
INSIDE: MORE GREAT ROCKET STORIES IDEAS, & CGN-TESTS



SPACESHIP CUT-A-WAY

WHY MY SPACESHIP?



SEE PAGE 6 FOR NUMBER DESCRIPTIONS

MIDDLE SCHOOL ROCKETEERS LAUNCH AS NASA VISITS SCHOOL

Towanda Area Middle School, Towanda, PA had a real "blast" the day NASA visited the school. Representatives of Goddard Space Flight Center visited local schools giving lectures and demonstrations on space flights past, present, and future.

The sixth grade model rocketeers of Ms. Eva Wade took the space launch theme and demonstrated their skills by launching their model rockets for an appreciative crowd of over 300 fellow students. They successfully launched 11 rockets with only one glitch using a newly-built 6-pad launch system.



Model rockets have enjoyed high popularity at TAMS. The program was extended last year to include an advanced club for experienced builders and another "for girls only".

GREAT 4-H DEMONSTRATION!

Darrin Larson from Fairfield, IA presented an excellent story about the history, building, safety, and launch of model rockets. He made his presentation for a recent 4-H Educational Demonstration Day.

The grand finale was, of course, firing the rocket which had streamer recovery. It was a perfect launch with an anticipated touch-down on a nearby football field. Instead, the rocket returned within three feet of the launch pad! The judge was impressed. Darrin received a trophy for his outstanding presentation.

Darrin became interested in model rocketry through a summer 4-H camp project started by Dean King, Extension 4-H and Youth Leader for Iowa.

ESTES MODEL ROCKET NEWS MAGAZINE

Mary Roberts Editor
 Robert Cannon Publisher
 Kent Jodrie Graphic Design
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 Charles Webb Photographer

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THE VANISHING ★ ACT STARS ★

SPIN FIN

Skill Level 1



High performance sport flier
 Achieve altitudes over 1,200 feet
 Try for orbit with 1/2A6-4, A8-5 (1st ft.),
 B4-6, B6-6, C6-7

SPIN FIN #1355 \$3.25

MARK II

Skill Level 1



Compact performance
 Very high flights
 Mid-body ejection

Streamer recovery for safe return from very high up
 Watch it vanish with 1/2A6-2 (1st Ft.),
 A8-3, B4-4, B6-4, B8-5, or C6-5 engines

#1202 \$4.50 \$3.00

METEOR

Skill Level 1



Stellar performance
 Streamer 90 inches long for gentle recovery
 Flights to over 1,200 ft.
 Flash into the sky with 1/2A6-2, A8-3 (1st ft.),
 A8-5, B4-4, B6-4, B8-5, C6-5, or C6-7
 high performance Estes engines

#1370 \$5.25 \$3.50

10 Parachute & Size

Kit Decals

Quick-Release Engine Mount

Streamer Recovery

Plastic Nose Cone

Balsa Nose Cone

Die-Cut Balsa Fins or Paper Parts

Plastic Fins or Fin Unit

Unless otherwise stated, all the model rocketry kits advertised in this magazine 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. Prices subject to change without notice.

MESSAGES FROM LAUNCH CONTROL

Thanks! The response from the Spring 1984 issue of Model Rocket News Magazine was great. We really enjoyed receiving those letters, Idea Box entries, cartoons, and other submissions for MRNM (Model Rocket News Magazine). I wish we had room in this issue to include more of them. We are using many of the best in this issue.

Thanks, also, for all those orders! Apparently the idea of receiving free kits with your orders went over big. See the list on page 9 for information on the current **FREE KIT** program.

You will find **BIG** savings on quite a few kits in this issue. These kits will be dropped from our line in January 1985. Take advantage now of these great savings and stock up. These kits will no longer be available when our present stock is gone, so buy now while they are still available. Of course, your total order still qualifies for the **FREE KIT** program if your order meets the new deadline.

Your letters have already been answered. I want to share with you a few letters and special replies.

Tommy Alligood of Pinetown, NC wrote:

I got into rockets in the first part of '82, and since then I have progressed greatly! I have 9 rockets now. I've tried many other brands besides Estes, but I like Estes better for many reasons such as the directions are easier to read and the rockets last longer.

Since I started flying model rockets I've gotten two other people into model rocketry. Flying rockets at school really helps my science grades a lot!

Thanks for your letter, Tommy. I was very pleased to learn that you are such a great Estes fan. Congratulations on having nine rockets in your fleet and on getting two of your friends into model rocketry.

We appreciate your kind words about our instructions and our rockets. We'll do our best to keep providing you with the best.

As a former science teacher, I was happy to learn that model rocketry has helped your science grade.

Keep up the great work!
Christopher Mathis of Southport, NC wrote:

One of my best friends, Ryan Boera, has interested me in model rocketry. He received his starter kit on December 25, 1983.

We have fully enjoyed these rockets.

With our experience, we are now doing experiments with small organisms by sending them up on rockets to extremely high altitudes and then observing their eating habits and behavior after their flights. We hope to some day discover something that will help us to learn more about these organisms.

My friend and I also are designing and constructing a rocket which my calculations estimate will reach 8,000 feet.

Please give Ryan Boera my thanks for getting you into model rocketry.

Good luck to you and Ryan on making a valid discovery from your test launches. Perhaps the suggestions on pages 1 and 2 of the Estes publication Projects In Model Rocketry (Estes #2831--\$0.75) will help you in conducting and in interpreting the results of your launches of living organisms.

That is all we have room for in this issue. Keep sending in those Idea Box suggestions, cartoons, articles, stories, cartoons, riddles, letters, and other things which you would like to see published in a future issue of Model Rocket News Magazine.

DON AND THE DEPUTY

This report was submitted by Philip Dodds, Industrial Arts teacher at Alton High School. He is quite proud of his son Don and attributes Estes products with helping Don spark his aeronautical interests.

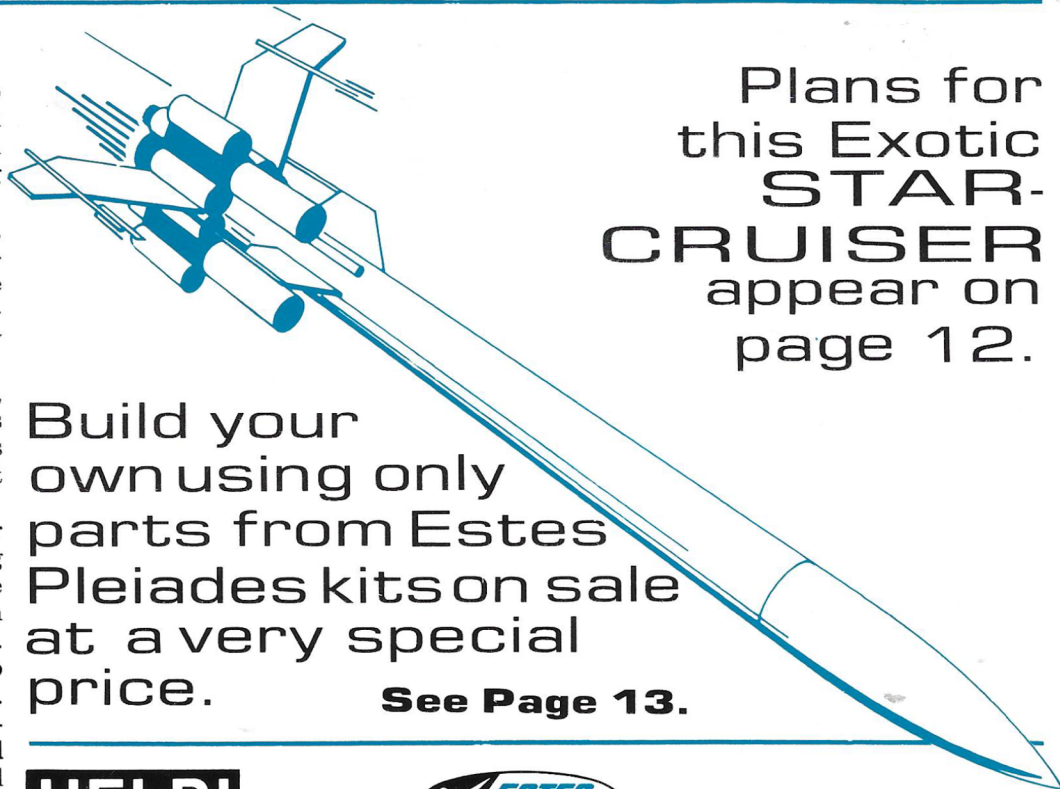
When Don was in junior high school, he was encouraged by his teachers and counselors to pursue his interest in aviation. He bought Estes model rockets and built several which he successfully launched many times.

One day during summer vacation, Don and several of the neighborhood boys took a recently completed rocket and his launching equipment to the empty field at the end of the sub-division.

A sheriff's department patrol car drove out into the field as Don was getting the rocket prepared for launch. When the deputy asked what the boys were doing, Don told him they were launching model rockets. The deputy got out of the car and started to lecture them about having illegal fireworks. Don didn't think he was doing anything illegal, so he picked up his rocket and started explaining all about it. Then the deputy said "Oh, model rockets. I thought you said bottle rockets!"

The deputy stayed to watch the launch and recovery, then drove away with a friendly wave.

Postscript: This is a true story. Don kept up his aviation interest. He started flying lessons when he was 15, soloed at 16, and received his Private Pilot license when he was 17 years old. He is now a senior in Aeronautical Engineering at the University of Illinois. He worked at McDonnell Aircraft in St. Louis as an Engineering Intern on the Harpoon missile last summer.



Plans for
this Exotic
**STAR-
CRUISER**
appear on
page 12.

Build your
own using only
parts from Estes
Pleiades kits on sale
at a very special
price. **See Page 13.**

HELP!



PLEASE send us stories, pictures, and information about you and your model rocket activities, club news, photos, articles, cartoons, riddles, games...anything you'd like to share with other rocketeers. We need your ideas, suggestions, and contributions!

If we use your material, we'll reward you with an Estes Merchandise Certificate. The dollar amount will be determined by the MRN editorial staff. A riddle could earn you

a \$5.00 certificate, and an article could earn you \$25.00 - \$50.00 in Estes model rockets and supplies.

All contributions become the property of Estes Industries and cannot be returned.

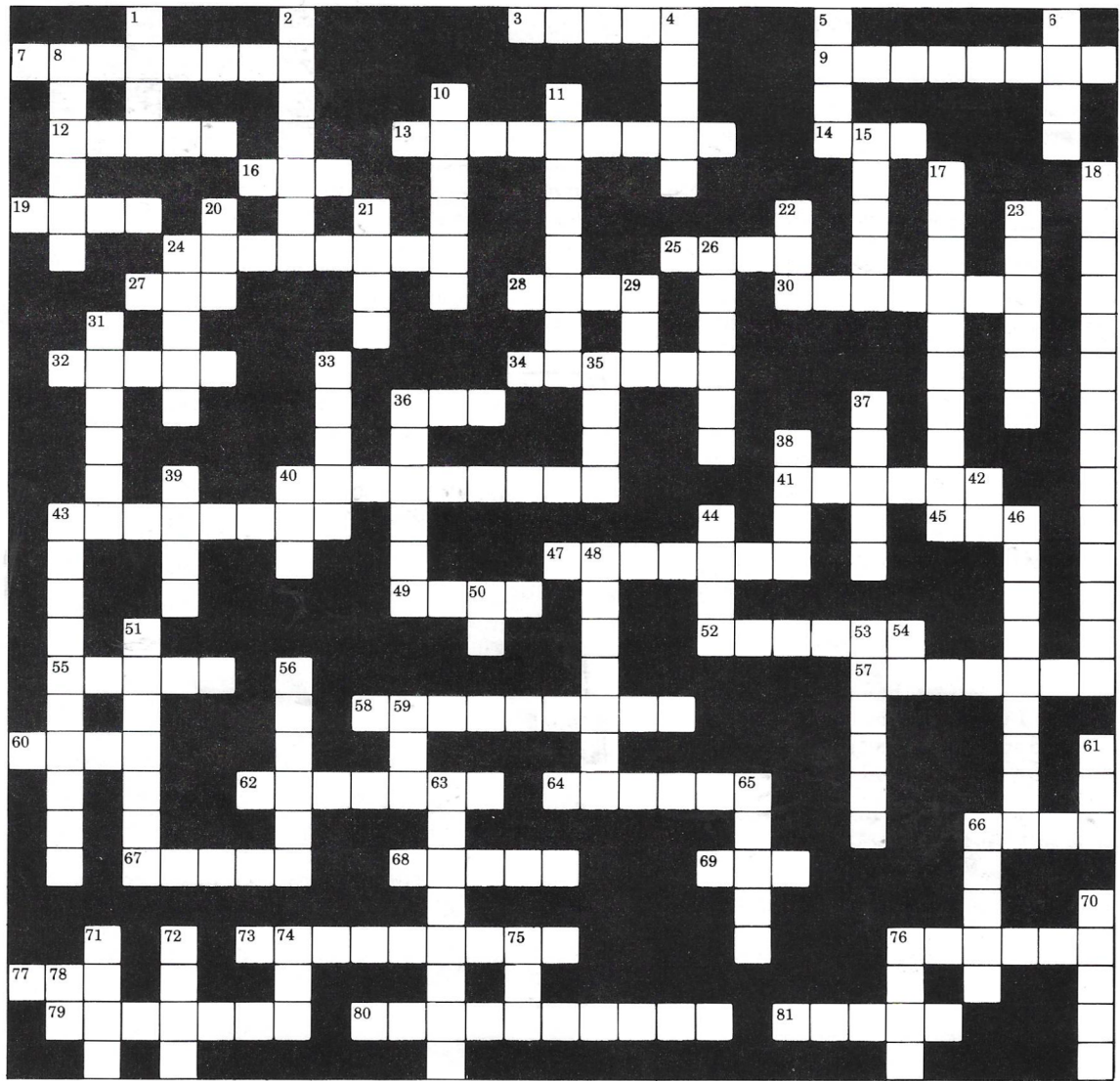
Please send your contributions to:

Estes Industries
MRN Magazine
Penrose, CO 81240

Hope to hear from you soon!

ROCKET CROSSWORD

By Roy B. Mellott, Jr.
Franklin, KY



ACROSS

3. Rocket manufacturing company.
7. Type of recovery system used by Mark II.
9. The instant at which engines propellant begins to burn.
12. A scale rocket.
13. Connects launcher to igniter.
14. Estes Aerospace Club (abrv. = abbreviation).
16. Stabilizing and guiding unit of rocket.
19. Material used for nozzle and retaining cap of engine.
24. Main frame of rocket.
25. Adhesive used in model rocket construction.
27. Rocket launcher base and rod.
28. Metal engine retainer.
30. Fire retardant material used to protect recovery system.
32. Action of rocket after burnout.
34. Said, "For every action, there is an opposite and equal reaction".
36. Safety device placed on top of launch rod.
40. Recovery system used by Alpha.
41. Model rockets should not weigh more than 16 _____.
43. The return of rocket safely to earth.
45. Guides rocket during lift-off.
47. Freight carried on rocket.
49. The leading _____ of a fin.
52. Propulsive force developed by engine.
55. Portion of rocket having its own engine.
57. Untrained person.
58. 5-4-3-2-1- lift-off.
60. National Aeronautic and Space Administration (abrv.).
62. Electrical device which initiates the combustion process in engine.
64. Rocket trip.
66. Aerodynamic resistance
67. Recovery system used by Falcon.
68. Not to be used for structural parts of model rockets.
69. Agency which controls air travel (abrv).
73. Person who flies model rockets.
76. First coat put on wood fins.
77. Unidentified flying object (abrv).
79. Rocketry competitive event.
80. Method of tracking rocket during coast period.
81. Used to put color on rocket.

DOWN

1. What you do to your instructions before you start to build your rocket.
2. The force which pulls your rocket back to earth.
4. The type of engine propellant.
5. What you may cause if you launch near dry grass.
6. Rocket safety rules.
8. Type of recovery used by Scout.
10. Reinforcing glue at joint of fin and body tube.
11. The foremost surface of a model rocket.
15. Term meaning ignition system activated.
17. Type of recovery system used by Gyroc.
18. Person who loads his own engines and does not follow safety code.
20. Guide for rocket during lift-off.
21. The term used to mean propellant is being used.
22. The opposite of old.
23. The device used to propel the rocket.
24. The most popular type of wood used for model construction.
26. The term used for putting a rocket into flight.
29. All of the parts to build a model rocket.
31. Exhaust duct of engine.
33. Time gap between burnout and ejection.
35. How electricity is carried to launcher.
36. Deploys recovery system. Ejection _____.
37. Type of day when you should not launch your model rocket.
38. Elastic band to hold nosecone to body.
39. Unit of electromotive force.
40. Rocketry expert, slang.
42. A model rocket needs an engine _____ that it will fly.
43. Opposition offered by a body or substance during movement.
44. Edge of fin against body tube.
46. Metal plate which protects launcher base and ground.
48. A cross section of a body designed to produce lift.
50. Everything is O.K. "all systems _____".
51. Publication to order rockets out of.
53. A very important part of model rocketry, the _____ code.
54. Technical manual (abrv.).
56. The highest point in a flight.
59. The point at which the engine ceases to produce thrust. Burn _____.
61. Round, hollow tube which goes around rod.
63. Deployment of recovery device.
65. To follow the flight of your rocket.
66. "Sticker" placed on rocket.
70. Direction in which wood fibers run.
71. Material usually used for rocket fins.
72. When launching, launch _____ the breeze.
74. At ejection the recovery system pops _____.
75. Metal screw anchored to nose cone to attach shock cord.
76. To make wood fins smooth.
78. Flight control (abrv.)

If you need an answer key to this crossword puzzle, send S.A.S.E. (self-addressed, stamped, 20¢ envelope) for mailing answer sheet to you to Fall Crossword Puzzle Solution, Estes Industries, 1295 H Street, Penrose, CO 81240.

ROCKETEERS PUT ON DEMONSTRATION AT SCHOOL

The following is taken from a letter written to Estes Industries by Christopher Fillinger of Corte Madera, CA. Following the letter is the text of a letter sent by the Vice Principal to Chris' parents. Perhaps you could put on a similar program for your school?

Dear Estes

I'm a Craftsman rocketeer, and I'm in the Estes Aerospace Club.

I started to show my Estes rocket catalog around class, though I got in trouble for disturbing the teacher. I found out one of my best friends was into model rocketry just as I was. Well, my friend Mike Field and I launched rockets at our park. But we also wrote a story about what we did. The whole class was interested so we asked the teacher if we could have a rocket show, and she said we could, so the following week we had a rocket show.

It was great. Everyone liked it. We launched five rockets, Estes of course--Scrambler, Quasar, Starliner, Mosquito, and Big Bertha.

Our principal, vice principal, and our teacher watched Mike Field and me. We got special recognition from Hall Middle School, a certificate, and two pencils. A copy of the certificate is enclosed. (Editor--The principal's letter is reproduced here.)

Since then we have had another rocket show (about three days ago). It was great! The journalism class came out and watched, and so did the wood shop. There will be an article about it in our school paper, The Hall Monitor. We launched over 13 rockets including the Mean Machine. That landed on the school roof, but the janitor got it down. His name is Cal, and he's a nice guy.

Since the last launch about four people in our class have bought the Sizzler or Alpha starter set. Also, a few of my friends in other classes have also gotten into the model rocketry hobby, and some of Mike's friends, too.

March 15, 1984

Dear Mr. and Mrs. Fillinger:

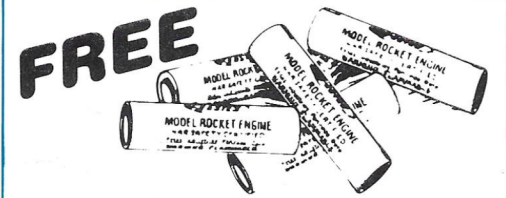
It is with great pleasure that we wish to inform you that your child has been selected to receive special student recognition by Mrs. Beamer for his rocket show.

The initiative, leadership, and dedication Chris has shown brings great credit to our school, his family, and our community.

Our congratulations to Chris.

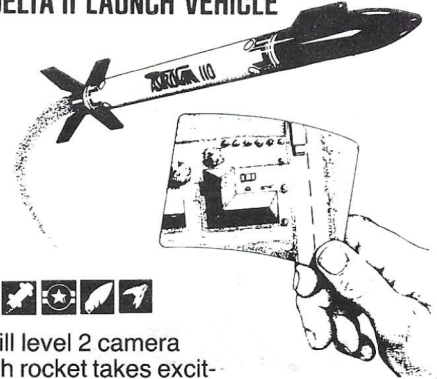
Sincerely,

Gene Ng
Gene Ng
Vice Principal



FREE
C6-7 ENGINES (Worth \$6.50!)
with purchase of

ESTES
ASTROCAM 110
AERIAL CAMERA WITH
DELTA II LAUNCH VEHICLE



Skill level 2 camera with rocket takes exciting color photos from hundreds of feet in the sky. Uses 110 color-print film, ASA 400. Purchase film and developing locally. No painting required.

Receive 6 FREE C6-7 model rocket engines with igniters (2 packages) when you purchase this fantastic camera!

#1785

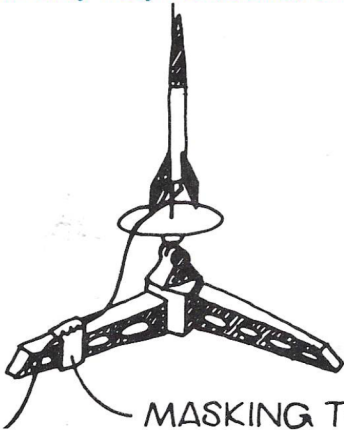
\$24.00

Film not included. Offer ends 12-31-84

idea box

As soon as you launch your rocket, don't move. Keep your eye on the rocket and do not look away. Follow its flight with your eyes so that you can watch every moment and see exactly where it comes down.

Submitted by Tracy Neal, Bonita, CA

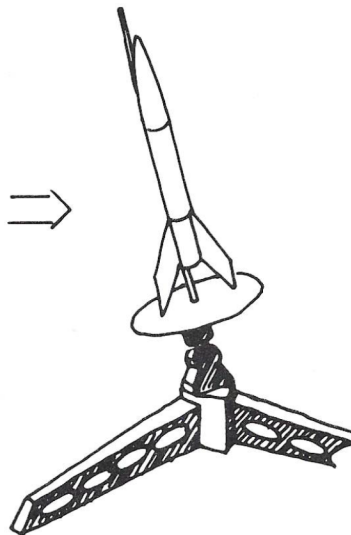


MASKING TAPE

Tape the launch cable to a leg of the launch pad to prevent the igniter from being pulled out of the engine in case the launch cable is accidentally pulled.

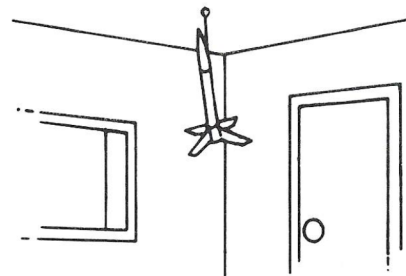
Submitted by Neil Sefton, Shenorock, NY

WIND →



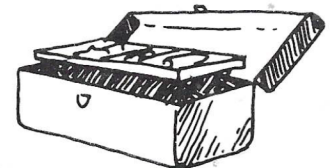
Whenever I launch my rockets on windy days I point the launch rod into the wind to increase the chances of recovering the rocket.

Bob Hackenberg, Coraopolis, PA



Keep your rockets out of the hands of little brothers and sisters by hanging them from the ceiling of your room with threads. It makes a great display, also.

Chris Unruh, Montezuma, KS



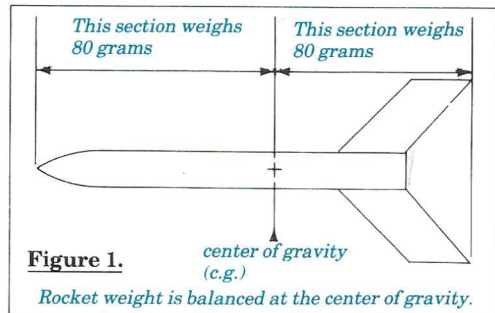
You can buy a tackle box at a sports store and use it to carry your model rocketry supplies. The compartments are handy for engines, igniters, etc.

Submitted by Frank Black, Mary Esther, FL

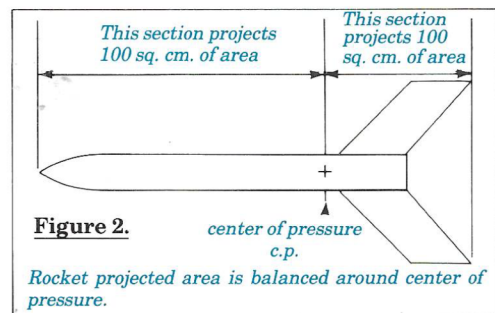
UNDERSTANDING ROCKET STABILITY

By Bill Constantino, Belmont, MA

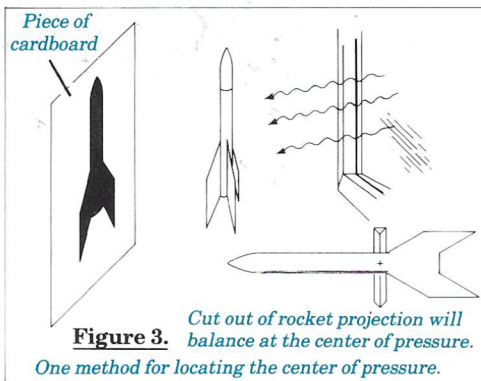
For a long time I had been flying model rockets thinking I understood stability. I had stability tested my rockets by tying them to a string and swinging them around in a circle. I had even built my own designs which were stable and flew well. It was not until recently, when I was reading for the third time Estes technical report TR-1, Rocket Stability, that I finally grasped the concept. And once I understood it what a difference it made!



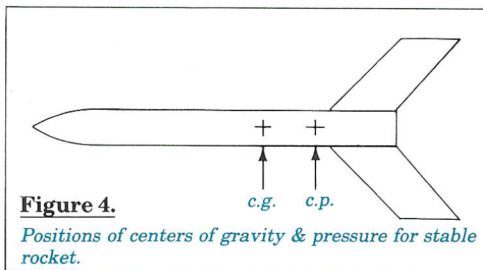
The key to understanding rocket stability is being able to distinguish the center of gravity from the center of pressure, and understanding the relationship between the two. The center of gravity is a quality of the rocket when acted on by the force of gravity. It is fixed by the weight distribution along the rocket's length. There is equal weight on either side of the center of gravity. See Figure 1. The center of pressure is also a 'balance point'; the point at which the rocket balances when acted on by a lateral wind force only, independent of gravity. The center of pressure is fixed by the area distribution along the rocket's length. See Figure 2. There is equal area on either side of the center of pressure.



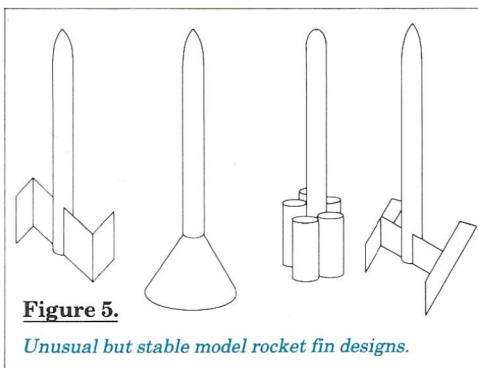
The center of gravity can usually be determined by suspending the rocket from a thread, as shown in Figure 1. The center of pressure can be determined by examining the projection of the rocket. This can be done by projecting the shadow of the rocket onto a piece of cardboard and tracing around it. The projection represents the area of the rocket available to wind forces during flight. The point at which this projection balances is the center of pressure. See Figure 3. Notice that the weight distribution in the rocket will not affect the center of pressure. For instance, having an empty payload section versus one with an egg in it will cause a change in the center of gravity, but not in



the center of pressure. Once you can locate the center of gravity and center of pressure you can determine how stable a particular rocket will be. The center of pressure must be behind the center of gravity for a rocket to be stable. See Figure 4. A good rule of thumb is that the center of pressure be at least 1/2 the body tube diameter behind the center of gravity--the further the distance, the more stable the rocket will be. If the center of pressure is ahead of the center of gravity, the rocket will be unstable and unsafe for powered flight. You can move the location of the center of gravity further forward by adding weight to the nose of the rocket. Alternatively, you can add fin area to move the center of pressure further back. Either change will improve the stability of the rocket.



OK, so what good is knowing that the center of pressure needs to be behind the center of gravity? Well, it allowed me to create all sorts of fin designs that I never thought would work before. All the designs in Figure 5 are stable. Can you see why knowing what is discussed above is important? Also, really understanding the principles of rocket stability allows you to design rockets with a sense of confidence and greater creativity. I urge anyone interested in gaining greater mastery in their own model rocketry to read Estes Technical Report TR-1 Rocket Stability. Happy lift offs!



SPACESHIP CUT-A-WAY

JUMBO FLYER DRAWING KEY

- 1 Jumbo Flyer mission patch
- 2 Remote manipulator arm
- 3 TV camera
- 4 Satellite maintenance attachment
- 5 Starlight piano lounge
- 6 Payload bay
- 7 Mad-scientist "Get-A-Way" Special
- 8 Flight deck (skill level 5 pilot required)
- 9 Crew quarters
- 10 EVA airlock and space suit lockers
- 11 Maneuvering blippers
- 12 Passenger entry
- 13 Passenger cabin
- 14 Galley
- 15 Zero - 'G' recreation lounge with wall-to-wall-to-wall carpeting
- 16 Upness/downness vector accumulator
- 17 Avionics stuff
- 18 Nose bipple
- 19 Nose gear well
- 20 Nose wheelies
- 21 Body tile layer
- 22 Gravity bilge
- 23 Loose body tile
- 24 Undercarriage well
- 25 Main landing gear wheelies
- 26 Greebly boggle bolt
- 27 Flat tire
- 28 Astronaut scale
- 29 Practical joke by launch crew (tin cans tied to landing gear)
- 30 Wing elevon
- 31 Body flapper
- 32 Estes uprated 'Big Blapper' engines (3)
- 33 Mark IV sure-fire igniter
- 34 APU - auxiliary power unit
- 35 Murphy panel
- 36 Pre-launch graffiti
- 37 Meteorite ding
- 38 OMB - orbital maneuvering blapper (2)
- 39 Airline insignia
- 40 Inert, post-landing purge vapor



BIG AND BAD!

MaxiCarus

Skill Level 2



Big "D" Power
29.75 inches long
Large, see-thru payload section
Flights to over 1,000 feet
Blast off with D12-5 engine

#1331 ~~\$12.00~~ \$8.00
Huge Savings!

MACH-2

Skill Level 2



Sounding rocket design
Big 25.5 in.
Invade the sky with D12-5 (1st ft.) or D12-7 engines

#1379 ~~\$7.75~~ \$5.25

SKYBOLT

Skill Level 2



Performance exceeds 1,000 ft.
Recovery with 90 in. streamer
Explore the upper air with powerful D11-9 or D12-7 (1st ft.) engines

#1334 ~~\$6.50~~ \$4.50

SCRAMBLER:2

Skill Level 3



The gourmet's delight!
Launch your breakfast (Try not to scramble it!)--carries an egg over 1,000 ft. in large payload compartment
Power big payloads with D12-5 engines

#1908 ~~\$7.75~~ \$5.25

SCIENCE FAIR

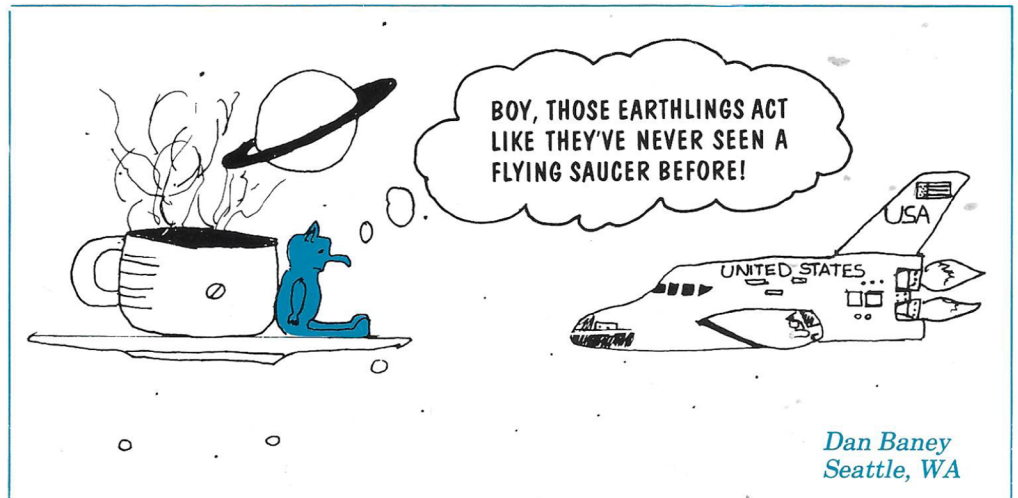


Model rockets make great subjects for Science Fair projects.

Mike Farmer of Salt Lake City, Utah did his project on the building and making of rockets--how, why, and what makes them work. He used model rockets to demonstrate the correlation between two experiments. His project won second place at his school's (Bennison Jr. High) Science Fair and went on to compete against other schools at the Metropolitan Salt Lake City Science Fair. There he took second place with an aerospace company (Hercules) and third place with NASA. He received two certificates from the Utah Academy of Sciences, Arts, and Letters in the Junior Division in recognition of the project, second place ribbon, second place gold pen and pencil set, and third place Book of Science.



A DAMON COMPANY



Dan Baney
Seattle, WA

ESTES ROCKETS PUT SPACE CAMP IN ORBIT

HUNTSVILLE, Ala. --- Estes Industries model rockets have appeared recently on "Good Morning America," "That's Incredible," the "Today" show, CBS "Morning News," and in "People" magazine and "Science Digest". It's all because of the U.S. Space Camp, the youth aerospace program in Huntsville, Ala.

The study of the principles of rocketry is a primary objective of Space Camp, said Director Edward O. Buckbee, "and there is no better way for youngsters to understand these principles than through assembly and firing of model rockets."

Although model rocketry has been popular for a generation, it has drawn special attention from the media because of its integral role in the camp's educational program.

"Huntsville is proud of its title of 'Rocket city, USA' because of the role the city played in the development of Redstone, Jupiter, Saturn I, Saturn V, and Space Shuttle rockets," said the director.

While campers assemble their Estes models, they hold detailed discussions with Konrad Dannenberg, the deputy manager of the Saturn V that took astronauts to the moon. They also tour the museum's rocket park with him as he explains the role of each in the nation's space program.

The extraordinary camp begins with arrival, registration, and orientation on Sunday afternoon, followed by:

DAY ONE: The mission of ROCK-ETRY DAY is to understand the principles of rocket structure, propulsion, launch, and guidance. After involvement in rocketry concepts, campers begin assembly of individual model rockets.



DAY TWO: Astronauts train for many years before their missions into space. The mission of ASTRONAUT TRAINING DAY involves campers in a variety of specific activities, from packaged food and waste management systems to life support systems for living in space. Campers handle spacesuits, helmets, and backpack life support units.

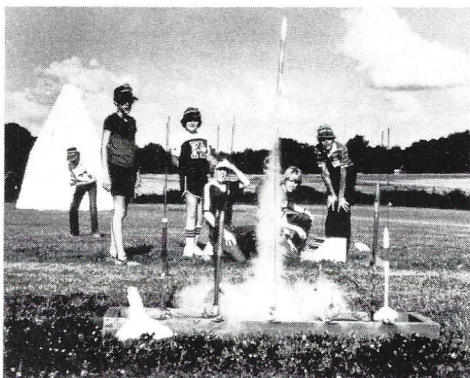
DAY THREE: A highlight of U.S. Space Camp, GRAVITY-NO GRAVITY DAY, casts youngsters in the role of as-

tronauts preparing for space walks and coping with the "zero gravity" of space. They practice in the "moon walk trainer" which reduces body weight to one-sixth normal (one's weight on the Moon). They experience the sensation of up to 3 G's - or triple normal body weight - during launch in the Lunar Odyssey and rendezvous with an orbiting space station while aboard the Shuttle Spaceliner. A behind-the-scenes tour at NASA's neutral buoyancy tank - a million-gallon water tank where astronauts have trained - prepares campers for a trip to a nearby swimming pool and an underwater task involving simulated weightlessness.

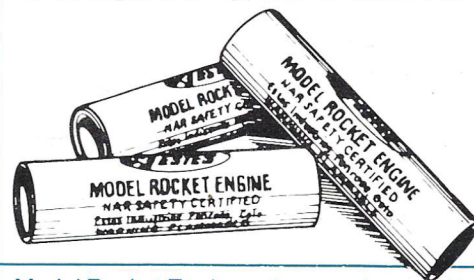
DAY FOUR: With the Marshall Space Flight Center in the forefront of planning the nation's first orbiting space station, campers study development of large space structures and their benefits for mankind. The mission of TOMORROW'S TECHNOLOGY DAY outlines a variety of careers in the aerospace field - apart from that of astronaut - which will be available in the future. Courses of study are also recommended. Activity with computers, a part of each day at camp, is intensified. Campers also launch their model rockets.

DAY FIVE: The culmination of the week is SPACE SHUTTLE MISSION DAY, an experience about which most youngsters can only dream. Each team of 10 youngsters is divided into crews for the Shuttle spacecraft and Mission Control. Using equipment acquired from NASA, team members conduct a simulated mission, beginning with checkout, countdown, launch, orbit, and return to Earth. Each team's performance depends upon how well campers apply principles learned earlier in the week.

In 1984, for the third consecutive year, Estes rockets will be a major element at Space Camp. Weekly camp sessions will be held from early March until November. For applications, write Space Camp, The Space and Rocket Center, Huntsville, Alabama 35807.



FLIGHT SUPPLIES



Model Rocket Engines, 4 per package, with Solar Igniters

1/2A3-2T	#1503	\$3.00
1/2A3-4T	#1504	\$3.00
A3-4T	#1507	\$3.15

Model Rocket Engines, 3 per package, with Solar Igniters

A8-0	#1600	\$3.00
A8-3	#1598	\$3.00
A8-5	#1599	\$3.00
B4-2	#1601	\$3.00
B4-4	#1602	\$3.00
B6-4	#1606	\$3.00
C5-3	#1617	\$3.25
C6-5	#1614	\$3.25
D12-3	#1666	\$4.95
D12-5	#1667	\$4.95
D12-7	#1668	\$4.95

Recovery Wadding

#2274 \$1.45/package

Solar Igniters

#2301 \$1.40/package of 6

BLAST-OFF FLIGHT PAK



24 of the most popular Estes engines
SIX each of 1/2A6-2, A8-3, B6-4, and C6-5 engines
THIRTY Solar Igniters
ONE package of Parachute Recovery Wadding
#1672 \$16.99
A BARGAIN!

LEARN AS YOU BUILD AND FLY

Alpha Book of Model Rocketry--32 pages of helpful facts, ideas, suggestions, and guidance for advanced projects
#2820 Only 95¢

SPACE SHUTTLE COLUMBIA

Skill Level 2

LAUNCH YOUR OWN COLUMBIA SHUTTLE!

- * Columbia Orbiter--over 10 inches long with wingspan over 8 inches wide. Realistically detailed!
- * Heavy duty Porta-Pad launch pad
- * Hi-tech Power Pulse launcher
- * Polaroid P-100 6/volt battery-FREE WITH PURCHASE OF THIS STARTER KIT!
- * Engines, igniters, and wadding for three Shuttle flights



\$27.90 VALUE

Only \$23.95

until 12/31/84.

SPACE SHUTTLE
COLUMBIA OUTFIT

#1786 \$23.95

White glue, plastic cement, paint, and finishing supplies--not included.



DESIGN OF THE MONTH CONTEST WINNERS

February 1984 WINNERS: Bill Schroeder, West Bloomfield, MI (Warp-1). Clifford Hagner, Warren, MI (Aldebaran). Peter W. Kodis, III, Mattapoisett, MA (The Right Stuff). **HONORABLE MENTION:** Walter L. King, Centerpoint, LA (Piercer). Craig Zelden, Encino, CA (Zendelion). Ken Murphy, Joliet, IL (Nighthawk I). Wendy Jiardina, Marion, IL (The Constellation). Eric Fredrick, Oktaha, OK (Caesar). Louis J. Jiardina, Marion, IL (Army LaCrosse). Greg Carr, Ferndale, MI (White Dwarf). Richard C. Aldrich, Denver, CO (Cigar Launch Box). Jerome Johnson, Memphis, TN (No Engine Rocket). David Schneider, Oxnard, CA (Helirock). Robert Eichner, Jr., Whitehall, PA (No Name).

March 1984 WINNERS: Dean Pilato, Warren, MI (Sand Skimmer). Frank C. Rodski Jr., Eldersburg, MD (Engine Holder). Mark Lavigne, Redondo Beach, CA (D-Camroc). David Rock, Linn, WV (Hellfire Laser Missile). Dan Waddich, Dubuque, IA (White Star). **HONORABLE MENTION:** Jeff Courtney, Roy, UT (U.S.S. Intrepid). Jeff Luppino, Hammondspport, NY (Star Warrior). Larry Ethell, Milo, IA (Multiple Rocket Launch Pad & Launch Control Box). Carlos Mabalot Jr., Oak Harbor, WA (Star Fire). Scott Cline, Lakewood, CO (Sky Skimmer). Tim Smith, Newcastle, DE (ACE). Doug & Dan Hollister, Ft. Morgan, CO (Explorer X-19). David J. Maurer, Wyomissing, PA (Commando). Flint Richter, Ash Grove, MO (Feuern Folgen). Brooks Wolfe, Colorado Springs, CO (Procyon). Wendy Jiardina, Marion, IL (Falcon Air to Air Missile). Wendy Jiardina, Marion, IL (Harpoon

Anti-Ship Missile). Louis Jiardina, Marion, IL (R.A.F. Bloodhound). David Snell, Butte, MT (Galileo). James Pearson, Littlerock, CA (Starship 3).

April 1984 WINNERS: Clifford Hagner, Warner, MI (Piston Rocket). Mark Henning, St. Croix, USVI (Alien Cruiser). Peter Kodis III, Mattapoisett, MA (F-100 Starfighter). John Johns, Charlotte, NC (Firefox). **HONORABLE MENTION:** Scott Arnst, Farmington, MI (Astro Xperimental Explorer (A.X.E.)). Marty Soper, Hampton, IA (Deep Space Communication Station). Geronimo Miramontes, LaPuente, CA (Atlantis). Ignacio Barandiaran, Santiago, Chile (The Orion Starship). Robert McGlade, Radnor, PA (The Aureus). Hugh Rillie, Indianapolis, IN (White Lightning). Dave Wolding, No Address (Rainbow Darter). Ken Chandley, Limestone, TN (XKI). Wendy Jiardina, Marion, IL (Firebird 2000). Louis Jiardina, Marion, IL (F-13 Fighter). Ray Kelly, Franklin, PA (Rainbow I).

May 1984 WINNERS: Troy Eggers, Melbourne, IA (Launching Facility). Bill Costantino, Belmont, MA (No Name). Wendy Jiardina, Marion, IL (Quail Missile). Dean Pilato, Warren, MI (Bellatrix). John Johns, Charlotte, NC (Astrid). Kenneth Cluchey, No Address (Phantom Fighter). **HONORABLE MENTION:** Ed Blesch, New London, WI (Orbital Surveillance Craft). Ed Blesch, New London, WI (Corona Borealis). Louis Jiardina, Marion, IL (Manta Ray). John Luskowski, Houston, TX (Starstreak). Monica Pitts, Chouteau, OK (The Flea).

FREE ROCKET

Choose one of these great rockets kits FREE!



FREE
WIZARD

\$2.50 Value #7602

Send in your order for merchandise totaling \$7.50 or more and receive a FREE Wizard kit. 12" sport model with streamer recovery.



FREE
COUGAR

\$3.75 Value #7603

Send in your order for merchandise totaling \$12.50 or more and receive a FREE Cougar kit. 17.5" sport model with streamer recovery.



FREE
DELTA WEDGE

\$4.50 Value #7604

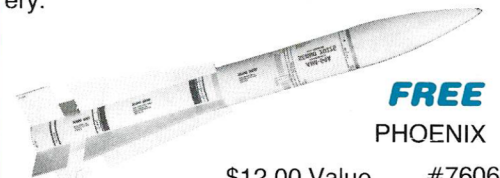
Send in your order for merchandise totaling \$20.00 or more and receive a FREE Delta Wedge kit. 16.5" exotic model with 12" chute recovery.



FREE
RED MAX

\$8.25 Value #7605

Send in your order for merchandise totaling \$30.00 or more and receive a FREE Red Max kit. 16.25" sport model with 18" chute recovery.



FREE
PHOENIX

\$12.00 Value #7606

Send in your order for merchandise totaling \$50.00 or more and receive a FREE Phoenix kit. Huge 30" semi-scale model of air-to-air supersonic missile.

Limit-One Free Rocket Kit Per Order

These special free offers are available only for orders received by Dec. 31, 1984. Orders must be accompanied by full payment (check, money order, Master Charge, or Visa charge). Order qualification for a free kit is based on amount of merchandise ordered. If you qualify for one of these free rocket kits, just list the name and special kit number from this page as the last item on your order.

List "Free" in the column for total price.

These special free offers may not be used with any other special offers, bonus coupons, or discounts.

ROCKET BINGO

By Michael A. Banks, Milford, OH

Rocket Bingo is a fun way to learn rocket terms. There are two ways to play Rocket Bingo. The first requires that you create bingo cards with illustrations of the parts of a model rocket instead of numbers. You can mark sheets of paper with lines to make 25 blocks, photocopy these "blanks", and draw in the illustrations. Or you can paste up illustrations in the blocks and photocopy the paste up sheets, varying the locations and types of illustrations for each card. I suggest that you have at least 15 illustrations and make no more than two copies of any one "card".

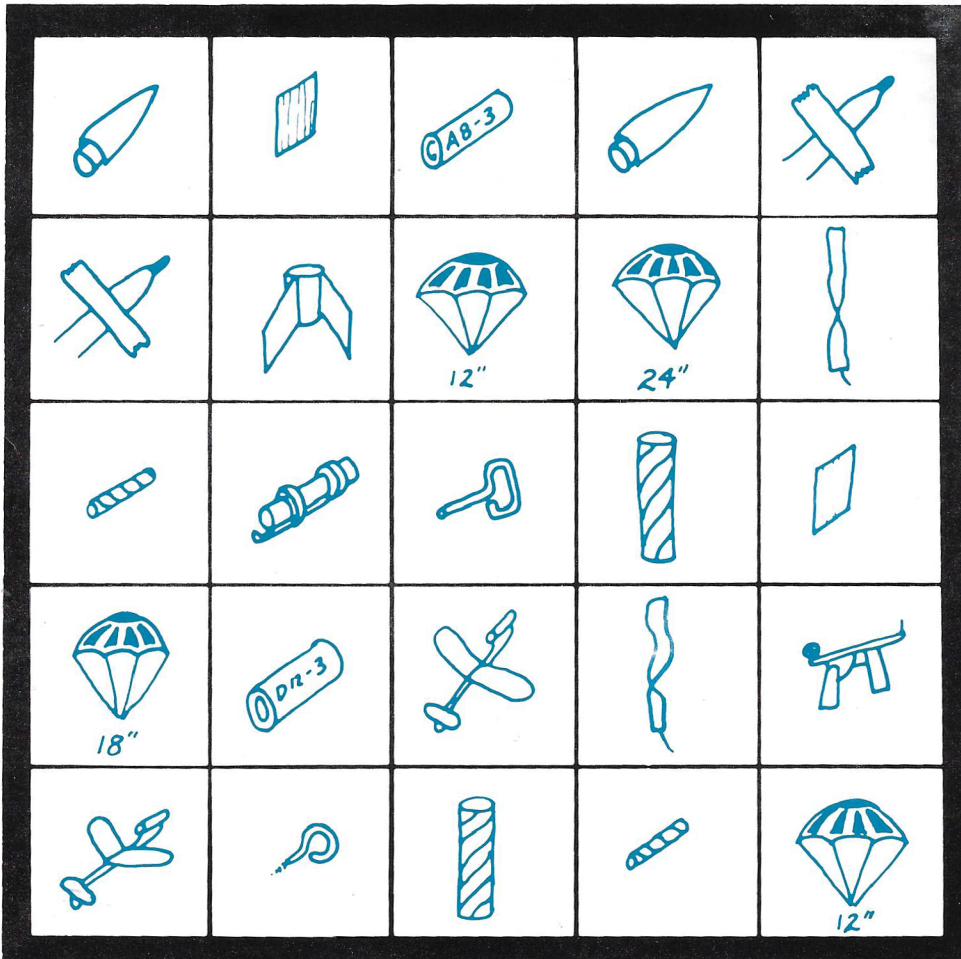
After you've made the cards, pass them out and call out the names of objects illustrated on the cards. The club members should cover their cards with plastic markers (or buttons, if nothing else is available),

and try to "bingo" in the usual way.

A variation of this is to write the names of objects or answers to questions in the blocks. Be sure to change the locations. To play this version, you simply describe an object and/or its function ("This stabilizes the rocket on the launch rod.") or ask questions ("What is the highest point in a rocket's flight called?").

You can also combine the illustrations with questions, in which case the players must determine the answers to the questions, and then find the objects on the card most closely related to the answers.

This is a great way to review your knowledge, and a lot of fun. It is great for use in emergencies such as rain on a launch day, a club meeting in which the leader for the day forgot to prepare, etc.



HONEST JOHN

Skill Level 3



Maxi-model--1/9th scale!
Dual 24" parachutes
Great for demos!
Blast off with D12-3



HONEST JOHN #1269 ~~\$32.95~~ \$18.00

SCALE MODELS

SEA DART

Skill Level 2



Semi-scale model of British Aerospace surface-to-air missile

Engines--A8-3 (1st ft.), B4-4, B6-4, C6-5

#1901 ~~\$6.75~~ \$4.50

SANDPIPER

Skill Level 2



Semi-scale model of actual target drone
Engines--A8-3 (1st ft.), B4-4, B6-4, B8-5, C6-5

#1389 ~~\$5.95~~ \$4.00

NIKEX

Skill Level 2



Scale-like model of surface-to-air missile
Engines--A8-3 (1st ft.), B4-4, B6-4, B8-5, C6-5

#1270 ~~\$8.25~~ \$5.50

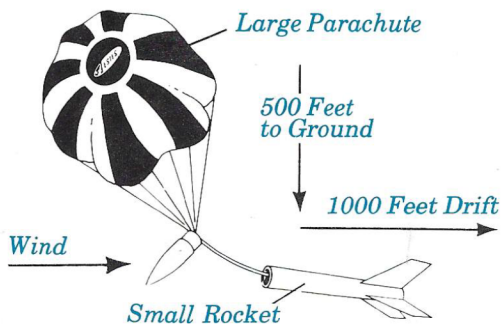
MODEL ROCKET CONSTRUCTION TIPS

BY ROBERT L. CANNON

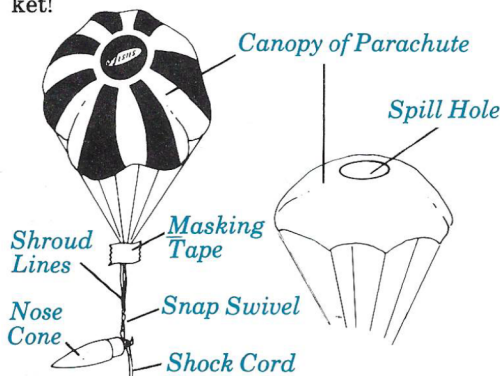
PARACHUTES

The parachute's job is to lower the rocket gently back to the ground. It does this by acting as an "air brake". The parachute has a high drag, so the rocket does not fall very fast. This prevents the rocket from falling so fast that it is broken by the impact of landing.

Possible Situation:



All the time that the rocket is in the air, returning under its parachute, it is being blown sideways if the wind is blowing. The slower the rocket returns under its parachute, the longer it is in the air for the wind to blow it away from the recovery area. If you use a parachute that is too large, you may have quite a hike to recover your rocket!



Two techniques are in common use to speed the descent of the rocket, yet not let it descend so fast that it is damaged. One technique consists of "reefing in" or taping the shroud lines part way between the nose cone and the parachute. This lets the parachute open to slow descent, but prevents it from fully opening. The other technique consists of carefully cutting out a circle from the center of the parachute. Once you do this, you can't undo the change when you fly on a calm day, so be very certain that you won't want to change back before you do this.

Of course, you can make a practice of attaching a small fishing swivel to each parachute. Then you can simply change swivels and parachutes to use a smaller parachute on windy days. If it is really windy, attach a streamer of the right size instead of a parachute (also with a swivel, of course).

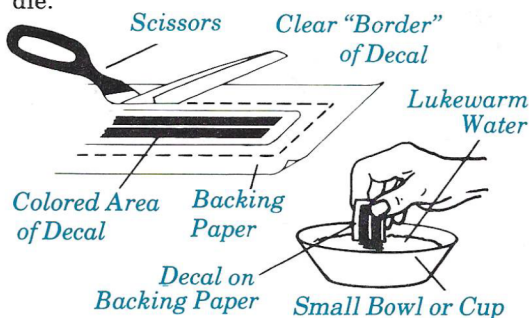


NOTE: You can usually have safe, successful recovery using a parachute one size smaller than the stock parachute supplied with your kit. Using too small a 'chute may cause damage to your model on impact. Remember--it's always best not to fly if it's too windy.

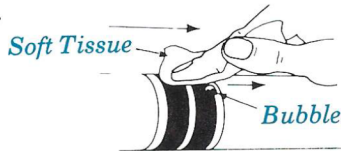
DECALS

The decals are the most delicate parts of the model rocket kit, so treat them gently.

Cut out the decals very carefully. Trim out each decal separately for ease in handling. Don't cut the decal with the paper trimmed close to the edge of the decal unless necessary. Leave a margin of the paper around each decal for ease in handling. You can recognize exactly how big the decal is by looking for the glossy area. Each colored section is surrounded by a clear area. This clear area is part of the decal. Keep it intact. It makes the decal stronger and easier to handle.



After a decal has been cut from the decal sheet, slide it into a small bowl or cup of lukewarm water. Lukewarm water works much better than cold water. Let the decal soften until the decal can be gently slid on the paper backing. This usually occurs just after the paper backing starts to uncurl. This normally takes 15 to 30 seconds. At this point, take the decal on its backing paper from the lukewarm water. Don't leave the decal in the water too long or the decal's adhesive may be dissolved off so the decal will not stick in place. Place the decal in position, and gently slide it from the backing paper and onto the model in the proper position.



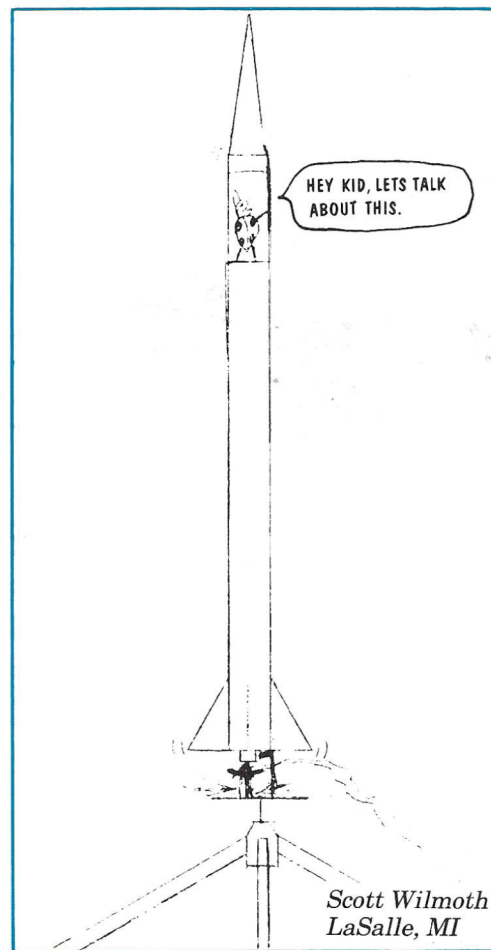
Carefully position the decal, then press it gently into position with a soft cloth or tissue. Blot away the excess water. If the decal sticks in the wrong position, apply a small drop of water to it with a clean paint brush, then move the decal into the right position before taking up the excess water with the cloth or tissue. Smooth out any wrinkles or bubbles before the decal dries. After the decals are completely dry, they can be protected by spraying the entire model with the proper clear spray--Testor's "Gloss-Cote" for models with a shiny paint finish or Testor's "Dull-Cote" for models with matte paint finishes. This final coat of clear protects the decals and the finish on the model.

GIANT ROCKET SALE

We have picked over 30 great model rocket kits to offer you at great savings. Now's your chance to buy these rockets at spectacular savings and be eligible to receive a FREE kit too! (See details on Page 9.)

Hurry...Supplies of these sale kits are limited. Prices valid only as long as present supplies last. For faster service, Visa and MasterCard phone orders may be placed by calling Estes at (303) 372-6565.

NOTE: ORDERS MUST BE PLACED BY CARDHOLDER ONLY.



WHAT DO YOU WANT??

What do you enjoy most in Model Rocket News Magazine? What would you like to see more of?

We've been putting t-shirt iron-ons and free rocket plans in your return mail-orders. Do you like them? Do you have any ideas for other goodies we can send you? Range box stickers, bumper stickers, stickers or decals for your rockets, technical notes and reports are possible ideas, but we want to hear from you!

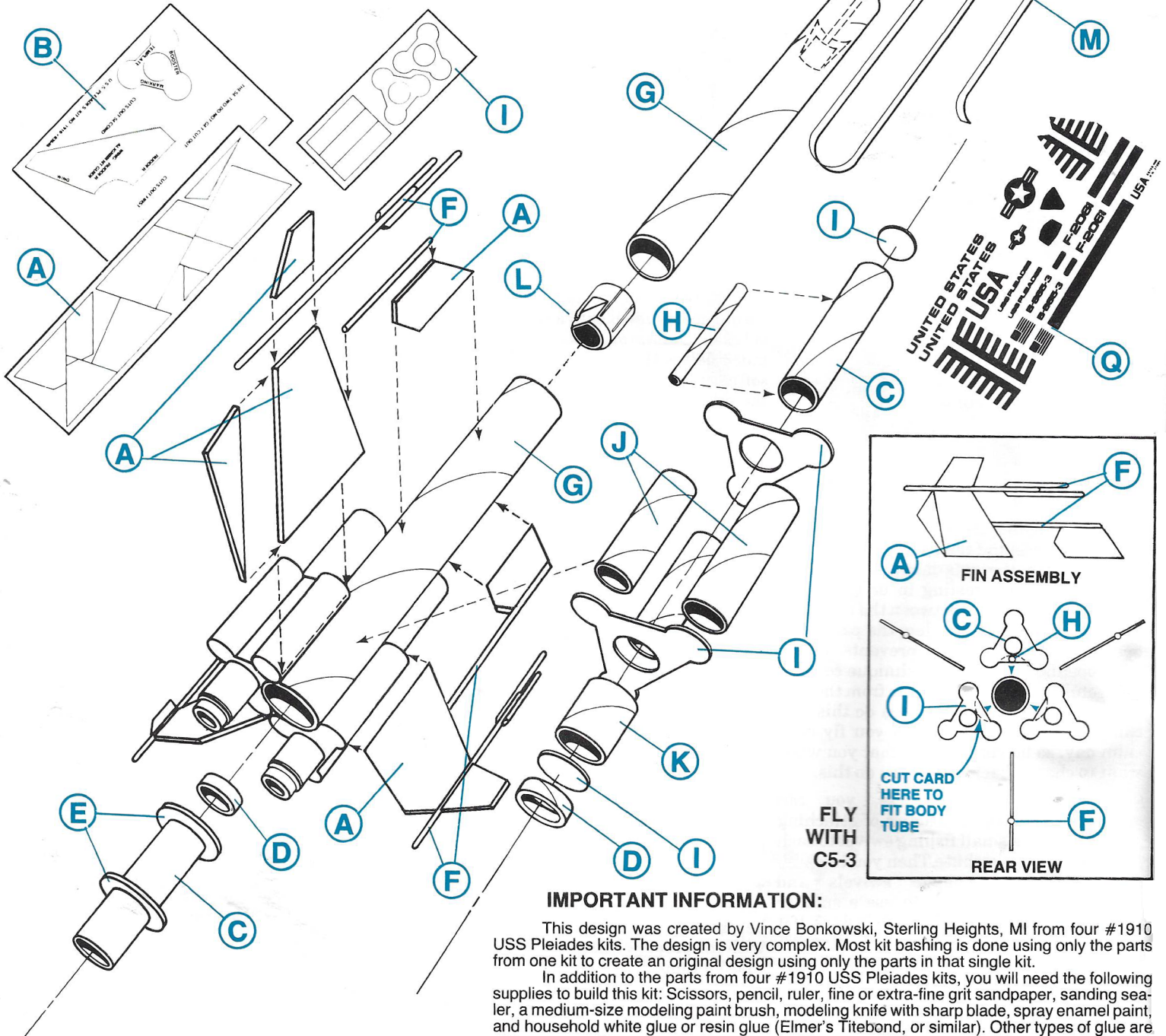
What do you want to see in your MRN Magazine? What goodies do you want us to put in your orders? Please write to us and tell us what you want. Share your ideas with us.

Write: Estes Industries
Dept. of Goodies
Penrose, CO 81240

STAR CRUISER KIT BASH

PARTS LIST

A	3	Balsa Die-Cut Sheet (type BF-1910)	32610
B	1	Pattern Sheet (back of kit panel)	83646
C	3	Body Tube (type BT-20J) 2-3/4" long	30326
D	4	Engine Block (type AR-520)	30162
E	1	Die-Cut Card (type PL-2055)	30127
F	3	Wood Dowel	32058
G	2	Body Tube (type BT-55KA)	30387
H	1	Launch Lug (type LL-2B)	38178
I	3	Die-Cut Card (type RA-1910)	32460
J	9	Body Tube (type BT-20M) 2-1/4" long	30334
K	3	Stage Coupler (type JT-20D)	30255
L	2	Nose Cone (type PNC-55B)	72056
M	1	Shock Cord (type SC-1)	85730
N	1	Parachute (type PK-18A)	85566
O	1	Shroud Line (type SLT-108)	38239
P	1	Tape Discs-6 (type TD-3F)	38406
Q	1	Decal (type KD-1910)	37225



IMPORTANT INFORMATION:

This design was created by Vince Bonkowski, Sterling Heights, MI from four #1910 USS Pleiades kits. The design is very complex. Most kit bashing is done using only the parts from one kit to create an original design using only the parts in that single kit.

In addition to the parts from four #1910 USS Pleiades kits, you will need the following supplies to build this kit: Scissors, pencil, ruler, fine or extra-fine grit sandpaper, sanding sealer, a medium-size modeling paint brush, modeling knife with sharp blade, spray enamel paint, and household white glue or resin glue (Elmer's Titebond, or similar). Other types of glue are not recommended.

THE FAR-OUT FLEET

StarshipNOVA

Skill Level 3



Beautiful
Exotic
Challenging



Cruise the stellar spaces with B4-2 (1st ft.), B6-2, C5-3, or C6-3 engines

#1371 ~~\$8.25~~ \$5.50
Unearthly value!

SPACE STATION AQUARIUS

Skill Level 3



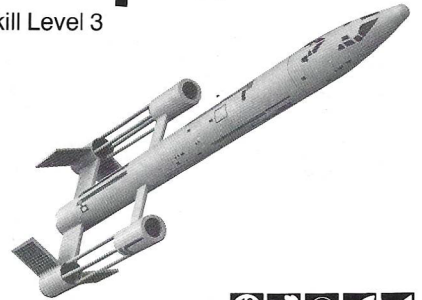
Deep space research station
20.75" long

Impressive flights with A8-3 (1st ft.), B4-2, B4-4, B6-2, B6-4, C5-3, C6-3, or C6-5 Estes engines

#1902 ~~\$8.75~~ \$6.00

Scorpius

Skill Level 3



Very advanced design spacecraft

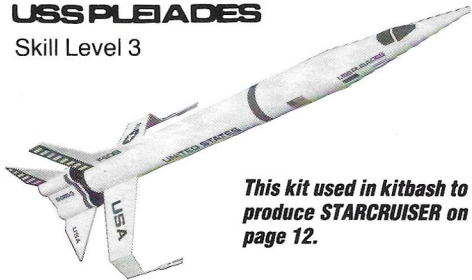
Great display model

Power with A8-3, B4-4 (1st ft.), B6-4, B8-5, C6-5.

SCORPIUS #1375 \$5.95

USS PLEIADES

Skill Level 3



This kit used in kitbash to produce STARCRUISER on page 12.

Two-stage
Exotic space fighter
Big 20.6 inches long



Reach for the stratosphere with A8-5 (1st ft.), B4-6, B6-6, or C6-7 engine in upper stage and A8-0 (1st ft.), B6-0, or C6-0 engine in booster.

Fly single stage with A8-3, B4-4 (1st ft.), B6-4, B8-5, or C6-5 engine

#1910 ~~\$7.25~~ \$4.75

galactic taxi

Skill Level 3



What Luke calls when away from his own ships

Impressive, 1,000' flights

Beautiful display model

Cruise with A8-3 (1st ft.), B4-4, B6-4, B8-5, or C6-5 energy units

#1914 ~~\$6.75~~ \$4.50

ESTES ASTEROID EXPLORER

Skill Level 2



Geological data gatherer

Collects ore samples

16.6" long

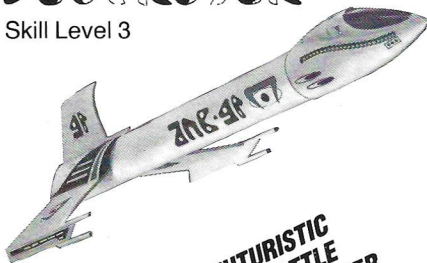
Able to reach 1,000'

Probe the unknown with A8-3 (1st ft.), B4-4, B6-4, B8-5, C6-5, or C6-7 engines

#1386 ~~\$5.50~~ \$3.75

MARCONIAN DESTROYER

Skill Level 3



**FUTURISTIC
BATTLE
CRUISER**



Beautifully detailed

Soar with A8-3 (1st ft.), B4-2, B4-4, B6-2, B6-4, B8-5, C5-3, C6-3, or C6-5 engines

#1903 ~~\$7.25~~ \$5.00

U.S.S.F. FIREFLASH

Skill Level 3



U.S. Space Force fighter
16" of power

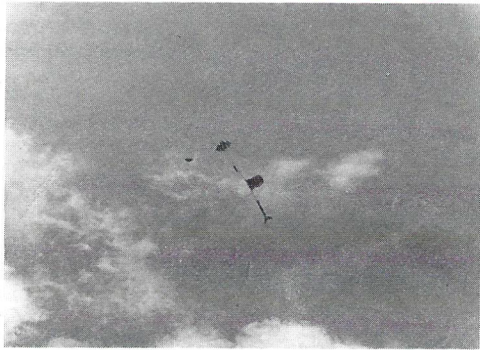
Scramble with A8-3 (1st ft.), B4-4, B6-4, B8-5, or C6-5 high performance Estes engines

#1909 ~~\$7.25~~ \$4.75

**BUILD YOUR
FLEET AT THESE
BARGAIN PRICES!**

These exciting kits provide excellent possibilities for the Kit Bash Contest featured on the back cover. The U.S.S. Pleiades was used in the Kit Bash plan on the opposite page.

PATRIOTIC PATRIOT



Here's a real flag-waving Patriot! Jim Zimmerman of the J.A.R.C. (Junior Aerospace Rocket Club) in Urbana, Illinois built this rocket and modified it by adding an American flag that displays upon parachute ejection. The flag is a small fabric flag found in many stores. The flag is attached to a string which is securely tied to the shock cord. A shock cord connects the nose cone and parachute to the other end of the string with the flag. This is a real crowd pleaser and is great for demonstrations, especially around Independence Day.

BOOKS

ETV Model Book by Robert Schleicher. #2808. \$7.95. An excellent guide to building flying model rockets. Many excellent how-to tips and fine photos. Covers all aspects of model building and painting -- kit building, kit-bashing, painting, decaling, instant weathering or battle damage, etc. If you are a serious modeler of any type, you need this book.

Out To Launch by Ross R. Olney. #2806. \$7.00. Hardback. An excellent beginner's book on model rocketry. Unusually well illustrated.

QUASAR

Skill Level 1



Fast construction with plastic fin unit, plastic nose cone, metallized pre-printed body tube wrap-on
No painting!
Flash away on brilliant flights with 1/2A6-2, A8-3 (1st ft.), B4-2, B4-4, B6-2, B8-5, C6-5

#0650 ~~\$6.95~~ \$4.50

MORE FUN AT SCHOOL!

Aerodynamics, astronautics, geometry, math, industrial arts, science...all of these subjects can be FUN!

Ask your teacher if you may bring one or more of your model rockets to school to show to your classmates. Explain model rocketry to them, and fly a rocket or two. Your teacher and classmates what you've learned about the center of pressure, center of gravity, and aerodynamic drag while building and flying your rockets.

Discuss countdown, launch control, coast phase, apogee, chute ejection, altitude tracking, and recovery. Explain that model rockets faithfully duplicate the happenings at NASA when a real spaceship is launched.

Your teacher will see how much you've learned and how model rocketry can be used to teach others about mathematics, science, and physics.

Your classmates will see how much FUN model rocketry is!

Ask if you can start a model rocketry club at school. And if you fill in the coupon below and mail it to Estes Industries, we'll send your teacher a "free" educator packet filled with ideas for teaching a model rocketry class. A Model Rocketry Club Guide is available, too.

Yes, I want more FUN at school this year! Please RUSH a "free" Educator Packet to:

Teacher's name _____

School name _____

School address _____

City _____ State _____ Zip _____

Please send a Model Rocketry Club Guide, also. Clip and mail to: Estes Industries
Dept. 273
Penrose, CO 81240

BARGAINS

POLARIS

Skill Level 1



Payload section

Engines--1/2A6-2, A8-3 (1st ft.), A8-5, B4-4, B6-4, B8-5, C6-5, C6-7

#1324 ~~\$6.75~~ \$4.50

FIRECAT

Anti-Tank Missile

Skill Level 1



Engines--1/2A6-2, A8-3 (1st ft.), A8-5, B4-4, B6-4, B8-5, C6-5, C6-7

#1378 ~~\$4.95~~ \$3.25

VINDICATOR

Skill Level 3



25.5 long
Engines--B4-2, B6-2, B6-4 (1st ft.), B8-5, C6-3, C6-5

#1367 ~~\$8.25~~ \$5.50

STREAK

Skill Level 2



D power
1,300 ft. flights
Engines--D11-9, D12-5, D12-7 (1st ft.)

#1387 ~~\$5.25~~ \$3.50

PATRIOT

Skill Level 2

BIG!



Impress the crowd with flights with B4-2 (1st ft.), B4-4, B6-2, B6-4, B8-5, C6-5, C6-7

#0652 ~~\$9.95~~ \$6.75
A BIG SAVINGS!

Spectacular red, white, and blue decor
Great demo model

MR DISPLAY IN SHOPPING MALL GAINS CLUB NEW MEMBERS

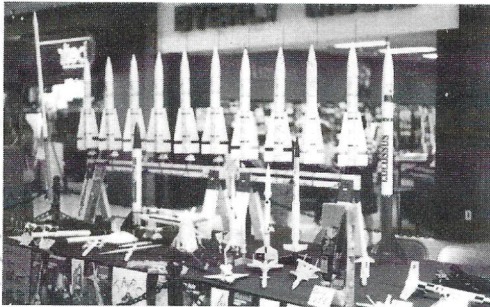
By Jim Zimmerman, Sponsor J.A.R.C.,
Thomas Paine School, Urbana, IL

The J.A.R.C. (Junior Aerospace Rocket Club) of Thomas Paine School, Urbana, IL set up a model rocket display in the Market Place Mall shopping center in Urbana. The display for the weekend was set up in cooperation with a local RC airplane club and their display of model airplanes. A wide variety of model rockets were displayed with ten Phoenix models in the background.

The club raised some money during the event by raffling off a Star Wars starter kit. A People's Choice contest was held in which visitors voted on their favorite from the member's best models on display. The owner of the hobby shop in the mall presented the top four winners with nice prizes.

The two-day display was a real crowd-pleaser. The club members became hoarse from talking to so many visitors. Club members told interested visitors about model rocketry's fun, safety, and educational value. Many people were surprised to learn that model rocketry is much more than Fourth of July type rockets.

A number of individuals were interested enough to come out to the club's flying field during the following weeks. If you are a member of a club or organization involved in model rocketry, a shopping mall display is a great way to bring model rocketry to the public!



ROCKETRY RIDDLES

Question: What did the blast deflector say to the rocket engine?

Answer: You really burn me up!

Submitted by Dan Gray, Montrose, CO

Question: Why did Mickey Mouse go into space?

Answer: To find Pluto.

Submitted by Caulfield, Tulsa, OK

Question: Why do rockets fly?

Answer: They can't walk.

Submitted by John Lucas, LaCrosse, WI

Question: What did the astronaut see in the frying pan?

Answer: Unidentified Frying Object

Submitted by Shawn Hovendick, Blair, NE

Question: If an athlete gets athlete's foot, what does a spaceman get?

Answer: Missile toe

Submitted by Kevin Cain, Traverse City, MI

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RULES

1. You may enter as many times as you like.
2. The kit you choose may be any of the Estes kits in the 1984 catalog!
3. You may use only those parts included in your kit. Use only one kit.
4. Your model will be modified from the "standard" model produced from the kit. The modifications may be for increased performance, unique appearance, or other valid purpose.
5. You must send in a clear diagram, kit name, and parts list of items from the kit which you used, and instructions which are necessary for someone else to duplicate the rocket as you built it. A photo of the completed model may also be included.
6. Always test your model for stability before the first test flight. Flight test your design away from all individuals not helping in the test.
7. All kit bash designs must be stable, flight-tested, and able to fly safely.
8. List the engines with which you flew the rocket.
9. All entries become the property of Estes Industries and cannot be returned.
10. Employees of Estes Industries and members of their immediate families are not eligible.
11. Entries will be judged on neatness, completeness, originality, and uniqueness.
12. Deadline for receipt of entries is midnight, December 31, 1984.
13. Decisions of the judges are final.
14. Mail entries to:

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