



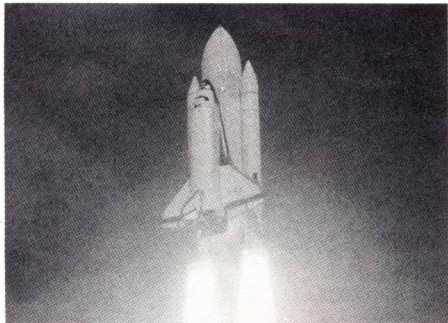
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# THE SHUTTLE'S SECOND FLIGHT AND BEYOND

By Gregory P. Kennedy, N.A.R. #12874

Who was the first American to orbit the earth? -- John Glenn. That was an easy question. Now let's try a tougher one -- who was the second American to orbit the earth? We often forget who the second person to do something was, preferring to focus on the more glamorous and spectacular "firsts." On November 12, 1981, a space second occurred which may prove to be more important than the first it repeated.

The "second" was the second launch of the Space Shuttle Columbia. Columbia's first flight in April, 1981 showed that the stubby-winged vehicle worked. The Shuttle's nearly flawless performance on one of the most challenging flights ever made ranks as one of the great achievements in aerospace history. However, the Space Shuttle is supposed to reduce the high cost of space flight. To accomplish this, it must be reusable. No previous launch vehicle or spacecraft has ever been reused. The second flight of Columbia proved the craft could be re-launched and that the concept of building a reusable space vehicle is sound.

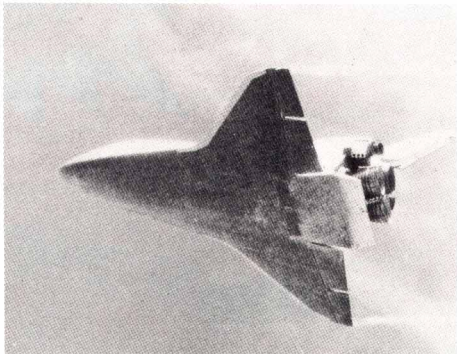


**Columbia's second lift-off into space.**

-Photo Courtesy NASA

A five-day flight was planned, but on the first day one of the fuel cells which generate Columbia's electricity malfunctioned. Mission control ordered Astronauts Joseph Engle and Richard Truly to come home early, on November 14. Despite the fact that the mission lasted only two days, all major mission objectives were accomplished. When Engle and Truly landed at the Dryden Flight Research Center in Southern California, they completed the second of four test flights for Columbia. Each test flight expands our knowledge of how the Shuttle performs. Malfunctions such as the one with the fuel cell are carefully investigated and analyzed to prevent them from happening again.

Through this testing process, the Shuttle will become an operational vehicle which makes frequent trips into space. The Shuttle will become a "space truck", able to place many different objects in orbit. Current plans call for a fleet of four Space Shuttle Orbiters. They will be named Columbia, Challenger, Discovery, and Atlantis.

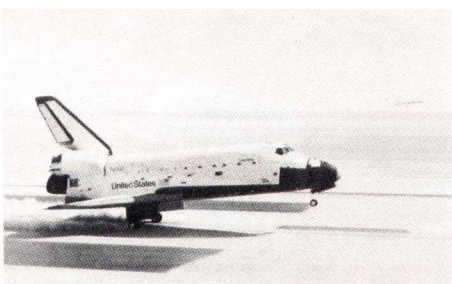


**The underside of Columbia prior to landing.**

-Photo Courtesy NASA

An individual Orbiter can carry up to 65,000 pounds in its 15- by 60-foot cargo bay. As many as five satellites can be flown on each mission. If more than one satellite is launched, the organizations which built the satellites share the flight costs. Cost-sharing like this should further reduce the cost to launch a satellite. On a typical mission, satellites will be carried aloft in the cargo bay and released.

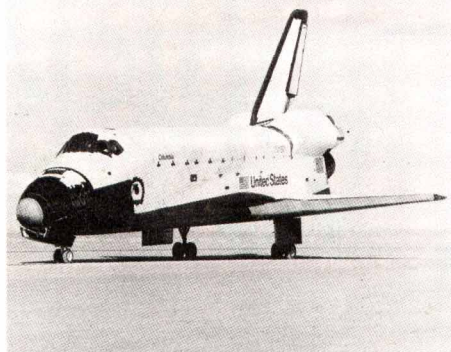
The Shuttle can reach an altitude of 690 miles. However, many payloads, particularly communications satellites, must be placed in a geosynchronous orbit 22,300 miles high. At this altitude, it takes 24 hours to complete an orbit. A satellite placed 22,300 miles above the equator remains fixed over the same spot on the ground. Solid rocket motors are attached to geosynchronous-bound payloads. After the Shuttle releases the satellite/upper stage motor combination, the motor boosts the payload to the desired orbit.



**Picture-perfect landing!**

-Photo Courtesy NASA





**Awaiting arrival of ground support equipment.**

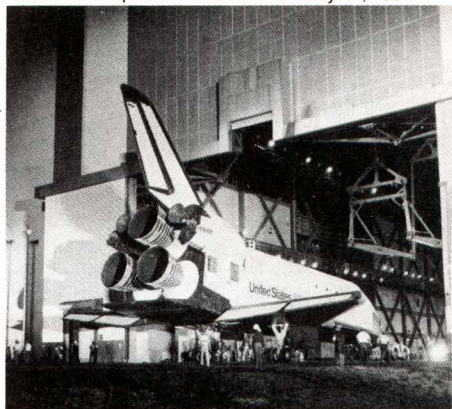
-Photo Courtesy NASA

Not all payloads are released in orbit. Some, like the European Space Agency's Spacelab, remain in the cargo bay throughout the flight. Spacelab is a flying laboratory where scientists, engineers, and physicians, can work in space. Future crews will include a new type of astronaut called a "payload specialist". Payload specialists will not be professional astronauts. Rather, they will be highly-qualified specialists in their respective fields who are allowed to conduct research aboard the Shuttle.

Experiments planned for Spacelab include studies of the effects of weightlessness on living organisms, astronomical observations, and attempts to create new alloys and materials in space. As many as four payload specialists can fly at a time. With the basic crew of three -- commander, pilot, and mission specialist -- up to seven people can fly on a single mission.

Payload specialists will not be the only people to fly experiments aboard the Shuttle. NASA has a program called "Small Self-Contained Payloads", or more popularly, "Getaway Specials". These will be built by individual experimenters. Anyone who can devise and build an experiment for space can have it flown for as little as \$3000. By the time Columbia made its first flight, more than 300 Getaway Specials had been sold. The Getaway Special program enables all researchers to have access to space. Through these and other payloads, the Space Shuttle will become a common carrier, a space truck, which expands our ability to perform useful work in Space to improve life here on earth.

By the way, the second American to orbit the earth was Scott Carpenter in Aurora-7 on May 24, 1962.



**75-ton Columbia leaving Vehicle Assembly Building.**

-Photo Courtesy NASA

## Help Us Publish The Model Rocket News

Got any good ideas, cartoons, technical articles, or contributions? Then why not submit them to us for possible publication? Our constant aim is to make MRN a better, more interesting magazine and yours may be just the contribution we need.

Illustrations of ideas for the Idea Box and cartoons should be drawn in ink and no smaller than 4 inches by 4 inches. Technical articles and contributions should be well written and photos accompanying the articles should be packed between cardboard sheets to avoid damage.

All contributions become the property of Estes Industries and cannot be returned. Address all material to: MRN Editor, Estes Industries, Penrose, Co 81240.

Should your article, idea or cartoon be used in MRN, we'll reward your efforts and talents with an Estes Merchandise Certificate, the amount of which will be determined by the MRN editorial staff.

Hope to hear from you soon!

## MRN and Free Goodies.. For You!!

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

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

Additional Bonuses . . . All orders received on even numbered months (February, April, June, etc.) will be returned with a "free" plan to help increase your Estes fleet. These new plans feature a variety of designs from single-stage sport models to far-out exotic rockets you will be proud to display. All "free" plans can be constructed from the Estes hi-performance parts and accessories listed in our catalog.

All orders received on odd numbered months will be returned with a free iron-on decal for your t-shirt, windbreaker, or range jacket. These iron-ons feature a variety of super-neat designs. You iron it on right at home to any surface containing 50% or more polyester.

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

# Stump Your Teacher Quiz

Q. The first successful flight of a liquid-fueled rocket was made on March 26, 1926 by what American scientist?

A. Robert H. Goddard

Q. This historic landing occurred on April 14, 1981. Where did the landing occur?

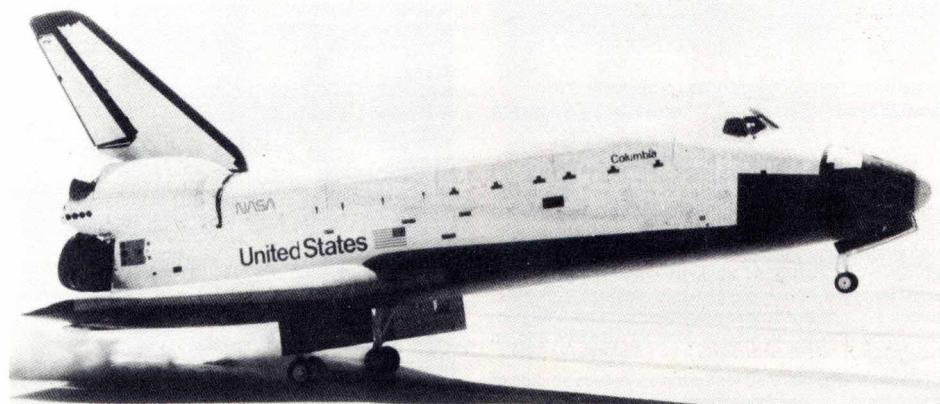
A. Edwards AFB, California.

Q. Give the name of the first Space Shuttle to be launched into Earth's orbit twice.

A. Columbia.

Q. On what date did the Space Shuttle's historic second mission end?

A. November 14, 1981.



Successful landing, April 14, 1981.

—Photo Courtesy NASA.

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# Spider T.E.V.

HONORABLE MENTION MARCH 1981  
DESIGN OF THE MONTH CONTEST  
BY BASIM EL SAYED, Stockton, CA

SKILL LEVEL 3

## PARTS LIST

A	1	18" Body Tube (BT-50)	3073
B	1	Nose Cone (BNC-50J)	8008
C	1	Screw Eye (Large)	2280
D	1	Shock Cord	2276
E	1	Launch Lug	2322
F	1	Parachute (PK-18)	2267
G	1	Engine Mount (EH-2050)	3150
H	2	Fin Stock (BFS-20)	3164

## ADDITIONAL MATERIALS

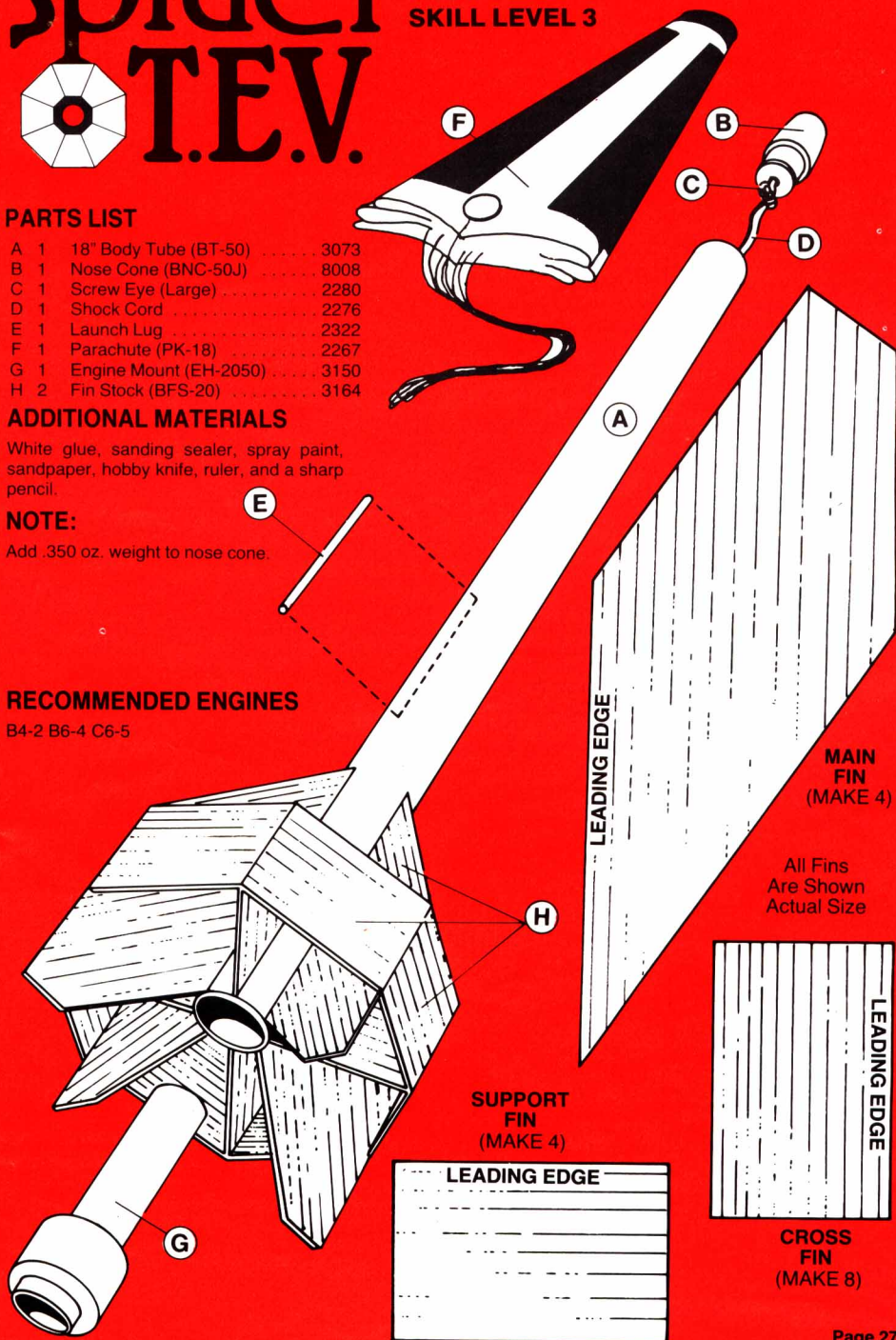
White glue, sanding sealer, spray paint, sandpaper, hobby knife, ruler, and a sharp pencil.

## NOTE:

Add .350 oz. weight to nose cone.

## RECOMMENDED ENGINES

B4-2 B6-4 C6-5



# DESIGN OF THE MONTH WINNERS

Congratulations to another fine group of Estes Rocketeers for their outstanding DOM entries. First place winners will receive \$75.00 merchandise certificates and honorable mentions will be awarded \$10.00 certificates. Keep those entries coming, maybe you'll be our next winner!

**DECEMBER 1980** — Winners: Rick Carpenter, Chattanooga, TN (Orbital Connection). Brad Woods, Tulsa, OK (X-19 Starfire). Klay E. Gilbert, Whitesboro, TX (Condor). Michael Manderino, Lombard, IL (Vapor Trail). Honorable Mentions: Steve Zehnpfennig, Harper Woods, MI (Starship Nova). Kris Bullock, Upland, IN (Athena). Kevin Norowitz, Brooklyn, NY (Gyro Copter). B. Serbus, Corunna, MI (USS Patton). Tim Purdy, Conyers, GA (Ace of Spades). Jason Wieder, Allentown, PA (Xenon Missile).

**JANUARY 1981** — Winners: Michael Kowalski, Dearborn Heights, MI (Proud American). Brian Fox, Security, CO (Mini Snoop). Honorable Mentions: Brad Glade, Shelburne, VT (Astro-Explorer). Phil Nguyen, Daly City, CA (No Name). Michael Peters, Cuero, TX (Demon).

**FEBRUARY 1981** — Winners: Bill Rossi, Northvale, NJ (Recovery Buzzer). D. & J. Eng, Liberty, MO (Electra-Tilt). Arthur Treiman, Huntingdon Valley, PA (Omega). Keir Yee, Waterford, MI (Silver Star). Arthur Coleman II, Philadelphia, PA (Starship Orion). Honorable Mentions: John Trepatschko, Iliion, NY (Raider). Carl E. Ruby, Westminster, CO (Big Bertha S.C.A.R. System). Arnold Garcia, Tampa, FL (Comet). Carl Ondraka, Stevensville, MI (Sallie II). Marcus Bodenhausen, Birmingham, AL (Ice Searcher). Daniel Suter, De Graff, MN (Super Payloader). Benjamin McIntosh, Okmulgee, OK (Fireball XL-5).

**MARCH 1981** — Winners: William Wolf, Middletown, NJ (Aries). Curtis Crum, McArthur, CA (Fighter Jet). Brett Nelson, McCall, ID (Spider). Robert Wickham, Englewood, NJ (Mission Control). Honorable Mentions: Basim El Sayed, Stockton, CA (Spider T.E.V.). David Franklin, Bethany, OK (Eagle). Dean Pilato, Warren, MI (Viper Seven). William Hughes, Bedford, MI (Baka Bomb). Slawko Mlynarsky, Toronto, Ontario (USAF Rascal). John Bonde, Nerstrand, MN (Hat Trick). Andrew Person, Rapid River, MI (Dragonfly). Steven Berens, Milbank, SD (Discovery). Eric Woelfel, Edina, MN (Saturn I). John McGurk, Cranford, NJ (Lyre).

**APRIL 1981** — Winners: Bob Wisenberger, Springfield, OH (Four 14). David J. Leavenworth, Malden Bridge, NY (Air Slicer). Le Cong Danh, Norcross, GA (Launch System). Jim & Kevin Bass, Hobbs, NM (STAR). Honorable Mentions: Joe Wegner, Penna Furnace, PA (Smaug). James Kelvey, Madison Heights, MI (No Name). Ray Beebe, Fond Du Lac, WI (Barlord). Dale Elenbaas, Farmington Hills, MI (Vector). Brad Biggar, Alexandria, LA (White Lightning). Scott Vasel, Allentown, PA (Ignition System). Mark McKee, Rockford, IL (Launch Controller).

**MAY 1981** — Winners: H.L. Stephens, Wayland, MA (Paper Shrouds for Streamlining). Todd Schowalter, Chesterfield, MO (Porta-Payload). Gary Rice, Shawnee, KS (Cosmos). Chris Celentino, Kansas City, MO (Defender). Greg Stevens, Paramount, CA (Sierra Skies). Honorable Mentions: Mike Bleyle, Hudson, OH (Shooting Star). Steven Washington, Upland, CA (Brandy). Terry Lefevre, Bay City, MI (Pulsar). Brendan Schilling, Great Falls, MT (Beeline). Dean Pilato, Warren, MI (Callisto). Josh Woltz, Mercersburg, PA (Argos). Angelo Incorvaia, Staten Island, NY (Aerodynamic Wonder). Chris Mayer, Worthington, OH (Nike Cajun).

## SECRETS OF PARACHUTE DURATION

By Matt Steele

One of the most natural tendencies when rocketeers gather is to see who has the better performing model. A national contest event to see who is on top is parachute duration. And, if you are like everyone else, you are probably looking to find methods to improve your performances. The following are some inside tips that National Champion rocketeers are using to "beat the other guy". They are relatively simple hints, but they can have a drastic effect on parachute duration performance.

**Choose the right model!** Estes offers many fine kits for parachute duration, but some are better choices than others. In general, the best designs for this event are lightweight. Low drag models that gain a lot of altitude, but still have adequate space for parachute storage. For example, if you agree to fly B engines, then good choices would be the Sky Hook, Sprint, Alpha, Antares, Gamma or Scamp. If you wish to remove the kit **Page 28**

streamers and replace them with parachutes, the Wizard, Meteor, Kadet and Bat are also good choices. As an additional note, engine selection is very important. If the recommended engine list shows more than one type of delay for the same engine (i.e. B6-4, B6-6), it is usually better to choose the shorter delay. This prevents the model from arcing over and gaining speed before ejecting the parachute, which often causes damage.

**Choose the right parachute!** When it comes to parachutes, it is true that bigger is better, but within reason. For most models, a 24" parachute (PK-24) is more than enough. Any size larger usually has difficulty opening with small, light birds, and also poses problems with packing and storage. Additionally, any increase in size merely makes it easier for the model to drift horizontally, while the vertical descent rate stays about the same. This translates to a long chase to return your bird!



**Use long shroud lines!** Longer shroud lines increase the effective area of the parachute. Lines that are too short waste a lot of the parachute's potential. For duration purposes, a good rule of thumb is to have the length of the shroud lines be approximately twice the diameter of the parachute. When attaching shroud lines, tie a small knot in the end slightly above the tape dot. This will help prevent the line from separating.

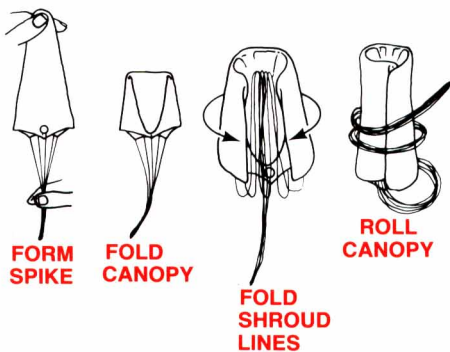
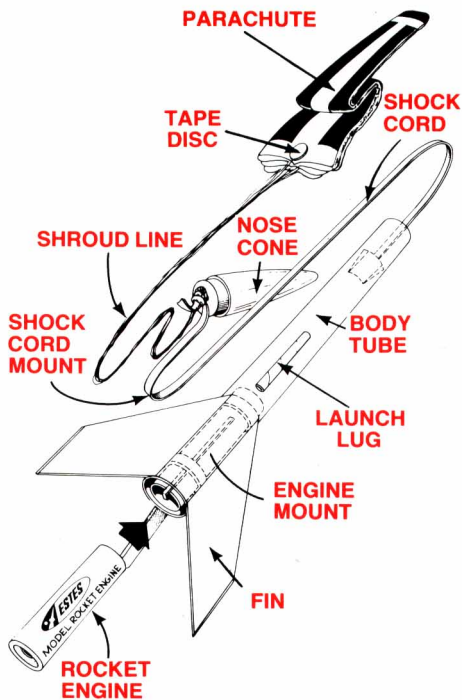
**Use a lot of shroud lines!** Tests have shown that the performance of a parachute increases with the addition of extra shroud lines. Twelve lines is a good number to work with, and it is quite easy to modify an Estes chute to use twelve lines. Merely attach the shroud lines as you would normally, and then add six more lines between the other lines. The additional lines help distribute the model's mass evenly over the parachute, and also increase the reliability of the parachute if one or two lines happen to separate.

**Snap swivels can be a big help!** Snap swivels are useful for many reasons. First of all, it allows you to detach the parachute from the model so you can store the chute properly. They also make handy hangers to store your parachute in an open, unfolded manner. This will make your chutes more "freeze-resistant" and allow it to open easier. Also, snap swivels allow flexibility in choosing the correct parachute for the weather conditions. Suppose you plan to fly your sprint with a 24" chute, but the wind is up a little, and the field is rather small. Rather than switch models, you simply unsnap the 24" chute and replace it with an 18" chute, and you are ready to fly!

**Use lots of wadding!** A scorched parachute is one that will not open. It is especially important to protect a duration chute from hot ejection charges, as even a little bit of heat can cause the parachute to melt and fail to open fully. Another good rule is to fill the tube with wadding about twice the diameter of the tube. For example, a BT-20 model should use about an inch and a half of wadding. Do not jam the wadding in tightly, as it must eject with the parachute. To tell if you have adequate wadding protection, hold one end of the model up to the light, and look through the other end. Any light that shines through means that wadding has to be added. Do not skimp on wadding!

**Pack your parachute carefully!** Sloppily packed parachutes rarely open. Always pack the parachute just before flying; otherwise there's a good chance that it won't open. Letting a packed parachute sit for more than ten to fifteen minutes is asking for trouble. Before you fold the chute, lightly dust it with talcum or baby powder. This helps keep the recovery device from sticking to itself, especially in cold weather. Then fold the chute according to the Estes instructions. They were developed over many years of experience, and if care is taken, the chute will open every time. When the chute is folded, slide it smoothly into the model. Any friction going in will cause problems at ejection, so if the chute sticks, either re-pack it, or switch to a smaller size chute.

Now that you've improved your parachute performance, pick a nice sunny day, get in touch with a friend, and see who's really the best at parachute duration. Now start running!



## -CORRECTION-

VOL. 21 NO. 3 "The 23rd Annual Space Modeling Championships". The Reserve Section Championship was awarded to the Northern Illinois Rocketry Association (NIRA) not the Wheaton Assn. of Rocketry. Our apologies.

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*(Matt Steele is a three time National Champion and a member of the World Champion 1980 U.S. International Spacemodeling Team. He and his teammates won parachute duration at the most recent national meet, using an original design model and Estes engines.)*

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# PHOTO CONTEST WINNERS

We are pleased to announce the results of the Estes Photo Contest. Each of the rocketeers listed below will receive \$25.00 in free Estes Merchandise. Congratulations to them for their fine photography.

Phillip Freed, Connellsville, PA. Shane Loomis, Whitewater, WI. Jerry Niles, Hickory Hills, IL. Travis Hartley, Lenoir, NC. Larry London, Highland Park, IL. Daryl Hill, Kansas City, KS. William G. Campbell, Brockport, NY. David Wu, Seattle, WA. Alan Aaron, Ellijay, GA. Joe Empert, Poughkeepsie, NY. Robert Glenn, Ft. White, FL. Mark Rainey, Hackettstown, NJ. Hank Herglotz, Tuscaloosa, AL. Daniel Brown, Indianapolis, IN. Trent Alexander, Manhattan, KS. Steven Florides, New York, NY. Edward Albrecht, Bloomington, MN. Bobby Scheibling, Hopewell Junction, NY. Rick Nelson, Hudson, OH. Viktor Narro, El Paso, TX. Paul Tetzlaft, Downey, CA. Joel Honeyman, Regent, ND.



**Phillip Freed, Connellsville, PA**



**Jerry Niles, Hickory Hills, IL**

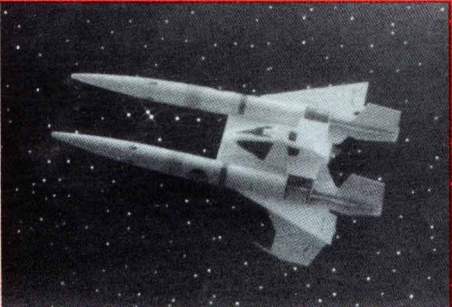


**Edward Albrecht, Bloomington, MN**



**Shane Loomis, Whitewater, WI**





**Trent Alexander, Manhattan, KS**



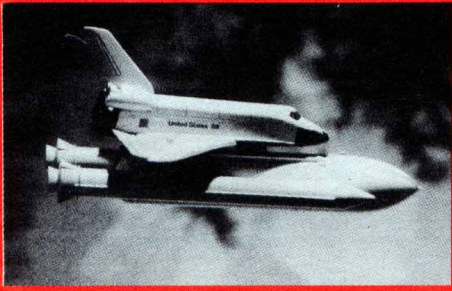
**Rick Nelson, Hudson, OH**



**Paul Tetzlaf, Downey, CA**



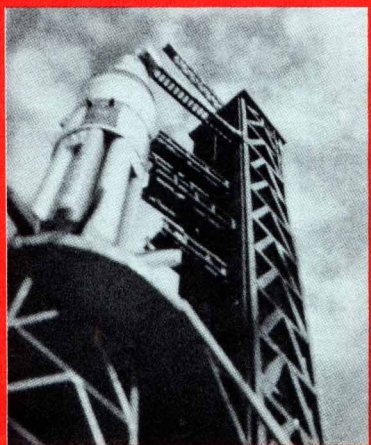
**Travis Hartley, Lenoir, NC**



**Steven Florides, New York, NY**



**Joel Honeyman, Regent, ND**



**Mark Rainey, Hackettstown, NJ**