MODEL ROCKET NEWS

Vol. 13, No.4
Nov./Dec. 1973

Featured In This Issue:

Skylab Astronauts To Study
"COMET OF THE CENTURY"

Photo of 1970 Comet Bennett. It is expected that Comet Kohoutek will be brighter than Comet Bennett. (Photo courtesy of Alan McClure and Science News)

Gerald Carr, Edward Gibson, and William Pogue, the astronauts of Skylab 4, the final manned mission in the Skylab series, are taking advantage of a rare opportunity to study a major comet. This unique comet is Comet Kohoutek. The comet is properly called Comet Kohoutek 1973f, the sixth comet discovered in 1973. It was discovered photographically on March 7, 1973 at Hamburg, West Germany, by astronomer Dr. Lubos Kohoutek.

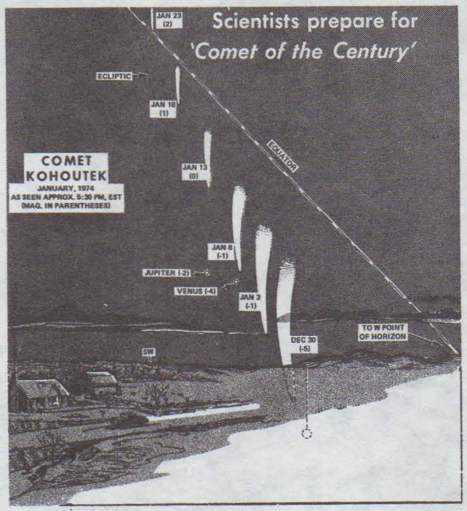
While current theories suggest that the nucleus of a comet is a sort of ball of "ice" (probably frozen water, methane, and ammonia), with particles of dust, much more information is needed to enable scientists to get an accurate picture of what comets are really made of and the processes which produce the tail of the comet. This nucleus may be a few miles across.

A comet may have no tail, one of two types of tails, or both types. The pressure of solar radiation is believed to cause the dust tail to spread out smoothly, be gently curved, and tinted yellowish from the comet's nucleus. The plasma tail is straight, often appears bluish, and is shaped by the solar wind.

Comet Kohoutek will probably be the most visible comet of this century, outshining even the famous Halley's Comet duc to reappear in 1986. Present information indicates that this comet is probably a long-period comet with a period of 10,000 years or longer.

Brightness of Comet Kohoutek will probably be between -2 and -10. This will be very bright as the moon's brightness is -12.7. Observation with the naked eye should be possible in November prior to sunrise. After the comet passes perihelion (closest approach to the sun) on December 28, evening viewing in the southwestern sky about twilight will be possible. Although the full moon on January 8 may interfere with viewing, after about January 10 and through January 20, viewing should be good.

Skylab observations of the comet are expected to be one of the primary goals of the Skylab 4 mission. The primary instruments which are currently planned for use in studying Comet Kohoutek are the white light coronagraph, the ultra-violet spectrograph and several others. One unique feature planned for the Skylab observations include EVA (extra-vehicular activity), using the multi-filer coronagraph and the fast ultra-violet electronographic camera.



View of southwestern sky in early January 1974. (Drawing courtesy of Science News from original by Dr. Stephen P. Maran, head of Operation Kohoutek at NASA's Goodard Space Flight Center.)

Kohoutek Observing Schedule

Dates	Time	Location	Method
Dec. 1-15	1-1/2 - 2-1/2 hours before sunrise	Southeast, near horizon	Naked eye (perhaps best period for a.m. view)
Dec. 15-28	1hour before sunrise until sunrise - will get closer to sun each morning	Southeast near sun	Naked eye Be careful not to look at sun
Dec. 29 - Jan. 15	Sunset to couple hours afterwards	At first, in southwest near where sun sets, but higher in sky each night	Naked eye Best period: closest to Earth Jan. 15
Jan. 15-30	Early evening after twilight ends	High above western horizon	Naked eye, binoculars
Feb. 1-15	Evening after twilight ends - highest at midmonth, then will be lower each night at sunset	High above western horizon	Binoculars very helpful, still visible to naked eye
Feb. 15-30	Evening after twilight	Lower in western sky	Binoculars, small telescopes needed

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NOTES FROM VERN

NARAM-15

This year's national model rocketry championships were held in Columbus, Ohio from August 5 through August 10 on the campus of Ohio State University. More than 200 rocketeers from across the nation attended the big meet hosted by the Columbus Society for the Advancement of Rocketry and the Upper Arlington Rocket Club.

NARAM, by the way, stands for National Association of Rocketry Annual Meet. The NAR is the official American organization for the sanctioning of model rocketry competition and record attempts. NARAM-15 was the 15th annual national model rocketry championships.

Although I initially intended to write a detailed article for NARAM-15, I have decided instead to attempt to capture the thrill and excitement of this year's NARAM through the use of a photo montage. I hope you enjoy it.

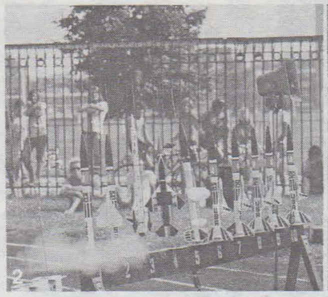
Although filled with activity, the week of NARAM goes by extremely quickly. It's Friday and time for the Awards Banquet before you know it. This year's banquet was held at the

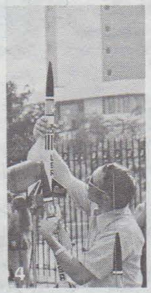
beautiful Center of Tomorrow on the OSU campus. Although everyone did not go home a winner, everyone did go home a better well-rounded rocketeer. The inter-action and exchange of ideas between contestants is an extremely valuable experience which will be recalled by all who attended for years to come.

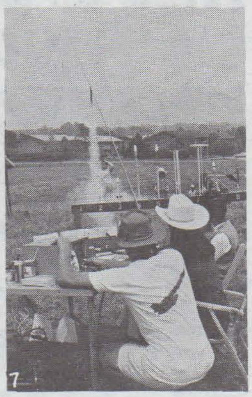
No doubt several winners from this year's NARAM will represent the United States at the Second International Model Rocketry Championships presently scheduled for Dubinca, Czechoslovakia in the fall of 1974. Events like NARAM and the international meet help to expand the wide world of model rocketry, as they provide important goals for the serious American rocketeer. Perhaps we will see you next year, at NARAM-16 or in Dubinca for the 1974 Internats.

For information on joining the National Association of Rocketry write:

NAR Headquarters
P. O. Box 178
McLean, Virginia 22101



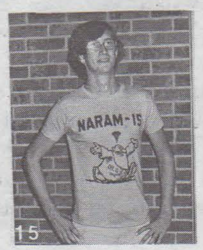



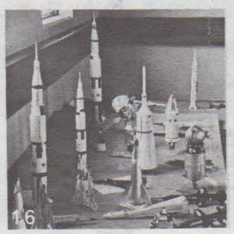












Special thanks goes to Jan Blickenstaff, Tom Pastrick, Model Rocketeer Magazine, and the National Association of Rocketry for providing us with a number of great pictures.

1. NARAM-15 Winners
2. Opening ceremonies
3. Air Force Museum Tour/B-70 prototype.
4. Bill Simon, Estes R & D
5. NARAM competitors range box.
6. Dane Boles activates Cineroc/Omega with parasite boost glider.
7. NARAM launch complex/egg loft event.
8. Boost glide event.
9. Vern preps "D" powered Red Max.
10. Estes Range Store and exhibit area.
11. Static test OSU Aero Lab.
12. Egg loft event.
13. Tihomir Marjanac "Tihe" of Yugoslavia preps tissue wing boost glider.
14. Safety Check-in.
15. Official meet t-shirt
16. Plastic Model Judging.
17. Tracking Station
18. Al Lindgren (NAR President) preps Pan American Clipper.

BRAIN BUSTER ANSWERS & KEY

G	C	A	R	B	O	C	Y	B	I	G	B	E	R	T	H	A	W	R	N	O	C	L	A	F	L	S	X
E	B	I	R	D	I	E	L	K	X	W	V	I	O	J	M	O	B	A	N	D	I	T	V	I	W	T	N
M	E	A	E	F	C	T	S	O	U	V	T	H	G	K	L	I	A	Q	S	T	U	S	T	D	Y	A	I
I	T	G	H	O	R	N	N	A	U	Z	W	A	U	V	M	I	N	I	B	E	R	T	H	A	Z	R	G
N	A	I	R	P	E	I	S	C	B	D	O	E	E	N	O	P	S	I	H	G	L	R	C	T	K	S	H
I	J	Y	K	I	L	Q	K	D	E	F	H	R	E	K	I	R	H	S	B	E	F	E	D	N	E	H	T
T	G	L	M	E	P	A	Y	T	B	C	I	O	X	A	M	D	E	R	J	O	K	A	J	I	I	I	H
I	M	A	V	N	O	D	H	A	O	N	W	B	P	O	V	U	E	O	G	L	M	K	N	R	R	P	A
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N	Z	I	H	N	X	S	K	D	R	I	F	T	E	R	C	R	B	S	U	W	A	L	Q	C	Y	G	X
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P	M	C	R	A	M	O	B	U	E	Q	O	N	E	K	G	S	C	R	E	A	M	E	R	I	A	T	Z
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P	O	G	I	A	M	E	R	C	U	R	Y	R	E	D	S	T	O	N	E	C	E	O	D	W	V	R	H
O	O	H	U	K	R	M	N	S	T	D	E	A	L	E	D	I	S	R	A	F	R	E	B	X	Y	E	O
O	M	I	Q	J	L	S	V	S	U	E	T	M	I	D	G	E	T	E	D	P	N	O	D	A	Z	P	J
N	O	N	S	Y	X	W	N	C	G	L	I	B	S	I	N	H	G	F	O	T	F	G	M	H	F	I	T
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O	R	B	I	T	A	L	T	R	A	N	S	P	O	R	T	Z	A	C	E	N	E	E	T	F	I	F	X

NAMES

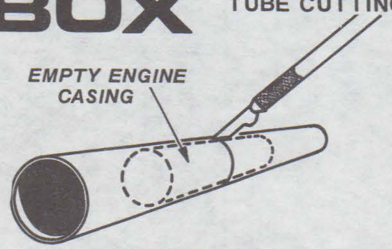
Alpha	*Saros*
Birdie	*Apogee*
Quasar	*Delta*
Scout	*Falcon*
Streak	*Goblin*
Vampire	*Gyroc*
Bandit	*Interceptor*
Beta	*Saturn*
Cobra	*Sprint*
Demon	*Bomarc*
Patriot	*Trident*

The correct answer for the Brain Buster Contest featured in our September/October MRN (Vol. 13 No. 3) is 22 rocket names or a total of 72 for the entire puzzle. Fifty lucky rocketeers have received free Interceptor kits for their winning guesses. Congratulations!

Note: A list of all winners is available upon request from Estes Industries.

THE IDEA BOX

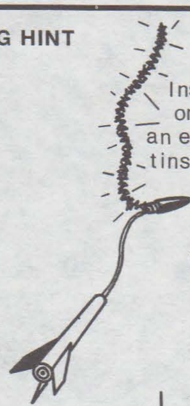
TUBE CUTTING HINT



When cutting BT-5, 20, and 50 body tubes, insert empty engine casings in order to avoid damaging body tube.

Mark James
Bismarck, N. Dakota

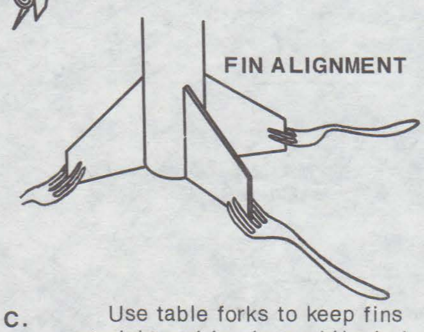
EASY-TO-SEE STREAMER



Instead of using a streamer on small rockets, try using an equal length of flameproof tinsel garland, the kind used in decorating Christmas trees. Attach the same way as regular streamer material.

Alan Watanabe
Gardena, California

FIN ALIGNMENT



Use table forks to keep fins straight and in place while drying.

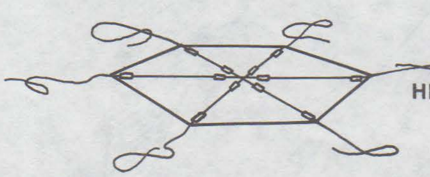
Mark Volpe
Stow, Ohio

KNIFE HOLDER

A small cork makes a very nice model knife holder when glued to your work bench or table.

Jimmy Kyzer
Winnsboro, S. C.

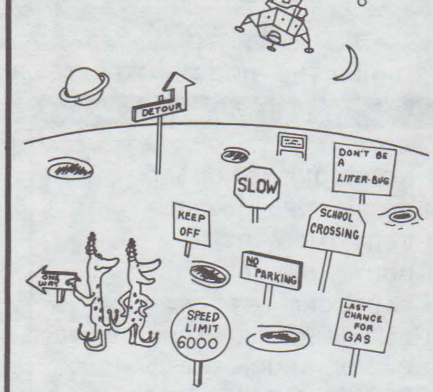
HIGH STRENGTH PARACHUTE



John R. Huerkamp
New Orleans, La.
NAR State Director La./Ark.

1. Cut out parachute per instructions. You will need additional shroud line and tape strips.
2. Cut new shroud lines that are long enough to completely cross over the 'chute and still leave the desired shroud line length.
3. Apply tape strips at the corners as usual, and also apply tape strips near the center of the 'chute. NOTE Do not apply tape strips at the center of the 'chute because this will make the 'chute hard to fold.
4. Tie the shroud lines together as usual.

Mike Edick
W. Brookfield, Mass.



"There! That should make them feel at home."

"DOM Winners"

AUGUST 1973 - First Place. T. C. Hoffeldeu, Sylvania, Ohio ("Andromeda IV"). Honorable Mention: K. Scott Keen, Bogaut, Georgia ("Skywriter"). Robert Martinez, Norfolk, Virginia ("Viking"). Steve Ingalls, Columbia, Missouri ("TIA"). James Hopkins, Sherman, Texas ("Radio Telemetry Transmitter"). Mark Coniglio, Omaha, Nebraska ("Deep Space Interceptor"). Ken Gamen, Westwood, Massachusetts ("Interplanetary Transport IV"). James E. Tusing, Hawthorne, Florida ("Project Phoenix"). Michael Giuliana, Pearl River, New York ("Lacrosse-2"). Thomas McPhee, Webster, New York ("Bee-Liner"). John L. Groezinger, Elizabeth, Illinois ("X-36"). Mitchell Morgan, Exton, Pennsylvania ("Grasshopper"). David Hinkle, Ashville, Ohio ("Explorator X"). Tom Kerr, Butler, Pennsylvania ("ICBG/1"). Dann Blackwood, Danville, Vermont ("XK-6 Midi"). Bob Sealy, Fallston, Maryland ("Scorpio"). C. H. Porter, Ann Arbor, Michigan ("Dragonfly").

SEPTEMBER 1973 - First Place: Kevin Thorpe, Ladson, South Carolina ("Crazy Face Goonybird"). Honorable Mention: Marc Boyer, Staten Island, New York ("Dart"). Robert Orr, Lordstown, Ohio ("Schutzengrabenvernichtungsautorocket 65"). Jeff Lane, Colorado Springs, Colorado ("Crystal Blue Persuasion"). Heinz G. Hemken, Pasadena, California ("Model Rocket Launcher and Tower"). Tom Eisenmenger, Winston Salem, North Carolina ("The Double Dart").

NiMBUS

SKILL LEVEL 3

HONORABLE MENTION
DESIGN OF THE MONTH

By BRIAN WHEELER Seminole, Florida

ESTES INDUSTRIES ROCKET PLAN NO. 81

SHOCK CORD ANCHOR
(Hardwood or Balsa)

BUILD THE NIMBUS WITH ESTES HIGH PERFORMANCE PARTS AND ACCESSORIES

PARTS LIST

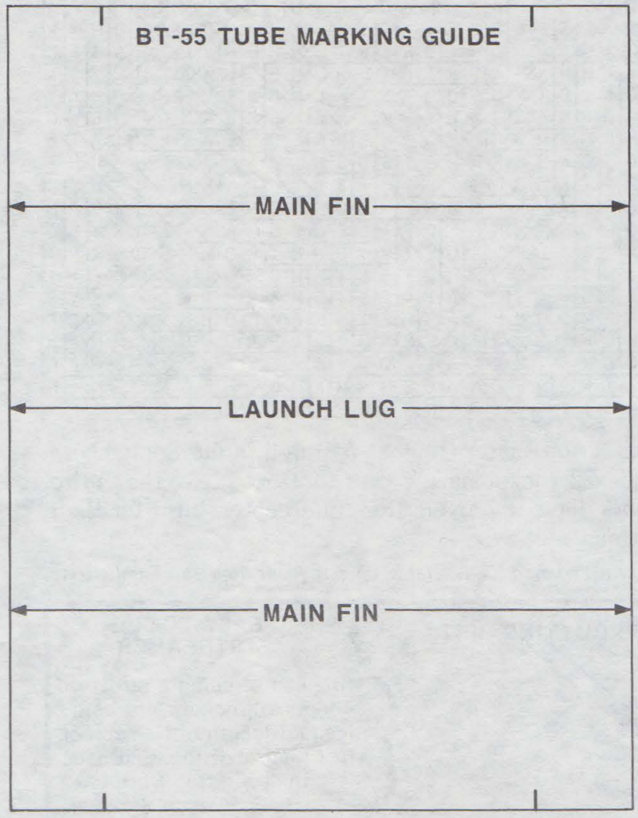
- 1 NOSE CONE - BNC-55AC
- 2 NOSE CONES - BNC-20R
- 1 BODY TUBE - BT-55
- 1 BODY TUBE - BT-20
- 1 TAIL CONE - BTC-55Z
- 1 ENGINE HOLDER TUBE - BT-20J
- 1 ENGINE BLOCK - EB-20A
- 1 PARACHUTE KIT - PK-18
- 1 SHOCK CORD - SC-1
- 2 FIN STOCK - BFS-30W
- 1 SCREW EYE - SE-1
- 2 LAUNCH LUGS - LL-2A
- 1 72" SHROUD LINE - SLT-1
- 1 SPENT ENGINE CASING

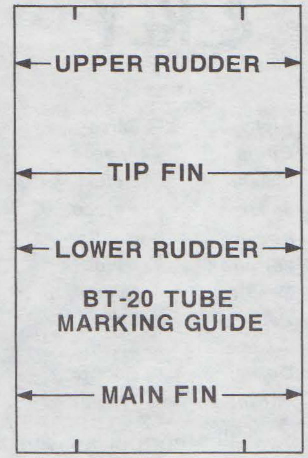
ADDITIONAL MATERIALS

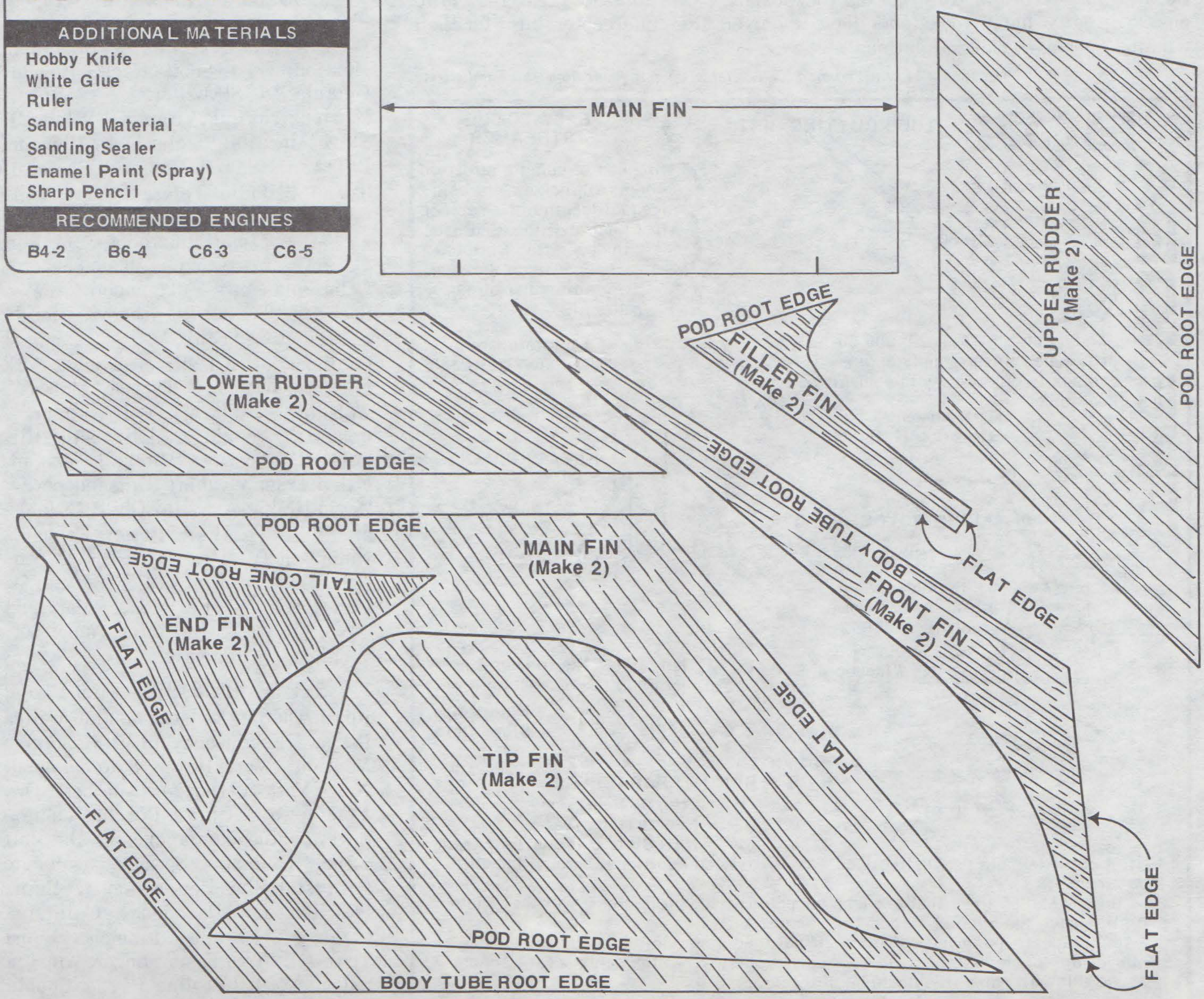
- Hobby Knife
- White Glue
- Ruler
- Sanding Material
- Sanding Sealer
- Enamel Paint (Spray)
- Sharp Pencil

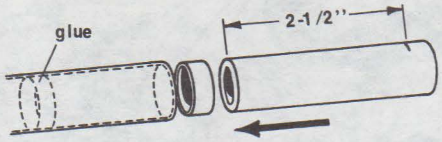
RECOMMENDED ENGINES

B4-2 B6-4 C6-3 C6-5

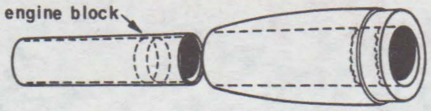




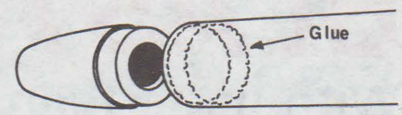




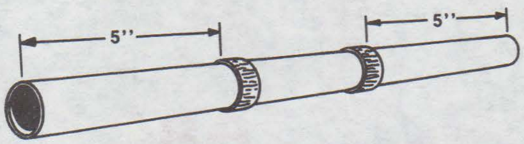
1 Measure 2-1/2'' from one end of the spent engine casing and place a mark. Smear glue around the inside of the engine tube (BT-20G) 3/4'' to 1'' from one end. From opposite end push in engine block with the spent engine casing up to the mark on the casing. Do not pause or the engine block may freeze in the wrong position. Remove the casing immediately.



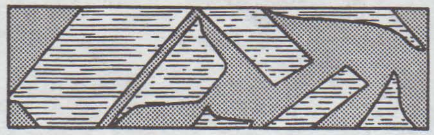
2 Smear glue around the inside of the tail cone near the large end. Let the glue set a minute, then insert the engine holder tube, engine block end first, into the rear of the tail cone. Quickly slide the tube forward until its rear is even with the end of the tail cone.



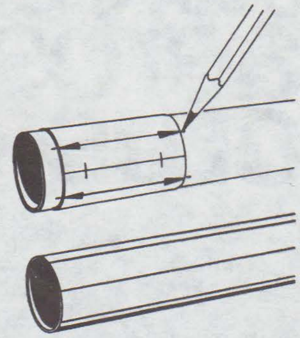
3 Apply glue to the inside of the body tube (BT-55) 1/2'' from the end. Slide the tail cone into this end of the tube and set the assembly aside to dry in a vertical position.



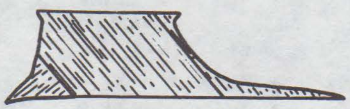
4 Mark the BT-20 body tube so that you have 2, 5'' lengths. To do this, mark the tube with the two measurements, one from each end, then wrap masking tape around the tube at the marks. Make revolutions with a sharp hobby knife until you have the tube cut. Then using fine sandpaper sand the tubes in a circular motion until smooth.

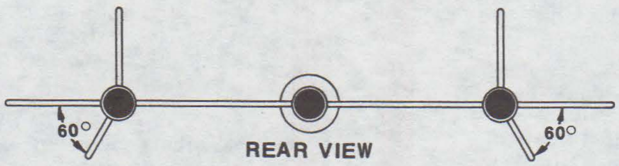


5 Cut out the fin patterns. Lay the patterns on the balsa fin stock as shown and cut out fins with sharp hobby knife. Sand flat sides of each fin until smooth. Sand the root edges and flat edges square. Sand other edges round.

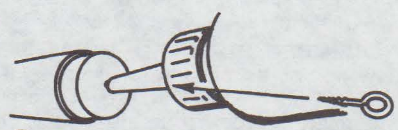


6 Cut out the tube marking guides. Mark the BT-55 and the two BT-20 body tubes at arrow points. Connect all marks with straight lines running full length of tubes.





7 First, glue the front fins, filler fins, and end fins onto the main fins as shown. Then work on the BT-20 outboard fins while main fin sections are drying. Glue upper rudder and tip fins at right angles on BT-20 sections. Glue lower rudder fin at 60° angle to the tip fin on BT-20 sections. Glue completed BT-20 outboard fin assemblies to each main fin tip. After both completed fin assemblies are dry, glue directly to main fin lines on BT-55. See illustration.



8 Insert the screw eye into BNC-55AC nose cone, remove, fill the hole with glue, and reinsert it into the nose cone.

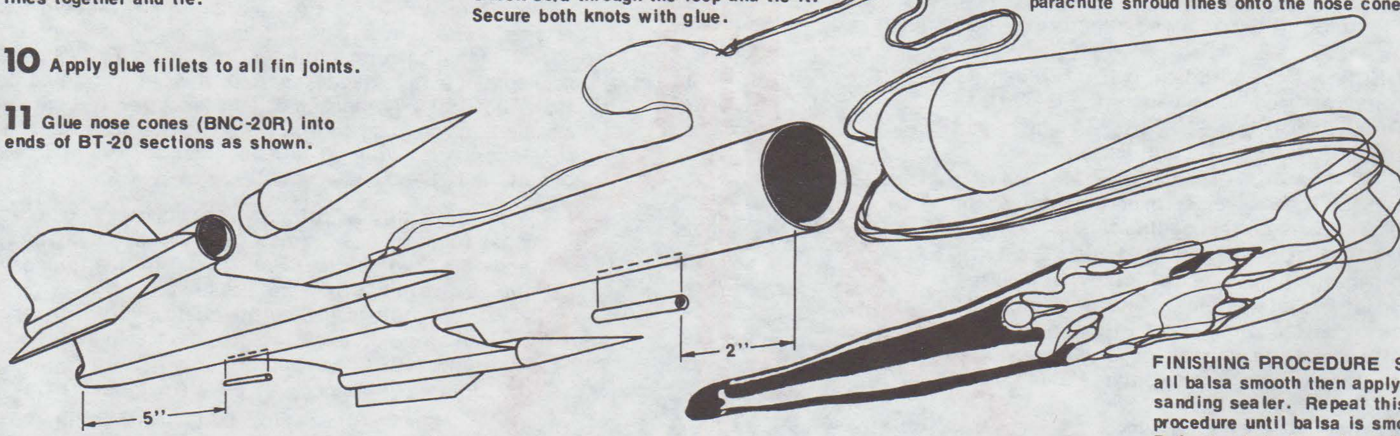
9 Assemble the parachute according to it's instructions. Gather all shroud lines together and tie.

10 Apply glue fillets to all fin joints.

11 Glue nose cones (BNC-20R) into ends of BT-20 sections as shown.

14 Tie a knot and a loop in the end of the two lines that were just assembled. Pass the shock cord through the loop and tie it. Secure both knots with glue.

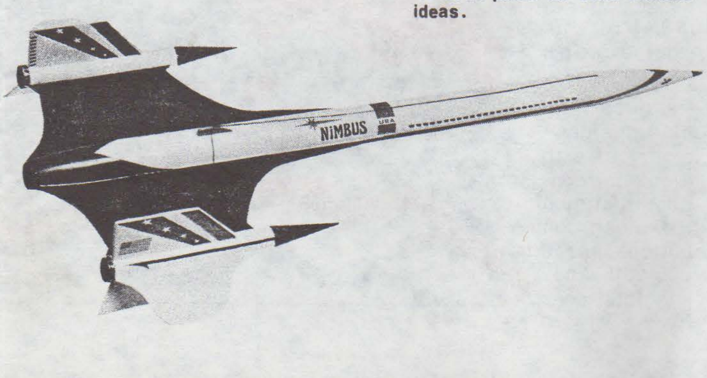
15 Take a ball-point pen and make a slit in the nose cone from the end that fits into the body tube up to the collar so the shroud line can run inside the body tube without binding against the nose cone. Tie the shock cord and parachute shroud lines onto the nose cone.



12 Glue one launch lug 5'' from the engine end of the model. Glue remaining lug 2'' from nose cone end. Be sure to glue lugs on alignment line. See illustration.

13 Find the balance point or center of gravity of the rocket after all fillets are dry and the spent engine is in place, but without the main nose cone or the parachute attached. After the CG has been found, mark the spot with a pen. Take a pin and make a small hole in each main fin close to the body tube so that the 72'' shroud line can pass through them. Take the shroud line, find the middle, and pass it through the two holes in the main fin. See illustration. Next, take a piece of 3/32'' balsa and shape it to the shock cord anchor pattern. Put a hole in it and glue it on the BT-55 body tube with the hole right over the CG. See illustration. Pass the shroud line through it. Glue the line in this position by filling the holes in the main fin and the hole in the anchor piece with glue.

FINISHING PROCEDURE Sand all balsa smooth then apply sanding sealer. Repeat this procedure until balsa is smooth. Refer to photo for color scheme ideas.



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BLAST-OFF!!

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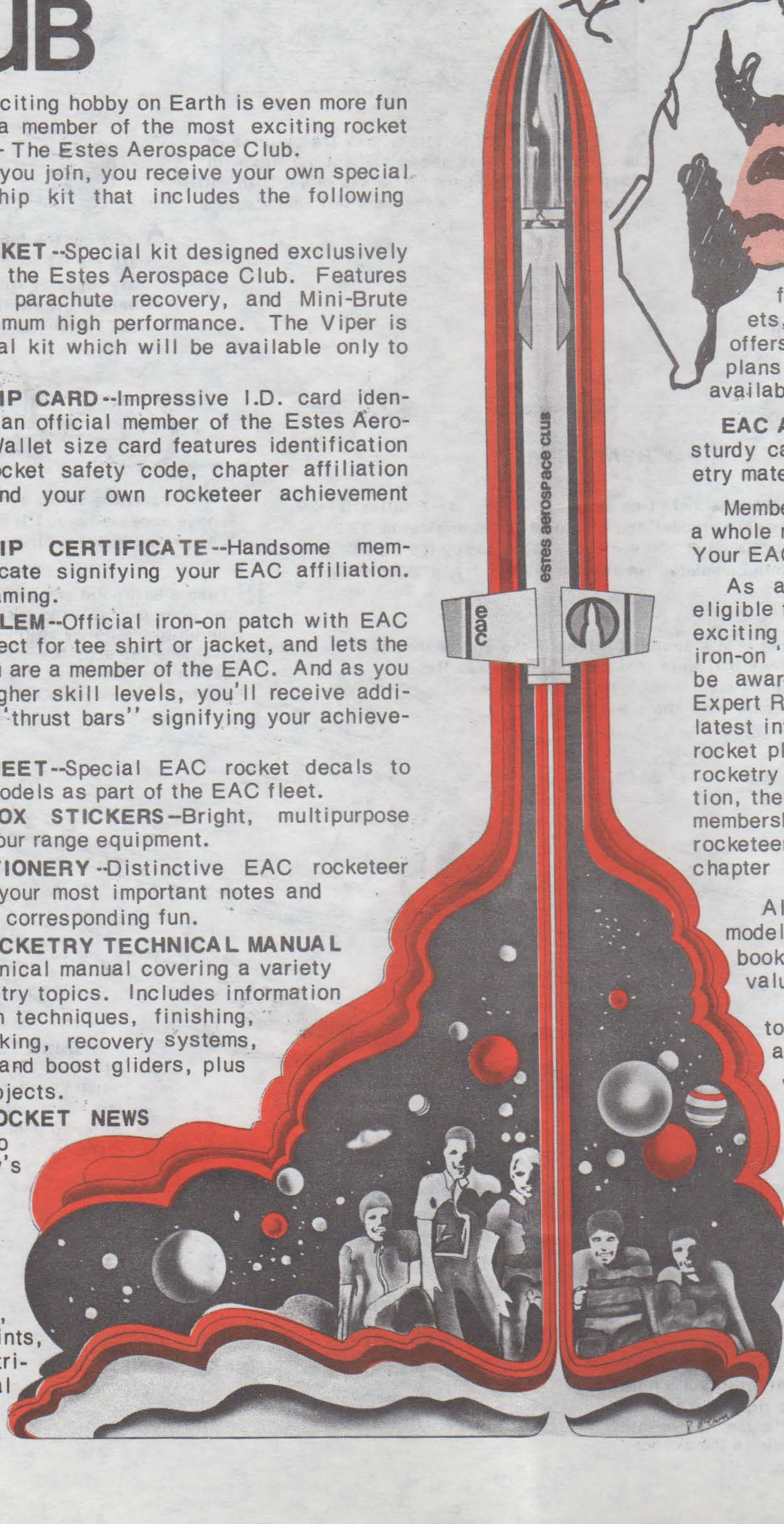

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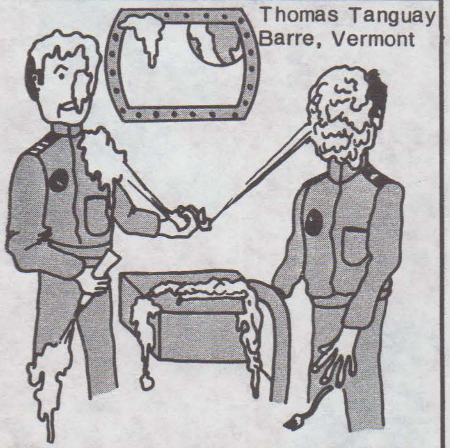
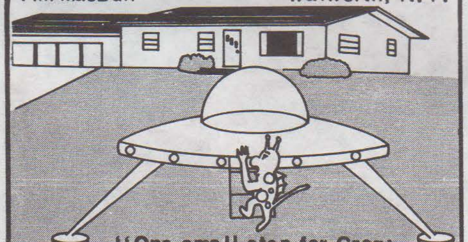


"I'll never get used to this space food."

Tim MacDuff Walworth, N.Y.



"One small step for Grog; one giant leap for Grogkind!"

Long John Silver

HONORABLE MENTION
DESIGN OF THE MONTH

By KEVIN J. MOORE Spencerport, N.Y.

SKILL LEVEL 1

ESTES INDUSTRIES ROCKET PLAN NO. 82

BUILD THE LONG JOHN SILVER WITH ESTES HIGH PERFORMANCE PARTS AND ACCESSORIES

PARTS LIST

- 1 NOSE CONE - BNC-5W
- 1 BODY TUBE - BT-5
- 1 FIN STOCK - BFS-20
- 1 SCREW EYE - SE-3
- 1 PARACHUTE KIT - PK-8
- 1 SHOCK CORD - SC-1
- 2 WEIGHTS - NCW-4
- 1 ENGINE BLOCK - EB-5B
- 1 LAUNCH LUG - LL-2B
- 1 DECAL SHEET - KD-45
- 1 SPENT MINI-ENGINE CASING

ADDITIONAL MATERIALS

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

RECOMMENDED ENGINES

1/2A3-2T A3-4T A10-3T

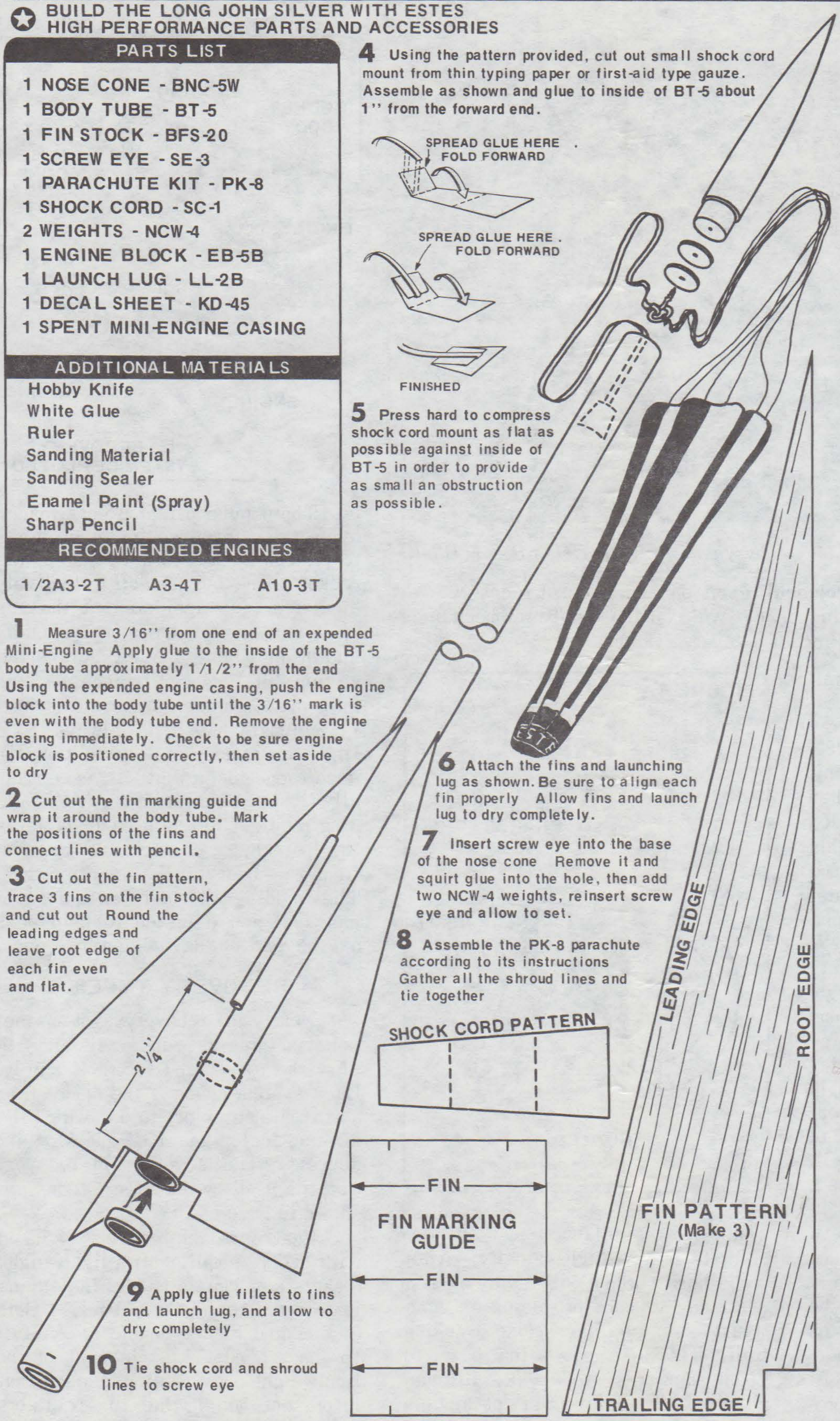
1 Measure 3/16" from one end of an expended Mini-Engine Apply glue to the inside of the BT-5 body tube approximately 1/1/2" from the end Using the expended engine casing, push the engine block into the body tube until the 3/16" mark is even with the body tube end. Remove the engine casing immediately. Check to be sure engine block is positioned correctly, then set aside to dry

2 Cut out the fin marking guide and wrap it around the body tube. Mark the positions of the fins and connect lines with pencil.

3 Cut out the fin pattern, trace 3 fins on the fin stock and cut out Round the leading edges and leave root edge of each fin even and flat.

4 Using the pattern provided, cut out small shock cord mount from thin typing paper or first-aid type gauze. Assemble as shown and glue to inside of BT-5 about 1" from the forward end.

5 Press hard to compress shock cord mount as flat as possible against inside of BT-5 in order to provide as small an obstruction as possible.



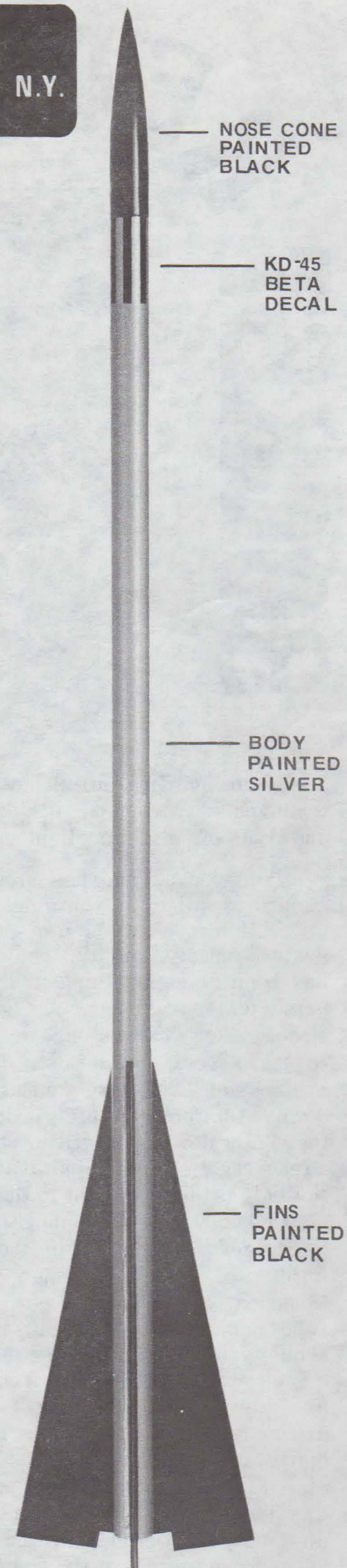
6 Attach the fins and launching lug as shown. Be sure to align each fin properly Allow fins and launch lug to dry completely.

7 Insert screw eye into the base of the nose cone Remove it and squirt glue into the hole, then add two NCW-4 weights, reinsert screw eye and allow to set.

8 Assemble the PK-8 parachute according to its instructions Gather all the shroud lines and tie together

9 Apply glue fillets to fins and launch lug, and allow to dry completely

10 Tie shock cord and shroud lines to screw eye



FINISHING PROCEDURE Sand all balsa smooth, then apply sanding sealer Repeat this procedure until balsa is smooth. Refer to photo for color scheme.

ROCKET RECOVERY PART III

by Wayne Kellner, Estes R & D Dept.

Third and final article in a technical report on model rocket recovery - - - techniques, types, and tips. In this article we examine the basic mechanics and types of solid-propellent model rocket recovery systems.

As soon as one has grown tall enough to fall over, you quickly discover Mother Nature's own recovery system, namely, gravity. Gravity has has been doing its thing in the Universe for some time now. So when model rocketry came along, we needed to make some refinements to this business of "what goes up must come down". Our rocketry safety code states that "a model rocket will always use a recovery system to return it safely". Not only is this important to the safety of our hobby, but it insures that you can recover your bird in the same number of pieces as when it was launched. The owner of your flying field might also get a bit up-tight should you begin excavating the local ecology trying to find the remains of an afternoon's launching. Well, writing rules and safety codes is easy, but here is how Estes and many rocketeers have solved this problem.

To fully understand and appreciate any recovery method, we must first know something about the heart of the system, the rocket engine. Each Estes engine first contains a precisely measured propellant section (Figure 1). At ignition, the propellant burns to provide the necessary thrust to lift the model from the launch pad and accelerate it to a high velocity. After propellant "burnout" the delay element continues to burn producing a "non-thrust" yet visible smoke tracking trail. This also allows the rocket to coast upwards to peak altitude. Finally, the delay element ignites the ejection charge. A sudden burst of gas pressure is generated which breaks through the clay retainer cap. This gas is released from the engine to activate the model's recovery system.

FIGURE 1

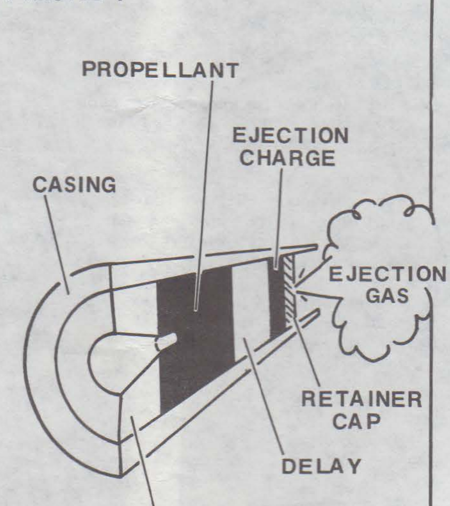
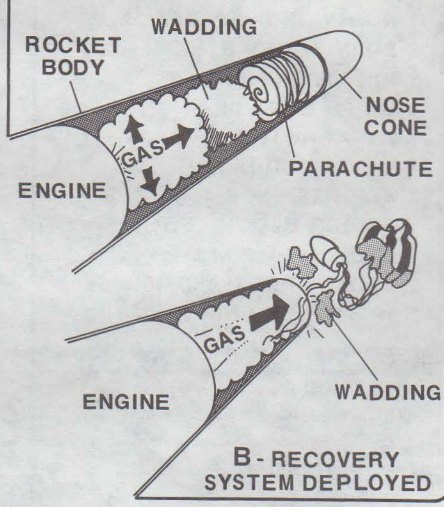


FIGURE 2



The popular parachute or streamer recovery systems use this ejection gas to pressurize the forward end of the rocket. The engine acts effectively as a rear gas seal so that the gas must exit the front of the rocket as shown in Figure 2. (A very small amount of gas will escape back through the engine nozzle. This loss is minimal, but it is always good flight insurance to be sure that the nose cone does not fit exceptionally tight.) Flameproof recovery wadding required for each flight protects the parachute or streamer material from the heat of the ejection gas. The wadding also acts as a forward gas seal and a piston to help push out the recovery device and nose cone.

RECOVERY TYPES

Nearly all recovery systems depend on drag or wind resistance to slow the rocket and return it safely. Each system changes the model from a streamlined object to one which the air can "catch against" and slow its descent. The seven main recovery methods used by rocketeers today are shown in Figure 3.

Featherweight recovery is used with very small, ultra-lightweight rockets. At peak altitude, the engine is ejected from the model. Both engine and rocket tumble or free-fall to the ground. The descent of the lightweight body is slow enough that it presents no hazard to spectators or model.

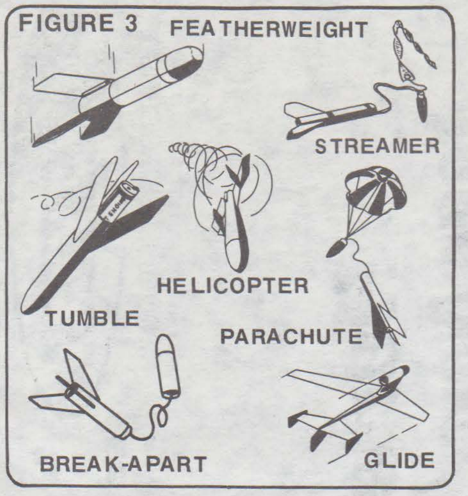


FIGURE 3

A tumble recovery model uses the ejection charge to move the engine rearward in the rocket. By moving the center of gravity (CG or balance point) to the rocket's rear, it becomes unstable and tumbles harmlessly to the ground. The added engine weight causes the model to fall faster than the featherweight bird. Therefore, you should expect occasional fin or body damage. These models must be built stronger to withstand a harder landing.

Break-apart recovery models are becoming increasingly popular. The rocket's streamlining is broken by simply ejecting the nose cone or separating the body in the middle. Both rocket sections must remain connected with a length of shock cord. Some wadding may be necessary to prevent scorching the shock cord. This method is ideal for very high altitude sport models and medium-sized rockets when flown from small launch sites. Surprisingly, this type of model is seldom damaged upon landing.

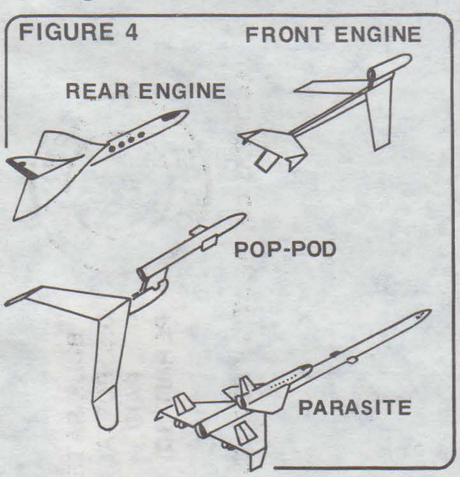


FIGURE 4

Glide recovery models are launched straight up like any other rocket. But they return to earth in a glide configuration like a model airplane. A boost-glider's graceful gliding return is spectacular to watch. Sometimes the glide is not-so-graceful in the case of a poorly trimmed model, but still exciting just the same. Boost-gliders are more difficult to construct and fly. However, the added challenge is important as you advance your model rocket knowledge and building skills.

There are four main boost-glider types (Figure 4). Once again the ejection charge activates the glide recovery system. It may be used to: eject an internal power pod (rear engine); change the model's center of gravity (eject the engine as in front engine type); separate an external power pod (action-reaction principle used with pop-pod systems); or release a piggybacked parasite glider (action-reaction principle again).


ROGALLO FLEX-WING IN FLIGHT

A fifth glider category would include the many weird and more complex glide recovery systems. An experimental Rogallo flex-wing device shown in the photograph is one example. The plastic wings fold for storage in the rocket body during launch, then eject to return the payload section. Sorry, no plans available.

Helicopter recovery (Figure 3) is another interesting system. (No, it doesn't mean buying a helicopter to find your rockets.) This method deploys flaps, blades, or other fin surfaces to cause high drag. These drag surfaces are held inside or against the rocket in a streamlined position during launch. The model usually spins or rotates as it returns.

SUGGESTIONS

Always select an engine so that the timed ejection occurs when your model has reached its peak altitude. At this high point (apogee), the wind resistance will be lowest. This is extremely important for rockets using an unusual or complicated drag device. Ejection should not occur during "fast coast" or too late when the model has streamlined into a fast free fall return. A recovery device suddenly exposed to high speed wind resistance may turn into a mass of aerial confetti.

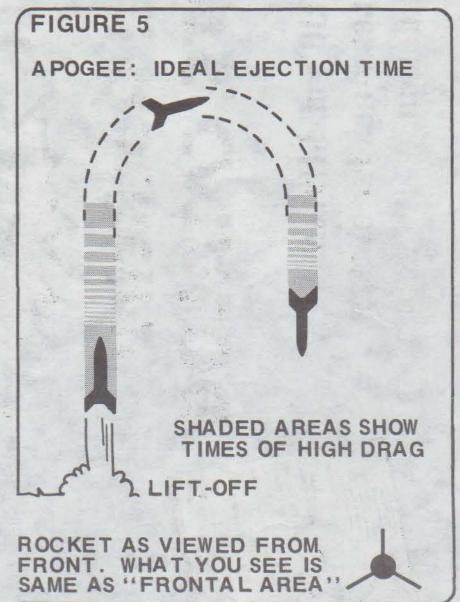


FIGURE 5

Rockets with large body diameters (BT-70 or larger) have a large frontal area, see Figure 5. Again, if ejection occurs too soon or too late, the wind resistance pushing against the nose cone may be greater than the pressure of the ejection charge. The recovery system will then be unable to eject from the rocket body.

Ejection charges build up a gritty residue inside the rocket body. Models which use internal, sliding power pods or piston devices must be cleaned occasionally. A toothbrush works well to brush away the residue. Frequent cleaning will prevent moving parts from sticking or binding and causing recovery failure.

Keep in mind the ejection charge "energy". You can put it to work pushing devices out of the rocket, moving internal actuating pistons, ejecting or relocating the engine. The possibilities are endless. Recovery is really half the enjoyment of flying. Experiment, and have fun. That's model rocketry.

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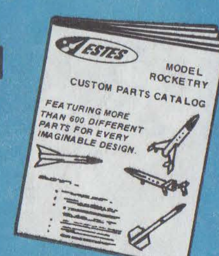

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MODEL ROCKET NEWS

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