

estes aerospace CLUB



Estes Industries proudly announces the formation of the Estes Aerospace Club . . . The most exciting rocket club on earth. Membership in the EAC opens up a whole new world of exciting model rocketry activities. Each new club member will receive a special EAC membership kit that includes the following exciting items:

- Viper rocket – *exclusively* for members of the Estes Aerospace Club
- Membership card
- Membership certificate
- Club emblem – iron-on patch
- Decal sheet – special EAC rocket decals

- Range box stickers
- EAC stationary
- Model Rocketry Technical Manual*
- Model Rocket News*
- EAC product sheet – special club flyer

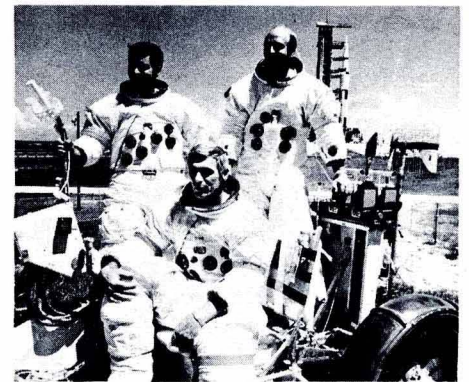
The EAC Membership Kit, however, is just the beginning. All club members will be eligible for exciting contests, special product offers, EAC achievement certificates, and iron-on thrust bars signifying their skill level as they advance to the status of Expert Rocketeer.

See the enclosed EAC membership brochure for additional details

on how to join plus information on skill levels, chapter membership, and the various special activities for EAC members and chapters.

FOLLOW APOLLO 17

Show your support of our nation's space program by following Apollo 17. Honor our courageous astronauts with a symbolic launch of your own model rocket. Lift-off on December 6 before this historic space mission. In appreciation of your effort Vern will send you a beautiful Follow Apollo 17 certificate. Just send us your name and address plus the name of your rocket and the time it was launched, and we will forward your certificate immediately. Thanks for your support!



— Courtesy of NASA

Astronauts Harrison Schmitt (lunar module pilot), Ron Evans (command module pilot), and Gene Cernan (commander) are the crew for this 12 day mission. Landing site for this last scheduled lunar landing in the Apollo program is the Taurus-Littrow region.

NOTES FROM VERN



FIRST WORLD CHAMPIONSHIP OF MODEL ROCKETRY

Penrose stands, unchallenged, as the Model Rocket Capital of the World. However, for a short period from September 22 to September 25, 1972, the eyes of the model rocket world were focused on Vrsac, Yugoslavia, site of the First World Championships of Space Models (model rockets). The United States with its 7 member team met to challenge 8 other nations including Yugoslavia, the host country, in parachute duration, boost glide duration, and scale.

On the evening of our arrival in Belgrade we were informed that the ESPETS (Estes Semi-Portable Engine Test System) and all of our rocket engines and our demonstration birds were being held at the Yugoslav customs. Difficulties had developed in obtaining their release. Early the next morning several of us went to the American Embassy in Belgrade. With their help plus the help of the Yugoslav Aero Club, and after several hours of discussion and a thorough inspection of our equipment and supplies, we were finally granted permission to bring our rockets and test equipment into the country.

It was getting late in the day before we headed northeast from Belgrade to Vrsac. That evening the ESPETS was set up to test and certify engines submitted by each country for use in the contest. Under the rules the maximum total impulse permitted was 5.0 newton-seconds for both of the timed events.

All engines passed the rigid inspection except the original engines submitted by Poland. The Estes engines approved for the meet showed the smallest deviation from engine to engine with total impulse variation of less than 1%, while the Czechoslovakian made B1.2-5 Adast brand engines showed the greatest variation in total impulse. After certification, all engines were impounded until needed.

Opening ceremonies at the Vrsac airport were colorful and well planned

as though we were attending a miniature olympics. Then, at 1100 hours we moved to the rocket range where the first event to be flown was parachute duration.

After two long hours the first event was over, and Ion Radu of Rumania had captured 1st place for keeping his parachute duration bird aloft for 415 seconds. The remaining two awards in this event went to the distaff side with Elena Ballo of Rumania taking second place and Ellie Stine of the U.S. coming in third. The other U.S. parachute duration team members, Shirley Lindgren and Jon Randolph, were just barely behind Ellie's time. Thus, when the judges added the U.S. team members' times together it gave the United States team first place standing and their only gold medal for the meet.



U.S. team members with awards: Front Row: L. to R. Bernard Biales, Howard Kuhn, Ellie Stine, and James Kukowski (team captain) Back Row: L. to R., Jon Randolph, Shirley Lindgren, Al Lindgren, and J.C. Worthen.

It was "back to the drawing board" for the U.S. team in boost glide. The weather was relatively calm at 1400 hours as the flights began; but as time passed the winds began to blow - 10 - 15 - then 20MPH - causing some gliders to 'lock up' on the pad and others to "Red Baron" when the pop pod sections tangled with the wings and tails of the gliders. Egypt, Britain, and Yugoslavia won first, second, and third with times of 165, 130, and 105 seconds respectively. The United States team placed 7th among the 9 competing nations, with J.C. Worthen turning in the best time of 96 seconds. Other team members for this event were Howard Kuhn and Bernard Biales.

That evening, my wife Gleda and youngest daughter Linda (age 11) helped me in handing our Estes goodies (rockets, literature, engines, etc.) to each of the foreign teams and in

preparing demonstration birds for the following day.

At 0900 Sunday morning we arrived back at the field to find models of United States rockets predominant in the Scale contest. Otakar Saffek from Czechoslovakia took first place with his magnificently detailed model of the Saturn V (using Estes decals, by the way). His team mate, Urban Karel, won the silver medal, also with a Saturn V, and Howard Kuhn of the United States took the bronze medal with his model of the Javelin. Other members of the U.S. team were Al Lindgren, who entered a model of the U.S. Falcon, and Jon Randolph with a Javelin. The U.S. team won a third place for the United States in scale competition.

Near the close of the meet, the temperature-sensing Estes Transroc was demonstrated to a very impressed crowd of spectators. The Cineroc demonstration was scrubbed just as it began to rain because of very cloudy weather.

FINAL RESULTS

	GOLD	SILVER	BRONZE
CZECHOSLOVAKIA	2	1	1
RUMANIA	1	2	0
U. S. A.	1	0	3
EGYPT	2	0	0
YUGOSLAVIA	0	1	2
GREAT BRITAIN	0	1	0
BULGARIA	0	1	1
CANADA	0	0	0
POLAND	0	0	0

There was a friendly and cooperative spirit among the contestants of all countries represented. The First World Championships were a success and many new doors have been opened for communications between people of the world who share a common interest in aero-modeling; perhaps even a small step forward toward peace in our troubled world.

MODEL ROCKET NEWS

• ESTES INDUSTRIES 1972

The MODEL ROCKET NEWS is published by Estes Industries, Inc., Penrose, Colorado. This publication is written for America's model rocketeers to promote safe youth rocketry, distribute current technical information, and make model rocketry more enjoyable and educational. Current issues of the MRN are distributed free of charge to all active Estes customers.

Vernon EstesPublisher
Charles WebbPhotographer



A SUBSIDIARY OF DAMON 2901-72

Take a teacher out to launch

by Robert Cannon, Education Director.

Want to do your teacher a big favor and have some fun yourself at the same time? You can do all of this by introducing him (or her) to model rocketry.

Teachers are always looking for new activities which help you learn. Thousands of teachers used model rocketry with their classes during the last school year. They did this because model rocketry provides an excellent way to actually let you plan, build, launch, recover, and relaunch your own real rockets in complete safety. Studying your own model rockets helps you understand how the full-size rockets operate because the same science principles govern model rockets and the big rockets.

You know model rocketry is fun. You launch your rockets because you enjoy it. Maybe you have given a report on model rockets, made a demonstration launch, or developed a Science Fair project about model rockets. If so, you know how well your teacher and your classmates liked it. Why not do it again? If not, why not try one now?

Giving a report or putting on a special demonstration is fun. You get a chance to show what you know about model rockets and how they operate. Most teachers will give you a bonus grade for special reports or projects, also. Those extra points don't hurt anything!

Ask your teacher to write to Education Department, Estes Industries, Department 108B, Penrose, Colorado 81240 to receive a free teacher's guide on the many ways model rocketry can be used in the classroom, a catalog, and other useful information. If you wish, you can send us your teacher's name and school address, and we will send the information to your teacher.

If your teacher likes model rocketry well enough, perhaps your class can have a class project with model rockets and learn how rockets operate, study the history of rocketry, and build and launch their own rockets. You can learn to track your rockets, have a contest, or any of several other great activities. Maybe you can even start a model rocket club with your teacher as sponsor.

CONTEST WINNERS

" SOLAR LAUNCHER WINNERS "

Thanks for the thousands of entries in the Sprint Contest we announced in the July 1972 *Model Rocket News*. Solar Launch Control Systems are on the way to these lucky winners. We received many correct answers so the first correct entry from each state was the winner.

ALABAMA-Steve Traylor. ALASKA-Karl Holfeld. ARIZONA-Andrew Zender. ARKANSAS-Patrick Rakes. CALIFORNIA-Mark Long. COLORADO-Dean Mueller. CONNECTICUT-Bob Paradise. DELAWARE-Jim Pogwist. FLORIDA-Keith Wright. GEORGIA-Frankie Moulis. HAWAII-Bruce Hosaka. IDAHO-John Snow. ILLINOIS-Kenny Karezewski. INDIANA-Steve Resing. IOWA-Alan Schultz. KANSAS-Francis Draubord. KENTUCKY-Paul Eickenberger. LOUISIANA-Michael McKee. MAINE-Alan Wolf. MASSACHUSETTS-Gordon Kerber. MARYLAND-Wesley Rippeon. MICHIGAN-Steve Caputi. MINNESOTA-Scott Ritter. MISSOURI-Michael Klein. MONTANA-Kelye Schlepp. NEBRASKA-Richard Bonczynski. NEVADA-Andy Hearne. NEW HAMPSHIRE - James Chung. NEW JERSEY-Michael Chunko. NEW MEXICO-Steve Stotts. NEW YORK-Bart Dunn. NORTH CAROLINA-Ken Kaper. NORTH DAKOTA-Jon Christensen. OHIO-Mark Wländecki. OKLAHOMA-Troy Dooley. OREGON-Todd Yarbough. PENNSYLVANIA-Rich Constantine. RHODE ISLAND-Richard Berard. SOUTH CAROLINA-Kim

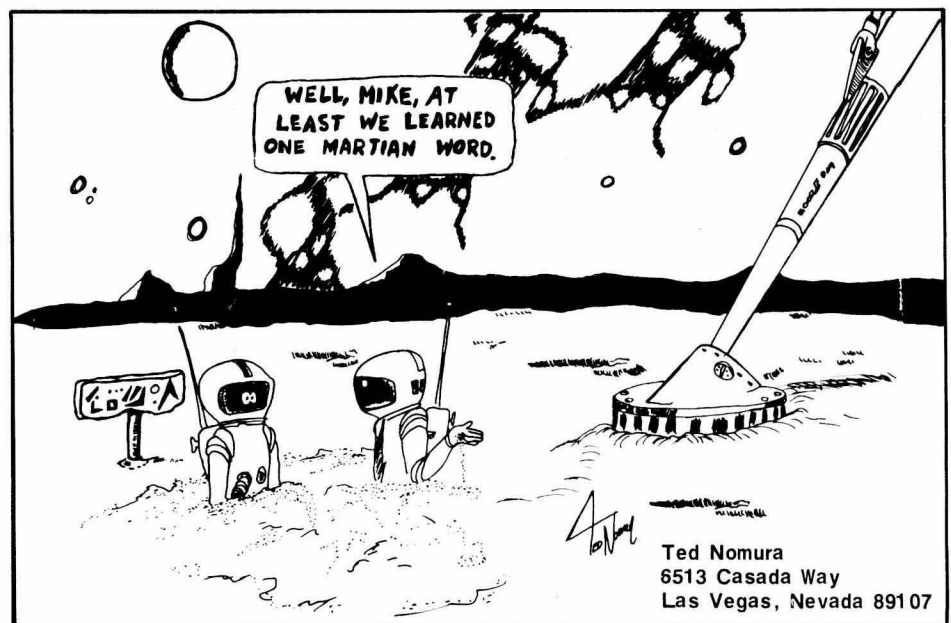
Wentzky. SOUTH DAKOTA-Mike Omfray. TENNESSEE-Audie Burke. TEXAS-Blaine Wallace. UTAH-David Young. VERMONT-Greg Glade. VIRGINIA-Kevin Seay. WASHINGTON-George Go. WEST VIRGINIA-Larry D. Wood. WISCONSIN-Lee Nelson. WYOMING-Gary Krause. WASHINGTON D.C.-Kerry Hopkins. PUERTO RICO-Gary Fouker. CANADA-Roy Ehrenlechner.

" DOM WINNERS "

Seven more rocketeers have received Estes merchandise certificates for outstanding designs. Two \$50 merchandise certificates were given for first place winners in March and April 1972. Five individuals won honorable mention prizes of \$5 merchandise certificates. Congratulations to these winners for their fine work. Keep those entries coming, and maybe you will win next time!

MARCH 1972 - *First Place*: Charles Wright, Tacoma, Washington ("D" Engine Booster Kit). *Honorable Mention*: Tom Weiser, Rochester, New York ("Space Cargo Ship").

APRIL 1972 - *First Place*: Michael Bennett, Neptune, New Jersey ("Vampire"). *Honorable Mention*: Mike Conrad, Joplin, Missouri ("The Gladiator"); R. Styges, McClellan AFB, California ("Boozer I"); Stephen Kramek, Springfield, Massachusetts ("SE 4300"); Doug Allgeier, Louisville, Kentucky ("U.F.O.").



Ted Nomura
6513 Casada Way
Las Vegas, Nevada 89107

SPACE SHUTTLE JPZ-3

**HONORABLE MENTION IN
SPACE SHUTTLE DESIGN CONTEST**

**DESIGNED BY
JOHN PIZZONIA
WEST ISLIP, NEW YORK**

ESTES INDUSTRIES ROCKET PLAN NO. 76

BUILD THIS FREE PLAN WITH ESTES HIGH PERFORMANCE PARTS & ACCESSORIES

PARTS LIST

- 2 BODY TUBES – BT-30
- 1 BODY TUBE – BT-60D
- 1 BODY TUBE – BT-50W
- 2 NOSE CONES – BNC-30D
- 1 NOSE CONE – BNC-60L
- 1 NOSE CONE – BNC-50K
- 1 FIN STOCK – BFS-40
- 2 FIN STOCK – BFS-20
- 1 ENGINE MOUNT – EH-2060
- 1 PARACHUTE – PK-12
- 1 SCREW EYE – SE-2
- 1 SHOCK CORD – SC-1
- 1 LAUNCH LUG – LL-2A
- 1 WOODEN DOWEL – WD-2
- 2 WEIGHTS – NCW-1

ADDITIONAL MATERIALS

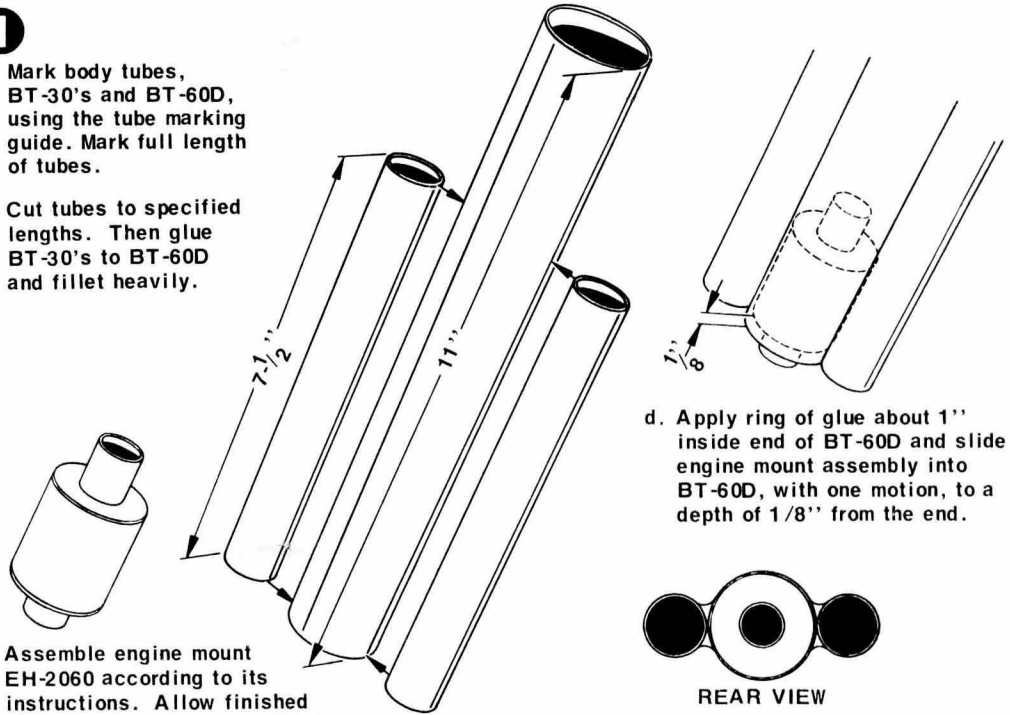
- Hobby Knife
- White Glue
- Ruler
- 320 Grit Mylar Sanding Material
- Sanding Sealer
- Color Enamel (Spray)
- Paint Brush
- Sharp Pencil

RECOMMENDED ENGINES

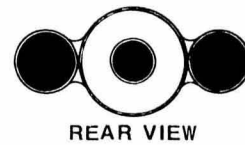
- B6-2 C6-3

1

- a. Mark body tubes, BT-30's and BT-60D, using the tube marking guide. Mark full length of tubes.
- b. Cut tubes to specified lengths. Then glue BT-30's to BT-60D and fillet heavily.



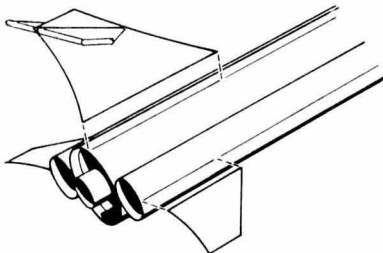
- d. Apply ring of glue about 1" inside end of BT-60D and slide engine mount assembly into BT-60D, with one motion, to a depth of 1/8" from the end.



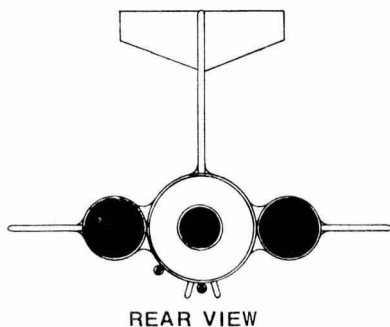
- c. Assemble engine mount EH-2060 according to its instructions. Allow finished engine mount to dry completely.

2

- a. Retrace all fin and nozzle patterns onto plain paper. Use only plain paper patterns in assembly.

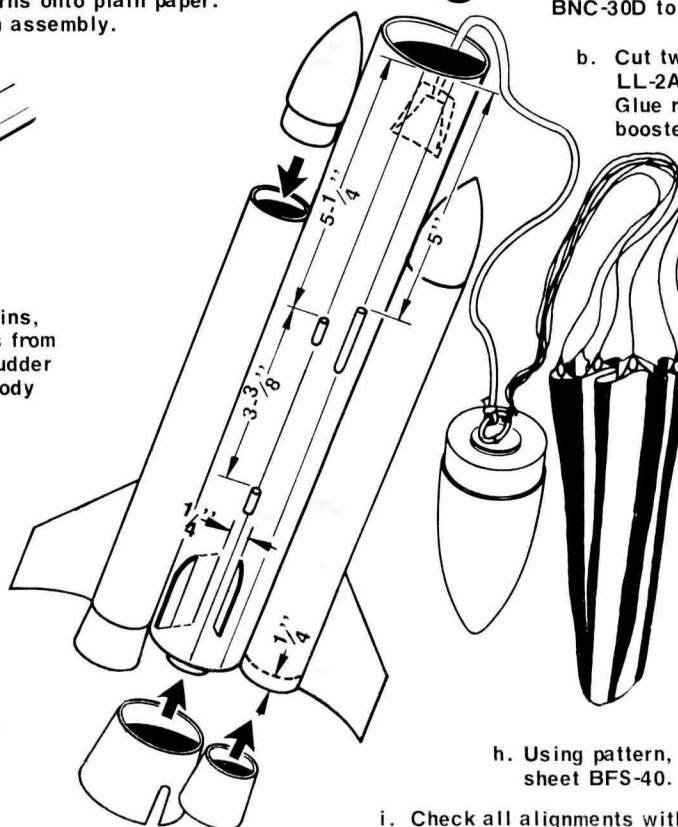


- b. Using patterns, cut out strap-on fins, booster rudder and rudder elevons from balsa sheet BFS-40. Sand fins, rudder and elevons smooth and glue to body tube as shown. Fillet all joints heavily.



3

- a. Glue nose cones BNC-30D to BT-30's.
- b. Cut two 1/4" sections from launch lug LL-2A and glue to BT-60 tube as shown. Glue remaining 3/4" launch lug to booster as shown.
- c. Using nozzle patterns, trace nozzles on heavy paper and cut out.
- d. When gluing on strap-on nozzles, push nozzles 1/4" into BT-30 tubes, then glue.
- e. For booster nozzle, push nozzle into BT-60 1/8" and glue. Be sure to align cut out with launch lug.
- f. Assemble shock cord and glue to inside of BT-60 about 1" from the end.
- g. Assemble parachute according to it's instructions. Attach parachute, shock cord and weights to screw eye.
- h. Using pattern, cut out booster fenders from balsa sheet BFS-40. Sand lightly and glue as shown.
- i. Check all alignments with rear view drawing.



INTRODUCING TWO NEW ROCKETS FROM ESTES

SHARK

Deluxe Sports Model
Surface-to-air Missile
Styling
Payload Section
High Performance
Design
Length 19.5"
Diameter 0.976"
Weight with engine
2.06 oz.

Parachute
Recovery
Shark Kit #1106

ONLY \$4.95

Die-cut balsa fins
Press-on Decals
Easy assembly
Pre-assembled cold
propellant engine

TEROS

Fun Sports Model
Scramjet Design
U.S.A.F. Decor
Ramjet Nose
Length 13"
Diameter 0.976"
Weight with engine
2.01 oz.

Parachute Recovery
Teros Kit #1103

ONLY \$3.95

The Cold POWER CONVERTIBLES

Dual Thrust Potential – Fly with
either RP-100 cold propellant
or Estes solid propellant
model rocket engines.

See Special Coupon on Page 2



NEW FROM ESTES SCALE X-15



Ready-to-fly in minutes
Detailed Styling
Authentic USAF Decor
Made of durable plastic
Impressive desk model
Mini-Brute power for maximum performance

Length - 9.5"
Wing Span - 3.63"
Weight - 1.33 oz.
Parachute Recovery

X-15 Scale Model (#0705) . . . ONLY \$3.95



The Cold Power Converter

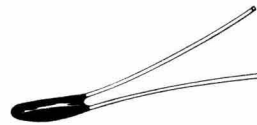
FREE Solid propellant conversion kit with your order of a COLD POWER CONVERTIBLE - Shark #1106 or Teros #1105 (featured on the preceding page).

Converts new cold propellant rockets to standard solid propellant power. Converter allows you to fly your Shark or Teros with ESTES solid propellant model rocket engines.

Include this coupon with your order.

Offer Expires 1-31-73

FREE SOLAR IGNITERS



WITH THE PURCHASE OF
A NEW SOLAR LAUNCH
CONTROLLER.

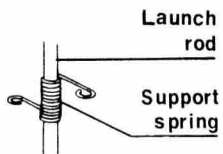
Receive 6 free Solar igniters (NW1-2) with your purchase of a Solar Launch Controller FS-10, \$2.95.

Be sure to enclose this coupon with order.

Offer expires 1-31-73

FREE ROCKET SUPPORT SPRING

Receive 3 free rocket support springs with each \$3.00 purchase!! Buy \$6.00 and get 6 free



- The perfect rocket stand-off
- A must for all launch pads
- Holds rockets above blast deflector
- Completely adjustable
- Compact
- Keeps micro-clips from touching.

You'll be glad you have these the next time you launch!!!

Include this coupon with order.

Offer expires 1-31-73

FREE ENGINE OFFER

3 Estes Citation Engines are yours just for ordering \$7.00 or more. CIRCLE only one package of 3 and include with your order.



CIRCLE ONE TYPE	EQUIVALENT TO TYPE	PRICE
A-3	A8-3	AA
B-2	B6-2	AA
B-4	B6-4	AA
C-3	C6-3	AA
C-5	C6-5	AA

Include this coupon with orders over \$7.00.

Offer expires 1-31-73

Super Buy 1/2 Price Engines

LIMITED OFFER.

Engine Type	Equivalent To		Reg. Price	Sale Price
A-3	A8-3	3 each	\$1.10	\$.55
B-2	B6-2	3 each	\$1.20	\$.60
B-4	B6-4	3 each	\$1.20	\$.60
C-3	C6-3	3 each	\$1.35	\$.67
C-5	C6-5	3 each	\$1.35	\$.67

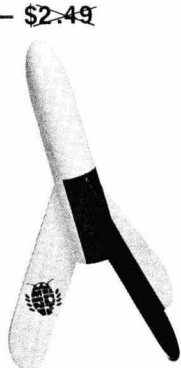
QUANTITIES ARE LOW.

ORDER NOW !!

FLEET PACK

now \$1.79 Offer expires 1-31-73

reg. - \$2.49



Mosquito

Fantastic Performance
Instant Lift-off
Less than 4" tall
Featherweight Recovery

Screamer

Spectacular Flights
High Performance Design
Perfect for Competition
Streamer Recovery

Mini-Bertha

Super Fun Model
Easy-to-build
Two Color Decal
Parachute Recovery



NEW!

SOLAR LAUNCH CONTROLLER

LATEST TECHNICAL ADVANCE IN MODEL ROCKET LAUNCH SYSTEMS

- Safety Interlock
- Complete Control
- Compact Storage
- Spring Loaded Micro-Clips
- Pre-soldered Wire Harness
- Continuity Check Lamp
- Recessed Launch Button
- Easy-Action Grip
- Requires Only Four AA Alkaline Batteries
- Converts to 12 volt system



ONLY \$2.95 (Batteries not included)

Uses Only Estes Solar Igniters (NWI-2)

ORDER YOURS TODAY!

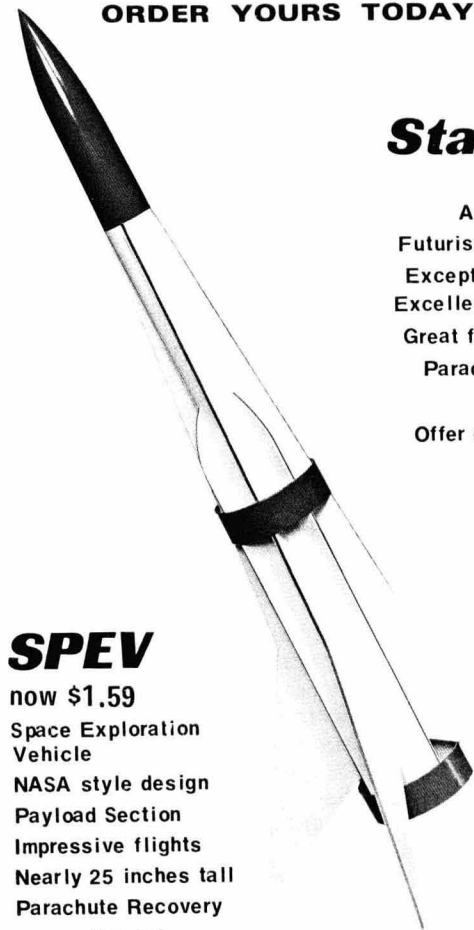
Starlight

now \$1.99

Advance Design
Futuristic Appearance
Exceptional Stability
Excellent Performance
Great for Sport Flying
Parachute Recovery
reg. - \$2.75
Offer expires 1-31-73

SPEV

now \$1.59
Space Exploration Vehicle
NASA style design
Payload Section
Impressive flights
Nearly 25 inches tall
Parachute Recovery
reg. - \$1.99
Offer expires 1-31-73



TR-8 Technical Report

This great new TR is now ready.

Your complete guide for advancement in solid propellant model rocketry. Progress from beginning through advanced model rocketry step-by-step by following the projects in this book.

Many photographs and drawings are provided to help you. Complete, illustrated glossaries are provided to help you learn the exact terms needed at each skill level. Self-tests to help you check your progress are included. A master "Project/Flight Record" sheet to let you track your progress is included.

Order yours today!

TR-8 75¢

50% Off

Special

- Great for test flights
- Perfect for competition
- Quantities are limited.

1/4 Engines

1/4A3-4	3 each	Only \$.39
1/4A3-4S	3 each	Only \$.39
1/4A3-1	3 each	Only \$.39
1/4A3-1S	3 each	Only \$.39

QUANTITIES ARE LIMITED.

3 each 39¢

Offer expires 1-31-72



Estes Christmas Wish List

Make Christmas shopping easy for Mom and Dad. Check all the exciting Estes products you would like to receive for Christmas.

MINI BRUTES

- TK-5 – Mini-Bomarc
- TK-31 – Star Blazer
- TK-123 – Fleet Pak

COLD-PROPELLANT ROCKETS

- 5091 – Valkyrie 1 Rocket
- 5092 – Valkyrie 2 Rocket
- 5124 – Sergeant Rocket
- 5125 – Sandpiper Missile
- 5122 – X-13 Rocket Plane
- 5123 – Astro-Gnat Rocket Plane
- 5102 – Baron Rocket Plane
- 5090 – Shrike
- 5101 – XS-1 Space Shuttle

SPECIAL KITS

- CK-3A – Assembly Special
- ES-55 – Launch Pad Special
- ES-110 – Lift-off Special
- ES-165 – Orbit Special
- RB-1 – Range Box
- RBK-2 – Large Range Kit

ASTRON ROCKET KITS

- KS-7 – Starter Kit w/launch.
- KS-8 – Deluxe Starter Kit
- K-1 – Astron Scout
- K-2 – Astron Mark II
- K-21 – Gemini-Titan GT-3
- K-23 – Big Bertha
- K-29 – Uprated Saturn-1
- K-33 – Astron Trident
- K-36 – Saturn V 1/100 Scale
- K-37 – Astron Scrambler
- K-38 – Astron Avenger
- K-41 – Mercury Redstone
- K-42 – Orbital Transport
- K-43 – Mars Lander

- K-46 – Shrike
- K-48 – Bandit
- K-50 – Interceptor
- K-51 – Sandhawk
- K-52P – Omega
- K-54 – Saros
- K-57 – SkyDart
- K-58 – Demon

PHOTOGRAPHY

- RC-1 – Camroc/Delta Kit
- RC-8 – Cineroc/Omega

LAUNCHING EQUIPMENT

- NWI-2 – Solar Igniters
- FS-10 – Solar Launch System
- FS-5 – Complete Launch Con.
- RL-3 – Tilt-A-Pad Launcher
- RL-4 – Porta Pad Launcher
- A-1 – Altiscope
- MFS-1 – Multi-Pad

FIRING LINE

- 0701 – Starter Outfit
- 0703 – Banshee
- 0704 – Vampire
- 0705 – X-15 Rocket Plane
- 0709 – Relaunching Components
- 0702 – Mini-Pad Launch System

CITATION ROCKETS

- KC-1 – Quasar
- KC-2 – Red Max
- KC-3 – Patriot
- KC-4 – Starship Vega
- KC-5 – Bomarc-boost glider
- MKS-8 – Starter Kit
- LS-1 – Star Port Launcher

GREEN LINE CONVERTIBLES

- 1101 – Scamp
- 1102 – Yankee Five
- 1103 – Marauder
- 1104 – Honest John
- 1105 – Teros
- 1106 – Shark
- 1108 – Flight Kit with Scamp
- 1109 – Launcher

TRANSROC TELEMETRY

- TX-1A Transroc (Assembled)
- TX-1 Transroc (kit form)
- TXA-1 Transroc Microphone Kit
- TXA-2 Transroc Spin-Rate Telemetry kit
- TXA-3 Transroc Temperature Tele-
- TXA-4 metering kits

GAMES AND PUZZLES

- Women's Lib
- Dirty Water (Deluxe)
- Smog (Deluxe)
- Population (Deluxe)
- Clean-up
- The Great Ecology Jigsaw Puzzle
- Ecology (Deluxe)

GROW KITS

- Sunflower
- Soy Beans
- Chick Peas
- Green Lentils
- Chives
- Sweet Basil

ECOKITS

- Ecokit I Why are leaves green?
- Ecokit II What lives in the water?
- Ecokit III How do things grow?
- Ecokit VI Do fish breathe?

SEND A FRIEND A GIFT CERTIFICATE FOR CHRISTMAS

Gift Certificate Request

Estes gift certificates make terrific gifts for your fellow rocketeers. So surprise a friend and send him one of the best gifts a rocketeer can receive. Remember, he might do the same for you!

I would like to purchase an Estes Gift Certificate in the amount of \$_____.

- Please return the gift certificate to me.
- Please forward gift certificate to my friend:

Name _____
 Address _____
 City _____ State _____ Zip _____
 Dept. 107B

Include with your next order or Mail to:



A SUBSIDIARY OF DAMON

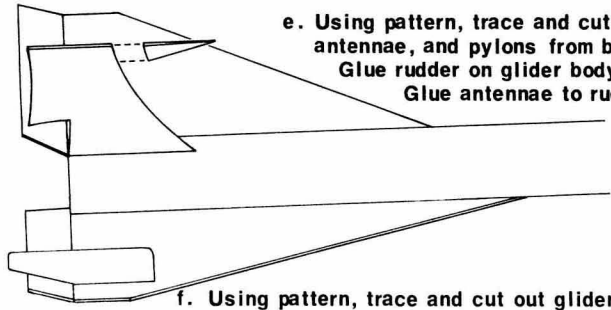
ESTES INDUSTRIES
 PENROSE, COLO. 81240

- 4** a. Cut body tube BT-50W to 6" length. Glue nose cone BNC-50K to one end.
- b. Mark body tube BT-50W with glider tube marking guide.

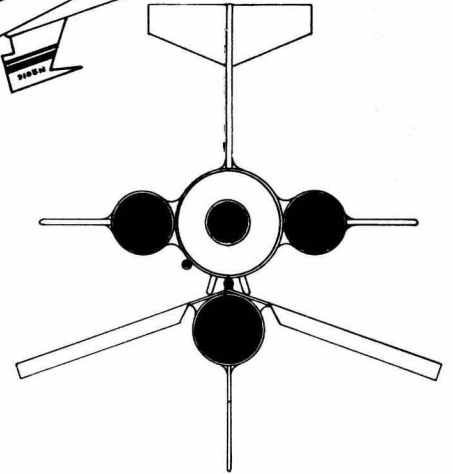
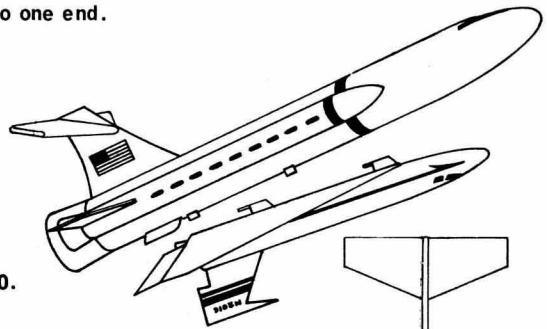


- c. Using pattern, trace and cut out glider wings from balsa sheet BFS-20. Glue the two wing sheets together, laying over BT-50 as illustrated. Apply heavy fillet as shown.

- d. Using pattern, trace and cut out glider elevons from balsa sheet BFS-20. Glue elevons to glider wings as shown, and check angle with elevon alignment guide.



- e. Using pattern, trace and cut out glider rudder, antennae, and pylons from balsa sheet BFS-20. Glue rudder on glider body as shown. Glue antennae to rudder.



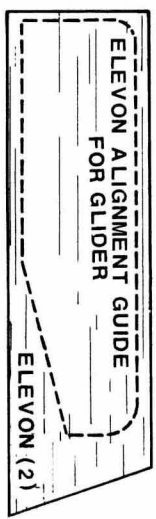
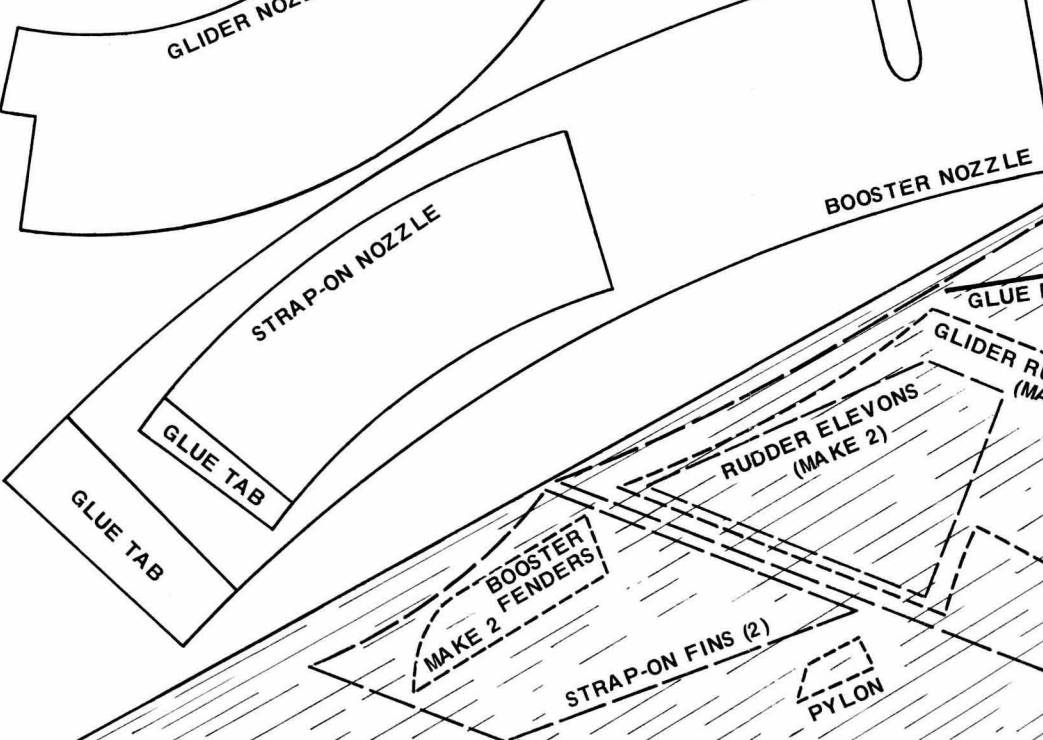
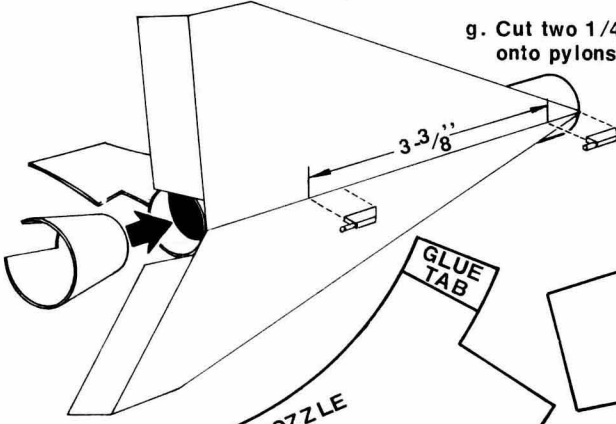
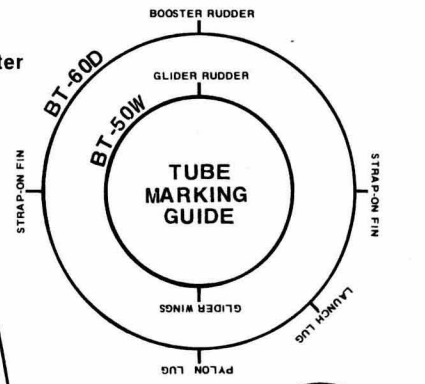
REAR VIEW

- f. Using pattern, trace and cut out glider nozzle from heavy paper. Glue nozzle in glider body as shown.



- g. Cut two 1/4" sections from 1/12" dowel. Assemble onto pylons and glue to glider body as shown.

- h. Check glider alignment on booster body with rear view drawing.



ROCKET PROJECT CONTEST

Have you ever performed a really "far-out" experiment using model rockets? Maybe it was a Science Fair project, possibly it was done in your model rocket club's R & D competition, or maybe it was just an experiment you made up for fun to answer one of your own questions.

Enter your experiment in this contest. Each winning experiment will receive a ten dollar gift certificate. There is no limit to the number of entries an individual may make. The number of winning entries is up to the discretion of the judges. One entrant may win prizes for several different entries.

Your report on the experiment should not be lengthy. (Limit your report to 500 words or less.) Drawings are fine, if needed. Be sure to state the question you set out to answer, what you did to find the answer, and the answer to your question.

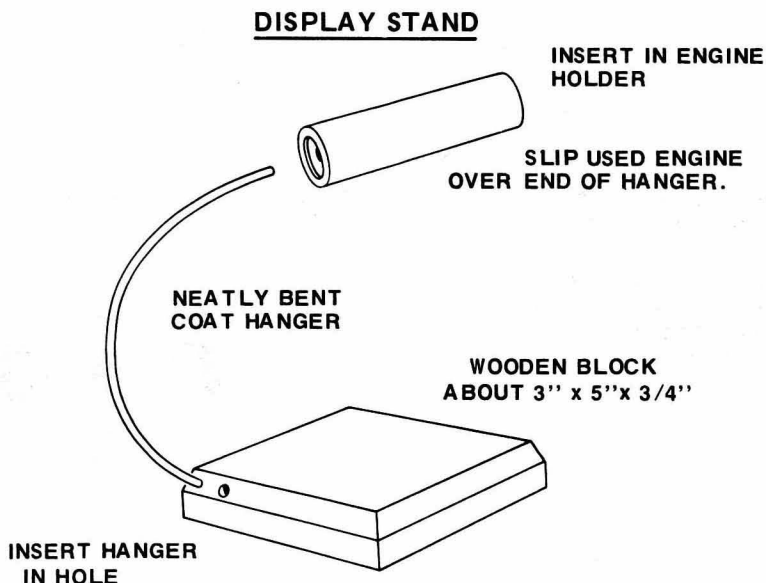
Be sure to tell what you wanted to find out and how you went about securing an answer to your question. Use the standard experiment report form if you wish. If your experiment provided an answer to your question, obeyed all of the safety rules, and used model rockets as an essential part of the experiment, enter it in our contest. The experiment need not be elaborate or involve a lot of mathematics. It could be a basic learning activity, or a simple test to prove a theory. It does not need to be an original experiment, but originality helps.

This contest is designed to encourage creative thinking in model rocketry experiments and to permit us to locate the best experiments using model rocketry so that we may publish them for others to use.

All entries become the property of Estes Industries and cannot be returned. In the event of identical entries, the entry with the earliest postmark wins. The decision of the judges is final. Address entries to Rocketry Project Contest, Estes Industries, Penrose, Colorado 81240.

Now is your chance to share your best experiments with others. Winners may be published in future issues of MRN. If you have a really great idea for a good experiment but haven't yet gotten around to doing the experiment, why not perform the experiment now? It might be a winner!

THE IDEA BOX

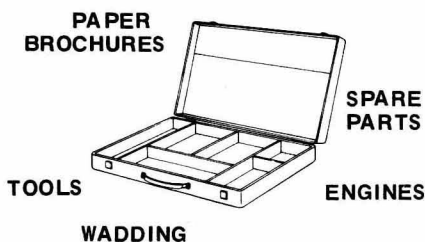


Jeff Edick
Route 9, Box 549
W. Brookfield, Mass. 01585

OLD BRIEF CASE

An old brief case makes a good place to store equipment and tools. Add cardboard or hardboard separations to fit the need.

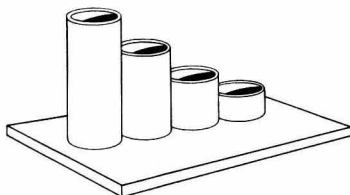
Jeff Maresa
Walton Hills, Ohio



WORKTABLE IDEA

Paper towel rolls cut in different lengths and glued to a board make good place to store dowels and small parts.

John Pickeral
Box 28
Fincastle, Virginia 24090



ADHESIVE ALUMINUM

To make adhesive aluminum, you need some Scotch brand Double Stick Tape, some aluminum foil, and wax paper. First, place a strip of double stick tape on some wax paper. Place a piece of foil (shiny side down) on a smooth table. Then, place the wax paper (the side with the tape facing down) on the foil and rub the wax paper firmly where the tape is with your finger. Next, peel the wax paper off. (Be careful, rubbing made the tape stick firmly to the wax paper, and the paper may rip and stick to the tape.) Now cut off all the excess foil, and it is ready to use right away or it can be placed on a piece of wax paper until needed. If you want a large piece of adhesive aluminum, place several strips of tape on the wax paper, lining up each strip carefully, preventing overlapping.

The adhesive aluminum can be used for stripes, roll patterns, letters, numbers, reflective beacons for tracking, etc.

Ronald Chin
45-706 Lanipola Place
Kaneohe, Hawaii 96744

Another Look at Multi-Staging

by Bill Simon

Many things have happened in model rocketry since Estes Industries' technical report on multi-staging, TR-2, was written in 1963. Engines have changed in size and power. Instrument payloads such as the Cineroc and Transroc have become common. Model rocketeers have achieved much greater sophistication in aerodynamic design and mathematical analysis of flight performance. In spite of all this, the basic multi-staging system described in TR-2 remains valid. However, some new techniques are also valid. This article is a quick survey of new ideas and methods.

POP-AND-GO

When "Pop-and-go" staging was introduced many rocketeers thought the new system made the old tape method of staging obsolete. For some, it did. Pop-and-go was made possible by the introduction of engines with larger nozzles, operating at higher chamber pressures. The advantage of Pop-and-go is that it is more convenient than taping — models can be prepped with less effort. It also allows more flexibility in design as engines do not always have to be right next to each other for staging.

The offsetting disadvantage is a small loss in reliability. If taping is 99.5% reliable and Pop-and-go 98.5% reliable, rocketeer #50 will never know the difference. Rocketeer #99 will, though, when he experiences staging failure with Pop-and-go.

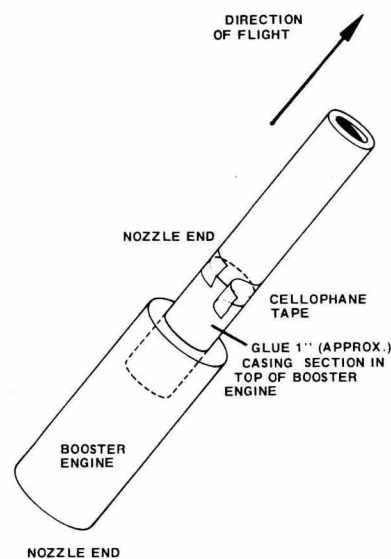
If you think you might be rocketeer #99, here's some things to do to improve your success ratio: 1) Tape the model's stage coupler until the two stages fit together tightly. 2) Make sure engine mounts in both stages are glued in securely and that there is no gas leakage around the engine mounts. 3) Use upper stage engines with larger nozzles (B14, B4, C6, etc.). 4) Don't use Pop-and-go with mini-engines. 5) Apply a couple of pieces of masking tape to the outside of the rocket (as shown in fig. 8 of TR-2). Any of these precautions will make

staging more reliable. Follow them all, and reliability should reach near 99.95%.

MINI-ENGINES

For models using Estes series "T" mini-engines, there's only one way to go: Tape the engines together! You say, "That's fine. For mini-to-mini combinations we follow TR-2. But what about when I want to use a standard size C engine as a booster and a mini-A for the upper stage? How do I tape 2 different sizes of engine together?"

The best method is to glue a short piece of used mini casing (without the nozzle) into the top of the booster engine. It must project at least 1/4" from the booster casing. Tape the upper stage engine to the protruding casing section.



D POWER

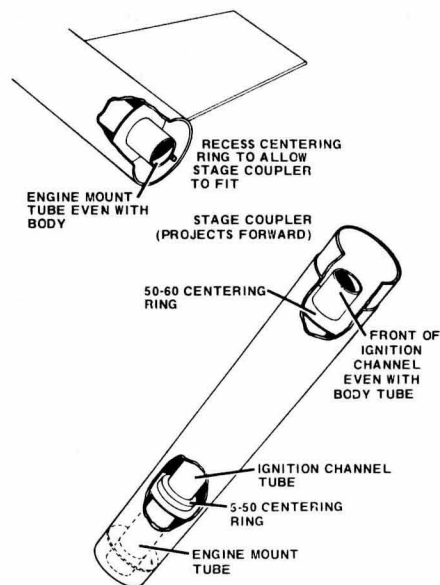
The same technique described above can be used for mounting standard size (Series I) upper stage engines above "D" boosters. In this case, glue a section of standard casing into the D engine. Do a thorough job of gluing, as the joint will have to withstand very high pressures.

When staging one D engine above another, the rocketeer has considerably more choice of model configuration and staging method. Taping is still the most reliable system, but excellent reliability can be had with Pop-and-go staging, too. In addition, the model's engines can be spaced a fair distance apart and still func-

tion properly if a few simple precautions are taken in designing the model.

If the nozzle of the upper stage engine is no more than 2 inches from the top of the booster engine, the only precautions necessary are to make sure there are no obstructions between the two engines and that the stages fit together tightly. If the distance is to be greater, the booster should be built with an ignition channel tube.

The ignition channel tube usually is a section of BT-5 body tube long enough to reach from the top of the booster engine to the nozzle of the upper stage engine when the entire rocket is assembled. This serves to confine the hot gases and particles at staging and direct them to the upper stage engine. Again, stages must fit tightly together. Even with all precautions, this system will not be as reliable as if the engines were close together. The farther the engines are separated, the less reliable it will be. Exactly how much reliability is lost, we don't know. The system appears to still be better than 95% reliable. In any event, engines should not be more than 12" apart for proper operation.



SO . . .

Each of the techniques described extends the range of the model rocketeer. In model rocketry, there is no "only way" to do anything. For the person who likes to experiment and explore, model rocketry is still the perfect hobby.

NEXT ISSUE: Booster Recovery Techniques

NEW CLUB/DEALER DEMONSTRATION PROGRAM

For more than a year many active model rocket clubs have been taking advantage of Estes' dealer-demonstration programs and receiving gift certificates for their efforts to promote local model rocketry. As previous programs have been a great success, we are happy to announce our newest club/dealer demonstration program which will become effective on October 1st and will run until March 31, 1973. Under the new program clubs will receive a standard gift certificate for hosting a public model rocket demonstration with a local Estes retailer. Clubs may then work to enlarge the amount of their initial gift certificate by placing as many demonstration news releases as possible in their local newspapers. Their standard demonstration gift certificate

will be increased according to the number of column inches and pictures they receive in their local newspapers. This makes the "sky the limit" for clubs to receive free merchandise under the new program.

For more information on our new demonstration program or hints on how to set up a good demonstration, write an effective news release, or obtain more local publicity, write Rocketeer Communications Department, Estes Industries, Penrose, Colorado 81240 and request our club/dealer demonstration program information kit.

Clubs, don't miss out! Take advantage of this tremendous offer to gain lots of free goodies for your club members!!

ENTER DISPLAY STAND CONTEST

Test your creative ideas for displaying your Estes model rockets in the Estes Rocket Display Stand Contest. Special prizes will be awarded to the first 100 best entries, plus a \$100 gift certificate will be awarded to each of the three most outstanding display stand ideas. To enter simply follow the rules below. Good luck!

RULES

1. All rocket display stand entries must be in plan form. Actual models of the display stands will be accepted. However, they are not required and cannot be returned.
2. All entries must include a parts list and should be manufactured from Estes merchandise or easy to obtain hobby materials.
3. Plans should include all instructions, patterns, and diagrams you feel are necessary to be able to construct the stand.
4. Photos are not required, but pictures of your completed display stand will be appreciated.
5. All designs must be original. Commercial display stands will not be accepted.
6. All entries will become the property of Estes Industries.
7. You may enter as many times as you like.
8. Employees of Estes Industries or members of their immediate families are not eligible.
9. Entries will be judged for feasibility, practicality, originality, visual impact, and for the creative use of construction materials.
10. All entries will be judged together and the decision of the judges will be final.
11. Special prizes will be awarded for the first 100 best entries and \$100 gift certificates will be awarded for the top three display stand ideas.
12. Entries should be sent to:

Display Stand Contest
Estes Industries
Penrose, Colorado 81240
13. Be sure to include your name, age, address, city, state, and zip code with each entry.
14. Deadline for entries is December 31, 1972.
15. Winners will be announced in a future issue of *Model Rocket News*.

MORE CAMROC WINNERS



TOP: Nick Yuschak, Whitestone, N.Y.
BOTTOM: Steve Pence, Rochester, Mich.



— Courtesy of Smithsonian Institute

F.C. Durant III, assistant director of astronautics of the Smithsonian, holds the CINEROC on an Astron Omega as Astronaut Michael Collins, member of the Apollo 11 crew, admires the CAMROC mounted aboard its Astron Delta launch vehicle. Both cameras and booster vehicles are now part of the permanent collection at the Smithsonian, along with such Estes scale models as the Mercury-Redstone, Gemini-Titan, Saturn 1B, and Saturn V.