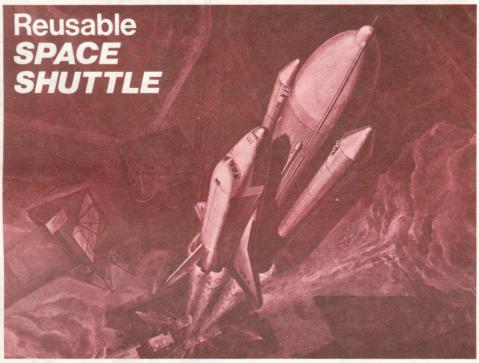


# OFFICIAL NEWSLETTER OF THE ESTES AEROSPACE CLUB



Courtesy of Rockwell International Corporation.

Spectacular launch of Space Shuttle, with Orbiter and booster engines all firing, is visualized by Rockwell International artist. Twin boosters flank the Orbiter's huge external fuel tank.

If you think our space program is rapidly going out of style, you are wrong. And if you believe that after the spectacular successes of Apollo and Skylab, U.S. space flights will henceforth be limited to unmanned activities, you are wrong again.

Starting in 1979, a new concept in the U.S. space program should drastically reduce the cost of space operations. For the following 12 years, from special launch sites at Cape Canaveral's Kennedy Space Center and Vandenberg AFB in California, manned reusable spacecraft will be rocketed into earth orbit.

During that period, some 725 launches, averaging about one a

week, are expected. Bus-size payloads weighing up to 65,000 poundsincluding weather, communication, earth-resource, military, pollution-control, scientific, and navigation equipment-can be carried into orbit by the Space-Shuttle craft now being developed for NASA by Rockwell International. If the payload is an unmanned satellite, the shuttle will return at once. If manned experiments are involved, the four-man flight crew and up to six passengers may stay in orbit up to a month. The 83-ton, delta-winged vehicle is designed to survive scorching reentries through the atmosphere, landing like an airplane on a runway.

After landing, Shuttle craft will quickly be readied for another mission. Each vehicle can be orbited 100 or more times. This reusable aspect of the Shuttle program lowers the cost per flight to \$10.5 million. Orbital transportation cost for each pound of orbital payload will be about \$160, compared to \$500-\$1000 with conventional expendable rockets.

The Space-Shuttle program will include three basic types of missions for government agencies and universities, foreign countries, and commercial organizations:

 Manned scientific or earth-related application missions using a modularized spacelab that remains with the Orbiter.

• Transporting unmanned or man-tended spacecraft to low orbit, revisiting them for modifications.

• Tug missions for higher orbits and unmanned lunar and planetary missions. The tug, an extra-propulsion unit, will be carried with the payload in the Shuttle's cargo bay.



Courtesy of Rockwell International Corp. Shuttle puts payloads in orbit 115 miles up—like earth-survey satellite, on manipulator arm, above.

Prior to launch, the payload will be loaded in the cavernous cargo bay in the center of the Orbiter's body.

(Continued on page 2)



Courtesy of Rockwell International Corp.

Safely past reentry, pilot heads for a more-than-200-mph touchdown on runway, and lowers wheels (dotted lines) just before reaching it.

The Orbiter is a DC-9-size, airplanelike vehicle with a 78-foot doubledelta wingspan. The payload bay accommodates loads up to 60 feet long and 15 feet in diameter.

The Orbiter has three 375,000pound-thrust Rocketdyne engines, but the liquid-hydrogen/liquid-oxygen they consume is not stored in the vehicle. Instead, propellants are carried in a huge external tank-27 feet in diameter and 155 feet long. The Orbiter rides this tank piggyback into space, until, just before orbital altitude, the tank is jettisoned. Also, for the first stage of the launch, two solid-fuel rocket boosters of 2-1/2-million pounds thrust each are side-strapped to the Orbiter's fuel tank.

Early in 1977, the first phase of a flight-test program is slated to begin at Edwards AFB, Calif. An Orbiter will be carried piggyback on a 747 aircraft to the cruising altitude of conventional airliners. The carrier will then begin a shallow dive while the Orbiter nose is raised with a hydraulic jack. This will enable the Orbiter upon release to glide off the back of its mother craft. These tests will be flown by two-man flight crews, equipped with traditional ejection seats.

A second test phase from NASA's John F. Kennedy Space Center should begin in late 1978. Two-man crews will ride a Shuttle into low earth orbit. Then two Orbiters will be refurbished for operational use and the final phase of the Shuttle program will be underway.

Reprinted courtesy of Popular Science, ©1974 Times Mirror Magazines, Inc., November 1974 issue from their article, "Reusable SPACE SHUTTLE..our biggest bargain in out-of-this-world research," by Wernher von Braun.

# Comments from EAC Advisory Board No. 1

The response from EAC Advisory Board No. 1 was excellent. We received many complimentary reactions like those listed below for the "new" Land Rockets. In addition, we also received a number of very helpful comments, constructive criticisms, and suggested improvements which we are currently evaluating. With the assistance of the EAC Advisory Board we will be able to continue to bring you the best performing, highest quality product possible.

Dear Sir, First I would like to thank you for selecting me for the EAC Advisory Board to try to test the ESTES LAND RACER KIT. At first my impression was—"Oh boy, a little kid's car!" But I was wrong. This car can be enjoyed by anyone. Though I recommend that kids be the main user. I am 16 years old -7years in model rocketry and this is the best item Estes has come out with since the SCISSOR-WING TRANSPORT .....

We tested it out like you asked us to, and we think it's super! Now let's see if Estes can come out with ROCKET POWERED BOATS.

Again thank you for selecting me for the EAC Advisory Board. It was a lot of fun working with the car. Thanks again.

Sincerely, Alan Dalfonso Henrietia, NY

Dear Sir,

I am very pleased, to have been chosen to serve on the EAC Advisory Board.

I think that the "Estes Land Rocket Race Kit", is a very good idea. It opens up many different aspects of model rocketry that I never knew existed.

Relating back to the race kit, ("Screamin Eagle") I think the design is very good. I love the idea of foam rubber tires, because they help absorb shocks from bumps on the sidewalks, rocks, etc ....

Thank you very much.

Carlisle Dewitt Expert Rocketeer Savannah, GA

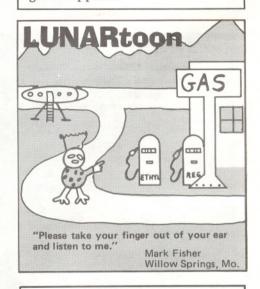
Dear Sir.

I enjoyed building the Estes Land Rocket very much. After I finished it, I ran it many times and invited some friends to watch. The parachute worked every time and was very dependable. This is a great idea because it lets you run the car in a short space if necessary. Thank you very much for letting me build and report on this model. I think it is great!

> Very truly yours, George Akers Montgomery, AL

# OHIO ROCKETEER WINS NEWSLETTER NAME CONTEST

Congratulations to Jack Greb of Macedonia, Ohio for winning our EAC Newsletter Name Contest. Jack will receive a \$50.00 certificate merchandise naming our EAC Newsletter, "SPECTRA". Judging was especially difficult in this contest as several thousand excellent entries were received. Thanks goes to all EAC rocketeers for their great support.



# ATTENTION **EAC ROCKETEERS:**

EAC HQ wants you to share your ideas, projects, experiences, and suggestions with your fellow EAC members. Our desire is to make the EAC Newsletter an exciting and valuable publication for EAC rocketeers. Your assistance is needed to make this newsletter the main vehicle for communication between EAC members and chapters.

Send us your contributions for plans, tech articles, cartoons, anecdotes, club news, and other interesting items. If you send us photos, please make sure that you pack them between cardboard sheets so that they won't get creased in the mail. All contributions become the property of the Estes Aerospace Club and cannot be returned. Address all material to: EAC Newsletter Editor. c/o Estes Industries, Penrose, Colorado 81240.

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

Hope to hear from you soon!



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

### RULES:

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

4. In addition to a sketch of your creature, tell us his name, where he comes from and any other characteristics you can imagine such as diet, size, life style, intelligence, breathing substance, physical makeup, etc. Why does he look the way he does? This additional information need not be lengthy, just interesting. 5. Entries will be judged for creativity, uniqueness, completeness, weirdness, strangeness, and anything else we can think of since this is the first time we've had such a freaky contest! It really should be fun!

- 6. Deadline for receipt of entries is midnight April 15, 1975.
- 7. Decision of the judges is final.
- 8. Be sure to include your name, age, address, city, state, and zip code with each entry. Also, be sure to include your EAC Skill Level.
- 9. Mail entries to:

Estes Industries EAC Creature Contest Penrose, Colorado 81240

GOOD LUCK!

# PROJECTS IN MODEL ROCKETRY

Official Project Guide for the ESTES AEROSPACE CLUB



Features suggestions on how to plan, prepare, and present research projects. Outlines ideas for dozens of special projects. Perfect for displays, exhibits, science fairs and skill level achievement work. Cat. No. 2831

Regular 50¢ ONLY 25¢ to EAC Members

(Use order form on page 7 to receive reduced price.)

# Rocket rap

EAC rocketeer, John C. LaMonte of the Rainbow Rocketeers writes:

"The Eagle Rocketeers claim to be the most colorful chapter in the EAC.

Each member of the Eagle Rock (Los Angeles) club signs up for his own special color. Spectrum hues ranging from fire red to hot blue are used in distinctive range safety helmets and nose cone to nose cone competition.

Club members who also belong to the EAC — and almost all do — use their exclusive colors on the Viper Mini-Brutes, substituting it for the purple suggested for the Vip's nose cone and fin and body tube stripes.

No other alterations are allowed in Viper competition, and the flight duration times are always close, proving that red rockets are not really faster than green ones!

Another use of the individual tints is the target contest. Each member has a stake tipped with his color. After a windage flight, he may place his stake anywhere on the range and launch again.

The rocket landing closest to the appropriate, color-coded stake wins.

So, sign up for colors in your club, keeping in mind that whoever gets purple won't have to Xacto the EAC Viper decals to keep things color coordinated."

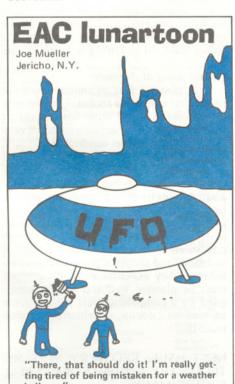
John C. LaMonte Los Angeles, CA

# eac tech tip



A handy way to make fillets is to cut a piece of 3/32" scrap balsa into a pick 1/4" wide and 1-1/2" to 2" long. Round one end of pick, then taper underside as shown in Figure 1. Next taper opposite end as shown in Figure 2. Use the round end in Figure 1 for making fillets on 90° angles of balsa. Wider and narrower picks can be made for corresponding angles. Run a small bead of glue where fillet will be and make several passes with pick until desired fillet is reached. After each pass, wipe off excess glue from pick. The flat end in Figure 2 is for removing any excess glue from model that may be left on either side of fillet.

Corey C. O'Roark Santa Maria, CA



# **EAC SPECIAL PROJECTS** PART 2 acceleration studies

NOTE: This article plus its future installments and our currently available list of "Model Rocketry Science Fair Projects" will provide the basis for our EAC guide to special projects. A new booklet entitled "Projects in Model Rocketry", is now available and features all special project information in one publication. See page 3 for details.

# **ACCELERATION STUDIES**

High acceleration at take-off means both rapid build-up of drag and maximum stress on the structures of the model rocket.

Rate of Acceleration

Studies to determine actual acceleration (with an accelerometer you design), relative accelerations (as by effects such as distances a small, loose weight as a bb will dent a rigid but reasonably soft and dentable structure as soft styrofoam or one or more mounted facial tissues), or theoretical accelerations (through mathematical analysis of predicted rocket performances or analysis of actual data from flights) are possible and can be fun.

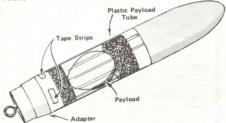
Launches of a rapidly blinking bulb at night or in twilight periods can permit the flight to be photographed by time-exposure and actual velocities determined (if the bulb blinks rapidly and at a consistent rate)

# ACCELERATION EFFECTS ON LIVING ORGANISMS

Do not launch an animal unless it is <u>essential</u> to the conduct of a valid scientific experiment.

Effects of Acceleration on Chick Embryos

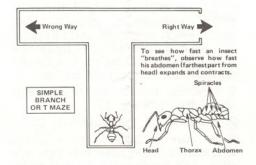
The launch and safe recovery of a raw hen's egg is a good test of payload handling capability. If a passenger is essential to the experiment, conduct payload experimentation using goldfish, reptile, insect, or amphibian, emphasizing the greatest care possible for the passenger's safety, comfort, and well-being. Study the effects of acceleration on its ability to recover equilibrium, on its ability to negotiate a maze, or on its heartbeat or respiration rate.



If you feel the desire to launch a small biological payload, do so with care. Wasps and bees make compact passengers for all but the very smallest payload compartments. However.....

Effects of Acceleration on Insects

Crickets, grasshoppers, and flies may be launched. Even if you goof, these creatures stand an excellent chance of surviving an error on your part. But don't launch them and recover them and expect to learn much by just looking at them. Some rocketeers "train" their passengers to do a simple one-branch maze or something similar, then test their reactions after flight. The results won't mean much if the specimen was damaged by poor handling or packaging in the payload compartment. Another problem can be that the effects you attribute to the g-forces experienced on the flight may be caused instead by a shortage of air in a too-small payload cap-



The launch of living organisms should never be lightly undertaken. It appears from published reports and from our correspondence that at least nine out of ten launches of living organisms are successful. The few instances in which the "specimen" was lost were nearly always the result of an error on the part of the individuals who made the launches. In addition to the waste of time and effort when a biological payload is lost or damaged, the loss may be a tragedy when someone's pet mouse is the specimen. A good rule to follow, if you must launch a biological payload, is to never launch a "higher animal" such as a mouse or hamster.

Experience indicates that most insects, given a minimum of protective packaging, can safely survive the forces developed during rocket launches. Aquatic animals such as topical fish have been successfully launched in special "aquarium" compartments. Remember that the comfort as well as the safety of the animals is important. Don't let the payload compartment become too hot or too cold. Be sure enough oxygen is supplied for the total time of the mission plus a safety reserve in case the payload compartment has to be recovered from a tree. An animal can use up a lot of oxygen just sitting in the payload compartment on the launch pad, especially if he is excited (as he probably is).

The primary purpose for the launch of a living creature must be carefully analyzed. If this project is to secure information that is useful, necessary, and which cannot be secured in any other way, fine. Proceed with care. Plan every procedure carefully and rehearse before using the living creature. Consider your project from the viewpoint of someone to whom the specimen is a cherished pet. Do nothing to endanger the creature.

Acceleration Effects on Algae

Some projects have been carried out using plant material, usually algae in a water chamber, as payloads. Some researchers report that they have observed changes in the growth rate of algae subjected to the stress of acceleration. However, results reported do not agree.

Always do parallel experiments ("control experiments") in which all conditions are identical except for the one condition being investigated. For example, observe one algae culture identical to the test culture except that it is not launched.

Effects of Acceleration on Maze-Learning Ability

One of the easiest effects to measure as a result of model rocket launches is the effect on growth and reproduction of such things as algae or uni-cellular organisms. The growth of fertile chick embryos can be observed to determine effects, if any, from the forces encountered during the flight. Possibly the easiest to observe phenomena for animals are disorientation effects (usually vanishing shortly after the flight), memory of previously learned "skills," and learning ability (as for mazes). Be careful to try to avoid the effects of "odor trails" on learning rates for solving mazes. Such phenomena as rate of heartbeat and respiration are sometimes hard to measure and generally are phenomena which change rapidly after flights. Additionally, the effects of handling, special restraints, new environments, and similar things are hard to eliminate from test results

Conditioning of Animals

It is possible that an animal could enjoy the ride aboard a rocket. Experiments to determine if this condition (a sort of thrill-seeking) exists would have to be very carefully planned and conducted.

The effects of plain "motion sickness" as a short term phenomenon on learning ability could be studied. Giving the animal a suitable (extremely diluted) dose of motion sickness medicine just before launch or conditioning the animal to become accustomed to pre-launch and post-launch conditions inside its "capsule" as well as to launch and recovery requires expert assistance. Any experiments of these types must be planned well and closely supervised by a competent adult with suitable training (as a doctor, veterinarian, or pharmacist).

NEXT ISSUE: RECOVERY SYSTEMS, TELEMETRY PROJECTS, and AERIAL PHOTOGRAPHY.



# Skill Level Achievement Roll

In recognition of their model rocketry accomplishments we have listed the names of EAC members who have achieved our highest and second highest Skill Levels, Congratulations to these Skill Level 4 Advanced Rocketeers and Skill Level 5 Expert Rocketeers. Achievement roll is current through November 15, 1974. For information on skill level advancement write: EAC Headquarters, C/O Estes Industries, Penrose, CO 81240.

### **EXPERT** ROCKETEER Skill Level 5

Steven Aguis Astoria, NY Louis Artale Springfield, IL

Adam Arzt Baldwin, NY Jim Barton

Chuck Bridges Ft. Walton Beach, FL

Gordon Bugg Ft. Gordon, GA Tom Carbone W. Simsbury, CT

Marty Ciara

Rick Craig Greensboro, NC **David Cummings** 

Modesto, CA John Czach

Al Dampf Montrose, NY Richard Debler

Charlotte, MI Thomas Dembawski Portland, CT

Carlisle De Witt Savannah, GA

Jeff Difib dland Hills, CA

Jeff Dunker Sandy, UT

Fred Ebetin

Scott Edick

Jon Eismann Brooklyn, NY

Ray Fehrenbach Augusta, GA

Richard Fero Memphis, TN

Mike Fields Pueblo West, CO

Garrett Fowler, Jr. Ft. Walton Bch, FL

Tom Frantz Baden, PA

Robert Girard Mt. Clemens, MI Howard Goldstein

Joey Grove

Placerville, CA T. Gryiswicy

Milon, IL

Don Guenther Ballwin, MO

Nicky Herthel Springville, IN

Bill Hogan Greenwich, CT Tim Hurst

Richardson, TX Kenneth Inghram Esperance, NY

Eric Jappe Wakefield, MA

Norman Jen Scarsdale, NY Thomas M. Johanneck St. Louis Park, MN

David Kaminsky Belle Harbor, NY John Kasper North Brook, IL

J. Kastrinos Trenton, NJ Leonard Kay Oceanside, NY Sheldon M. Kornick Des Plaines, IL

Brad Kushner Roslyn Hgts., NY David Labie Boston, MA Mark Laiuppa

San Diego, CA Paul Lonstein Ellenville, NY

Robert Lopez Merced, CA Kevin Lougheed Moorhead, MN

Kenneth B. Mais Edwardsburg, MI Mike Marshall Troy, MI

Bill Martello lilwaukie, OR Paul Mead

Bruce Meyer Shaker Hgts., OH

Mark Minot Los Angeles, CA Ken Montanye Butler, NJ

Bradley Moore Northglenn, CO

Douglas Morrison R.J. Mullane

Harrison, N. Bill Munns, Jr. Steamboat, NV

Vernon Musselman

Royersford, PA John McKeon Anaconda, MT

Tom Neale New Canaan, CT

Bill Norton Pleasanton, CA Patrick W. Ohear

Clint H. O'Connor Houston, TX

Robert Orr Lordstown, OH Richard Packer

Rye, NY Ralph Parillo, Jr. Milltown, NJ

Glen Peterson Solon, OH Robert Piekiel

Marcellus, N Jon Randolph Cleveland, OH

Michael Rausch Fairfax, VA Ken Riggins Longmont, CO

Alan Rollow Wynnewood, OK Murray R. Roth

George Ryan Village, OK

Jeff Scott Scotia, NY Steve Shabram Carmel, CA Bret Simpkins Albuquerque, NM

Andy Smetana David Smith Grand Prairie, TX John Spofford Harvey Stoker

San Manuel, AZ Bill Stoller New York City, NY Eddie Szekere Pittsburgh, PA

Joseph A. Tanner, Jr. Eldred, PA William R. Tantlinger New Florence, PA

Joseph Taschetta Wakefield, MA L.M. Taylor Rapid City, SD

Mark Temple Edwin Teruga Honolulu, HI Roger Uzun Wood Dale, IL

Danny Wheeler Chester, VA

Ken Wood Inver Grove Hats, MN

### ADVANCED ROCKETEER Skill Level 4

Ken Aaron Alamagordo, NM Anthony Abbatanton Harrison, NY Mark Abent Avoca, PA Shawn K. Aiken Marshall, MN

Bill Alexander Walhalla, SC Domenic Ali Brooklyn, NY

Jim Amos Mission Hills, CA Michael Arthur Yorktown Heights, NY Paul Artz Aberdeen, SD

Mark Bambach Springfield, PA Ray Banegas Las Cruces, NM

Tim Barila Bethesda, MD Steve Bassett Lima, OH

Tom Beach Waterville, MN James E. Beggs, Jr. Rochester, NY

Tim Benchkini Coopensburg, PA

Mark Benner Selinsgrove, PA Paul Bernheime Mansfield MA

Frank Bisser Garland, TX Michael Black Brockport, NY Mark Blue Indialantic, FL

Torin Blumst Orinda, CA Edward Boogaerts New Orleans, LA

Donald Boss Fairfax, VA Chip Botti Greenlawn NY Edward Bowes Brookpark, OH Ronny Bradburr Chesapeke, VA

Steven Breite Brockton, MS

Tim Brewer Waterford, CA George Brody Costa Mesa, CA Dale Broehm Columbus, OH Stephen Brook Dix Hills, NY Roger Brown Farmington Hills, MI Jon Broyles Kirksville, MO David Brummel Corpus Christi, TX Paul Buckingham Ft. Worth, TX Richard Bunt Glenmont, NY Mike Carraway Gillette, WY Rick Carrico Louisville, KY Clancy Carroll Mark A. Chaney Heath, OH David Chapel Springfield, IL

Dave Chapman Hacienda Heights, CA Jim Chapma Merced, CA Dan Cheng Dix Hills, NY Herman Chier Bellevue, WA Gunther Chir Calexico CA Michael Claprood Mt. Morris, NY

Ray Cleaveland APO San Francisco, CA

Tim Cochran Greenwich, OH Joe Colangelo Port Chester, NY

Dennis Cooper Hunlock Creek, PA

Bob Costello Middletown NJ Bret Costin Shalimar, FL

Richard Cox St. Thomas, Ontario, Canada

Pat Crerand Pittsburgh, PA

Bill Crosby Tom W. Crowell Manchester, MA

Jim Cunningham Dayton, OH Bob Dafferrn Hust, TX

Richard Deble Charlotte, MI Fred DeMey W. Redding, CT

Alex Dininno Sewickley, PA

Terence Dobronyi Miami, FL Wayne Doerney West Orange, NJ

Larry Dolton Brian Downey Brian Doyle Nashua, NH

Fred Duda Jeff Dunker Ephraim, UT Michael Dunn Ontario Canada

Michael Dunn Grand Rapids, MI Paul Dutkiewicz

Jeff Duvall Millbrae, CA Jeff Eaton Ft. Worth, TX Carter Edwards Lincoln, NE

Randall Edwards Dunlap, KS Thomas Elausky Canton, OH Cilon Enloe Vincent Eqarian Yonkers, NY Bob Farley Almont, MI Scott Michael Fate Hoosick Falls, NY Mark Ferree Ft. Worth, TX David H.A. Fitch R.D. Fox, Jr Rosedale, IN Craig Frank Frankfort, NY David Freed Royersford, PA Lew French III Pearland, TX Dave Fritsma Grand Rapids, MI Larry Fugate Eureka, IL Alan Funk Peoria, IL Chris Gangi Cresskill, NJ Tom Ganse Hershey, PA Steve Garde Joplin, MO Jim Gazur Rocky River, OH James Gearhart Rochester, NY Craig George Rochester, NY

Frank H. Gee, Jr. Woodland Park, CO Joseph R. Gerusa Pacifica, CA Brad Gilbert Fleminton, NJ Tim Gilbert Luray, VA Russell Gillenwater Muscatine, IA Ted Glenson E. Grand Rapids, MI Richard Glossop Stamford, CT Paul Goewey Wilbraham, MA Derek Gordon Kinnelon, NJ James Hageman Livingston, MT Will Hall Ballwin, MO Alan Hammon Rochester, NY John Hanafin Milton, MA Peter Hand Simsbury, CT Arlen Hanson Owatonna, MN

Carson J. Hardacre Alameda, CA

Al Hargas Chicago, IL

Charles Harmiso Ames, IA

Douglas Harris Farmington Hills MI

Steve Harper Kaufman, TX

Mark Harris Northridge, CA

Gordon Hartgrov Greensboro, NC

Rick Hawkins Earlville, NY

David Hawtho Hazlet, NJ

Geoff Hayton Redlands, CA

Gary Haynes Bell Gardens, CA

John LaMonte

Sheldon Lange Salinas, CA

Billy Lapenta Nyack, NY

Frank Laubach Mentar, OH

David LaVie Boston, MA

Los Angeles, CA

Greg Harter Belvidere, IL

Dale Hitchings St. Louis, MO John Ho Pittsburgh, PA C.A. Hoffman Newport, NC Lee Hogman Raltimore, MD Albete Holimon Middletown, NJ Gary Holt Ballwin, MO Kenneth Hoove Center Hill, FL Peter Huckstep Jefferson City, MO Mike Hyman Jerry Irvine Claremont, CA Scott Isensee Moorhead, MN Andy Jackson Florence, AL Eric Jacobs Havertown, PA Keith Jacobson eattle. WA Wayde Jenkins Atwater, OH Lars Jensen Richmond, UT Curtis Johnson Cushing, MN Johnny Johnson Ruston, LA Terry Johnson go, IL Mike Jones Charlotte, MI Chris Jones Pittsford, NY Steve Kalucki Nutley, NJ Todd Kay Colorado Springs, CO Bill Keese Niagara Falls, NY Elgin Keller Los Angeles, CA Brad Kemp Palmyra, NY Tim J. Kennedy Oklahoma City, OK Burrell Kilmer Towson, MD Daniel Kingsbury Huntsville, AL Randolph L. Kirk St. Louis, MO John Kixztnber Lakewood, CO Kevin Knepper Oxnard, CA Roger Koch Pequot Lakes, MN Myron Kolodij Philadelphia, PA Rick Kolstad Inver Grove Heights, MN Mark Korngiebel Hutchinson, MN Jeff Kottmyer York, PA Bob Kouse Palmyra, NY Eric Kowalik Ridgefield, CT Andrew Kralick, Jr. Allentown, PA K. Kuczjhski Wyckoff, NJ Chris Lageman Elsberry, MO

B. Heaphy Brewster, NY

a, CO

Larry Henderson Northglenn, CO

Brian Helm

Roy Hende Portage, IN

John Henn Quakertow

**Bob Hickle** 

Pat Hester Little Falls, NJ

North Syracuse, NY

Carl Hides Baton Rouge, LA

Greg Hilger Concord, NH

Craig Hilton Los Angeles, CA

Tim Lawrence Unadilla, NY Will Layman Wyckoff, NJ John J. Lehn Jon Lerner St. Louis Park, MN Brian Lewis Montpelier, IN Steven Lindsey Elizabethtown, KY James Loch Mark Logsdon Arvada, CO Robert Long Reading Center, NY Paul Lonstein Ellenville, NY Adham Loutfi Oakland, CA Adam Luckenbach Houston, TX Virgil Lueth Spring Valley, WI P.J. Lynch Southbury, CT Richard Maebe LaVerne CA Pedro Marinez Arvada, CO Robert Meier, Jr Winston Sale Paul Melka Baltimore, MD David Mellinge Arlington, VA Ronald Merkord Corpus Christi, TX Jordy Metcalf Roy A. Metz David Miles Dennis Miller Millersburg, IN John Miller Orefield, PA Roger L. Miller Greenwood, IN Tommy Miller Luray, VA David Mitchell Paul H. Moorefield Charleston, WV Larry Morris Salt Lake City, UT Graham Mottola San Diego, CA George D. Munro Ridgecrest, CA Bryan Murphy Indianapolis, IN Mark Mushkin Douglaston, NY Ronnie Myatich Allison Park, PA Ben Myers Chicago, IL Tom MacIntyre Santa Rosa, CA Scott MacLaren Chagrin Falls, OH Kenneth E. McAlister Jacksonville, FL David McConnell Manhasset, NY Patrick McGraw Allan McKinlay Maple Glea, PA Ray McKnight Mark McMinn Jackson, MI Robert McMurray

Steve Nagy Solon, OH

David Naver Ypsilanti, MI

Mike Neely El Paso, TX

Alan Neff Belleville, IL

Aurora, CO

Scott Nehmuti

Tom Neuser Manitowac, WI

Tommy Nichals Memphis, TN

David Nicklas Danvers, MA

Jack O'Leary Hanover, MA

James T. Ormon Burlington, MA

Lynn Nannemann Gillette, WY

Dan Lavin Cleveland, OH Tom Parker Joliet, MT Craig Passov Leland, IL Chester Pay Wade Peterson Dassel, MN Pat M. Petricio Katonah, NY Tim Pignatari Dean Pilato Warren, M Bill Piva Matthew Ploito Nutley, NJ Rodney Pope Visalia, CA Aldo Ray Por Quincy, FL Bruce Poye Rome, OH Andrew Pozdol DeKalb, IL James Pyle Mark Raker Bethesda, MD Mike Renner Dickinson, ND Doug Rischbieter Arnold, CA Jim Roberts Syracuse, NY Joe Roberts Wilbraham, MA Scott Robertson Knoxville, TN Tim Robertson Sepulveda, CA Kent Rose Kailua, HI Joe Roth Westbury, NY David Runion Asheville, NC Ricky Rusc Cape Coral, Dean Russ Wellesley, MA Larry Sanna Greenwich, CT Kenneth Saylor Fairfield, CA Mark Schleckse Bricktown, NY Mark Schmitz Caldwell, KS Ruebon Schmitz Watertown, WI Randy Schultz Seattle, WA Tim Schwartz Pine Grove, PA S. Schweitzer Wilmington, DE Rob Seabroo St. Paris, OH Shannon Sebunich Cocoa Beach, FL Frank Seilhame Springfield, OH Stanley Seleski City of Sunrise, FL Terry Senger Fairfield, OH Royce Senr Odessa, TX

Bradley Packard Orlando, FL Roger Wayne Pollock Goshen, IN Richard Portnoy Far Rockaway, NY David Rapp Colorado Springs, CO Randy Reinhardt Colorado Springs, CO Norris G. Reynolds Oolitic, IN George Shaw San Lorenzo, CA

F. Sole W. Pat W. Paterson, NJ Ken Solosan Southgate, MI Steven Spada Berlin, CT David Squire Steve States Ken Stefancio Milwaukee, WI Phil Steinberg Linwood, MI Tom Steiner Bret Stoneking Canton, OH Page Stoutland Ackley, IA Gary Strathear Simi, CA John Stris Orinda CA Harvey Stoker Minden, NV Nathan Szczawinsk St. Clair Shores, MI Gary Tanson Leominster, MA Lloyd Taylor Newton Ctr., MA Frank Tegel Cleveland, OH Eric Theisen John M. Thomas Warren, OH Andy Thom Lytle, TX Darrell Thomp Milltown, NJ Michael Tomcsak Youngstown, OH Tom Treiman Princeton, NJ David Trimble Tulso, OK LaVer ne CA Steve Walker

Mike Turner Pittsburgh, PA Donald Udel Coral Gables, FL John Ulahonlu John Upchurch Hans Van Den Brink Westport, CT Kevin Van Ness Denfield, NY Christopher Vargas Kansas City, MO David Vaughn High Point, NO Claude Vest Sellersburg, IN Jeffrey S. Vigliel Woodstock, NY Paul Voelker San Diego, CA Andy Walgemuth State College, PA Chris Wathen Evansville, IN Harold Webb Winthrop, NY Ron Webbe Sidney, NY Mark Webe Elyria, OH Daniel Weimer Jackson, MI Greg Weis Madera, CA

Brian Wellman Bridgeport, MI Ron Wellman Mill Valley, CA John Wesly Warrontow Robin White Ricky Whitt Burlington, NC Wade Winker College Park, MD Jeff Shrager Jeff Shrager Jeff Shrager Jeff Shrager Jeff Shrager Mark Wladecki Elvria OH Scott Woelfel St. Peters, MO

Danny Skarka Riverhead, NY Mike Wong Cincinnati, OH Dan Slama St. Paul, MN Dale Woys Paul Smetan Raleigh, NC John Wriedt Pittsburgh, PA Jay Smith Concord, NH

Steve Shaw Newport, MN

Jay Silla

Michael Sherman Staten Island, NY

Ken Yearwood Ridley Park, PA Danny Snide ort CT Bryan Zajakowski Chicopee Falls, MA Tom Snowden Smith Creek, MI

# **Exclusive Offers For EAC Rocketeers**



Available Only to EAC Rocketeers

Limited Run Edition—This Kit Will Not Be Made Again—Order Today—Supplies Are Limited.



From the drawing boards of the not-too-distant future comes the FireCat, a remote-piloted, reconnaissance drone. Launched from high altitude bomber aircraft or "zero launched" with strap-on solid propellant booster from mobile ground platform, it can perform a variety of surveillance and intelligence missions.

Scale version of this authentic vehicle-of-thefuture features military decor, two-color decals, die-cut balsa fins, quick-change engine mount, 12" parachute recovery, and scramjet appearance.

RECOMMENDED ENGINES: A8-3 (First flight)

SPECIFICATIONS: Length 14.32" (36.4cm.) Body Dia 0.976" (24.8mm. Weight 1.13 oz. (32.0g.) Shimsing We 7 oz.

Cat No 0821 Reg \$2.75

NOW Only \$2.00 Save 75d

(Offer good only with EAC Newsletter Order Form (page 7). Offer expires 4-1-75 or when supply is exhausted. Hurry! Supplies are limited.)

# BLAST-OFF BONANZA

B6-4
ENGINES

5 ENGINES FOR ONLY \$1.00 Perfect for sport flying. Great for competition. Packaged in a plastic bag with igniters and instructions.

Cat. No. 1751



Limit-2 orders (10 engines) per customer, All orders must be received on EAC Newsletter Order Form, page 7. This offer expires February 15, 1975, HURRY, ORDER TODAY!







# ESTES AEROSPACE CLUB ORDER FORM

А	SUBSI	DIARY OF	DAMOR						_		3 - E
TYPE	OR PE	RINT PLA	INLYIN	INK UPS is ava			Fo	r Office	Use	Onl	У
Your I	Nama				nable in my	area.	Amt.	Recd			
							Check	ed By_			
Addre	155				-		No. La	bels			
City							No. Pk	gs			
State				ZIP C	ODE		P				
				ded use a separate sh	neet of pape	er.)	N/F_			/ED	
			_		am an EA		er.		CEN	/ED	
VV	Quan.		more tha	Product Description		Unit	Total		e yo	ur la	st
1		#1447	EAC M	lembership Kit \$2.0		Price	T	your			
2								1	Ĭ	1	
3			-								
4							- 3				
5				- Sor Hal	ndling.						Zip
6			Save	85¢ for Hal Orders Over	\$6.00						N
7		Lat. Co.	On	Orders Gro							
8											
9											
10											
11									S		
12								Name	Address	City	State
13			12. 4					SENE			
14										ALO	
15				85¢ for Hal	ndling.				Ĭ	1	
16			Save	85¢ for na	\$6.00						
17			nn f	85¢ for Hall orders Over	70.			t t			Zip
18			011					Both			
19								60			
20								Parts Catalog			9
21											State
22								log			
				AMOL	UNT THIS	ORDER		Cata			
		do not wr	ite	85¢ A	rs Under \$6 Additional H	landling	.85	cket	ne		
	in t	this space.		F	oue Estes In rom Previou	us Order		end:	Nar		
Mail		DUCTO		Priority Postage (If Desired) (Col	State Sales lo. Resident	Tax 3% ts Only)		Please send: Model Rocket Catalog	Friend's Name	Address	,
		IDUSTRI E, COLO.		Т	OTAL ENC	LOSED		=	Fri	Ad	City
	P	OSTAGE/I	PRIORIT		WEIGHT (UP TO BU NOT OVE	T 100z.1		3 lbs.	4 11	bs. 5	lbs.
by r	egular	land mail,	UPS, or I	d postpaid in U.S. by the customer's require additional	Allow	\$ .8	\$1.13	\$1.51	-		2.48 lers 9

postage. For extra rapid delivery, you may request Priority Mail (Air Mail) service. Total up the shipping weights on the items you are ordering, then find the amount to allow for extra postage on the chart. When your order is pro-cessed you will be charged only for the difference between regular parcel post and priority mailany excess will be refunded.

WEI (UP TO	GHT O BUT	10oz.to 1 lb.	2 lbs.	-	-	-
Allow	2 4 111/	\$ .80	\$1.13	\$1.51	\$1.93	\$2.48
6 lbs.	7 lbs.	8 lbs.	9 lbs.	10 lbs.	For orders ounces or	
\$3.13	\$3.73	\$4.33	\$4.93	\$5.53	less, send 99 per ounce.	

### **PAYMENT ON ORDERS**

Full payment must accompany all orders. Please send all remittances by either check or money order.

We do not ship orders C. O. D.

# (Limit one per order. Offers expire 4-1-75.) Your choice only 35¢ with \$6.00 order. AERO-HI (Skill Level 1) Scale-Like Sounding Rocket Vehicle • Realistic Decor • High Performance Design • Features Fin Strap-On and Payload Coupler Decals Regular \$1.75 (Skill Level 2) •Mini-Engine Powered •Two-Stage Vehicle •High Performance Design Parachute Recovery Regular \$1.75 My order is over \$6.00 I have enclosed an additional 35¢.

### Your choice only 50¢ with \$9.00 order.

Please send me: (check one)

☐ AERO-HI (#0817) OR ☐ BETA (#0845)

ARCAS®(Skill Level 3) · Scale Model Sounding Rocket Vehicle · Authentic ARCAS® Decal ·Sleek Design Regular \$3.50

SPRINT (Skill Level 3)

- High Performance Design
- Competition Vehicle
- Streamer Recovery
- · Low Drag Tail Cone Regular \$2.95

My order is over \$9.00 I have enclosed an additional 50¢. Please send me: (check one) ☐ ARCAS®(#1226) OR ☐ SPRINT (#1249)

# Your choice only 75¢ with \$12.00 order.

**BIG BERTHA** (Skill Level 1) · Perfect Demo Model • Slow, Realistic Llft-Offs Plastic Nose Cone Parachute Recovery Regular \$3.95 SANDHAWK

(Skill Level 2) "D" Engine Powered Super Scale Design

 Sounding Rocket Vehicle

Detailed Plastic FinsOver 30" Tall

Regular \$3.95 My order is over \$12.00

I have enclosed an additional 75¢. Please send me: (check one) ■ BIG BERTHA (#1223) OR

■ SANDHAWK (#1251)

NOTE: "Bonus Kit" offers good only with this order form. Limit one "Kit" per order. Substitutions will be made when necessary. Offers Expire 4-1-75.

Sallenger SAK, C TRAHAN

..........

NOW MORE THAN 45,000 MEMBERS

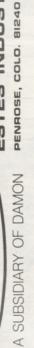
The EAC Newsletter is published by Estes Industries, Penrose, Colorado. This publication is written for members of the Estes Aerospace Club to promote safe youth rocketry, distribute current technical information, and make model rocketry more enjoyable and educational. Current issues of this Newsletter are distrib-

January 1975

EAC NEWSLETTER

U.S. POSTAGE BULK RATE PERMIT NO. 1 PAID







# A LOW LOOK A

		22 20
	G 7	
	g p	
	Par Ba	
	Pau Bal	

# HAVE YOU STARTED AN EAC CHAPTER YET?

Special EAC Chapter Membership is available to existing rocket clubs or to EAC members wishing to join together to form a local chapter of the Estes Aerospace Club. Chapter membership opens up a universe of exciting model rocket activities for EAC rocketeers. New chapters receive a payload of fantastic club supplies including:

# Chapter Wall Certificate

Collection Technical Report

"Guide for Aerospace

Deluxe Safety Code **EAC Wall Poster** 

"Model Rocket Contest

"Launch Systems Booklet" **EAC Contest Kit** 

**EAC Range Box Stickers** 

**EAC Iron-on Emblems** 

# Large Model Rocketry Safety Code suitable for framing. Colorful wall poster identifies your club as an official EAC chapter Outstanding collection of all Estes' technical reports and technical notes. A must Handsome chapter certificate signifying your club's EAC affiliation. Suitable for framing and perfect for clubhouse or workshop. for all club libraries. CHAPTER MEMBERSHIP KIT

Complete club guide for EAC chapters. Explains club organization and how to plan and carry out all types of exciting model rocket activities.

Complete contest guide for organizing your EAC rocket meets. Details on ten different types of competitive events.

Explains the various types of safe launch systems and tells how to make your Includes 12 award certificates plus flight data sheets for EAC competition

Additional, multi-purpose EAC stick-ons for your club and range equipment

own multi-pad club launch system

Additional iron-on club insignias for your teeshirts or jackets

Your chapter membership kit includes all this plus special EAC chapter services for only ...... \$4.00. To become an official EAC Chapter you must have at least four rocketeers (Club President, Vice-President, Secretary-Treasurer, and at least one additional member) who are EAC members.

Request an EAC Chapter Membership Application from EAC HQ, C/O Estes Industries, Penrose, Colo. 81240

©Estes Industries 1975

Bob Cannon..... Director of Publications Charles Webb ..... Photographer

Vernon Estes.....Publisher Dane Boles..... Editor

uted free of charge as a service to all active EAC members.