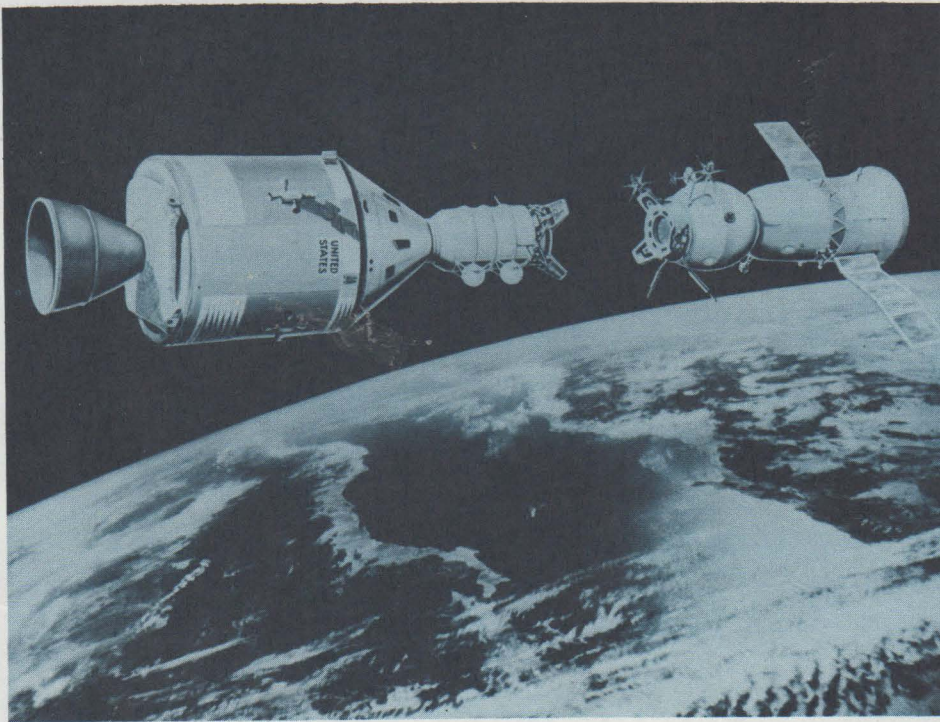


# MODEL ROCKET NEWS

Vol. 13, No. 2  
July 1973

## APOLLO-SOYUZ PROJECT



NASA PHOTO

Current plans call for a mid-1975 link-up of orbiting Apollo and Soyuz spacecraft. The Apollo launch will follow the Soyuz spacecraft launch by seven and one-half hours. Once in orbit, the American spacecraft will separate from the launch vehicle, reverse position, and extract the Docking Module (DM) from the launch vehicle.

The Apollo crew will maneuver to join the Soyuz and actively maneuver the Docking Module to connect to the Soyuz. Differences in atmosphere (Apollo-100% oxygen at 5 pounds per square inch; Soyuz-nitrogen and oxygen mixture at 14.7 pounds per square inch)

will be adjusted so crewmen can transfer between the two spacecraft through the Docking Module which links them.

The mission plans call for an orbit of about 200 kilometers (124 miles). The two spacecraft will remain docked for as long as two days. This event marks the most ambitious US-Soviet cooperative space effort so far. In addition to exhibiting international cooperation, this mission will prove international space rescue capability, build closer ties in space efforts, and open further the possibility of future joint space missions to reduce duplication of efforts and costs.

### Featured In This Issue;

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### "DOM Winners"

Congratulations to another fine group of Estes Rocketeers for their outstanding DOM entries. First place winners will receive \$50.00 merchandise certificates and honorable mentions will be awarded \$5.00 certificates.

FEBRUARY 1973 - First Place: Dick J. Robeuson, Clovis, California ("Snoopy's Baron Buster").

MARCH 1973 - First Place: Robert Orr, Lordstown, Ohio ("Nike Hercules"). Honorable Mention: Bryant H. Bigelow, Troy, New York ("Computer Altitude Programs"). Jim Dodrill, Tryon, Oklahoma ("Diogenes Sport Rocket").

APRIL 1973 - First Place: James F. Hooper, M.D., Jackson, Mississippi ("Snap-Wing Boost-Glider"). Honorable Mention: Grey & Gary Bumgardner, Kansas City, Missouri ("Trisonic B/G"). Harry W. Reed, Miami, Florida ("The Pencil Rocket").

MAY 1973 - First Place: Bret Simpkins, Albuquerque, New Mexico ("Top Secret").

Got any good ideas for MODEL ROCKET NEWS articles, technical information, cartoons, anecdotes, club news of unusual interest, etc.? Then why not submit them to us for possible publication? Our constant aim is to make MRN a better, more interesting magazine, and you might just be the type of contributor we need.

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. Also tell us in your letter if you want your material returned. Address all material to: Editor, MRN, Estes Industries, Penrose, Colorado 81240.

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

Hope to hear from you soon!

## NOTES FROM VERN



On June 5, according to the news reports, Charles Conrad, aboard Skylab I, pointed his big earth resources telescope down toward Colorado. Somehow it failed to make the evening news, but he must have noticed the Estes plant at Penrose and our big signs out on Highway 50 advertising free tours of the Model Rocket Capital of the World. As he cruised overhead (at 17,000 or so miles per hour) he may have wondered about all the rockets being launched that failed to achieve orbit or why so many mail trucks kept coming and going.

It's the mail trucks I'd like to tell you about today, since you already know about Estes Rockets and how difficult it is to get one into orbit. The incoming mail trucks contain two important things, orders and letters from America's Rocketeers. The outgoing trucks contain rockets and replies to your letters. We appreciate your orders, and of course we couldn't stay in business without them. It's the letters, however, that make Estes a unique company, because each letter gives us an opportunity to learn more about your needs and to help you personally when you have a problem. As we've grown and as the number of rocketeers we serve has increased, so have the numbers of your letters and the size of our staff to answer them. Because many of you ask the same questions, we've found we can often do a better job answering by using a detailed printed response on how to solve a specific problem. However, many suggestions and requests are unique, and of course we answer each individually. The following are some representative letters I recently received which I think will be of interest to most of you.

### CATALOG COMMENTS

Dear Mr. Estes,

"Today I received my 1973 Estes Model Rocket Catalog. You know the one with the yellow cover. It really is a great catalog, but I noticed that it did not have the technical section in the middle and wondered if it was

still available separately. Your old Model Rocketry Tech Manual, you know the one with the yellow pages, was really a help to me and now my little brother is getting into the hobby and would like to have a technical section of his own." *Jerry K., Nevada*

Dear Jerry,

"Because of the increase in the number of rockets we offer in this year's catalog there simply wasn't enough room to include the entire tech manual. For this reason we continue to offer the "Model Rocketry Technical Manual" separately to our Estes model rocketeers. To receive a copy of this handy guide for model rocket activities, send us your name and address plus 25¢ for handling, and we will rush your copy to you by return mail. Thank you for your letter, and good luck to your little brother." *Vern*

Dear Estes Industries,

"I think your new Goonybirds and the Firing Line rockets featured in your new catalog are really great, but my big brother, who I guess you could say is an advanced rocketeer, says they are only for beginners. He says the Goonybirds are really silly and the Firing Line rockets too simple. I think they are really neat, but how can I convince him they're OK." *Bobby D., (age 10) Maryland.*

Dear Bobby,

"Our Goonybirds and Firing Line models are certainly meant to reach a younger group of rocketeers, but we also know that a good number of advanced rocketeers and adult modelers are enjoying them too. Your big brother is right when he says Goonybirds are silly and our Firing Line models simple to operate, as this is the way they're supposed to be.

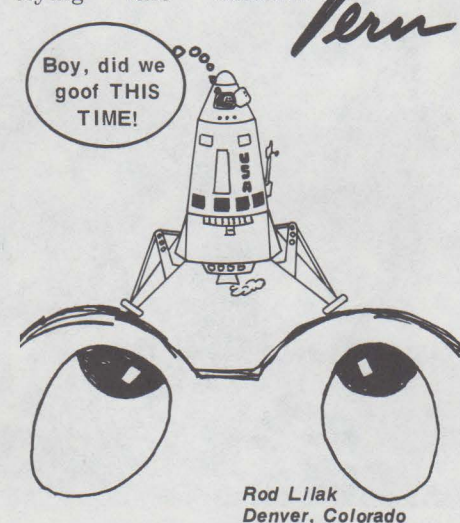
"Goonybirds are meant to be the zaniest flying freaks in the universe. The Firing Line, on the other hand, is meant to provide an extremely simple method for individuals to get involved and participate in model rocketry. Beginning rocketeers sometimes do not have the experience or ability to build a complete model rocket the way it should be. For this reason, we have introduced the Firing Line to allow them to get involved in model rocketry early and to enjoy the exciting exhilaration of launching at a younger age, and under the supervision of a parent or big brother if necessary.

"Tell your big brother that we have introduced such rockets as the Goonybirds and Firing Line in order to meet the needs of everyone involved in our hobby. This broadens the scope of model rocketry which will mean more potential advanced rocketeers in the long run. Thank you for your inquiry, and keep 'em flying." *Vern*

I certainly hope you enjoyed our comments and answers concerning our rocketeer mail. Perhaps we answered a question you've been wanting to ask.

During the past few months many of you have written asking why it is taking longer to get your orders from us. Yes, it has taken longer than usual because everybody wanted to build up their rocket fleet at the same time. We've put on over 100 new employees to fill this need and have kept critical departments running 24 hours a day. We're beginning to build a backlog now, and most orders are again being shipped within 24 to 48 hours.

So long for now and keep'em flying this summer.



### MODEL ROCKET NEWS

• ESTES INDUSTRIES 1973

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



A SUBSIDIARY OF DAMON

# TOP SECRET

Skill Level 2

DESIGN OF THE MONTH WINNER  
 BY BRET SIMPKINS  
 Albuquerque, New Mexico  
 ESTES INDUSTRIES ROCKET PLAN NO 78

★ BUILD THE TOP SECRET WITH ESTES HIGH PERFORMANCE PARTS AND ACCESSORIES

**PARTS LIST**

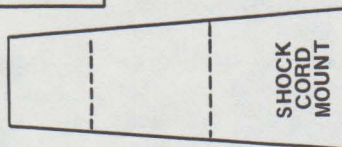
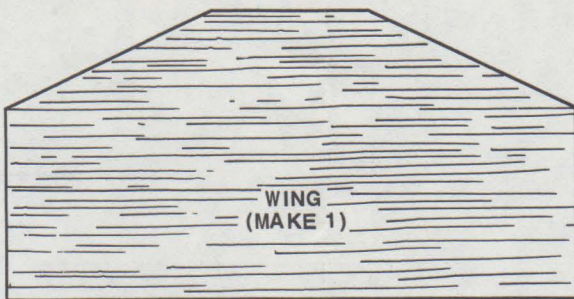
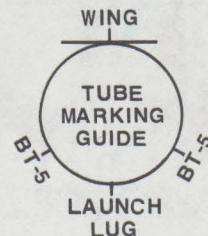
- 1 BODY TUBE - BT-20B
- 1 BODY TUBE - BT-5
- 1 NOSE CONE - BNC-20N
- 1 FIN STOCK - BFS-20
- 1 ENGINE BLOCK - EB-20A
- 1 PARACHUTE KIT - PK-8
- 1 SCREW EYE - SE-2
- 1 SHOCK CORD - SC-1
- 1 LAUNCH LUG - LL-2A
- 2 WEIGHTS - NCW-1

**ADDITIONAL MATERIALS**

- Hobby Knife
- White Glue
- Ruler
- Sanding Material
- Sanding Sealer
- Enamel Paint (Spray)
- Sharp Pencil

**RECOMMENDED ENGINES**

- A8-3
- B6-4
- C6-5



**5** a. Trace fin patterns onto balsa sheet as shown in the fin layout.

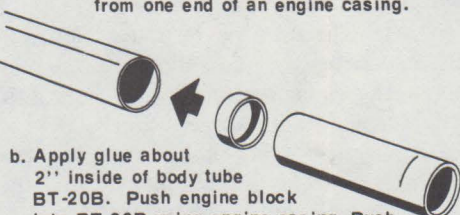


- b. Glue rudder fins onto wing fin as shown.
- c. After glue dries, sand all areas.
- d. Glue completed wing assembly to BT-20B body tube.

**1** a. Cut body tubes to specified lengths.  
 BT-20B - - 6 3/4"  
 BT-5 - - 2" (Make two).

b. Mark body tube BT-20B using the tube marking guide. Mark full length of tube with straight lines.

**2** a. Using a pencil, make a mark 1/4" from one end of an engine casing.

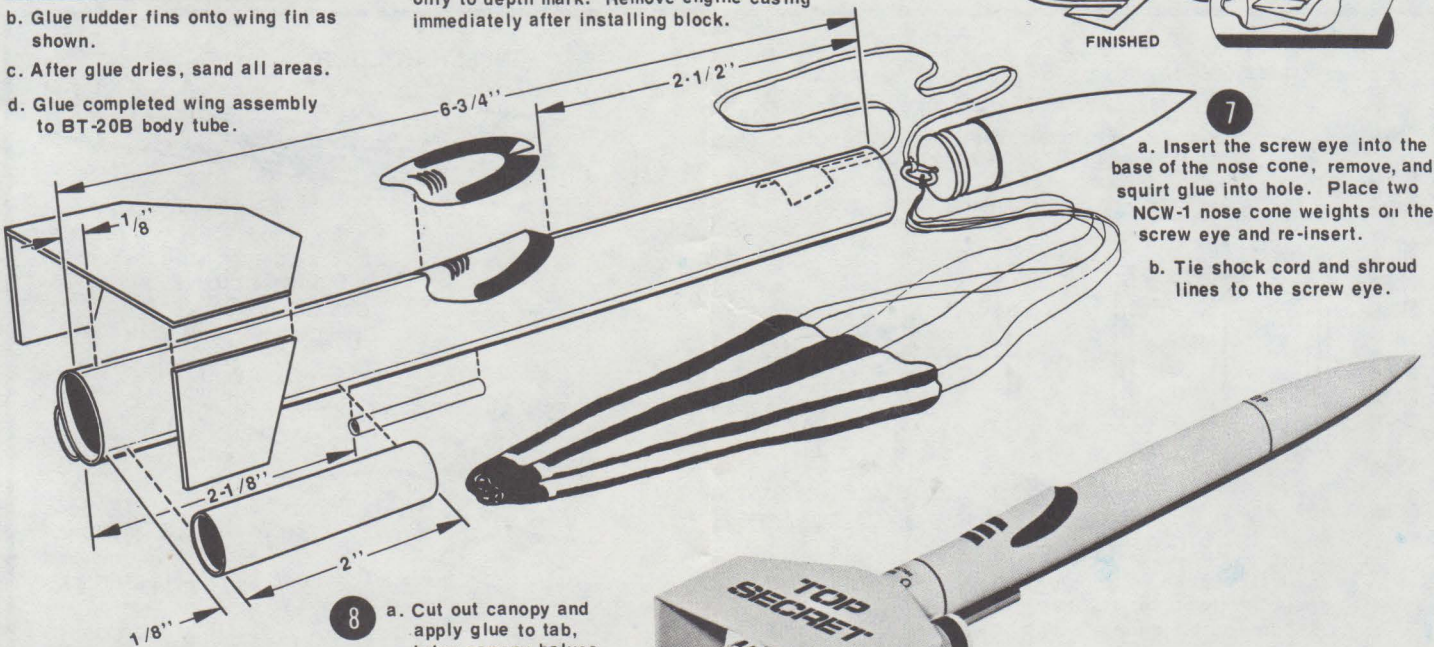


b. Apply glue about 2" inside of body tube BT-20B. Push engine block into BT-20B using engine casing. Push only to depth mark. Remove engine casing immediately after installing block.

**3** a. Glue BT-5 body tubes 1/8" from the end of the BT-20B body tube which contains the engine block.  
 b. Glue launch lug on BT-20B. 2-1/8" from rear.

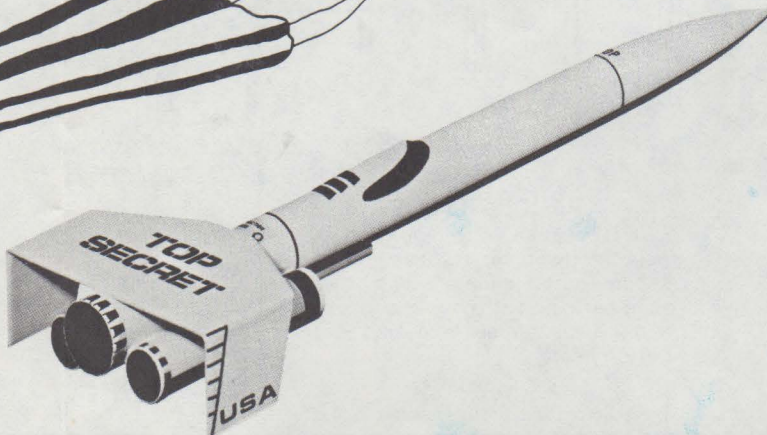
**4** Assemble parachute kit according to its instructions.

**6** Cut out and install shock cord mount.



**7** a. Insert the screw eye into the base of the nose cone, remove, and squirt glue into hole. Place two NCW-1 nose cone weights on the screw eye and re-insert.  
 b. Tie shock cord and shroud lines to the screw eye.

**8** a. Cut out canopy and apply glue to tab, bring canopy halves together over tab.  
 b. Glue canopy on top of BT-20B body tube 2-1/2" from front.



# HIGH THRUST ENGINES

EXPAND HORIZONS OF MINI-ROCKETRY *by Ed Brown*

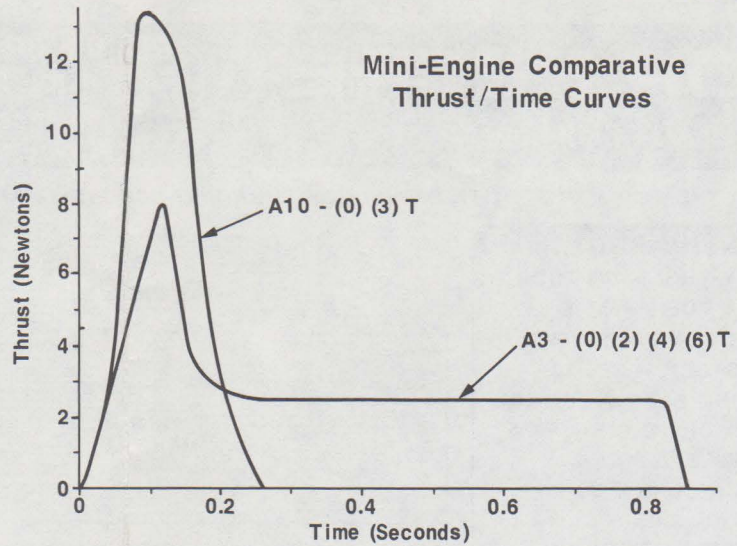
A whole new world of mini-rocketry was created with Estes' introduction of mini-engines in 1971. With their lower weight and smaller size (0.505 inches in diameter and 1.75 inches long), the minis powered smaller, more efficient birds to record-setting altitudes. Due to their lower thrust levels, they were ideal for more efficient boost-gliders. The minis in the lower total impulse classes were perfect for small launch sites. They also allowed the staging of A engines to be more efficient than the use of a single B engine. This has been a deciding factor in payload events. Model rocketeers have made mini-engines and mini-rocketry a permanent part of Model Rocketry.

Some areas in mini-rocketry were not quite filled by the original low thrust engines. Heavier models sometimes lost altitude with variations in their flight path caused by low thrust-to-weight ratios. Models with large frontal areas and/or low fineness ratios were subject to weathercocking (turning

into the wind) because of their low velocities. This could occur at any altitude, but weathercocking at low altitudes or at liftoff reduced total altitude much more than if it occurred at higher altitudes. Although they performed extremely well in staged payload birds, a lot of us felt that they would do even better if a high thrust booster were used to achieve faster initial stabilization.

The new A10-0T and A10-3T mini-engines fill the need for higher thrusts without increasing diameter or weight. They are the same size as the other T-series engines, but since they are core-burning, they have higher peak thrusts and higher average thrust levels

Mini-Engine Comparative Thrust/Time Curves

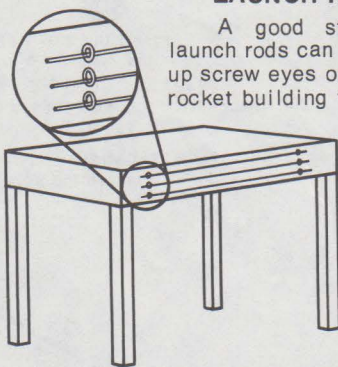


(effectively) than the A3 engines. These new engines are ideal for the new Goonybird series and the Estes' ready-to-fly plastic models. Mini-payloaders using staged A10-0T and A3-4T engines can set new standards of performance. Unusual models and some scale subjects may now be practical with the higher thrust levels. The A10 is of course ideal for most all of the Estes Mini-Brute kits. The new mini-engines have peak thrusts of 48 ounces (A3's have 28 ounce peak thrusts.), and higher average thrust levels than other mini-engines. Comparative time-thrust curves for the A3 and the A10 engines are shown above. Try 'em, you'll like them!

## THE IDEA BOX

### LAUNCH ROD STORAGE

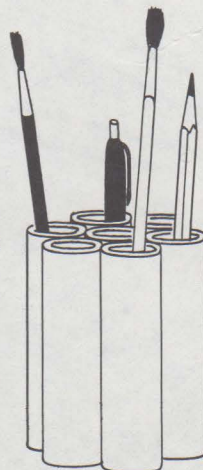
A good storage place for launch rods can be made by lining up screw eyes on the back of your rocket building table.



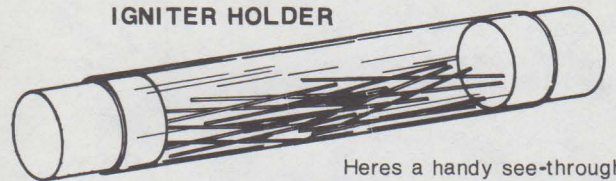
Danny Shryock  
Springfield, Illinois

### PENCIL HOLDER

If you have trouble finding pencils, pens, or brushes, about seven empty engine casings glued together in a honeycomb shape make a convenient and inexpensive holder.



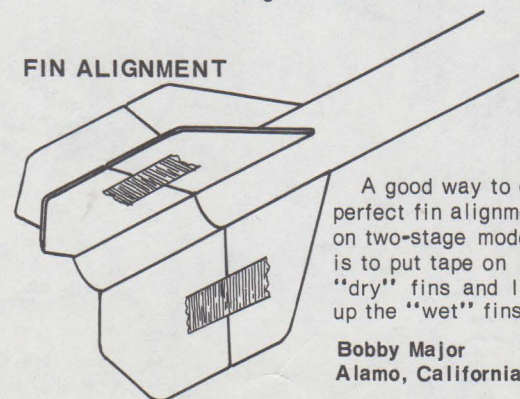
### IGNITER HOLDER



Here's a handy see-through igniter holder. All you need is a PST-20 clear body tube and two NB-20 nose blocks.

Dan Cheng  
Long Island, New York

### FIN ALIGNMENT



A good way to get perfect fin alignment on two-stage models is to put tape on the "dry" fins and line up the "wet" fins.

Bobby Major  
Alamo, California

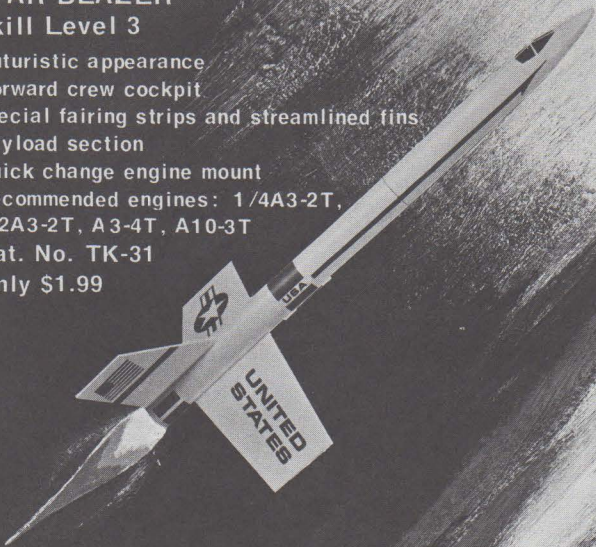
LAUNCH YOUR OWN DEEP SPACE EXPLORATIONS  
WITH THESE EXCITING MODELS!

# Exotic Designs

## STAR BLAZER

Skill Level 3

Futuristic appearance  
Forward crew cockpit  
Special fairing strips and streamlined fins  
Payload section  
Quick change engine mount  
Recommended engines: 1/4A3-2T,  
1/2A3-2T, A3-4T, A10-3T  
Cat. No. TK-31  
Only \$1.99



## STARSHIP VEGA

Skill Level 3

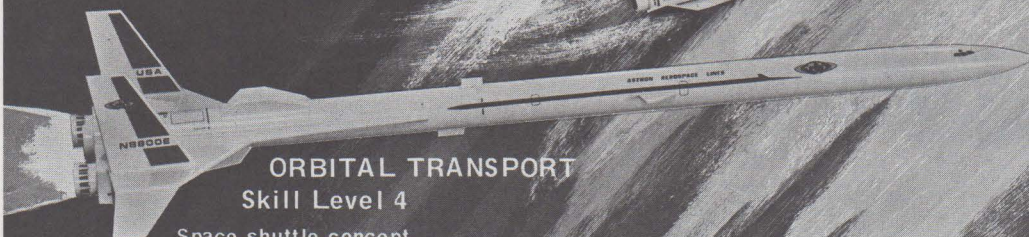
Deep space design  
Futuristic appearance  
3-Color decal sheet  
Die-cut fins  
Foam body wrap-on  
Simulated landing shocks  
Recommended engines: B4-2,  
B6-4, C6-5  
Cat. No. KC-4  
Only \$4.75



## ORBITAL TRANSPORT

Skill Level 4

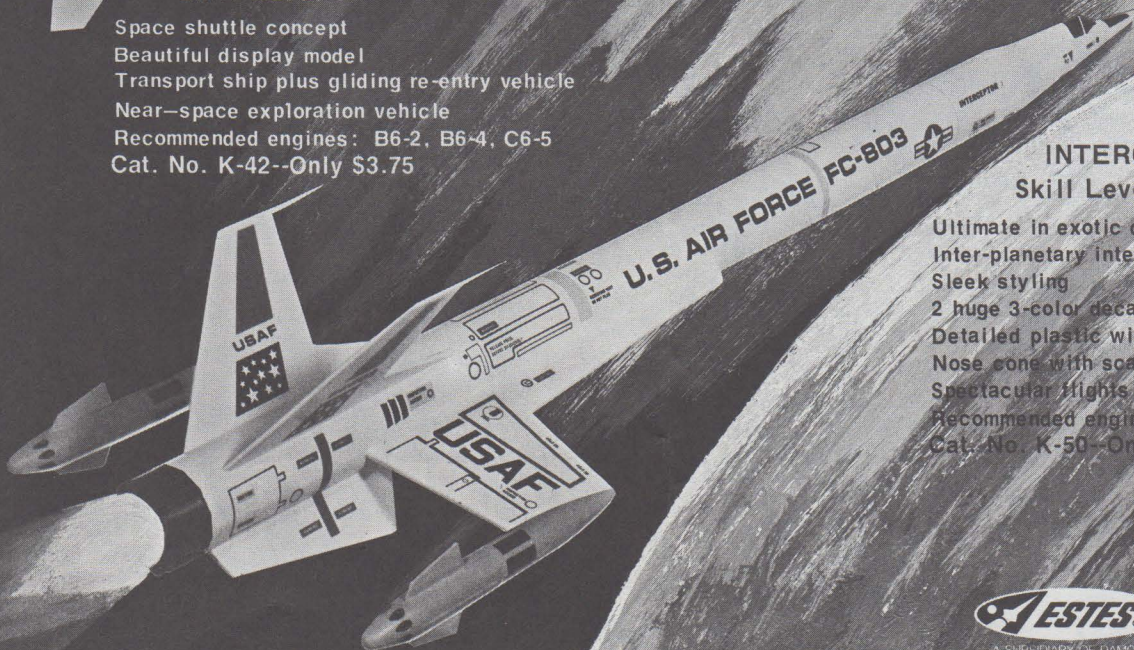
Space shuttle concept  
Beautiful display model  
Transport ship plus gliding re-entry vehicle  
Near-space exploration vehicle  
Recommended engines: B6-2, B6-4, C6-5  
Cat. No. K-42-Only \$3.75



## INTERCEPTOR

Skill Level 3

Ultimate in exotic design  
Inter-planetary interceptor  
Sleek styling  
2 huge 3-color decal sheets  
Detailed plastic wing pods and tail cone  
Nose cone with scale-like canopy  
Spectacular flights  
Recommended engines: B4-2, B6-4, C6-5  
Cat. No. K-50-Only \$5.25



ESTES INDUSTRIES  
A SUBSIDIARY OF DAMON  
PENROSE, COLO. 81240

# Sounding Rockets

## SANDHAWK Skill Level 2

"D" powered  
Ultra-detailed vehicle  
Super scale design  
Features plastic payload  
section, nose cone, & fins  
30 inches tall.  
Dual parachute recovery  
Recommended Engines:  
D12-5 or B4-2 & C6-3  
using EM-2050 adapter  
(not included)  
Cat. No. K-51  
Only \$3.00

## AEROBEE 300 Skill Level 3

Vehicle for space  
experiments during the  
1950s and 1960s  
Accurately detailed  
Payload compartment  
Authentic decals  
High performance design  
Recommended engines:  
1/2A6-2, A8-3, B6-4,  
C6-5  
Cat. No. K-17  
Only \$2.00

## ARCAS Skill Level 3

Scale model of the  
Atlantic Research  
Corporation vehicle-  
ARCAS decal  
Easy-to-assemble  
Precisely detailed  
Parachute recovery  
High performance  
Recommended  
engines: A8-3,  
B6-4, C6-5  
Cat. No. K-26  
Only \$2.40

**"MODEL ROCKETRY'S MOST AUTHENTIC SCALE MODELS!"**

## HONEST JOHN Skill Level 3

US Army ballistic  
missile  
Historic replica  
Highly detailed  
Authentic decals  
Great performance  
Recommended  
Engines: 1/2A6-2,  
A8-3, B4-4, B6-4,  
C6-5  
Cat. No. K-27  
Only \$2.25

## V-2 Skill Level 3

Historic replica  
Accurately  
detailed  
Easy to build  
World War II  
vintage  
Recommended  
engines:  
1/2A6-2, A8-3,  
B6-4, B14-5,  
C6-5  
Cat. No. K-22  
Only \$2.75

## MINI-BOMARC Skill Level 3

Authentic Canadian  
Air Force decal  
Scale surface-to-air  
interceptor missile  
Die-cut fins  
Accurately detailed  
Authentic nacelle  
nose cones  
Recommended  
engines: 1/2A3-2T,  
A3-4T, A10-3T  
Cat. No. TK-5-Only \$2.49

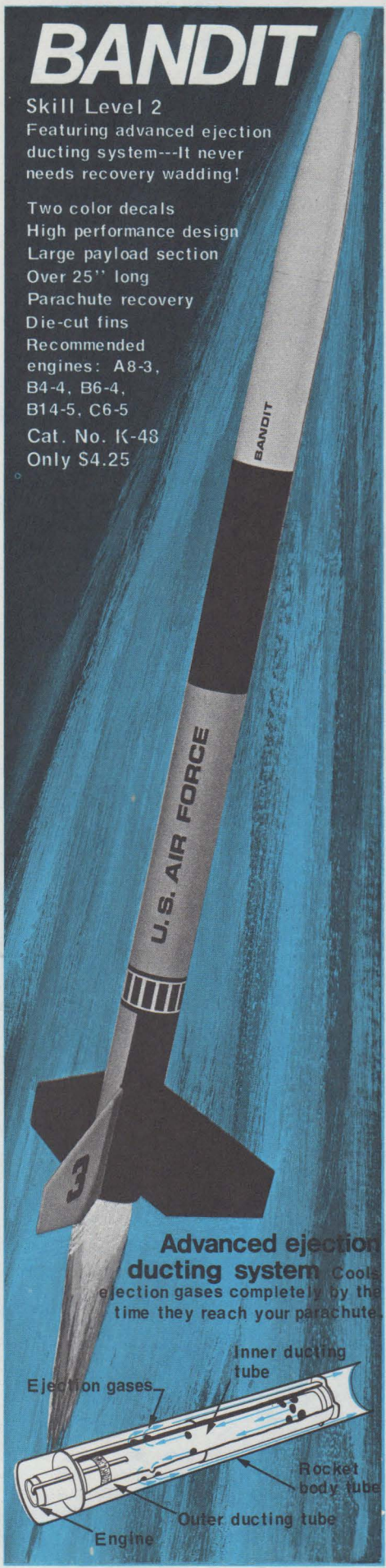
# MILITARY VEHICLES

# BANDIT

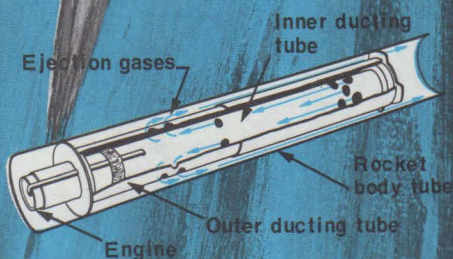
Skill Level 2

Featuring advanced ejection ducting system---It never needs recovery wadding!

- Two color decals
- High performance design
- Large payload section
- Over 25" long
- Parachute recovery
- Die-cut fins
- Recommended engines: A8-3, B4-4, B6-4, B14-5, C6-5
- Cat. No. K-48
- Only \$4.25



**Advanced ejection ducting system** Cools ejection gases completely by the time they reach your parachute.



# Designer's Special

Features more than 20 different parts

Perfect for constructing your original designs

Real surprise bag of miscellaneous parts and assorted supplies

Includes many body tubes of various lengths and diameters



- Balsa fin stock
- Payload Sections
- Assorted stage couplers
- Centering rings
- Shroud line
- Nose cones
- Model marking decal
- Shock cord
- Plastic body tubes

Quantities of some parts are limited - substitutions of equal value will be made when necessary.

At least a \$5.00 value for only \$1.95, Cat. No. 01465

# FREE KITS

Offers expire December 31, 1973.

## Your choice with \$5.00 order

**Birdie**  
(Skill Level 1)



- Flying shuttlecock
- Featherweight recovery
- Spin stabilization

**Sprite**  
(Skill Level 3)



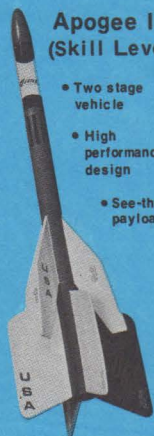
- Futuristic design
- Quick change engine mount
- Less than 6" tall

My order is over \$5.00. Please send me: (check one)

- Birdie Cat. No. TK-44  
OR  
 Sprite Cat. No. K-15

## Your choice with \$10.00 order

**Apogee II**  
(Skill Level 3)



- Two stage vehicle
- High performance design
- See-through payload section

**Nighthawk**  
(Skill Level 4)



- Pop-pod boost glider
- Sleek design
- Programmable glide

My order is over \$10.00. Please send me: (Check one.)

- Apogee II Cat. No. K-5  
OR  
 Nighthawk Cat. No. K-34

## Your choice with \$15.00 order

**Cobra**  
(Skill Level 2)



- Three engine cluster
- Payload section
- Powerful lift-off

My order is over \$15.00. Please send me: (Check one.)

- Cobra Cat. No. K-10  
OR  
 Farside Cat. No. K-12

**Farside**  
(Skill Level 3)



- Three stage vehicle
- Ultra-high altitude probe
- Multi-purpose payload carrier

**Important Notice:** Quantities of some free kits are limited. When necessary, substitutions will be made. HURRY! ORDER TODAY!!



# ORDER FORM

Dept. MRN-L

A SUBSIDIARY OF DAMON

DATE: \_\_\_\_\_ Age \_\_\_\_\_

TYPE OR PRINT PLAINLY IN INK

UPS is available in my area.

For Office Use Only

Amt. Recd. \_\_\_\_\_  
 Checked By \_\_\_\_\_  
 No. Labels \_\_\_\_\_  
 No. Pkgs. \_\_\_\_\_  
 P \_\_\_\_\_  
 N/F \_\_\_\_\_

Your Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
(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	<input type="checkbox"/>	#1447	EAC Membership Kit	\$2.00	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Save 45¢ for Handling.  
On Orders Over \$6.00

### MOVED RECENTLY?

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

NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_  
 STATE \_\_\_\_\_ ZIP \_\_\_\_\_

### IMPORTANT READ THIS FIRST

Starting April 16, 1973 Estes Industries will begin shipping all mail orders originating east of Colorado by United Parcel Service (UPS). This means faster service for Estes rocketeers living east of Colorado. To take advantage of UPS service, your order must weigh at least one pound and your address must include a house number and a street name. Check the yellow pages of your telephone directory to see if your area is serviced by UPS. Remember, you must live east of Colorado, UPS is not yet available to the west.

### CATALOG REQUESTS

Send your friends a catalog.

Please do not write in this space.

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

Mail to:

**ESTES INDUSTRIES**  
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 below. 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) Allow	8 oz. to				
	1 lb.	2 lbs.	3 lbs.	4 lbs.	5 lbs.
	\$ .70	\$ .88	\$ 1.33	\$ 1.93	\$ 2.48
	\$ 3.13	\$ 3.73	\$ 4.33	\$ 4.93	\$ 5.53

For orders 7 ounces or less, send 8¢ 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.

Friend's Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Friend's Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

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# JOIN NAR



The National Association of Rocketry is a must for the serious rocketeer. Membership includes insurance, competition sporting license, membership card, NAR decals, and subscription to the publication, MODEL ROCKETEER. For further details write to the National Association of Rocketry, P.O. Box 178, McLean, Virginia 22101.

## Did You Go To Camp This Summer?

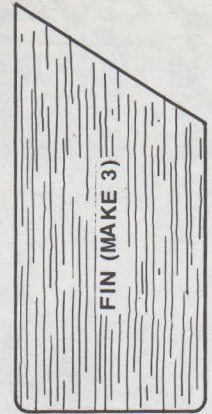
Quite a few camps are now offering model rocketry as an activity. We have just published a new guide for model rocketry as a camp program. If you will send us your camp director's name and address, we will send a free copy of this new guide to him and a new Estes iron-on insignia to you. Perhaps he'll start a model rocketry program in your camp!



# PENCIL ROCKET

Skill Level 1

HONORABLE MENTION  
DESIGN OF THE MONTH  
BY BARRY REED Miami, Florida  
ESTES INDUSTRIES ROCKET PLAN NO 79



★ BUILD THE PENCIL ROCKET WITH ESTES HIGH PERFORMANCE PARTS AND ACCESSORIES

**PARTS LIST**

- 1 BODY TUBE – BT-20
- 1 NOSE CONE – BNC-20R
- 1 FIN STOCK – BFS-30
- 1 ENGINE BLOCK – EB-20A
- 1 PARACHUTE KIT – PK-12
- 2 LAUNCH LUGS – LL-2A
- 1 SCREW EYE – SE-2
- 1 SHOCK CORD – SC-1
- 1 EMPTY ENGINE CASING
- 1 SHEET FOIL – 2-1/2" square sheet

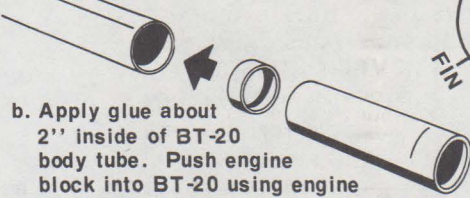
**ADDITIONAL MATERIALS**

- Hobby Knife
- White Glue
- Ruler
- Sanding Material
- Sanding Sealer
- Enamel Paint (Spray)
- Sharp Pencil

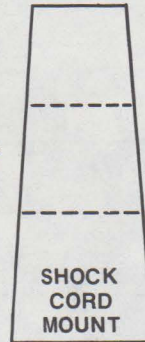
**RECOMMENDED ENGINES**

- A8-3
- B6-4
- C6-5

**1** a. Using a pencil, make a mark 3/8" from one end of an engine casing.

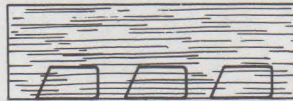


b. Apply glue about 2" inside of BT-20 body tube. Push engine block into BT-20 using engine casing, push only to depth mark. Remove engine casing immediately after installing block.



**2** a. Mark BT-20 body tube using the tube marking guide. Mark full length of tube with straight lines.

b. Trace fin patterns onto balsa sheet as shown in the fin layout.



c. Glue fins on each fin guideline, make sure they extend straight away from the body tube.

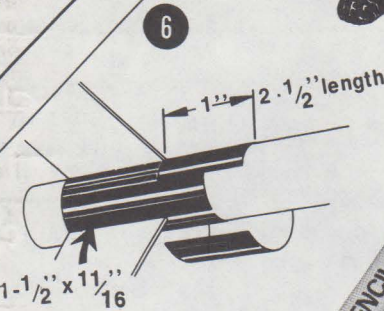
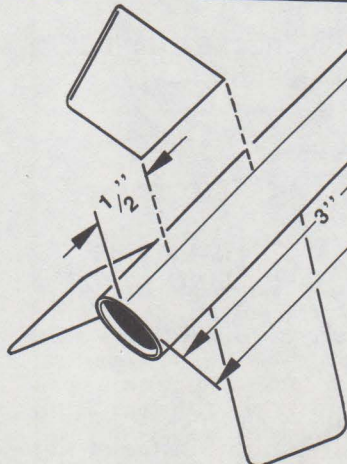
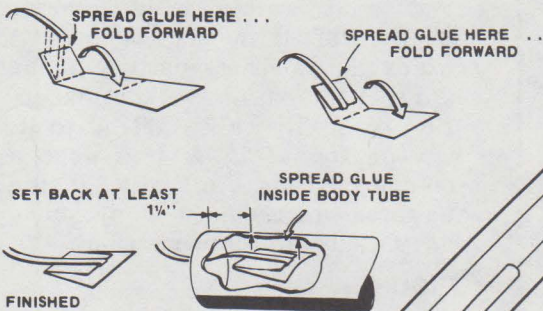
d. Glue launch lugs as shown.

**4** a. Insert the screw eye into the base of the nose cone, remove, and squirt glue into the hole. Re-insert the screw eye.

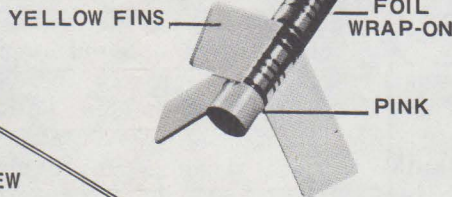
b. Tie shock cord and shroud lines onto the screw eye.

**3** Assemble parachute kit according to its instructions.

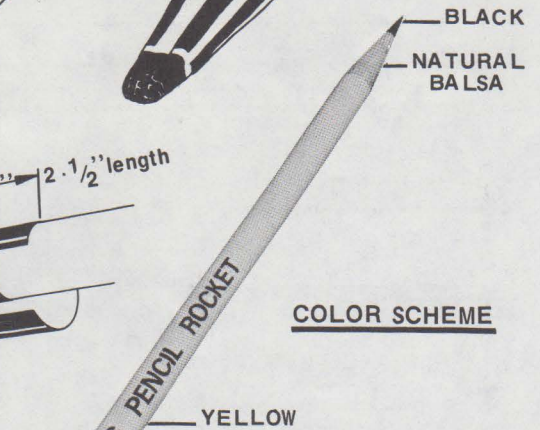
**5** Cut out and install shock cord mount.



**FOIL WRAP-ON**  
Cut foil wrap-on into:  
3 – 1-1/2" x 11/16" strips  
1 – 1" x 2-1/2" strip  
FOIL – (Silver or Gold)



**COLOR SCHEME**



**"Enter the Design of the Month Competition"**

Have an idea for an original design? Enter our DOM competition today! See page 78 of our current Estes catalog (#731) for details. Keep those entries coming, and maybe you will be our next winner!

# Finders, Keepers

Part I

by Wayne Kellner Estes R&D Dept.



First installment in a three part technical report on model rocket recovery – techniques, types, and tips. In this article we look at a simple, but effective method for finding your rockets.

Before reading further, please check the appropriate box or boxes below.

- My last name is Rockefeller.
- My mailing address is Fort Knox, Kentucky.
- I just inherited \$1,000,000 provided I spend it all on model rockets.
- None of the above.

If you checked one or more of the first three boxes, go out and buy some more rockets. This article is definitely not for you. But, if you're like me and thousands of other rocketeers, "a rocket found is a rocket earned" (apologies to Ben Franklin).

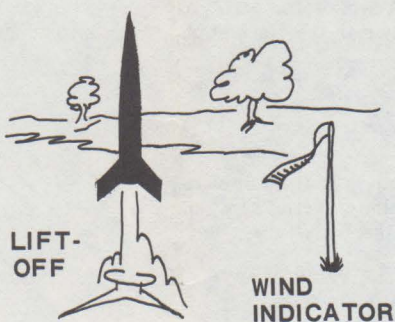
No rocketeer enjoys spending many hours building and finishing a supernifty model only to lose it on its first flight. That's really grimsville. Perhaps you are about to launch an unusual payload or instrumented device. Or maybe you've just blown your life savings on a model rocket to land on Mars. Whatever the case, losing them to the Great Golden Chute Hook in the Sky can be expensive in time and materials. Well, don't despair

'cause we're gonna lay some suggestions on your grey matter to help you find those rockets and possibly have more fun at the same time.

## LINE SEARCH METHOD

The military "line search" method is the most reliable way to locate a rocket's exact touch-down location. Here's how it works. Before launching, you should know in which direction the wind will be drifting your bird during recovery. Look for obvious wind direction signs such as movement of trees, tall grasses, or smoke. You might even wish to construct a simple wind direction indicator as shown in Figure 1. Attach an 18" long, brightly colored crepe paper streamer to a 3

FIGURE 1



foot wooden dowel. Place this into the ground near your launch pad. The streamer will keep you constantly informed as to wind direction and speed.

Should you be launching multi-stage rockets or "D"-powered birds, try flying a wind marker rocket first. It is not unusual for the wind to be traveling in different directions and speeds at various low altitudes. Select an Alpha-size rocket, preferably something you can afford to lose. Launch it with a B or C engine. Watch the rocket closely to get an idea of changes in winds aloft and recovery drift conditions for your flying site. Once you have flown the marker rocket you can determine exactly where to place your launch site. This will greatly increase your chances of keeping all rockets within your launch and recovery area. Then as in Figure 1, pre-flight and launch your rocket as usual.

FIGURE 2

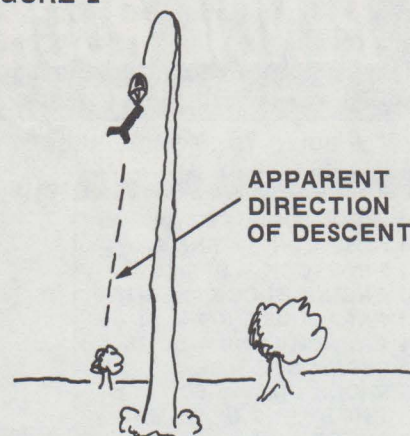
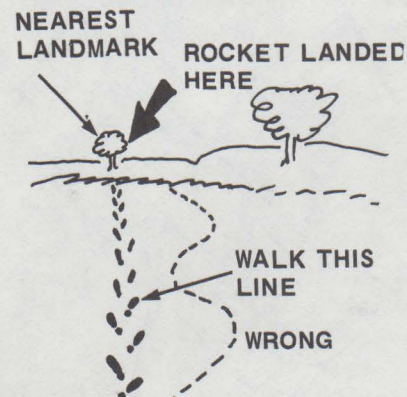


Figure 2 shows the rocket's flight path to the point of parachute deployment. Watch it very closely now. Try to anticipate which direction it will be drifting as it nears the ground. As the rocket finally lands, select a prominent landmark as close to the point of touchdown as possible. This might be a tree, bush, telephone pole, fence post, outhouse, or oil well as shown in Figure 3. If there isn't any landmark close by, select something farther in the distance. But the landmark must be in a straight line between you and the rocket.

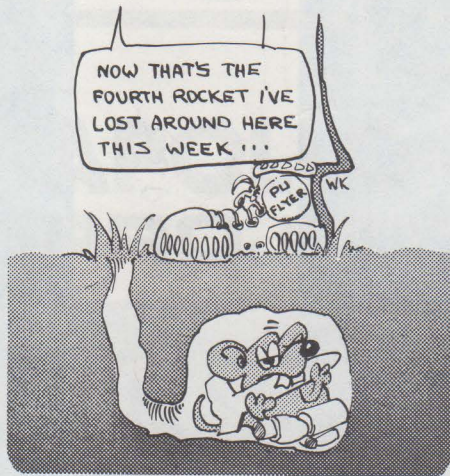
Once you have chosen that landmark, DON'T take your eyeballs away for even a second. Keep them peepers glued right on and start walking. Walk as STRAIGHT a line as you can towards the landmark until reaching the rocket. Almost without exception, you will walk right up to it. Or, on top of it as I've done a couple of times. An Estes Cineroc camera sure makes a funny sound as it is being stepped upon!

FIGURE 3



Should your rocket land behind a hill or other obstacle, merely select a landmark where the

rocket disappeared from view. Now, walk towards that point. If you reach the landmark without sighting the rocket, select a second landmark and continue walking. The second landmark MUST also be in line with the direction you have been traveling. Continue walking until you locate the rocket.



Keep one additional thing in mind. Distances are very deceiving to the eye. Your rocket will always be a bit closer than you think. Our next article tells you how to find your way back to the launching site, so try not to get lost in the meantime!

**SUMMARY**

Let's summarize briefly the line search recovery method:

- 1. Check wind direction to determine which way rocket will drift during recovery descent.
- 2. Pre-flight and launch in the normal manner.
- 3. Follow rocket carefully during recovery phase of flight.
- 4. Select a prominent landmark nearest the touchdown point.
- 5. Glue your eyes to that spot and walk as straight a line as possible towards the landmark until reaching your rocket.
- 6. An unusual crunching sound may be your rocket.
- 7. Happiness is finding your rocket.

Next issue, Part II, Rocket Recovery Tips. In this article we will explore everything from how to pack and modify parachutes to which paint colors are best for tracking and recovery. Don't miss it!

# "Rocketry Project Contest" Winners

This contest brought in many fine entries. In fact, judging was hard because of the excellence of the entries. The final results are in, and we are happy to announce the winners. Each winning entry listed below has earned its author a \$10 gift certificate.

William C. Arrants, St. Petersburg, Florida, ("Model Boat Propelled by Rocket Power")

Jim Babb, Cleveland, Ohio, ("Night Launching")

Steve Behrends, Highland Park, Illinois, ("Piston Staging")

Bob Bruce, Granada Hills, California, ("Multi-Staging Scale Models")

Gary Cole, Overland Park, Kansas, ("The Effect of High Speed Acceleration on Algae")

Charles Compton, Chesterfield, Virginia, ("Effect of Nose Cone Shape on Drag")

Vince Draa, Frankfurt, Germany, ("Effects of Model Rocket Flight on The Learning Process")

Doug Fuller, Las Vegas, Nevada, ("New Use for the Cineroc")

Terry Gordon, Baltimore, Maryland, ("Effect of Dramamine on Experiment to Determine Method of Reducing Effect of Model Rocket Launch on Learning Process")

Bill Gowan, Ellenboro, North Carolina, ("Effect of Rocket Launch on Unhatched Chicken")

William C. Griffiths, West Coxsackie, New York, ("Study of Acceleration Effects")

John Langford, Atlanta, Georgia, ("Cluster Ignition by Flashbulbs")

John Langford, Atlanta, Georgia, ("Lifting Body and Gliding Booster Vehicle Research")

Sid Martin, Auburn, Nebraska, ("Comparison of Recovery Systems")

Michael Pendley, Odenville, Alabama, ("A Study of Air Currents")

Ed Reilly, Niagara Falls, New York, ("Study of Wind Drift")

Martin Rubins, Spring Valley, New York, ("A Rocket Powered Car")

William R. Tantlinger, Jr., New Florence, Pennsylvania, ("A Process to Increase Lifespan of Tumble and Featherweight Recovery Models")

Craig Towner, Columbia, Maryland, ("A Study of Effects of Different Sized Parachutes on Flight Duration")

Frank Vaughan, Irving, Texas, ("Wind Speeds at Different Altitudes")

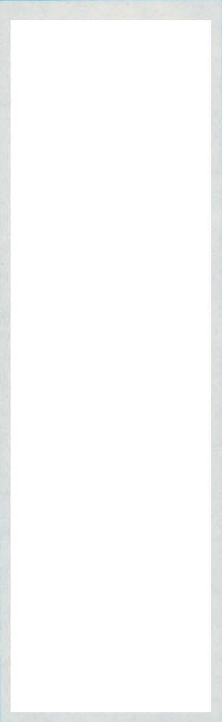
Barry Wilhelm, Peninsula, Ohio, ("Conical Shrouds for Stability")

## ROCKETOONS

Kevin McCabe  
Bensenville, Illinois

Bryan Pinnick  
Bicknell, Indiana

Greg Eckenrode  
Huntingdon, Pennsylvania



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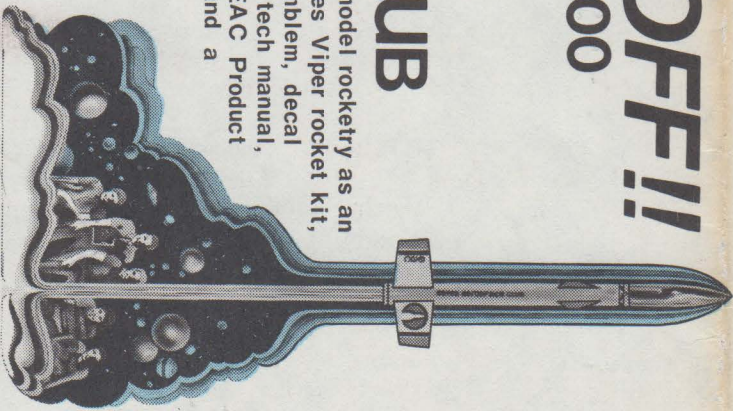
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Enjoy the fun and excitement of Estes model rocketry as an official EAC rocketeer. Membership includes Viper rocket kit, ID card, membership certificate, iron-on emblem, decal sheet, range box stickers, EAC stationery, tech manual, subscription to MODEL ROCKET NEWS, EAC Product Bulletin and Newsletter, Estes catalog, and a variety of exclusive club services.

Lift-off for fun! Join today!  
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on your MRN Order Form.



## A Hoppin' New Contest

How high will a Cloud Hopper "hop" with the Mini-Brute A3-4T engine?

To make things fair for everyone, let's assume a Cd of 0.6 and that the Cloud Hopper weighs two ounces without engine. Use the "Normal Procedure" with the Estes Altitude Computer to determine the altitude the rocket will reach.

The first two correct answers received from each state, based on postmarks, will earn the rocketeers who submit them their choice of a new Goonybird. On your entry form put down (1) the altitude achieved with the A3-4T engine, (2) your



choice of a new Goonybird in case you are a winner, and (3) your name and complete address (including zip code). Send your entry to Cloud Hopper Contest, Estes Industries, Penrose, Colorado 81240. Entries must be received before October 1, 1973 to be eligible to win. Good luck!