



FALL 1990

MODEL ROCKET NEWS

This Issue:

Soviet Young
Pioneers Build
Estes Rockets
How to Keep From
Losing Your Rocket
Two PC MR Software
Products



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



We all share a small planet. We all, both humans and other living creatures, must share this diminutive speck in space.

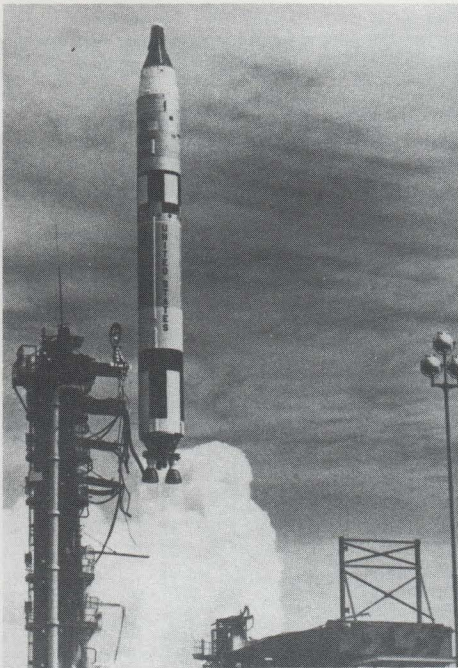
This photo was taken of a young great horned owl as it perched in an unlikely spot, on Launch Pad 39B alongside the orbiter Discovery. The owl apparently departed for parts unknown before the launch of STS-31 carrying its five-member crew and the Hubble Space Telescope. Photo courtesy of NASA

THIS MONTH IN SPACE HISTORY: SEPTEMBER GEMINI ALTITUDE RECORD

By Douglas Kirk, Canyon Lake, TX

On September 12, 1966, Gemini XI lifted off on what was to be a world altitude flight. The flight was piloted by Richard F. Gordon, Jr. It lifted off from Cape Kennedy after a series of delays. An Atlas-Agena rocket was sent into orbit first. The Gemini XI was launched on a Titan rocket less than two hours later.

The objective was to chase the Agena target vehicle and rendezvous and dock with it. This maneuver would be required if man was to fly to the moon. Several Gemini missions were tasked to proving the concept. Gordon and Charles "Pete" Conrad, Jr. linked with the Agena during their first orbit.



Lift-off for Gemini XI
Photo courtesy of NASA

The next day, the Agena's primary propulsion system was ignited, and the booster carried its Gemini payload to a record altitude of 739.2 miles above the Earth's surface. There, the crew continued docking tests and maneuvers, including an umbilical EVA (extra vehicular activity) in which Gordon left the spacecraft, straddled the nose of the Gemini spacecraft, and tied a 30 meter long tether to the Agena. On the third day, the Gemini separated from the Agena and made two revolutions around Earth with Agena in tow.

Conrad and Gordon would later fly Apollo 12 to the moon. The same docking operation would be required for the success of that mission, not at 700 miles from Earth, but at a quarter of a million miles away!

Astronaut Conrad compared his earlier Gemini V flight with L. Gordon Cooper, Jr. in 1965 with "eight days in a garbage can". The Gemini spacecraft was extremely small.

THE MODEL ROCKETEERS' SHUTTLE MISSION--UPDATE

Probably scheduled for launch in mid-1991, the STS-37 Mission will have as its major task the deployment of the massive Gamma Ray Observatory.

Two of the mission specialists are Jerry Ross and Jay Apt, both of whom are experienced model rocketeers. While several other NASA astronauts, both former and current, have participated in model rocketry, we are including extra coverage of this mission for several reasons. Both of these men are outstanding examples of what can be accomplished if you try hard enough and have "the right stuff". Also, many years ago, your editor was sent by Vern Estes to Pittsburgh, PA to make a short presentation at the Pittsburgh Spring Convention. This convention was set up and operated by Jay Apt, at that time a high school student. Since that time, Jay has obviously continued his enthusiasms for rocketry and for science.

One of the experiments which Jay and Jerry will conduct is a test of the new CETA (Crew and Equipment Translation Aid), a kind of cart planned to move equipment on Space Station Freedom. One mode of the test will have a crewman propel the cart by hand-pushed pedals, somewhat like a bicycle. The pedals will generate electricity which will drive the cart.

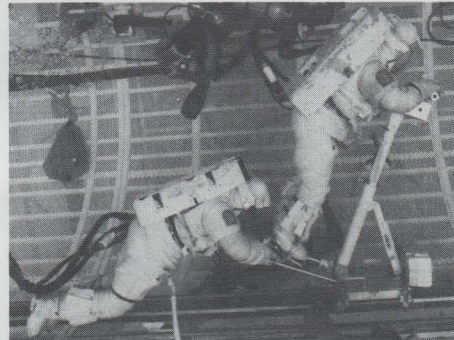


Photo courtesy of NASA

Somewhere over the years Jay picked up a contingent of model rocketeers who dubbed themselves the "U.S. Aptlofting Team". This group has composed a song which they graciously permit us to share with you. The following is the copyrighted property of the U.S. Aptlofting Team. Permission to reprint it was secured from Patrick McCarthy of Cape Canaveral, FL and some fellow members of the Space Coast Rocketry Association. It was written by Patrick McCarthy and Mike Megrick and originally appeared in the January 1990 issue of Space Coast Rocketry.

"THE BALLAD OF JAY APT" (Sung to the tune of "The Beverly Hillbillies")

Come and listen to the story 'bout a man named Jay,
M.I.T. Grad Student, got his Ph.D. one day;
As a space hero he was looking for employ,
When in through the mail came a note that brought him joy.

Well the next thing you know, Jay Apt's an astronaut,
Model Rocketeer with a ticket on a shot;
They said the "Low Earth Orbit" was the place he oughta be,
So he loaded up his car and moved to J.S.C.

Pretty soon you'll see Jay work in zero-gee,
An astro-stevedore with a doctoral degree;
He flies aboard a shuttle prepped by model rocketeers,
The hobby's biggest hero in over thirty years!

When he straps on his E.M.U. and steps out for a walk,
Some weightless high adventure our friend Jerome will stalk,
We hope that he remembers Mr. Newton's still the boss,
For we don't wanna see him bounce off of Jerry Ross!

What is Jay Apt gonna' do when his ship touches ground?
He ought to enter R and D, he'd win first place hands down.
He'd get flight points for doing gamma ray astronomy,
And we hear the NAR will soon endorse "high power" rocketry!

When Astro-Jay again takes wing be sure to crack a smile,
Another set of verses on this stupid song we'll pile!
Those younger rocketeers say they wanna be like Jay.
But at "The Cape" we are content to send him on his way.

Oh, has Jay launched a rocket--did he ever try?
I've never watched him build one and I've never seen him fly.
Perhaps it's just a rumor that's believed by you and me,
It wouldn't be unheard of in an N.A.R. Trustee!

In addition to their work with the Gamma Ray Observatory, Jay and Jerry will be doing a six-hour spacewalk. Also, they will be carrying ham radio gear. The American Radio Relay League is encouraging clubs to set up rigs in schools so the students can contact them, or at least their packet radio computer.

Knowing a little of the background of Jerry and Jay, I suspect that they may also do something for education. Why not try to get your youngsters involved in keeping up with the mission (hopefully a mid-1991 launch, but the actual launch date may slip again), watching whatever TV coverage is available (videotape the evening news for showing to your students the next day, if nothing else), try to take part in the ham radio contacts through a school amateur radio club or a local ham club, and whatever else you can think of which will help your students.

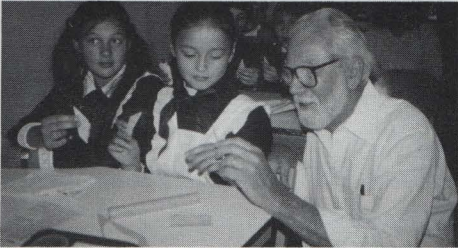
You can use this launch as a reason to review the Laws of Motion, what to study in school to try to become an astronaut, etc. Encourage your students to dream big, and to "Go for it!"

YOUNG PIONEERS LAUNCH ESTES MODEL ROCKETS!!!

By Dr. Ted Colton, Georgia State University

For the last four years, Dr. Ted Colton of Georgia State University has been invited to the Soviet Union to demonstrate science teaching techniques and strategies for teachers. He has worked with teachers in the public schools of both Moscow and Leningrad.

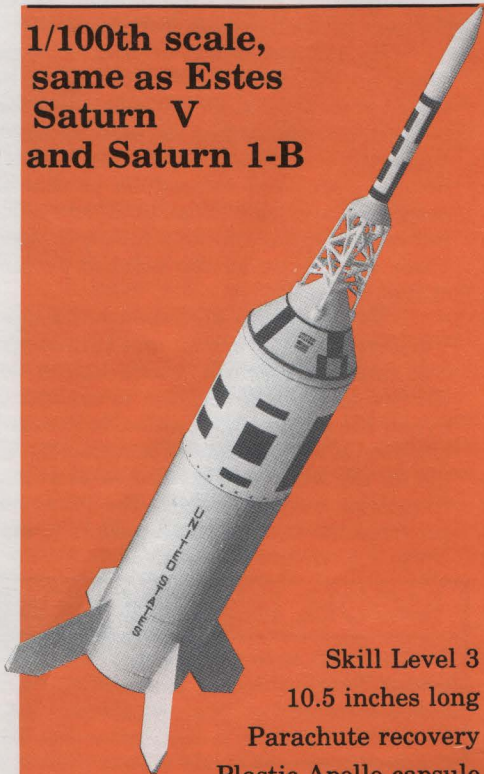
In previous years, he taught children in Soviet classrooms about Bernoulli's principle and Newton's Laws of Motion. This year's trip in January was unique. This year he helped Young Pioneers build and launch Estes model rockets.



Dr. Colton and the Russian students

In Leningrad, Soviet children in the eighth form were briefed on Estes model rocket concepts and launching and retrieval procedures. They learned about model rocket solid fuel cells and how they perform. About thirty Young Pioneers built their own Estes model rockets and set them aside for launch on the next day.

**1/100th scale,
same as Estes
Saturn V
and Saturn 1-B**



Skill Level 3
10.5 inches long
Parachute recovery
Plastic Apollo capsule
Make your own test flights
Estes A3-4T (First Flight)
or A10-3T.

LITTLE JOE II™ #0892 ... \$15.49

A rainy, overcast day did not dampen their enthusiasm the next morning. The children and Dr. Colton left the school and boarded a trolley bus for a park-soccer field in the heart in Leningrad.

Rocket engines were loaded, and the launch began. As each rocket was launched, more Soviets were attracted to the launch site. The final countdown and launch of a larger demo rocket went off amid cheers and applause! All rockets were retrieved and a happy, but damp group of kids returned with their physics teacher and Dr. Colton to the school.

The following week, Dr. Colton was at Moscow Public School #710. Along with other metro-Atlanta educators for the third time in three years, he demonstrated classroom techniques and strategies along the lines of American educational philosophy. Rocket builders at this school were chosen from the sixth form. The kids in this group also proved to be really eager and competent.



Dr. Colton started the session with the principles of rocketry and talked about model rocketry in America. The kids were briefed on how Estes model rockets work. A discussion of solid fuels containing both fuel and oxidizer followed. The lucky kids then assembled the rockets and put them aside for launch the next day.

Launch day was bright and sunny. The school director suggested that before the children leave for the launch site there be a demonstration launch for the whole school (grades K through 12). This was arranged. A successful launch of a larger demo rocket resulted in the rocket disappearing above the school grounds. It landed somewhere in Moscow.

The class then headed for Fireball Stadium on the trolley bus. Each child's launch was successful. The athletes training on the track and field equipment provided an impromptu cheering section. Dr. Colton and the kids returned on the trolley bus to the school with their launched rockets and the burned-out engine casings.



Look familiar?

**You asked for it...
and
now it is here!**



Skill Level 4
26.5 inches long
2.618 inch diameter
1/100th scale model!
Same scale as the Estes
Saturn V

High-relief plastic body wraps
for great detail

Special sub-assembly painting
procedures

Dual 'chutes for gentle recovery, flight
after flight

Awesome flights with Estes D12-5
engines

SATURN 1-B™ #2048 \$39.89



Bob Cannon of Estes Industries led one of more than 30 concurrent sessions for the 1,300 attendees at the National Congress on Aviation and Space held in April. This photo was taken by SSgt. George Wendt, USAF. It is used with permission from the May 1990 Civil Air Patrol News.

ESTES HELPS ORGANIZE 4-H CLUBS

Mike Dorffler, New Products Manager, and Rudl Mergelman, Manager of Product Design and Development, worked with youngsters and six adult volunteer leaders in Alamosa, CO on April 7, 1990. They were invited by Lynelle Green to introduce leaders, interested youngsters, and adult volunteers to model rocketry as a fun/learning project for the San Luis Valley 4-H Clubs.



Mike Dorffler explains some of the basics of model rocketry to interested youth and adult leaders.



Parent volunteer helps some youngsters as she builds her own first Alpha.



Mike helps young rocketeer build his first Estes rocket.

Photos by Rudl Mergelman



Photo of SR-71 Blackbird by Mike Morabito of Akron, OH.
Is this the full size SR-71 or the Estes version?

SPACEWEEK LAUNCH

By Steven W. Jochums, VP, Peoria L5 Chapter, Roanoke, IL

As with all large public model rocket launches, it started over five months prior, with advance media and site planning, discussions and resolutions, gathering of manpower and resources, and a seemingly endless string of unplanned problems. But all things considered, this sixth annual Peoria SpaceWeek commemorative launch, the fourth to be held at Illinois Central College, was unquestionably the best ever.

It was possibly the fact that 1989 marked the twentieth anniversary of the Apollo 11 lunar mission, and media attention was high. Possibly our group's large summer launches were well-known and anticipated. Possibly, it was the little green flyers that we plastered around Peoria and the surrounding area. Whatever the reason, we drew over 750 people to the launch, almost twice the number of the prior year. And we thought last year was good!

We began the event on time, at 2:30pm on July 23. The first launch of the day was an original Estes Saturn V, built in 1969 by the author. It was launched by Scott Benyacko of Peoria, winner of the student literary award at the 8th Annual Space Development Conference in Chicago. The Saturn, a veteran of more than 50 launches, put in a magnificent flight, with the actual Apollo lift-off playing in the background.

Our launch system is a rack-type system with two launch racks, placed 25 feet apart. Each rack contains five pads. We launched from one rack while reloading the other to reduce both time between flights and audience boredom. The launch plan called for 50 models to be flown. Even with wind problems, things went very smoothly until a light rain shower came to dampen the event. Undaunted, we proceeded, and

the rain never went beyond the hard drizzle phase.

Some of the most noteworthy launches came from the scale models including concept scale models of the AMROC Industrial Launch Vehicle (dedicated to the late George Koopman), and Space Services Inc.'s Conestoga rocket, the new Estes Titan IIIE, and numerous Estes scale models. Incredible high altitude flights were launched.

By 4:30 pm it was all over. The rain was gone, the crowd was dissipating, we had talked to three local TV stations, three local newspapers, and logged the most successful single public outreach event in our chapter's history. Our final impression is that the people of America's "Heartland" are indeed interested in our nation's future in space. Their attendance at our event is evidence of that interest.

Thanks to our kind sponsors: Folger's Variety; R.C. Workshop; and Illinois Central College of Peoria, which helped with the means and the location to conduct the event; the people and families of Peoria L5 Chapter of the National Space Society who did all the work; and the fine folks at Estes Industries who throughout the years have provided the material and models to make these events successful.

MODEL ROCKET NEWS

Bob Cannon Editor
Charles Webb Photographer
Karen Oelschlager Graphic Design
Karen Oelschlager Typesetter

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 through adult. Adult supervision suggested for those under 12 years of age. Prices subject to change without notice.

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MESSAGES FROM LAUNCH CONTROL

Results of Summer 1990 Survey

We hope to have the results of this survey available for publication in the Winter issue. Thanks to everyone who returned the survey this summer!

Free Model Rocket News

I hope that you enjoy reading this magazine. We try to make it enjoyable to read as well as useful. It is mailed FREE to all current Estes mail order customers. So don't forget to order periodically to stay on the mailing list, even if you purchase nearly everything you need locally.

Contributions NEEDED!

Please send us articles, photos, and anecdotes. Each issue we try to present a somewhat "balanced" magazine with something to appeal to everyone who receives it. This includes the young 10-year-old rocketeer who is just starting, the NAR veteran who has attended numerous NARAMS, and anyone else who receives it. This means that we need lots of articles, photos, Idea Box ideas, stories about unusual successes, etc.

Right now our "inventory" of good things to share with our readers is low. Plus we are now seriously considering adding an extra issue of Model Rocket News each year. Our need for good items to publish is expanding. And our rate of receipt of good items to publish is not keeping pace. So please send in that article, photo, etc. now. I thank you, and our readers will thank you!

Lend a Helping Hand

And you can be of immense help locally. Lend a helping hand to local schools or other groups who are trying to get a model rocket program started. Many individuals, and many, many youngsters are eager to get into model rocketry, but need a helping hand to show them how. This is where you, and your club if you have one, can really be helpful.

Don't wait for the teachers, Scoutmasters, or others to come to you. Volunteer! Leave word with local hobby shop owners, local schools, YMCAs, churches, etc. Good leaders are often hard to find, and there you are ready to help!

It will prove to be fun. Most leaders who get involved enjoy it. I know you are busy. But this can be a great excuse to build and launch some more rockets, and be doing it in a Good Cause, so your Significant Other or others cannot chide you for "goofing off" while you are doing it!

Annual Rocketry Campout

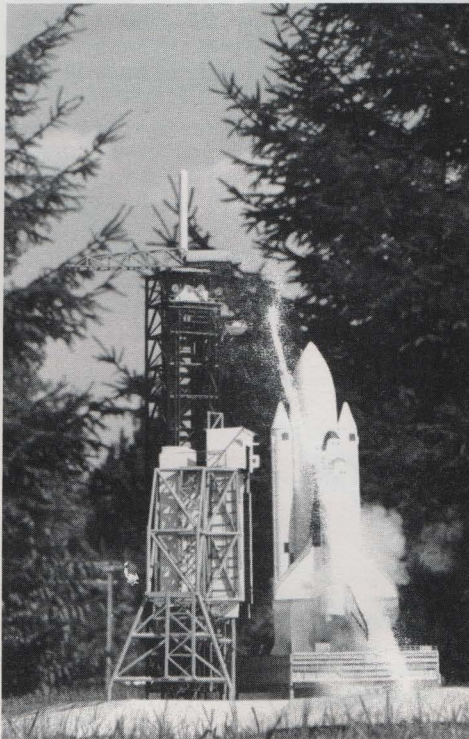
David Trevino, Committee Chairman of Boy Scout Troop 154, in Sterling Heights, MI and his troop again used Estes model rockets for their annual Rocketry Campout. Over 100 Cubs and Boy Scouts attended the special weekend last year. The Rocketry Campout is their recruiting drive for the year. They have been very successful in having boys join their troop because of the excitement and enjoyment of rocket building and launching.

They even developed a nice special patch for the Rocketry Campout. Thanks, David. David and his children are also members of GLAR (Great Lakes Association of Rocketry), NAR, and American Modelers Association.

Fun Places To Visit

This report comes to you a bit late, but maybe it will help when you plan next summer's vacation. The September 18, 1989 issue of U.S. News & World Report carried an article about interesting places to visit. Estes Model Rockets was listed as one of the 20 more interesting places to tour. Y'all come, y'hear!

Bob Coan



Nice photo of Shuttle launch immediately after ignition. Photo taken by Mark Rainey of Hacktstown, NJ. See page 9 for more information.

THE MONSTER!

Over six feet of spectacular D-performance!



Mean Machine

Skill Level 2

Really impressive flights with Estes D12-5 engines.

Requires use of 3/16 inch Maxi™ Rod for launch.

MEAN MACHINE™ #1295 \$17.99

DID YOU KNOW? THE BROWN BOTTLE OF SPACE

By Douglas Kirk, Canyon Lake, TX

What is brown, weighs 66,000 pounds, stands 153.8 feet high, holds 528,616 gallons of liquids, and essentially is a giant Thermos® bottle? This giant bottle is more than 27 feet in diameter. When it is full, it weighs 1,655,600 pounds!

It is the external tank (ET) of America's Space Shuttle. It contains super-cooled liquid hydrogen and liquid oxygen. Its thermal protection system, its insulation system, is a one-inch thick coating of a substance like Styrofoam®. The coating is actually polyisocyanurate foam, but it is very similar to the Styrofoam® in an ordinary picnic cooler. This special foam is a little heavier, a little denser, and is a light tan in color.

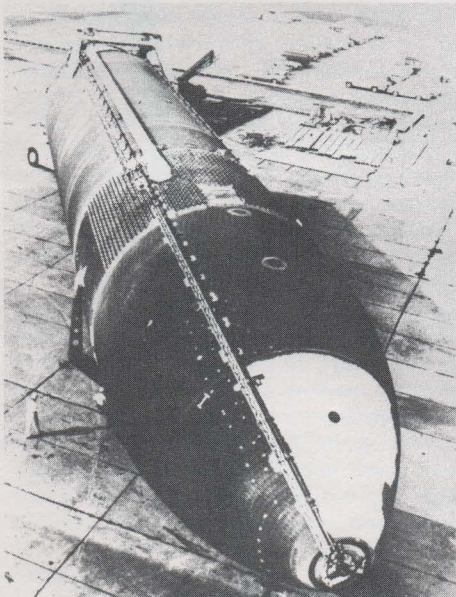


Photo courtesy of NASA

Certain parts of the tank which will be subjected to very high temperatures receive a coating of a special ablative material. This material chars but does not burn. As it heats up, layers peel away exposing fresh, uncharred layers below. This removes heat so that the ablative material can withstand heat without becoming completely destroyed if the coating is thick enough.

To finish out the multi-layered thermal coating on the ET, there are special thermal insulators made of phenolic.

The thermal protection system (TPS) serves three purposes. First, like any Thermos® bottle, it maintains the propellants it contains at or below -423° F (degrees Fahrenheit) for liquid hydrogen and -298° F for liquid oxygen. Second, the system protects the metal of the tank itself from aerodynamic heat. Third, the system minimizes ice formation on the outside of the tank. Ice forms simply because the cryogenic liquids inside are so cold that they cause the moisture in the air next to the tank to cool so much that it freezes on the surface of the tank. The principle is the same as the condensation of water droplets on the

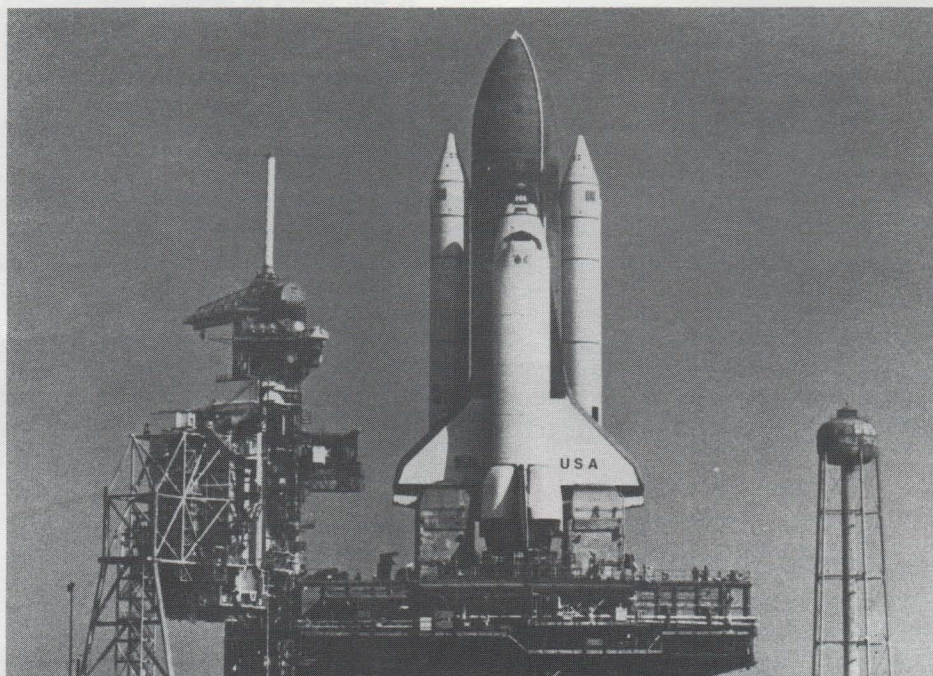


Photo courtesy of NASA

outside of a glass of ice water in the summer. The surface of the tank is so cold that the water condenses and freezes on the surface. This ice can be a serious problem because huge chunks of it will vibrate free during liftoff and can damage equipment on the space vehicle as well as to objects on the tower and ground.

The thermal protection system weighs 4,823 pounds. That is a lot of foam. It is actually sprayed onto the tank while the tank is standing upright on a special turn table in a room at the Michoud (pronounced mee'shoo) Assembly Facility near New Orleans, LA. The foam is sprayed on under controlled conditions for temperatures, humidity, and cleanliness. The entire tank is created at Michoud within a huge 43 acre

warehouse. This warehouse was used for the manufacture of airplanes during World War II.

The insulating foam is light tan in color when it is sprayed onto the tank. But this isn't the color you see when the Shuttle lifts off. Once upon a time, the tank was painted white. This was to protect the foam insulation. But to optimize the performance of the Shuttle, scientists decided to leave off the coat of white paint. This reduced the weight of the Shuttle by 700 pounds. This meant that the Shuttle could carry that much more payload. It also saved the costs of the paint and applying the paint.

The ET at launch is a rusty brown color. What happened to the light tan insulation layer? When sunlight hits it, it turns brown. So now you know!

SOLAR SAILER II™

Extremely high-visibility aluminized parachute



Skill Level 3

BIG! 28.5 inches long (72 cm), 0.976 inches wide (2.5 cm)

Fun flights with Estes A8-3 (First Flight), B4-4, B6-4, B8-5, and C6-5 engines.

Distinctive appearance of this model makes it a standout on display, on the launch pad, and in the air.

SOLAR SAILER II™ #2044

\$12.69



CONTEST SPECIAL

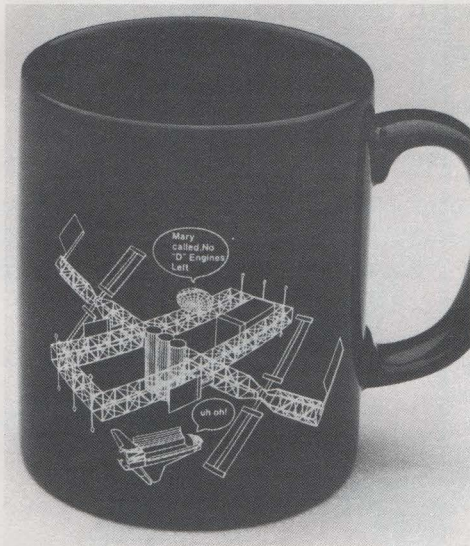
The basics you need to put on a good contest

- ★ Model Rocket Contest Guide #2815
- ★ Information letter with lots of suggestions
- ★ 30 participated award certificates #2836
- ★ Five won award certificates #2837
- ★ THREE GREAT PRIZES:
 - One Mean Machine #1295
 - One Strike Fighter #1987
 - One Sentinel #1987
- ★ Three posters to advertise the contest

This special is available only to ESP members. Send in one of your ESP Official Validation Seals with your order. See page 3 of the previous issue of this magazine for further information. Allow four weeks for delivery.

ESP CONTEST PAK™ #1453

\$29.99



Dick Nelson's Pearl River Vulture Squadron sponsored their annual Modroc Seminar again this spring. This makes number 19 for them. This photo shows one side of the souvenir mug they produced for this year's meeting. Mary Roberts, Marketing Manager for Estes Industries, denies any collusion or advance knowledge of this. Anyway, we are not out of D engines!

JAMMINTM

Fun Flier!



Skill Level 1 Sport Model
10.5 inches (27 cm) long with breakapart recovery
Great flights with Estes 1/2A3-2T, 1/2A3-4T (First Flight), A3-4T, and A10-3T.

JAMMINTM #0890 \$ 4.59

SURVEYORTM

Real eye-catcher
features prism
pressure-sensitive
decal!



15⁷/₈ inches (40 cm) long
sport model is Skill Level 2.
Launch this little jewel very high
into the sky with Estes A8-3 (First Flight),
B4-2, B4-4, B4-6, B6-2, B6-4, B8-5, C6-3, C6-5,
or C6-7 engines.

SURVEYORTM #2046 \$ 9.99

GODDARD DAY CEREMONY CHRISTA MCAULIFFE SPACE CENTER

By Douglas Smith, Christa McAuliffe Space Center, Glendale Elementary School, Tonawanda, NY

On March 16, 1990, our school held a ceremony honoring Robert H. Goddard on the anniversary of the first launch of a liquid fueled rocket. In preparation for the ceremony, the students studied books about Goddard's life and his rockets. They then wrote short reports which were shared with the entire school on morning announcements the week before the ceremony. These

reports introduced students schoolwide to the importance of Goddard's accomplishments.

On the anniversary date, all grades K through 5 assembled on the school playground for a rocket launch in commemoration of Goddard. Twenty-two model rockets were launched, including the Space Shuttle. We placed cabbages on the launch site to remind students of the historical cabbage patch.

The ceremony was a grand success. Beyond the knowledge of Goddard and his first rockets, students gained the experience of the joys of model rocketry. We are looking forward to conducting these activities again next year.

BETA LAUNCH VEHICLETM

Impressive pseudo-scale
satellite launcher



Skill Level 2 vehicle is
24.375 inches (62 cm) long and 1.673
inches (4.2 cm) in diameter.
Interchangeable display nozzle/clear
plastic fin unit
Fly with Estes A8-3 (First Flight), B6-4, B8-5,
or C6-5 engines.

**BETA LAUNCH VEHICLETM #2054
..... \$14.19**

AMERICATM

Beautiful
gold-plated
nose cone



Skill Level 1
15 inches (38 cm) long
with a 0.976 inch (2.5 mm) diameter
Super flights with 1/2A6-2, A8-3 (First
Flight), A8-5, B4-4, B4-6, B6-4, B6-6, B8-5,
C6-5, or C6-7 engines

AMERICATM #2042 \$ 9.19



Kit Bash Fever at NARAM-29. Photo by Alan Williams

SCIENCE FAIRS!

Now is not too early to start planning for Science Fair. In fact, the earlier you start, the better your chance of producing a winning exhibit. And you will have more time to have fun with it. I don't know about you, but I hate having to rush at the last minute to finish. And my efforts usually show my hurry!

Choose any topic you like, but I recommend model rocketry. In addition to being fun, a good rocketry project can be expanded over several years to make a really fantastic project.

Ask your teacher and your parents for help. And don't forget to check out the Estes publication Projects in Model Rocketry (#2831). There are over a hundred ideas for model rocketry projects in this booklet. And the suggestions in the "Foreword" can be invaluable in making a "winner" out of what could have been an "also ran". Projects in Model Rocketry #2831 is a bargain at \$1.

If you really want to give yourself an edge, buy and use the Rocketry Science Kit™ #0900 available from Estes Industries and from most Estes retailers. The Project Manual is 36 pages of very useful information. And this overgrown "starter set" provides a wide range of model rocketry supplies plus a rocket which flies exceedingly well in three different configurations. The Rocketry Science Kit™ #0900 retails for \$39.99.

And model rocket projects usually have an "edge" when it comes time for judging. They actually use real science. And you can do some true research for very minimal cost. And they are very impressive to the judges.



TITAN III E™

MARTIN MARIETTA'S WORKHORSE

Beautiful, 1/73rd scale model

Skill Level 4
Flies well with Estes D12-3 (First Flight) or D12-5 engines.
Maxi™ Rod required for launch

TITAN III E™ #2019 \$28.69

FAMILY HOBBY SURVIVES PROBLEMS

This article is based on information contained in two letters from John Clark, Sr., of Carroll, IA.

Estes model rockets have become a very enjoyable family hobby for us. We now own upwards of twenty, and the time spent as a group buying, building, and flying your kits is a wonderful sharing experience.

We live in a small community in west-central Iowa. Access to more advanced level kits, repair parts, and flight supplies is very limited. Two variety stores in town carry a few of your kits and some engines, but no advanced level models or repair parts. Sad to say, our family's passion has outgrown the available Estes products in Carroll, IA. We have more rockets than are carried at either of the local outlets. These retailers are reluctant to special order the more expensive and challenging kits in your line.

We thought we had ordered your "Designer's Special" on several occasions from a store in Fort Dodge. Each time we checked with the owner, he insisted it was on order and would be in soon. We waited over a year and still no "Designer's Special". (Editor's note--Does this sound familiar? We encourage you to purchase locally. But we continue to provide mail order service to help in situations like this.)

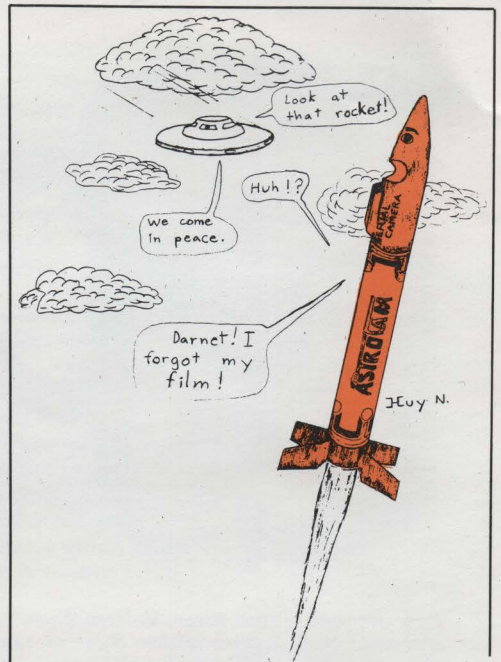
The store has since gone out of business, leading us to believe the owner neither ordered the kit nor intended to, preferring that we buy the few remaining kits he had in stock before closing his doors.

During the past three years of flying our models, we have experienced a few mishaps. When we experience a problem, as a broken fin, we need supplies to make repairs. Not having them available through local stores is a big inconvenience.

My sons recently pooled their allowances and purchased a Helio*Copter™. Your products seem to have accomplished something my wife and I have tried to foster in all our children, a sense of cooperation and sharing. This is something which at times we thought we would never see!



The youngest Clark rocketeer



Submitted by Huy Nguyen, Santa Ana, CA



MAGNUM™

D-POWER!

Two-Stage,
D-Boosted,
Payloader!

1.637 inches in diameter
34.625 inches long
24 inch parachute
Clear payload compartment
Skill Level 2

Fly with Estes D12-0 in booster

Fly with Estes A8-5 (First Flight), B4-6, B6-6, or C6-7 in upper stage

Makes a great single stage rocket when launched with Estes B4-4, B6-4 (First Flight), B6-5, or C6-5 engines.

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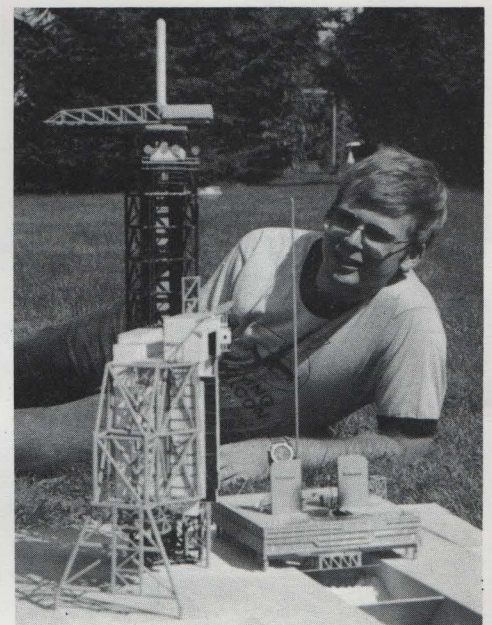
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To put things more into perspective, here is a photo of Mark Rainey of Hackettstown, NJ with his balsa gantry which he built to scale from photos.

A BIT OF HISTORY

Based on a letter from Craig F. Lindsay, Program Control Specialist, Office of Public Services, Patent and Trademark Office, U.S. Department of Commerce, Washington, DC

The Patent and Trademark Office celebrated the 200th anniversary of the first U.S. Patent and Copyright laws in May 1990. In reflecting back on the amazing achievements of inventors for the past 200 years, I have identified in my casual research several model rocketry pioneers who have been directly associated with Estes Industries. It has been exciting for me to look back into history at the creative and analytical problem solving skills utilized by those who launched model rocketry to its modern day success.

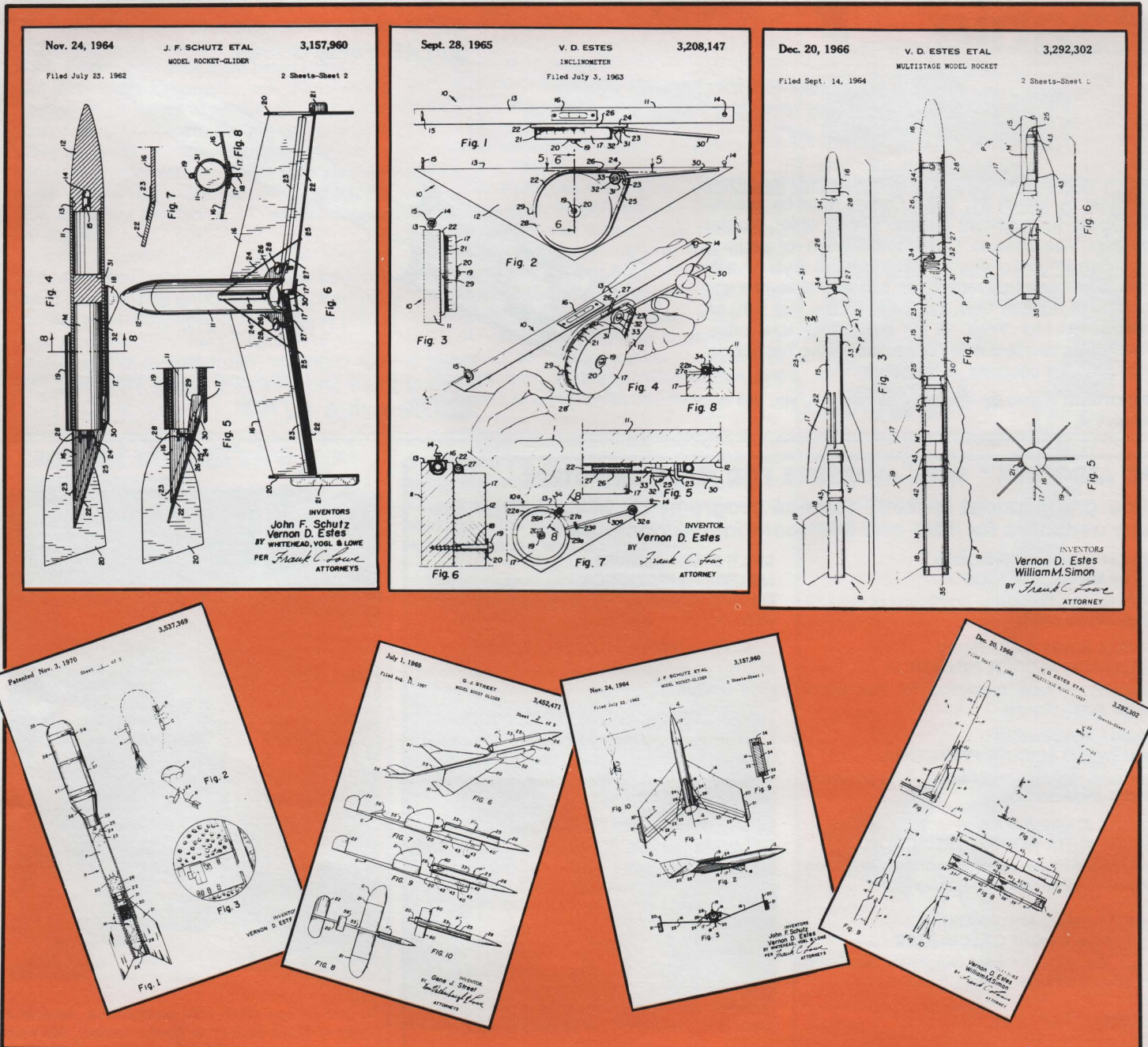
Let me help you share with your readers some of the tremendous contributions of those who have helped Estes participate by

taking part in the creative process. This could be great encouragement for those rocketeers who enjoy designing their own models. Why shouldn't rocketry be included in the problem-solving competitions held throughout the educational system? With the recent release of your Science Kit, I believe that we will see a renewed excitement for exploration.

My research discovered several early patents. Among the more interesting were a model rocket glider (Space Plane) invented by Vernon Estes and John Schutz (patented 11/24/64), an inclinometer (Altiscope) invented by Vernon Estes (patented 9/28/65), a multistage rocket (Apogee II) invented by Vernon Estes and William Simon (patented 12/20/66), a model rocket glider (Nighthawk) invented by Gene Street (patented 7/1/69), and a model rocket camera (Camroc) invented by Vernon Estes (patented 11/3/70).

Model rocketry is much more than an exciting sport and hobby. Those who enjoy the competitive side of rocketry understand this well. For those of us who lead youth as educators or through a youth organization, the sport offers more. It is a very real way to explore science and the principles of physics.

When model rocketry is combined with creative thinking and problem solving skills, we see two significant things happen. First, excitement fills a young student's eyes when he or she begins to synthesize knowledge and understanding. Second, their awareness of the importance of technology in their own lives, in their neighborhood, in society, and in our environment is enhanced. Once they catch this "vision", there are no limits to their potential contributions to mankind.



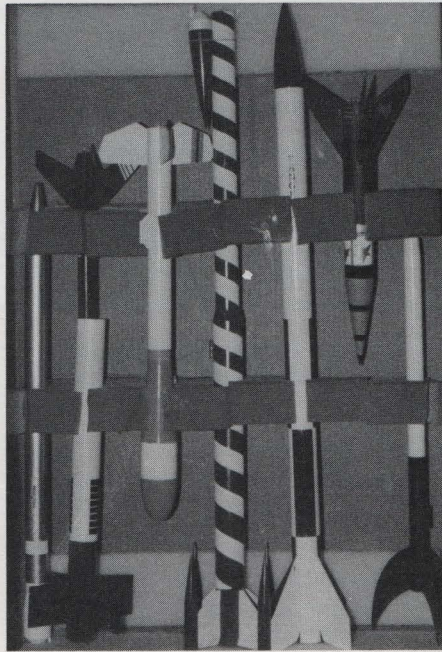
IDEA BOX IDEA BOX IDEA BOX IDEA BOX

Getting the Rockets to the Range (Safely)

One of the biggest problems is getting all of the "stuff" to the launch site. I made a really great range box out of a large plastic tool box, but you can't put rockets in the range box.

I got a large flat box, some foam rubber scraps, and everything but the Mean Machine™ becomes portable.

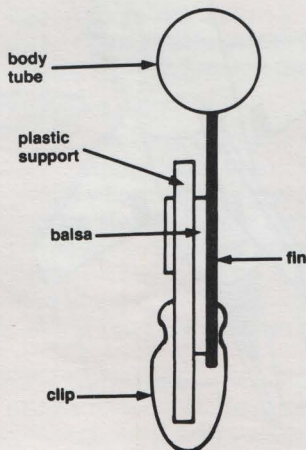
Contributed by Tom Grabowski, Baltimore, MD



Using the Fin Alignment Guide for Very Thin Fins

To use the Estes Fin Alignment Guide for fins smaller than 3/32" or 1/8", sandwich a small square of balsa sheeting between your fin and the guide's plastic fin support when clipping on your fins.

Contributed by Ed Brown, Indianapolis, IN



Parachute or Streamer Quick-Change System

If you live in an area with always changing wind conditions (and who doesn't?), don't attach your parachute directly to the nose cone as directed in most instructions. Instead, fasten the shroud lines to the small end of a fishing swivel. And make a streamer, with the streamer attached securely to an extra piece of shroud line instead of to the nose cone or shock cord as directed in most instructions. Attach a fishing swivel to the end of the length of shroud line.

If you have several different-sized parachutes and streamers rigged in this manner, you can select the best one for the wind conditions each time you launch. Also, the swivel part of the fishing swivel will spin when necessary to minimize your shroud lines getting twisted.

When buying fishing swivels, the type with the small "hooks" (end of the wire bent at right angles to long part of the wire) are usually more secure than the usual type.

Contributed by Chad Hiatt, Everett, WA

Making Engine Blocks

You can make usable engine blocks from dummy engine casings included in some kits. Cut the dummy casing into 1/4" sections. Smear a little glue around the inside of it before inserting it to help protect it from heat. Attach it into the engine holder in the usual way.

Contributed by Louis J. Jiardina, Marion, IL

Fin Alignment for Custom Models

After you have built many models and want to construct your own designs, you will probably need a fin alignment guide. Save the three-fins and four-fins alignment guides from your Estes kits for each body tube size. This makes it a snap to make accurate markings for fin alignments by wrapping them around the proper-sized body tube.

Contributed by Clarence Hoover III, Easton, PA

Save Those Instructions

It is a good idea to save all of your old model rocket kit instructions. Not only can you later refer to them for information about which engines to use and the number of squares of wadding to use, but you can get ideas for designing your own rockets.

Contributed by Jeff Hartkopf, Schofield, WI

Invitations and Thank-Yous are Important

Be sure to invite the parents to take part in Launch Day. Don't forget to invite the local newspapers and TV stations, also.

Have students write letters to parents thanking them for attending the Launch Day. Be sure to thank the newspapers and TV stations who attended.

It never hurts to let administrators and school board members hear from the students. If the students put it in their own words, then the administrators can see what the unit has meant to the students and how the future will benefit from this experience.

Contributed by Mike Dickens, Bourbon Middle School, Bourbon, MO

Inventory and Work Box

Each rocketeer will be able to keep track of all parts if, when the kit package is first opened, they make sure that all parts are there and then transfer the items to a shoe box for safekeeping.

Submitted by Michael E. Dickens, Bourbon Middle School, Bourbon, MO

Preconditioning Your Parachutes

If you store a parachute or streamer for a long period of time, straighten it out and lay it flat on a table for a day before the launch. Otherwise, the creases that set in may result in late deployment or malfunction of the recovery system.

Contributed by Clarence Hoover III, Easton, PA

Fin Patterns

To make a handy reference file of each of the fin patterns for your rocket, before you attach the fins to your rocket, trace around each fin on an index card. Label the cards and keep them with the appropriate rocket instructions. This makes making a replacement fin later much easier.

Contributed by Ed Brown, Indianapolis, IN and David Baum, Allentown, PA

Keeping a Neat Range Box

To keep everything easily accessible in your range box, keep each type of thing in its own zip-lock plastic bag. You can see what is in each bag easily. The bag keeps things from spreading all over your box. Inventory of your supplies is quick and easy.

You may wish to keep a large zip-lock plastic bag for the parts of the rocket you are currently building.

Contributed by Jimmy Schaferling, Richardson, TX

MANITOBA AT 113 FLIGHTS

By Dean Pilato, Warren, MI

On Sunday, May 9, 1982, a strange blue and red rocket lifted off from the launch pad in Warren, MI. A B6-4 lofted it for an uneventful first flight.

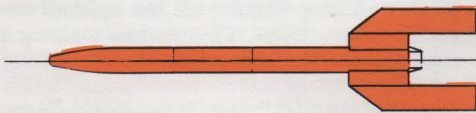
On Friday, April 13, 1990, this same rocket lifted from the pad and was recovered in Westview Park. The body tube was crumpled at the nose section joint. The shock cord was brown with ejection residue. The 'chute was blasted, and the shroud lines much repaired. After 113 flights, any rocket would look a bit rough.

The Manitoba had survived it all...landings in trees, puddles, streets, schools, in peril from kids and dogs alike. Somehow it has survived over a hundred flights over eight years.

During July 1989, the Manitoba was flown 25 times from the Ford engine plant in Romeo, MI. Quite a few times it had dodged the proverbial bullet. Once, upon 'chute ejection, the tube-stabilized rocket began to drift over a stand of large trees. "This is it!", I thought, since the trees had claimed the nose cone of my Saturn V and my Scissor-Wing glider. Nothing entering that forest of doom had ever been recovered. At the last instant, the wind shifted 180 degrees, and the rocket was saved again.

How do you build a century-flight bird? First, consider building your rocket extra tough. The Manitoba is stabilized with tubes rather than fins. It has fallen from apogee on C6-5 flights without parachute deployment and still not been damaged. Use thin monocothe strips instead of the white paper disks to attach shroud lines. Install extra shroud lines. Reinforce the engine mount. Use a large diameter body tube so that the 'chute will more reliably eject. Finally, hope for the best!

How many flights will this original equipment support? I rather doubt the tube will last 200 flights. On the other hand, stay tuned...



WRITE YOUR CONGRESSPERSON

President Bush has come out strongly in favor of Space Station Freedom to become operational in this decade. He also favors a return to the Moon and a manned mission to Mars. Unfortunately, politics in Congress often make these goals seem unnecessary to many Congressmen. Their priorities often hinge primarily upon what they can get for their district and what they can do to get reelected. The future of the U.S., and the space program in particular, often does not enter their thoughts in any positive manner.

Your help is needed, and it is needed now! Please write the Senator and Congressman whose addresses appear below. They are crucial to any hopes of NASA receiving sufficient funding to give this country a chance in space. Also write your own Senators and Representatives to express support for our space program. One or two letters may not seem like much, but your voice will be heard. This is more important to them than you think.

Please write or call these individuals and ask them to support full funding for the President's Moon/Mars Program:

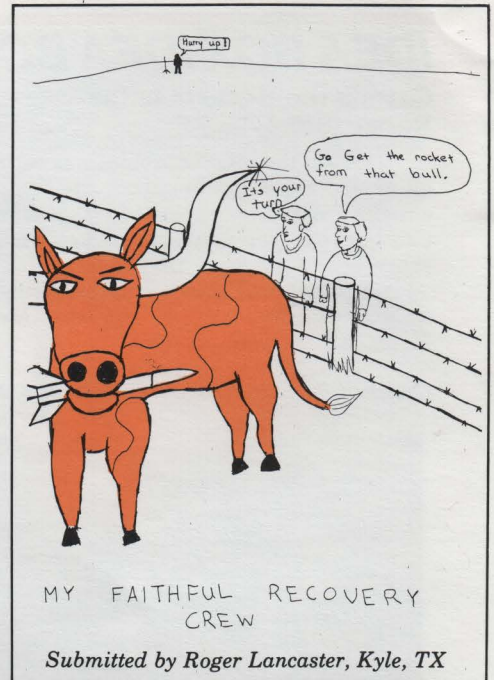
Senator Barbara Mikulski
320 Hart Senate Office Building
Washington, DC 20510
(202) 224-4654

Congressman Bob Traxler
2364 Rayburn Building
Washington, DC 20515
(202) 225-2806

You are more aware than most of the importance of a successful space program to the present and future prosperity of the U.S. And you realize the importance of keeping a hope for the future alive in our children. Man will be in space soon. One of the big questions is "Will the individuals and companies who collect money for taking you or your cargo into space collect the fares in dollars, yen, francs, or rubles?"

Please write those letters this week. We need to reassure our legislators that we still believe in America.

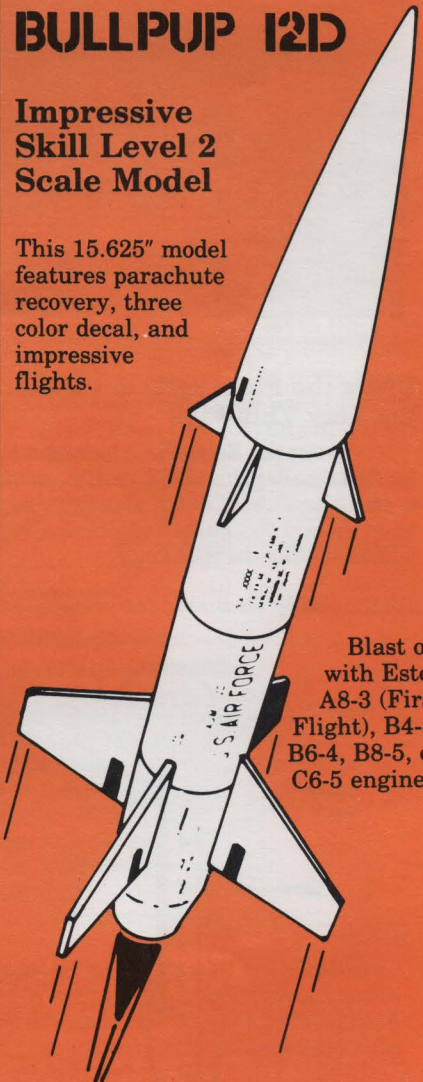
If you want further information, or if you just want to help what appears to be the most effective organization for promoting the space program, write to:
National Space Society, International Space Center, 922 Pennsylvania Avenue SE, Washington, DC 20030.



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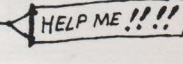
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Submitted by Felipe Foronda,
Alta Loma, CA

GROWING UP WITH MODEL ROCKETRY

This article is taken, with permission, from a letter written to us in September 1989 by Brian Vaupel of Waterman, IL

I was reading tonight your latest edition of Model Rocket News Magazine. I enjoyed the article about Jerry Ross who built rockets as a child and is now an astronaut. I just thought that you would like to know about another person who has grown up with model rocketry. For the past 10 years, I have been building model rockets of all sizes, shapes, and skill levels, and have enjoyed every minute of it.

I first began building rockets in 4-H at the age of 9. Since then, I have made much progress in my knowledge of rocketry and shared this knowledge many times with friends, fellow 4-H members, and even people I don't know.

My first demonstration was simply showing how an igniter works. It was pretty interesting because the people watching the demonstration thought that I would blow up the building. People eventually became used to my "different" hobby (At that time, I was the only person in my town who built model rockets.) and even started getting interested in what I was doing.

Since that demonstration, I have given many more demonstrations, the most interesting of which was at our school's art and science fair when I was in the seventh grade. I had set up what was probably the standard set up--engine display, various rockets, catalogs, books, etc. But the interesting part of my display was the 16 special launches I arranged.

In these ten years I have built more than 50 rockets, launched nearly all of them, and lost only about five. Some of my rockets have been the Star Trek™, Mosquito™, Mean Machine™, SR-71 Blackbird™, Mini Mars Lander™, Mercury Redstone™, and my prized possession, the Saturn V™, which I built this past year.

I have also earned many awards through 4-H in the Aerospace (Rocketry) project. I have received the county rocket honor awards six times, the state rocket honor award seven times, county outstanding award six times, state outstanding award five times, county rocketry medal six times, have won regional competition twice, have won state competition once which awarded me a trip to the National 4-H Conference in Chicago, have been selected for State Fair from county show three times, have gone to the State Fair twice, and have received A ratings both times.

At first, I was one of the few county 4-H members in rocketry. Now there are about 50 members in rocketry, 20 of whom are in my club, one of whom is my nine year old brother. He just began model rocketry last year and has already built three rockets.

Next summer will end my 11 years of 4-H, but will not end my fascination, and now lifetime hobby, of building and most importantly, flying model rockets. Thanks for your GREAT service.



Brian Vaupel with a few of his rockets

SCIENCE EXPLORATION

By Ron Sindic, Mathematics & Science Department, Southwestern Michigan College, Dowagiac, MI

We offered a series of classes for young people in grades five to eight in the summer of 1987. Our college called the classes Summer Campus Adventure 1987. We planned one section of twelve students. The response was so great that we had to offer two sections.

The classes met for three hours a day for one week. In the class called "Science Exploration", each youngster built and flew an Estes Sunbird™. During the class, we had a contest with each entry receiving points for artistry and craftsmanship of finish as well as flight performance (altitude). We gave Estes model rocket kits as prizes.

I taught the youngsters how to use mathematics to determine the altitude reached and the speed of the rockets.

We also got into making photographs using the college darkroom. I used the AstroCam™ 110 to lead into that area.



Photo courtesy of Barbara Newman

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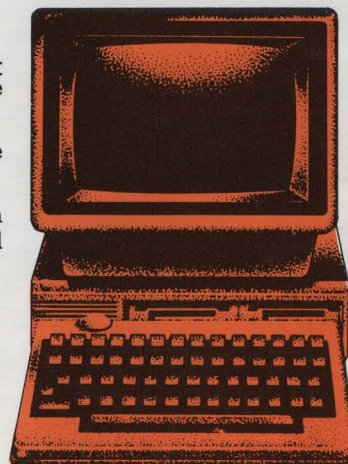
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HOW TO KEEP FROM LOSING YOUR ROCKET

By Douglas Kirk, Canyon Lake, TX

INTRODUCTION

After spending hours constructing a really beautiful model rocket, it is a disappointment when a high flight is followed by sight of the rocket drifting off into the distance, never to be seen again.

Fortunately, there is a procedure which can be employed by the model rocketeer who wants to insure that all of his rockets are recovered safely. This procedure involves six major phases: preparation of the rocket; selection of the flying field; proper choice of launch conditions; preparation of the recovery crew; proper tracking; and use of a good ground search technique.

Proper Preparation of the Rocket

Carefully follow the manufacturer's directions in constructing the rocket. Also, plan other aspects of the model to help you with its recovery.

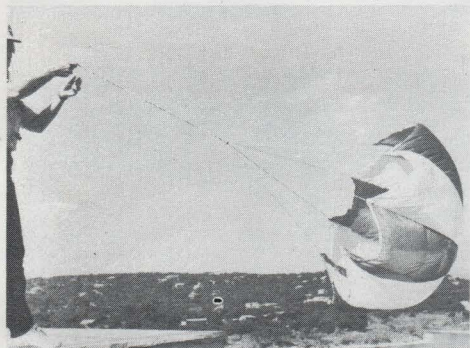
The colors and patterns painted on the rocket are important. Proper selection can greatly improve its visibility, both in the air and on the ground. Bright red, orange, and yellow are good primary choices, with contrasting black and white to help form patterns.

Distinct patterns help you see the rocket during flight, help you determine if the rocket is rotating in flight, and will even help you see it once it lands.

The rocket should be fitted with a brightly colored recovery device. Attention should be paid to the type of recovery device, especially if the flying field is small and winds are common.

There are a number of ways to reduce lateral drift when using a parachute, including "reefing" the shroud lines, cutting a vent in the canopy, or even cutting the canopy into a square shape. The ideal chute allows the rocket to drop to the ground without damage and without leaving the range.

Photos by Douglas Kirk



A parachute can be reefed by attaching a loop to the lines preventing full inflation of the chute and thereby reducing drift.

Attach your name and address to the body of the rocket in such a way that they will be seen by anyone who finds it. This will help insure the return of the rocket.

Waxing your rocket with paste floor wax will not only help it fly better because of reduced drag, but will help it withstand

nighttime moisture if it is not recovered immediately.

You may install a transponder or transmitter into your rocket.

Selection of an appropriate engine is a very important preparatory step. Always use lower power engines for initial flights. This lets you see how a particular model will perform. If your tracking and recovery operations are adequate, you can then move up to more powerful engines.

When possible, calculate the expected altitude before launching the rocket. That way you and your crew will know what to expect from the flight. (Refer to Estes Altitude Prediction Charts, The Rocket Box by Cannon and Banks, The Handbook of Model Rocketry by Stine, Aerotrek, or As-trocad).

Proper Selection of a Flying Field

Once you know what to expect from your rocket, you will be able to determine how big your rocket range needs to be for a specific flight.

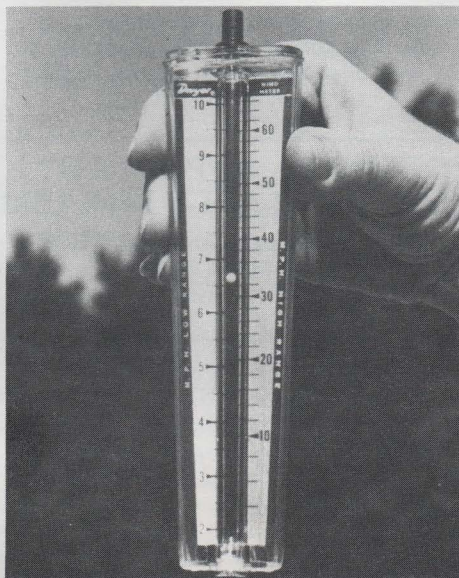
An ideal range is large enough to accommodate the mission and free from obstructions which could jeopardize recovery operations.

In general, the rocket range should have a diameter which is at least one quarter of the expected altitude. If there is a wind blowing, the field should be even larger. Use this formula:

$$\text{Field Diameter} =$$

$$\frac{\text{Expected Altitude} + \text{Wind Velocity}}{4}$$

The Field Diameter and Expected Altitude are expressed in feet, and the Wind Velocity is expressed in miles per hour. To determine the wind velocity, you can measure it yourself, estimate it using the Beaufort Scale, or call your nearest National Weather Service office or airport control tower to ask the velocity of prevailing surface winds.



This wind meter shows the wind speed with a dancing ball which rises in relationship to the prevailing winds.

When selecting your rocket range, make sure the field matches the mission to be flown. The larger the field the better, but you can fly for fun in smaller fields as long as you use lower-powered rocket engines.

Proper Choice of Launch Conditions

The vast majority of all model rockets are successfully recovered. Most of those that are lost are lost because the mission was flown in less than adequate flying conditions.

Just as NASA uses a launch window of flying conditions, you, too, should pay attention to the wind, visibility, light level, cloud cover, temperature, humidity and time available for the flight.

Launch Window	Minimum Conditions	Ideal Conditions
Wind Velocity	20 mph	0 mph
Light Level	Objects barely visible at 2,000 feet	Noon
Cloud ceiling	2,000 feet	None
Temperature	0° F to 110° F	70° F
Humidity	95%	25%
Time	30 minutes	Unlimited

Proper Preparation of Tracking and Recovery Crew

The better trained and more experienced the recovery crew, the higher the likelihood that a rocket can be launched and retrieved.

All members of the crew should be familiar with the flight plan, the nature and color of the rocket and its recovery device, the launch field and surrounding terrain, and the general safety and countdown procedures involved in the field, as through a pre-flight conference.

It is important for each member to know what to expect from the flight, how to keep an eye on the rocket, how to spot the landing area, and how to maintain communications.

Keeping an eye on the rocket involves keeping the sun to your back, wearing sunglasses when the sky is bright, and concentration on the rocket in the sky. If visual contact is ever broken, the crew member can often re-establish the visual sighting by searching in a circular manner from the point where he last saw the rocket and in the direction the rocket was headed when last observed.

As the rocket approaches the horizon, the crew member should watch carefully to see just where it touches down. The location should then either be marked mentally or, better yet, on a small sketch of the horizon. A simple Boy Scout compass can be used to measure the heading from the tracking station to the point on the horizon where the rocket was seen coming down. With the heading, it is possible to walk a straight line to the rocket.

If two or more crew members have headings from different directions, then the rocket will almost always be found where the two headings intersect.

The natural tendency when a rocket touches down is to immediately run to re-

cover it. But if a minute is taken to sketch the horizon and mark the heading, then this data can be used in a scientific approach to find the touchdown site if the rocket is harder to find than anticipated.

Communications are essential in tracking and recovery operations. Inexpensive walkie-talkies can be used or rocketeers can work out a system of flag or whistle signals. For example, short blasts on a whistle can be used to ask questions and give answers so long as everyone knows the code:

Example	Message
One whistle	Do you see the rocket?
Two whistles	Yes, I see it.
Three whistles	No, I don't see it.
A long and short whistle	I have found the rocket.
Two long whistles	I cannot find the rocket.

If you wish, you can use the whistles to communicate via international Morse code.



Having a well-equipped tracking crew is one of the best ways to avoid losing a rocket during recovery. Dr. Valerie Kirk sports some basic tracking crew equipment, including binoculars, walkie-talkie, compass, whistle, dark glasses, and a safety hat.

Proper Tracking of the Rocket

The objectives of the tracking team are to measure altitude of the rocket, to maintain eye contact with it, and to provide information to the recovery crew as to where the rocket touched down.


Tracking crew members should be the more experienced members of the team. They should be familiar with their tracking instruments and should know the techniques for using the instruments.

Practice is the key. It is not necessary to fly rockets in order to gain the basic practice needed. Simply take the equipment downtown and measure the heights of buildings and other landmarks. Often, a phone call to the building manager can yield the exact height of a building as a check against tracking technique.


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Proper Ground Search Techniques

Most rockets which are sighted to a position on the horizon and which are sighted by two or more crewmen will be found.

To find a very important rocket, you may have to use a systematic ground search. First, locate the boundaries of the search area. Divide the search area into grids measuring 100 feet by 100 feet. With a compass and tape measure it is possible to mark off the grids. Search the grids one by one. This may sound like a lot of work, but if a valuable payload is involved, the effort may be warranted.

If the search is systematic, the rocket will almost always be found. The idea is to search the more likely zone first, and then expand in all directions until the rocket is located.

Recovery team members should learn how to spot a missing rocket. The searcher should walk slowly, back and forth, looking on the ground, in bushes, and up into trees. The search should proceed slowly enough to allow the eyes to focus on the search area and to try to pick out the colored recovery device or the body tube. To improve the search, it is sometimes helpful for the searcher to stop and, while he or she is

standing still, slowly look around in all directions. This takes time, but is more thorough than simply walking and hoping that the rocket will be close enough to be obvious.

In some cases, it may be necessary to calculate the location of a touchdown zone. This is done by flying a similar rocket with a similar engine, paying attention not to lose sight of the second rocket. In many cases, the second rocket will land in the approximate location as the missing rocket as long as flying conditions are similar.

Summary

With some effort, nearly all model rocket flights will end in a successful recovery. As long as the rocketeer approaches his model flying in a scientific and ordered way, control can be maintained throughout the rocket flight. Good luck, and happy flying.

This article is an abbreviated version of a soon to be released pamphlet on the same subject to be published by Morton Falls Publishing Company. If you are interested in obtaining the expanded pamphlet, send your name and address to: Morton Falls Publishing Company, Route 9 Box 810-S, Canyon Lake, TX 78133-5122. You will be sent an announcement when the pamphlet is ready.

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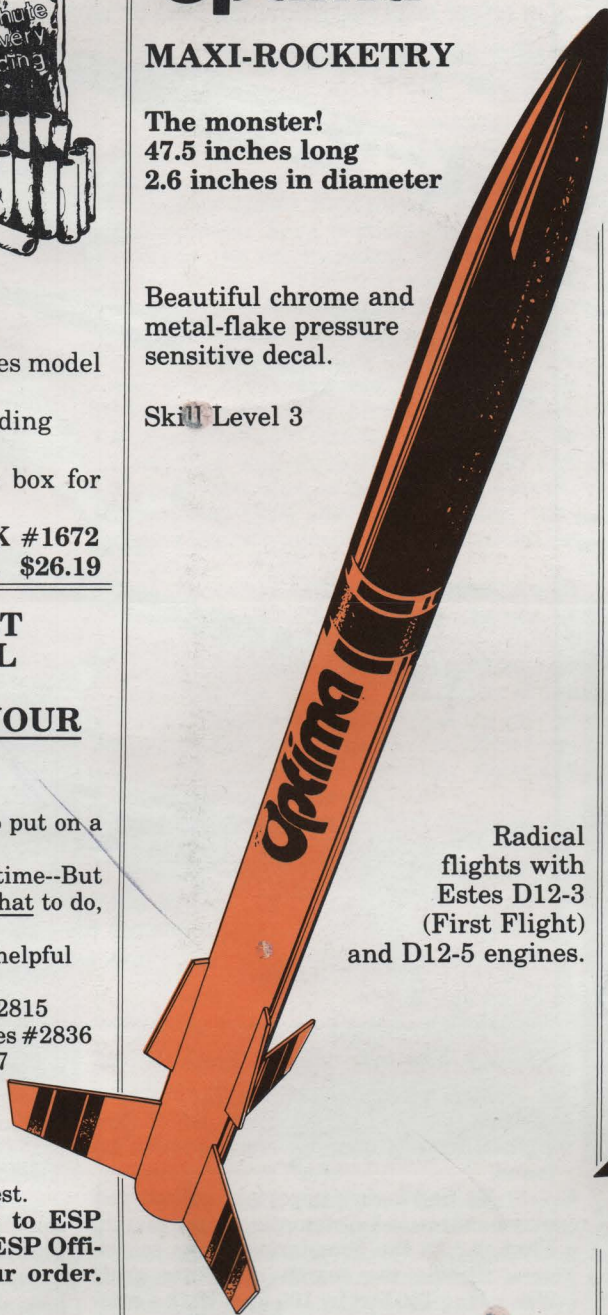
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