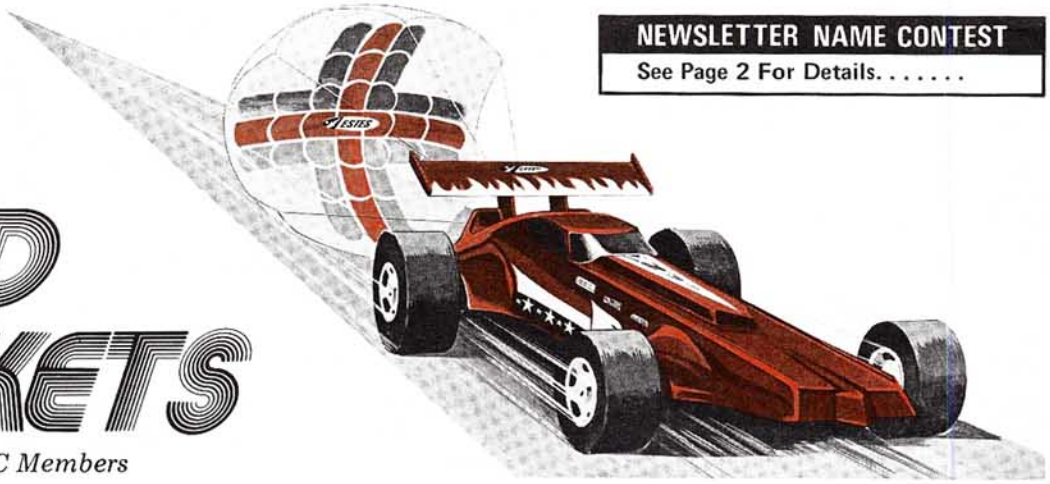
Vol.1 No.1
June 1974

OFFICIAL NEWSLETTER OF THE ESTES AEROSPACE CLUB

THE FANTASTIC ESTES LAND ROCKETS



NEWSLETTER NAME CONTEST

See Page 2 For Details. . . . . .

Exclusive News Release To EAC Members

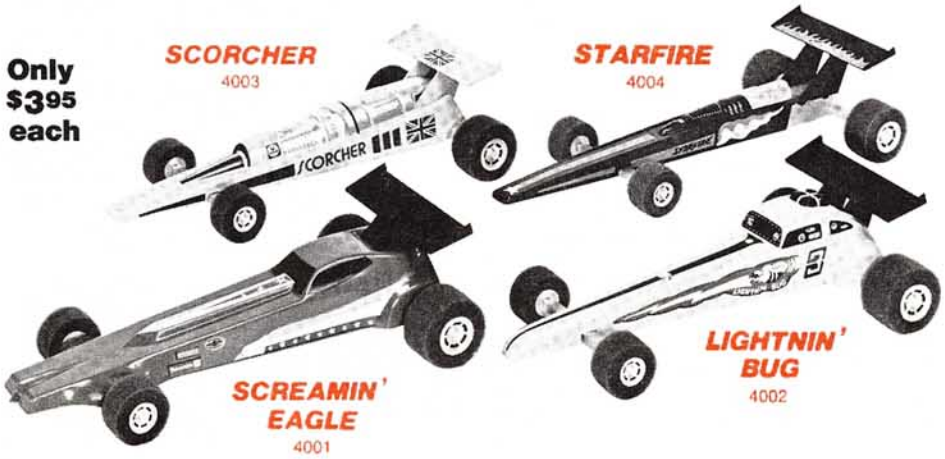
Rocket Power has finally gotten down to Earth. At last a safe, practical system of rocket propulsion for model cars is available.

For years our Estes Rocketeer Communications Department has received 100's of requests for rocket powered cars. Unfortunately, cars powered by standard solid propellant rocket engines present several problems for the consumer, such as horizontal blast deflection. However, the development of the cold propellant rocket engine using Estes ColdPower fuel has solved these safety considerations. All the new Estes Land Rockets (ELR's) are powered by high performance XR 100 re-usable ColdPower engines for a really exciting and completely safe hobby.

The first ELR prototype was constructed in late 1971 and has been in development by the Estes R & D staff since that time. Each Land Rocket is uniquely designed in the Estes quality tradition. Body styles include two "funny cars", the "Lightnin' Bug" and "Screamin' Eagle", a "salt flats machine" called "Scorcher", and the "Starfire", a "rocket powered dragster". All feature interchangeable chassis, reusable engine, T-wing air foil, racing slicks, and colorful decals. Engineered for action and speed each model is easy to build and fun to race. All Estes Land Rockets are only $3.95 each. For added fun a special ELR Race Kit (#4000) has also been produced and is available for only $6.95 each. Race Kit includes standard "Screamin' Eagle" Racer, drag chute, XR 100 engine, race flags, racing decals, ColdPower Propellant, Synchro Line and Anchor System, and Land Rocket Competition Guide. Be the first in your area to hold an ELR Grand Prix, Le Mans, or Championship Drags.

Our Land Rockets are another first from Estes...and as an EAC member you were the first to know!

Only $3.95 each



OFFICIAL NEWSLETTER OF THE ESTES AEROSPACE CLUB

Newsletter Name Contest

Name our official EAC newsletter and win a $50.00 merchandise certificate. Name must fit within the area taken by the "?" in this issue. Send as many entries as you like. Be sure to include your name, address, city, state, and zip code with each entry. Deadline for entries is September 1, 1974.

Letters to Headquarters

Dear Headquarters,

I have been an Estes rocketeer for 6 years and recently joined the EAC. As most of my rockets are scratch-built I would like to know if they can be used for skill level credit. Also, I have several built-up kits which I would like to show proof of, but I have thrown the parels away. What should I do?

Sincerely,
Dale Morgan
Anaheim, CA

Dear Dale,

Its really great to have long time Estes rocketeers joining the EAC. We have received many requests from EAC members for us to accept scratch-built models in place of kits as proof of skill level advancement. As it appears that this is what our members would like, we have decided to accept original designs as proof of achievement providing a photograph of the model is enclosed. A photo will allow us to decide if the model meets the skill level at which the member has placed it. A photo can also be used for proof of kits already built in place of panels.

Respectfully,
EAC HQ

Dear EAC,

Is it possible to use kits or parts from other manufacturers for rockets used for proof of achievemnet? I have several models from other companies and was just wondering.

Dave Long
Denver, CO

Dear Dave,

As the EAC is an Estes sponsored club we would prefer not to accept kits from other companies as proof of achievement. However, this is very difficult to enforce and we will therefore leave it to the conscience and best judgement of each EAC member. The EAC is offered to Estes customers mainly as a service and not as a product. For example, the cost of EAC membership barely covers the cost of the membership kit plus postage to mail it to you. For years our customers have asked for an Estes sponsored rocket club and that is why we began the EAC, as a service to our rocketeers.

Sincerely,
EAC HQ

Dear EAC HQ,

What kind of additional services will the EAC provide for its members. I have several friends who are interested in joining, but would like to know just what the club will offer them.

Kindly,
Larry Charles
Dallas, TX

Dear Larry,

In addition to the EAC membership kit which features a variety of outstanding membership materials including the Viper rocket, EAC members are provided with the following additional aervices.

- The EAC Newsletter to be published several times yearly.
- Contests available only to EAC members and chapters.
- An opportunity to receive more technically oriented information through the EAC Newsletter.
- New kits designed and made available exclusively to EAC members.
- New product information
- An opportunity to share your experiences, ideas, and projects with fellow EAC members through your contributions to the EAC Newsletter.
- Chance to have you name appear on the Skill Level Achievement Roll in honor of your reaching Skill Levels 4 and 5.
- Potential to be selected as a member of the EAC Advisory Board which will review new products and make new product suggestions directly to Estes Industries.
- Receiving of additional free goodies such as post cards, range box stickers, and free plans, with the return of your mail order shipments.
- The EAC Product Bulletin which features reduced prices, special offers, and exclusive items available only to EAC members.
- Additional club products such as personalized stationery, "T" shirts, and jackets to be offered in the near future.

The items listed above are just a start. EAC Headquarters would like to hear additional suggestions for club services and activities. EAC members are urged to let us know what items and services they would like to have the club offer and sponsor.

Sincerely,
EAC HQ

First EAC Member

Jon Randolph of Cleveland, Ohio, was the first model rocketeer to join the EAC. Jon's application for membership was the very first received by EAC HQ. The EAC is pleased to welcome Jon as it's first member, especially considering his past model rocketry activities.

Jon was the 1971 "D" Division National Champion for the National Association of Rocketry. He racked up first places in Scale and Space Systems at NARAM-12 and first places in Scale and Pee Wee Payload at NARAM-13. He was a member of our first U. S. Rocket Team in Vrsac, Yugoslovia in 1972 and has been chosen as a competing member on our second U. S. Team scheduled to compete in Dubnica, Czechoslvakia in September 1974.

EAC HQ wishes Jon the best of luck in representing the U. S. A. in Europe and is proud and happy he joined the EAC.

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.

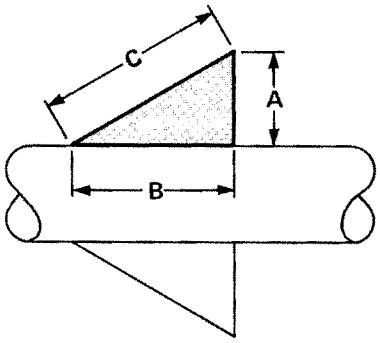
Hope to hear from you soon!

eac tech note 1

TAPERED SHROUD DESIGN

by William Simon, Mgr., Estes R & D

Ever wonder how to make custom designed shrouds for your orginal designs. Well, here's a simple method which should solve your problems. See box for explanation of symbols.



☐ 1) Calculate taper length C = _____
$(C = \sqrt{A^2+B^2})$

☐ 2) Calculate distance r_1 = _____
$(r_1 = \frac{C}{E-D} \times D)$

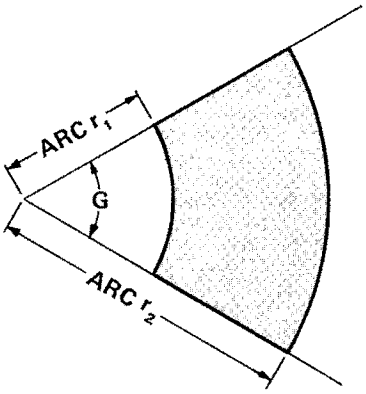
☐ 3) Calculate distance r_2 = _____
$(r_2 = \frac{C}{E-D} \times E)$

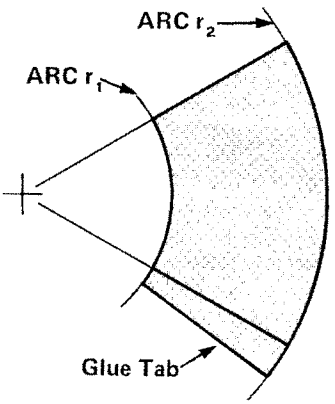
☐ 4) Calculate angle G = _____
$(G = \frac{180E}{r_2})$

☐ 5) Draw arcs r_1 and r_2 on suitable paper stock.

☐ 6) Measure angle G and mark.

☐ 7) Add suitable glue tab.





EXPLANATION OF SYMBOLS

A = ½ difference between tube diameters

B = Distance along tube from start of taper to end

C = Taper length $(C^2 = B^2+A^2)$ $C = \sqrt{A^2+B^2}$

D = Smaller tube o.d.

E = Larger tube o.d.

G = Angle to draw for shroud

r_1 = Radius of inner edge of shroud

r_2 = Radius of outer edge of shroud

EAC SPECIAL PROJECTS PART 1

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", to be published in late summer, will feature all special project information in one publication and will be available to all EAC members at a reduced price.

INTRODUCTION

Your project will be as good as you make it. Select a project that looks like fun and that you can handle. A project that is "over your head" is no fun, and your chance of successfully finishing it is small. It is better to pick a project with some challenge and lots of fun rather than an awe-inspiring task and failing to complete it.

The first step is to choose something that looks like fun and that appears possible for your present level of skill and financial resources. This article and its future installments should give you plenty of ideas. Read these articles carefully to see what appeals to you. The topics will be topics for specific possible projects. The list of specific projects is not complete, but it should provide suggestions for you.

The grouping of topics in general areas is not entirely consistent because many projects can actually involve ideas from several areas. Look around in all areas for ideas which appeal to you.

PLANNING

Planning is half the secret of success for a good project. It is a lot easier, and cheaper, to think your way through your project BEFORE you do anything. So select your project, then think about it. Go through all of the steps several times in your mind. List on paper:

A) What you want to accomplish
B) What you plan to do
C) How you plan to do it
D) What supplies you need
E) When you will start
F) Where you will work
G) When you should have a tentative result
H) What you will use for references to read before you start
I) Who you can go to for help
J) When the final report and/or display must be started
K) When it must be completed

RECORDING

Write everything down. Date all of your notes. It is extremely easy to forget to write down a critical fact or idea, then have to do a lot of extra work later to rediscover that fact or idea.

Measure all things which seem pertinent. Record times. Weigh everything and record the weights carefully. Use English measurements or metric, but be consistent. Metric measurements are actually easier to use once you get the hang of them.

Make graphs as well as tables of data whenever possible. It is amazing how much information a graph can provide. Sometimes making a graph lets you see relationships which are not evident from the data. When making graphs always be sure to label each axis with what it is as well as with the appropriate numbers. Name the graph for what it tells. Plot each point on the graph carefully.

Photos can add a lot to your report and/or your display. Everyone likes pictures. Be sure the pictures are as sharp (focused) and as large as you can make them without spending too much money. A few, well-planned pictures can make the difference between a winning project and a nice effort.

Nearly every experiment should involve the use of "controls"; These are ex-

periments done on an unmodified subject to see if the modification you are testing really does anything. For example, if you are testing the effect of boat-tailing on drag, you should conduct experiments on an identical rocket without the boat-tail to see what effect the boat-tail had and how much was the change produced.

Make large, detailed drawings with everything labeled. So you are no great artist and you haven't had mechanical drawing, you can still do your best! Use a ruler and a compass to make things neat-looking. Do the drawing neatly in pencil and erase all goofs before you ink in the drawing. The drawing doesn't have to be in india ink. Use a ball point pen or a fountain pen, but ink it. A pencil drawing can be messed-up easily with handling. Put measurements on your drawings. It makes them look more impressive, and it also provides exact data which can make your report much more useful.

One format to use in writing up your experiment is the "classic" experiment report form.

1. Purpose. State exactly what you wanted to find out or to produce.
2. Procedure. What you planned to do, step-by-step.
3. Background. Information on your subject which you determined by reading in suitable references.
4. Materials. The apparatus (equipment) which you used.
5. Data. The facts you gathered as you did your project. Give full details on what you did and the results. Provide full details on your control experiment, also.
6. Results. The facts you learned which answer your original question. If the data is sufficient, you may be able to state a major truth instead of just the answer to your problem.

One question which a critic can ask about your project is "So What?". Your project should have a purpose in easy-to-understand terms. If you are only after one specific fact, fine. Knowledge is usually accumulated slowly as a result of the efforts of many people.

The following is an outline of general and specific topics which will be discussed in greater detail in future issues of your EAC newsletter. Many of these have already been successfully researched by EAC members and Estes rocketeers participating in science fair projects.

I. ACCELERATION STUDIES

A. Rate of Acceleration
B. Effects of Acceleration on Chick Embryos
C. Effects of Acceleration on Insects
D. Acceleration Effects on Algae
E. Effects of Acceleration on Maze-Learning Ability
F. Conditioning of Animals

II. RECOVERY SYSTEMS

A. Descent Rates for Parachute-Recovered Rockets
B. Parasitic Boost Gliders
C. Designing the Most Efficient Parachute
D. Para-Wing Recovery
E. Scissor-Wing Recovery

F. Glide Rates for Boost Gliders
G. Optimizing Boost Glider Design
H. Booster Stage Recovery by Gliding
I. Parachute Modification Studies
J. Recovery System Comparisons
K. Helicopter Recovery Systems
L. Streamers for Rocket Recovery
M. Effects on Descent Rate of Different Sized Parachutes
N. Launch Angles, Wind Speeds, and Rocket Recovery
O. Techniques to Improve Durability of Model Rockets

III. TELEMETRY

A. Radio-Homing Devices to Assist Rocket Recovery
B. Audio Devices to Assist Rocket Recovery
C. Miniaturization of a Transmitter
D. Air Temperature Profiles
E. Causes and Cures for Spin
F. Audio Profile of a Rocket Flight
G. Rocket Flight Log From Viewpoint of a Passenger
H. Cloud Studies
I. Smog Studies
J. Micro-Environmental Studies

IV. AERIAL PHOTOGRAPHY

A. Aerial Photo-Interpretation
B. Habitat Analysis with Aerial Photos
C. Aerial Movies

D. Analysis of Stage Separation
E. Survey of an Area by Aerial Photography
F. Photo-Mapping

V. WINDS

A. Wind Speeds at Different Altitudes
B. Relationship of Wind Speed to Drift Rate
C. Effect of Surface Area and Weight of Falling Object and Wind Speed on Rate of Drift
D. Wind Patterns at Specific Altitudes
E. Wind Dispersal
F. Air Turbulence
G. Message Dispersal by Wind

VI. STAGING AND CLUSTERING

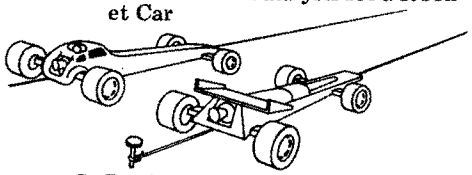
A. Effects of Streamlining
B. Optimization of Ballistic Coefficient
C. Altitude Increase Through Staging
D. Effects of Using Clusters of Engines
E. Staging Versus Clustering
F. Improved Staging Techniques
G. A Booster As A Piston Launcher

VII. DRAG

A. Effect of Minimizing Drag on Altitude Performance
B. Drag Determination
C. Drag Reducation Techniques and Their Effects
D. Nose Cone Shape and Drag
E. Fin Shape and Altitude Performance
F. Derivation of a Formula for Increase in Altitude with Different Types of Engines
G. Effects of Changes in Weight of a Rocket on Altitude Performance
H. Effect of Delay Smoke on Rocket Performance
I. Boundary Layers

VIII. ROCKET POWER FOR HORIZONTAL TRANSPORTATION

A. Rocket Powered Car
B. Performance Analysis for a Rocket Car



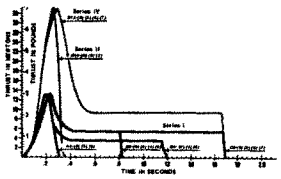
C. Rocket Powered Boat
D. Guidance Systems for Rocket Powered Boats

IX. STABILITY STUDIES

A. Effect of Fin Shape on Performance
B. Effect of Fin Size on Performance and Stability
C. Wind Tunnel Tests
D. Rotation for Stability
E. Conical Shrouds for Stability
F. Cylindrical Fins for Stability
G. CLA Versus CP Determination
H. Determining the Center of Aerodynamic Pressure
I. Determining the Center of Gravity
J. Roll Rate Study
K. Spinning Rockets As An Aid to Stability

X. MODEL ROCKET ENGINES

A. Krushnik Effect
B. Static Tests



C. Temperature Effects on Engine Performance
D. Exhaust Plume Studies

XI. LAUNCH SYSTEMS

A. Launch Towers
B. Capacitative Discharge Ignition System
C. Flash Blub Ignition System
D. Closed Breech Launchers
E. Gantries
F. Effects of Igniter on Engine Thrust
G. Underwater Launch

XII. ALTITUDE CALCULATIONS

A. Three Dimensional Tracking
B. Altitude Tracking Devices
C. Enhancing Visibility at Apogee
D. New System for Calculating Apgee
E. Computerizing Altitude Calculations

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 April 15, 1974. For information on skill level advancement write: EAC Headquarters, C/O Estes Industries, Penrose, CO 81240.

EXPERT ROCKETEER Skill Level 5

Gordon Bugg
Ft. Gordon, GA

Tom Carbone
W. Simsbury, CT

Marty Ciara
Worth, IL

John Czach
Houston, TX

Al Dampf
Montrose, NY

Thomas Dembawski
Portland, CT

Richard Fero
Memphis, TN

Mike Fields
Pueblo West, CO

Garrett Fowler, Jr.
Ft. Walton Beach, FL

Don Guenther
Ballwin, MO

Nicky Herthel
Springville, IN

Norman Jen
Scarsdale, NY

Thomas M. Johanneck
St. Louis Park, MN

J. Kastrinos
Trenton, NJ

Leonard Kay
Oceanside, NY

Sheldon M. Kornick
Desplaines, IL

Brad Kushner
Roslyn Hgts., NY

Kevin Lougheed
Moorhead, MN

Mike Marshall
Tray, MI

Bill Martello
Milwaukie, OR

Bruce Meyer
Shaker Hgts., OH

Mark Minot
Los Angeles, CA

Ken Montanye
Butler, NJ

R. J. Mullane
Harrison, NJ

Tom Neale
New Canaan, CT

Bill Norton
Pleasanton, CA

Robert Orr
Lordstown, OH

Richard Packer
Rye, NY

Glen Peterson
Solon, OH

John Randolph
Cleveland, OH

Michael Rausch
Fairfax, VA

Alan Rollow
Wynnewood, OK

Murray R. Roth
Laurel, MD

George Ryan
Village, OK

Jeff Scott
Scotia, NY

Bill Stoller
New York City, NY

Joseph A. Tanner, Jr.
Eldred, PA

William R. Tantlinger
New Florence, PA

L. M. Taylor
Rapid City, SD

Edwin Teruga
Honolulu, HI

Ken Wood
Inver Grove Hgts., MN

Rick Craig
Greensboro, NC

Carlisle DeWitt
Savannah, GA

Fred Ebetino
Waterloo, IA

Scott Edick
Syracuse, NY

Howard Goldstein
Brooklyn, NY

Joey Grove
Placerville, CA

Tim Hurst
Richardson, TX

Kenneth Inghram
Esperance, NY

Paul Mead
College, AK

Bradley Moore
Northglenn, CO

Ralph Parillo Jr.
Milltown, NJ

Robert Piekiel
Marcellus, NY

Steve Shabram
Carmel, CA

David Smith
Grand Prairie, TX

John Spofford
Chicago, IL

Harvey Stoker
San Manuel, AZ

Eddie Szekeres
Pittsburgh, PA

Mark Temple
Houston, TX

ADVANCED ROCKETEER Skill Level 4

Steven Aglus
Astoria, NY

Jim Amos
Mission Hills, CA

Adam Arxt
Baldwin, NY

Mark Bambach
Springfield, PA

Michael Black
Brockport, NY

Chip Bottl
Greenlawn, NY

Tim Brewer
Waterford, CA

George Brody
Costa Mesa, CA

Roger Brown
Farmington Hills, MI

Clancy Carroll
Milwaukee, WI

Richard Cox
St. Thomas, Ontario, Canada

Pat Crerand
Pittsburgh, PA

David Cummings
Modesto, CA

Ferenc Dobronyi
Miami, FL

Steve Domotor
Pasadena, MD

Brian Doyle
Nashua, NH

Jeff Duvall
Millbrae, CA

James Gearhart
Rochester, NY

Craig George
Rochester, NY

Brad Gilbert
Flemington, NJ

Russell Gillenwater
Muscatine, IA

John Hanafin
Milton, MA

Al Hargas
Chicago, IL

Charles Harmison
Ames, IA

B. Heaphy
Brewster, NY

John Henn
Quakertown, PA

Carl Hides
Baton Rouge, LA

Craig Hilton
Los Angeles, CA

Dale Hitchings
St. Louis, MO

John Jenkins
Richmond, VA

Wayde Jenkins
Atwater, OH

Lars Jensen
Richmond, UT

Terry Johnson
Marengo, IL

Chris Jones
Pittsford, NY

Steve Kalucki
Nutley, NJ

David Kaminsky
Belle Harbor, NY

Bill Keese
Niagara Falls, NY

Burrell Kilmer
Towson, MD

Roger Koch
Pequot Lakes, MN

Mark Korngiebel
Hutchinson, MN

Eric Kowalik
Ridgefield, CT

Andrew Kralick Jr.
Allentown, PA

Sheldon Lange
Salinas, CA

David La Vie
Boston, MA

Jon Lerner
St. Louis, Park, MN

Mark Logsdon
Arvada, CO

Paul Lonstein
Ellenville, NY

Pedro Marinez
Arvada, CO

Paul Melka
Baltimore, MD

David Miles
Northglenn, CO

Larry Morris
Salt Lake City, UT

Ronnie Myatich
Allison Park, PA

Jack O'Leary
Hanover, MA

Wade Peterson
Dassel, MN

Matthew Ploito
Nutley, NJ

Rodney Pope
Visalia, CA

Mark Raker
Bethesda, MD

Joe Roberts
Wilbuaham, MA

Dean Russ
Wellesley, MA

Mark Schmitz
Caldwell, KS

Gordon Schwartz
Brooklyn, NY

Rob Seabrook
St. Paris, OH

Royce Senn
Odessa, TX

Jay Silla
Sewickley, PA

Ken Solosan
Southgate, MI

Ken Stefancic
Milwaukee, WI

Page Stoutland
Ackley, IA

Gary Strathearn
Simi, CA

John Upchurch
La Verne, CA

Claude Vest
Sellersburg, IN

Harold Webb
Winthrop, NY

Ron Wellman
Mill Valley, CA

Ricky Whitt
Burlington, NC

Ken Aaron
Alamagordo, NM

Shawn K. Aiken, Esq
Marshall, MN

Bill Alexander
Walhalla, SC

Domenic Ali
Brooklyn, NY

Steve Bassett
Lima, OH

Tom Beach
Waterville, MN

James E. Beggs, Jr.
Rochester, NY

Frank Bisser
Garland, TX

Edward Boogaerts
New Orleans, LA

Edward Bowes
Brook Park, OH

Dale Broehm
Columbus, OH

Stephen Brook
Dix Hills, NY

Paul Buckingham
Ft. Worth, TX

Richard Bunt
Glenmont, NY

Rick Carrico
Louisville, KY

Mark A. Chaney
Heath, OH

Dan Cheng
Dix Hills, NY

Gunther Chin
Calexico, CA

Michael Claprood
Mt. Morris, NY

Ray Cleaveland
San Francisco, CA

Tim Cochran
Greenwich, OH

Joe Colangelo
Port Chester, NY

Tom W. Crowell
Manchester, MA

Richard Debler
Charlotte, MI

Fred DeMey
W. Redding, CT

Jeff Dunker
Ephraim, UT

Jeff Eaton
Ft. Worth, TX

Bob Farley
Almont, MI

Mark Ferree
Ft. Worth, TX

David H. A. Fitch
Conventry, CT

Alan Funk
Peoria, IL

Jim Fyke
Colenia, NJ

Chris Gangi
Cresskill, NJ

Frank H. Gee, Jr.
Woodland Park, CO

Joseph R. Gerusa
Pacifica, CA

Robert Girard
Mt. Clemens, MI

Mark R. Glammeier
Sioux Falls, SD

Richard Glossop
Stamford, CT

Derek Gordon
Kinnelon, NJ

James Hageman
Livingston, MT

Alan Hammond
Rochester, NY

Steve Harper
Kaufman, TX

Douglas Harris
Farmington Hills, MI

Rick Hawkins
Earlville, NY

Gary Haynes
Bell Gardens, CA

Geoff Hayton
Redlands, CA

Larry Henderson
Northglenn, CO

Bob Hickle
N. Syracuse, NY

John Ho
Pittsburgh, PA

C. A. Hoffman
Newport, NC

Lee Hogman
Baltimore, MD

Mike Hyman
Allentown, PA

Jerry Irvine
Claremont, CA

Scott Isensee
Morrhead, MN

Andy Jackson
Florence, AL

Curtis Johnson
Cushing MN

Johnny Johnson
Ruston, LA

Mike Jones
Charlotte, MI

Elgin Keller
Los Angeles, CA

Brad Kemp
Palmyra, NY

Tim J. Kennedy
Oklahoma City, OK

Daniel Kingsbury
Huntsville, AL

Rick Kolstad
Inver Grove Hgts., MN

Jeff Kottmyer
York, PA

Chris Lageman
Elsberry, MO

Mark Laiuppa
San Diego, CA

Frank Lauback
Mentor, OH

Dan Lavin
Cleveland, OH

Brian Lewis
Montpelier, IN

John F. Lehning
Ridgewood, NY

Robert Long
Reading Center, NY

Robert Lopez
Merced, CA

Adham Loutfi
Oakland, CA

P. J. Lynch
Southbury, CT

Richard Maebe
LaVerne, CA

Robert Meier, Jr.
Winston Salem, NC

Ronald Merkord
Corpus Christi, TX

Roy A. Metz
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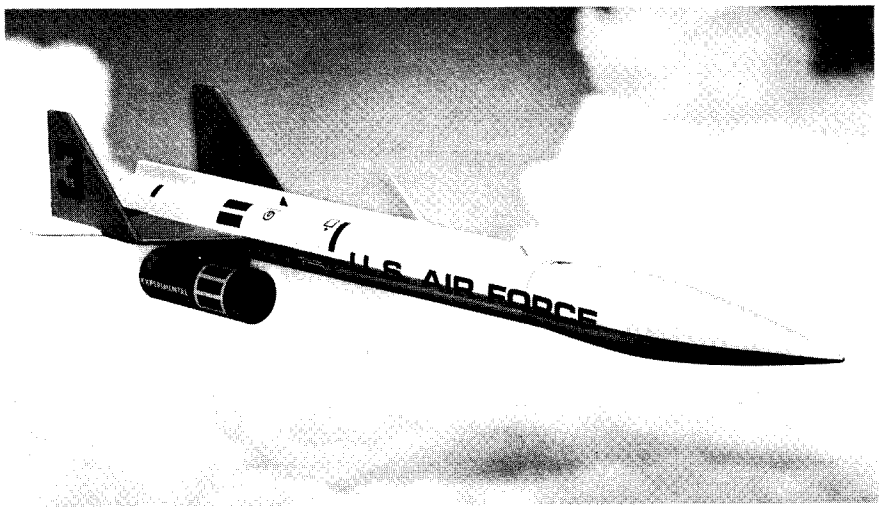
NEW FIRECAT

"Reconnaissance Drone"

Skill Level 2

Available Only to EAC Rocketeers

Limited Run Edition—This Kit Will Not Be Made Again—Order Today As It Will Become A Collectors Item—Supplies Are Limited.



From the drawing boards of the not-too-distant future comes the FireCat, a remote-piloted, reconnaissance drone. Able to slip undetected at treetop level behind enemy lines using advanced terrain avoidance control or race high above hostile areas at speeds in excess of Mach 4. 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-the-future features military decor, two-color decals, die-cut balsa fins, quick-change engine mount, 12" parachute recovery, and scramjet appearance.

RECOMMENDED ENGINES:
A8-3
B6-4
C6-5
(Use A8-3 for first flights.)

SPECIFIATIONS:
Length 14.32" (36.4cm.)
Body Dia. 0.976" (24.8mm.)
Weight 1.13 oz. (32.0g.)
Shipping Wt. 7 oz.

Cat. No. 0821 **Reg. $2.75**

Special Price Only $2.25 With Orders Over $4.00. Save 50¢

(Offer good only with EAC Newsletter Order Form (page 7). Offer expires 9-1-74 or when supply is exhausted. Hurry! Supplies are limited.)

EAC SPECIAL OFFER

Save 50¢

SAROS

PAYLOAD CARRIER

Skill Level 2

- Scale-like Sounding Rocket Vehicle
- Futuristic Appearance
- High Performance Design
- Plastic Nose Cone, Adapter Section, and Fin Unit
- Embossed Metallic Fin Rivet Press-on
- Three-color Decals
- Payload Section
- Quick-Change Engine Mount
- Parachute Recovery
- Over 2 Feet Tall
- Exciting Flights

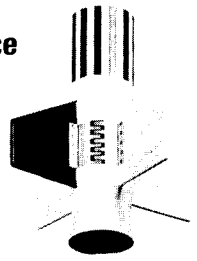
UNITED STATES

Recommended Engines:
A8-3
A8-5
B4-4
B6-4
C6-5
(Use A8-3 for first flights.)

Cat. No. 1254

Regular $3.50

Special EAC Price ONLY $3.00



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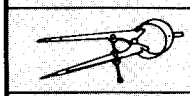
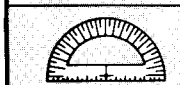
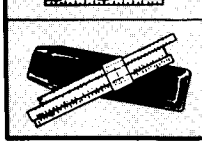
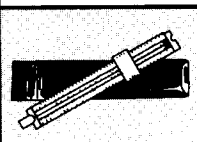
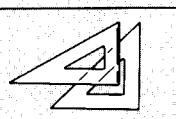
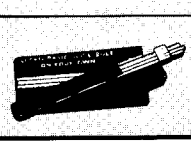
CLOSE-OUT SPECIALS DRAFTING AND CALCULATING SUPPLIES

	ITEM	CAT. NO.	REG. PRICE	EAC PRICE ONLY
	**Metal Compass (DC-2)** -Use as pencil compass or divider. Includes extra leads-	#2697	40¢	25¢
	**Bow Compass (DC-3)** -Use as divider, ink, or pencil compass. Interchangeable points and screw adjustment-	#2698	$1.40	$1.00
	**6" Protractor (DP-6)** -Clear plastic with sharp graduations and accurate 6" ruler-	#2699	25¢	15¢
	**6" Pocket Slide Rule (SR-3)** -Features A, B, C, CI, D, K, S, T, and L scales. Very accurate, perfect for computing altitudes. Includes vinyl case-	#2706	$1.40	$1.00
	**10" Decimal-Trig, Multi-Log Slide Rule (SR-4)** Features 22 scales and covers full log-log and trig requirements. Double faced, spring loaded adjustable cursor and protective carrying case-	#2707	$4.00	$2.00
	**Triangle Set (DT-2)** -Clear plastic with beveled edges and recessed lifts. Accurate and precise. Set includes one 6" 45° triangle and one 8" 30°-60° triangle-	#2702	85¢	50¢
	**Basic Slide Rule With Book (EK-1)** -Features A, B, C, D, CI, K, S, L, and T scales. Durable plastic case. Excellent self-instruction manual. Easy, quick, accurate way to learn-	#2703	$6.00	$5.00

HURRY! ORDER NOW!! Quanities of these items are limited. Offer ends when supplies are exhausted.

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Dept. EAC-X

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TYPE OR PRINT PLAINLY IN INK

☐ UPS is available in my area.

For Office Use Only

Amt. Recd. _____

Checked By _____

No. Labels _____

No. Pkgs. _____

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Your Name _____

Address _____

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(If additional space is needed use a separate sheet of paper.)

Is this your first order? ☐ Yes ☐ No ☐ I am an EAC member.

Was your last order more than one year ago? ☐ Yes ☐ No

	Quan.	Cat. No.	Products Description	Unit Price		Total	
1	☐	#1447	**EAC Membership Kit $2.00**				
2							
3							
4							
5							
6							
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MOVED RECENTLY?

If you have moved since your last order please give your old address.

Name _____ Address _____ City _____ State _____ Zip _____

SEND A FRIEND A CATALOG

Please send: ☐ *Model Rocket Catalog* ☐ *Parts Catalog* ☐ *Both*

Friend's Name _____ Address _____ City _____ State _____ Zip _____

Please do not write in this space.

AMOUNT THIS ORDER	
Offers Under $6.00 add 45¢ Additional Handling	
Balance Due Estes Industries From Previous Order	
Priority Postage (If Desired) / State Sales Tax 3% (Colo. Residents Only)	
TOTAL ENCLOSED	

Mail to:

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PENROSE, COLO. 81240

POSTAGE/PRIORITY MAIL

All retail orders are shipped postpaid in U.S. by regular land mail, UPS, or by the customer's choice of carrier which may require additional 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 processed you will be charged only for the difference between regular parcel post and priority mail -- any excess will be refunded.

WEIGHT (UP TO BUT NOT OVER)	10oz. to 1 lb.	2 lbs.	3 lbs.	4 lbs.	5 lbs.
Allow →	$.80	$1.13	$1.51	$1.93	$2.48
6 lbs.	7 lbs.	8 lbs.	9 lbs.	10 lbs.	
$3.13	$3.73	$4.33	$4.93	$5.53	

For orders 9 ounces or less, send 9¢ 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.

Bonus Kits

(Limit one per order. Offers expire 9-1-74.)

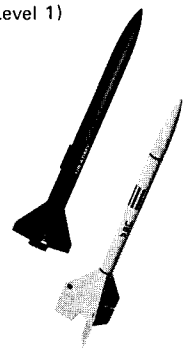
Your choice only 35¢ with $6.00 order.

LITTLE JOHN (Skill Level 1)
- Mini-Engine Powered
- Semi-Scale Model
- Surface-to-Surface Military Vehicle

Regular $1.75

BETA
(Skill Level 3)
- Mini-Engine Powered
- Two-Stage Vehicle
- High Performance Design
- Parachute Recovery

Regular $1.50



My order is over $6.00
I have enclosed an additional 35¢.
Please send me: (check one)
☐ Little John (#0819) OR ☐ Beta (TK-45)

Your choice only 50¢ with $9.00 order.

ARCAS® (Skill Level 3)
- Scale Model
- Sounding Rocket Vehicle
- Authentic ARCAS® Decal
- Sleek Design

Regular $2.75

SPRINT
(Skill Level 3)
- High Performance Design
- Competition Vehicle
- Streamer Recovery
- Low Drag Tail Cone

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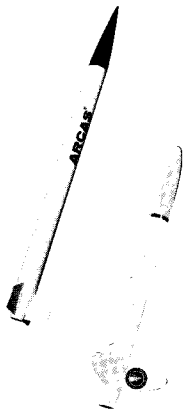

My order is over $9.00
I have enclosed an additional 50¢.
Please send me: (check one)
☐ ARCAS (K-26) OR ☐ Sprint (K-49)

Your choice only 75¢ with $12.00 order.

BIG BERTHA (Skill Level 1)
- Perfect Demo Model
- Slow, Realistic Lift-Offs
- Plastic Nose Cone
- Parachute Recovery
- Quick-Change Engine Mount
- 24" Tall

Regular $3.25

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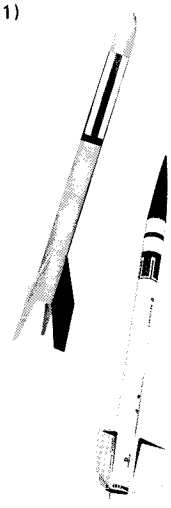
(Skill Level 2)
- "D" Engine Powered
- High Performance Flights
- Low Drag Design
- Two-Color Decals
- Die-Cut Balsa Fins
- 18" Parachute Recovery

Regular $3.50



My order is over $12.00
I have enclosed an additional 75¢.
Please send me: (check one)
☐ Big Bertha (K-23) OR ☐ Cherokee "D" (K-47)

NOTE: "Bonus Kit" offers good only with this order form. Limit, one "Kit" per order. Substitutions will be made when necessary. Offers Expire 9-1-74.

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EAC NEWSLETTER JUNE 1974

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

Vernon Estes.....Publisher
Dane Boles.....Editor
Bob Cannon.....Director of Publications
Charles Webb.....Photographer

Estes Industries 1974

EAC ADVISORY BOARD NO. 1

With the introduction of each new Estes product a special group of EAC Rocketeers will be selected to review it. They will be sent a sample of the actual product and will be asked to test it and comment directly to Estes engineers. Below is our first group of EAC Advisory Board members who are currently checking out kits from our first run of Estes Land Rockets. Suggestions for new product ideas are always welcome from all EAC rocketeers.

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