

# THE LEADING EDGE



NOVEMBER / DECEMBER 1984 VOLUME 7 NO 6

EDITORIAL  
by  
Ric Gaff

Seasons greetings to you all, and welcome to this the last Leading Edge of 1984. Unfortunately, this will also be my last issue as editor. With the January/February 1985 issue of the Leading Edge, Larry Mika will be our newsletter editor. I know he will do an excellent job with the Leading Edge and that you will give him the same excellent support you've given to me over the years.

My decision to leave this post after six years was not easily or quickly made. The fact of the matter is that I'm suffering from a bit (or a byte?) of burnout. The fact that this issue is a month and a half late is the clearest indication of "editor burnout". Burnout is an appropriate term to use, since like a rocket, a person who burns out has a tendency to coast for a time. That, I realize now, is what I've been doing for the last year or so, coasting. I probably could continue for a while longer, but you, the members of NIRA and subscribers deserve better.

I will still be around, writing articles, shooting pictures, and doing other work for the newsletter. You don't get rid of me that easy!

On the same note, Bunny has also decided not to run again for President of NIRA. Lack of time (and a touch of burnout) are the main reasons for Bunny's decision. Like myself, Bunny won't be turning into a "black hole". He plans to remain active in NIRA.

Nominations for club officers were taken at the December meeting and are listed below. For me, it's heart-warming to realize that two such important club offices can be filled with such relative ease. It's an indication of how strong a club NIRA really is.

NOMINATIONS FOR  
CLUB OFFICES

PRESIDENT:

Tim Marcy  
Mark Schmitt

VICE-PRESIDENT:

Tom Pastrick  
Tony Lentini

SECRETARY/TREASURER:

Bob Kaplow

Elections will be held at the January 1985 meeting. Be there or be square.

ARE THOSE BELLS  
I HEAR RINGING???

Yes!! Believe it or not, wedding bells will soon be ringing for our own Bunny Rabbit! The lucky (?) lady is an attorney by the name of Barbara Frick. That's Barbara on the cover with Bunny. She was at one of the November launches and apparently had a good time. (She also blew up my SPEV, but I decided to marry her anyway. - Bunny) The wedding is scheduled for May 11. We wish Bunny and Barbara all the best.

FIELD TRIP TIME  
by Tony Lentini

Arrangements have been made for an outing Sunday, January 13, 1985, at 2 PM, to see "The Space Shuttle: An American Adventure". The film will be shown at the new Triton College "Cernan Earth and Space Museum." NIRA will be the first group to see this film. It includes footage from an

earlier Challenger mission. The movie used a new 360 degree projector. The film will be shown on the museum's dome, surrounding the audience with an incredible panoramic view of space.

There will be a group rate fee of \$2.25 per person. For NIRA to qualify, we must get 30 people to attend. Otherwise, regular admission will be \$3.00.

Triton College is located at 2000 Fifth Avenue, River Grove, IL. Please use the parking lot at far northern boundary of Triton's campus. Maps will be available at the January meeting. The Museum is the most northerly building on campus, and is located just northwest of the old museum. Finally, much of Fifth Avenue is under construction, so allow some extra travel time.

For further information, call Tony Lentini, 455-7756, after 6 PM, or show up at the January meeting.

MONTHLY NIRA MEETING Jan. 4  
G.E. Civic Center 7:30 PM

ELECTION NIGHT! Study the list of candidates in this issue and vote! Also, final planning for Triton College Field Trip.

FIELD TRIP January 13  
Triton College 2:00 PM  
2000 Fifth Avenue, River Grove, IL. Call Tony Lentini for details (455-7756).

MONTHLY NIRA MEETING Feb. 1  
G.E. Civic Center 7:30 PM

Park District response to our training class proposal. BE THERE TO FIND OUT THE DETAILS OF OUR CLASS SIZE, FEE AND SCHEDULE!!!

# MODEL OF THE MONTH WINNERS

*Hi there, this is your dummy former editor. Somewhere along the line I seem to have missed a Model of the Month Winner. There was no one published as the May MoM and my notes for that month don't show who did win. If anyone out there does know, please inform me and they will be published in a future issue. Sorry about that Chief, missed it by THAT much.*  
R. Gaff



The Model of the Month Winner for October is Mark Schmitt and his excellent Nike-Tomahawk scale model. Congratulations Mark!!

## COVER PHOTO

Barbara and Bunny and November launch. Bunny's the one with the cat-o-blasted Spev smoldering in his hand!



## THE LEADING EDGE

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## CONTRIBUTORS

BOB KAPLOW  
MARK BUNDICK  
CRAIG DUDEK  
LARRY MIKA  
TONY LENTINI  
LARRY LONDON

## NEW EDITOR OF THE LEADING EDGE

With the January issue, Larry Mika will be the editor of the Leading Edge. All letters, articles, suggestions, hate mail, etc. should now be sent to:

Larry Mika  
7985 Iroquois Court  
Woodridge, IL 60517

## LEADING EDGE STAFF

EDITOR	-	Ric Gaff
HALFTONES	-	Tom Pastrick
MAILING LIST	-	Bob Kaplow
TYPIST	-	Mark Bundick



## 5, 4, 3, 2, 1 blastoff! The fun's launched

### A propelling hobby keeps rockets aloft

By Eleanor Nelson

"ON THE PAD. Heads up. 5, 4, 3, 2, 1..."

There is a loud whoosh as a rocket bursts from its moorings and soars skyward. It climbs far above the heads of the men and boys gathered in the Glen Ellyn park, appears to pause a moment at its apex and pops off its nose cone, allowing the bright red parachute inside to descend slowly to the ground.

"I like to get off the first launch," said Mark Bundick, 30, of Evanston, who was watching with satisfaction as the chute descended over a distant part of the field.

"I guess I like model rocketry because of the fire and smoke," he said, preparing to gallop off to retrieve his toy. "This is a crazy, really neat activity. It lets you act like a kid again."

Both kids and former kids who belong to the Northern Illinois Rocketry Association gathered on a recent Sunday afternoon to enjoy the "fire and smoke" of the hobby they say is safer than playing baseball.

THE ASSOCIATION, a chapter of the National Association of Rocketry, draws its 50 members from all over the Chicago area. For \$3 a year in dues anyone can join the group, which meets the first Friday of each month at the Glen Ellyn Civic Center, 535 Duane St., Glen Ellyn.

Launches are held twice a month in good weather, usually in a Glen Ellyn park, and members participate in national and regional contests.

Enthusiasts press a button on a small, hand-held launcher, causing an electrical wire extending about 15 feet to the rocket on the launch pad to glow red hot, igniting propellant in the rocket.

The propellant charge produces the thrust to send the rocket into the air, a delay charge lets the model coast to its peak altitude and an ejection charge blows off the nose cone and deploys a small parachute, which remains attached to the rocket as the two descend.

BUT ONLY when the rocket successfully lifts off the launch pad do the hobbyists find out how well they have done their work.

A rocket that isn't "aerodynamically stable" will usually tumble to earth after the engine burns out and the model will be damaged.

That's what happened to Larry



Kevin Wiecek (left) and John Dugan, both 12 years old and from Glen Ellyn, experiment with some of the model rockets they launch as

Mika, 19, of Woodridge, a sophomore at the Illinois Institute of Technology, on Sunday when he fired his one-seventh scale model of the NASA sounding rocket, a rocket used to study the atmosphere.

The 2-foot-long missile got off to a shaky start as it lifted itself in the air a few yards, then plummeted.

"I used the bad launch rod instead of the 'ath rod," said Mika, explaining that the rod is part of the launching device.

"It shook a bit—it wasn't going fast enough to be stable," said Mika, who took second place in the national championships held in Allentown, Pa., in August.

Ken Busky, 13, of Wheaton, looked on sympathetically.

"THE LAST TIME I launched my rocket it didn't go off either. The engine was defective," said Ken, who was introduced to model rocketry in his school industrial arts class.

This time, his rocket fired perfectly.

Performance wasn't the problem with another rocket he'd brought to the park. All he seemed to care about was how it looked.

"Do you think it's ugly enough?" he asked, displaying a 1-foot fuselage painted red, black and brown. But the "ugliest

members of the Northern Illinois Rocketry Association. The group draws its 50 members from all over the Chicago area.

Rocket Contest" had been postponed for two weeks, Ken discovered.

"I guess I'll take it home and ugly it up a little more," he said.

There was no formal contest that day for the most bizarre rocket, but the excited spectators seemed to feel it was a toss-up between the empty potato salad container, which set a straight course for the moon, and the McDonald's "Happy Meal" flying saucer, launched by the club's secretary, Robert Kapiow, of Palatine.

THE TWO off-the-wall "rockets" were placed on launching rods like ordinary rockets. The

launch rods went through holes in the tops and bottoms of the food containers.

Only 25 years ago, there were no model rocketry fans gathering in city parks to enjoy their hobby.

Instead, teenagers bitten with the rocketry bug were making rockets from scratch, without instruction or supervision and maiming or even killing themselves in the process.

"Kids were mixing propellants in their basements," said Thomas Patrick, 43, of Niles, who came to the launch equipped with a "range box" full of replacement parts for on-the-spot rocket re-

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## Rocketry

Continued from page 1

pair. "A kid would get a metal container and fill it with a chemical mixture for fuel," he said.

A TEXAS SCIENCE teacher was killed and seven of his students injured in a rocket attempt. In California a boy made his rocket from a pipe filled with match heads; it exploded during loading, killing him instantly and injuring his friend for life.

"Model rocketry was developed to eliminate the 'basement bomber,' to provide a safe alternative for kids who wanted to make rockets," said Bundick, who lives in Evanston and is president of the Glen Ellyn-based association.

Safe materials for model rocketry are now availa-

kits, motors, launch equipment and parachutes, with simple, clear directions.

In addition, there are informal educational programs like the ongoing ones at the Northern Illinois Rocketry Association, where more experienced members help less experienced ones.

"WHEN IT'S done the right way, rocket launching is safer than Little League baseball," said Scott Gochron, a retired chemical company employee from Glen Ellyn who helped start the Northern Illinois chapter of the rocketry association about four years ago.

Not only is model rocketry safe, but it stimulates young people's interest in science while providing them with an enjoyable hobby.

"I knew you could teach kids more by indirection than by direction," Gochron said.

Several young people who got "hooked" on model rocketry through the association have gone on to further scientific study at the undergraduate and

QUOTABLE QUOTE FROM A PAST NIRA MEETING.

Bunny explaining use of a flight card. This is your flight card with lots of boxes and lines, just like your tax form.

Unknown heckler. Does this mean we can cheat on it?

# TRACK

## A SIMPLE ALTITUDE PROGRAM BY CRAIG DUDEK

"TRACK" is a Sinclair BASIC program made specifically for the Timex/Sinclair 1000 or Sinclair ZX-81. The program uses the Geodesic method of data reduction to compute altitude, closure status and percentage of error. The purpose of using this discontinued, but still available computer is its portability. The Sinclair has distinct advantages over a programmable calculator in that it is more convenient to use, is more powerful, and there are no LED's for the sun to wash out.

The contest field is the place you need to calculate altitudes and most fields don't have outlets. All that you need to make the Sinclair field-portable is a 12 volt Gel-cell, Ni-Cad or motorcycle battery. Try that with an Apple IIe! The Sinclair uses a black and white TV as a monitor and cassette tapes for storage. These will have to be portable as well. The best sized TV is 9 inches, about \$100, the cheapest 12 inch is about \$60, but I used a 5 inch at \$120. Anything smaller will be impossible to read.

All these TV's are available with battery capability, sometimes internal. Mine uses six "D" cells. Others use Gel-cells or have a cigarette lighter plug.

What has been called the weakest point of the Sinclair is the tape storage. You will need a quality battery powered mono tape recorder with a tone control. This device, with quality cassettes, will give you no problems.

The program uses the full memory of the Sinclair, but for power consumption purposes, do not use the "RAM Pack". You should have no problems with running out of memory. If you do, delete line 20. Do not tamper with any other part of the program unless you understand programming and BASIC.

If you want to enter the program off the keyboard, load the subroutine, lines 600 to 900, first. Check it by loading the data in "Sample 1" directly on the keyboard, and then type "GOTO 600". Print your "A" and "C" from the keyboard. Don't forget to run in "FAST" and "CLEAR" after you have checked the subroutine. Now you can safely enter the rest of the program.

For those of you used to pre-packaged software, sent me a cassette along with a self addressed, stamped cassette mailer, and I will copy the program for you. When you run the program, you simply input your "trackers" data, the baseline and wait to get your results. To check out your program for errors, see the test cases in the September 1983 Model *Rocketeer*. Also see "Publisher's Prangs", November 1983 Model *Rocketeer*. Real "hackers" can also check out the April and July 1983 issues. Happy computing!

```
20 REM TRACK (C)1984 C.D.
30 LET A$=" AZIMUTH: "
40 LET B$=" BASELINE: "
50 LET C$=" CLOSED: "
60 LET D$=" DEG."
70 LET E$=" ELEVATION: "
80 LET I$=" INPUT"
90 LET M$=" METERS"
100 LET O$=" ONE"
110 LET P$=" PERCENT"
120 LET R$=" ERROR"
130 LET T$=" TRACK"
140 LET W$=" TWO"
150 LET Y$=" OK? YES/NO"
160 PRINT I$;B$
170 INPUT B
180 IF B>299 THEN GOTO 200
190 PRINT R$;B;M$
200 PRINT I$;T$;O$;A$
210 INPUT A1
220 PRINT I$;T$;O$;E$
230 INPUT E1
240 PRINT I$;T$;W$;A$
250 INPUT A2
260 PRINT I$;T$;W$;E$
270 INPUT E2
280 CLS
290 PRINT B$;B;M$
300 PRINT
310 PRINT T$;O$;A$;A1;D$
320 PRINT
330 PRINT T$;O$;E$;E1;D$
340 PRINT
350 PRINT T$;W$;A$;A2;D$
355 PRINT
360 PRINT T$;W$;E$;E2;D$
365 PRINT
370 PRINT I$;Y$
380 INPUT Q$
390 IF Q$="NO" THEN GOTO 160
400 GOSUB 600
410 PRINT
420 PRINT AT 10,1;"ALTITUDE :";A;M$
430 PRINT
440 PRINT T$; " IS";C$;C
450 PRINT IF C>10 THEN PRINT AT 12,7
460 PRINT TAB 18; P$;R$
470 PRINT
480 PRINT " NEXT";T$;Y$
490 INPUT Q$
500 IF Q$="NO" THEN STOP
510 CLS
520 GOTO 200
600 FAST
620 LET A1=A1/180*PI
630 LET A2=A2/180*PI
640 LET E1=E1/180*PI
650 LET E2=E2/180*PI
660 LET C1=COS E1
670 LET C2=COS E2
```

# NORTH COAST ROCKETRY

```

680 LET C3=COS A1
690 LET C4=COS A2
700 LET S1=SIN E1
710 LET S2=SIN E2
720 LET S3=SIN A1
730 LET S4=SIN A2
740 LET F=S1*S2-C1*C2*(C3*C4-S3*S4)
750 LET D=1-F*F
760 LET T=(C2*S1*S4-C1*S2*S3)/SQR D
770 LET D1=(C1*C3+F*C2*C4)/D
780 LET D2=(C2*C4+F*C1*C3)/D
790 LET A=B*(S1+S2)*(D1*D2)/(D1+D2)
800 LET C=ABS (T*B/A)*100
890 SLOW
900 RETURN

```

BASELINE: 300 METERS

TRACK ONE AZIMUTH: 90 DEG.

TRACK ONE ELEVATION: 45 DEG.

TRACK TWO AZIMUTH: 50 DEG.

TRACK TWO ELEVATION: 40 DEG.

ALTITUDE: 380.0484 METERS

TRACK IS CLOSED: 6.3234335  
PERCENT ERROR

NEXT TRACK OK? YES/NO

BASELINE: 300 METERS

TRACK ONE AZIMUTH: 30 DEG.

TRACK ONE ELEVATION: 45 DEG.

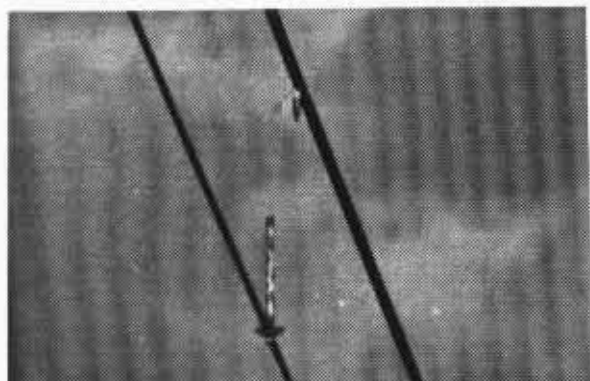
TRACK TWO AZIMUTH: 60 DEG.

TRACK TWO ELEVATION: 45 DEG.

ALTITUDE: 203.26921 METERS

TRACK NOT CLOSED: 31.188915  
PERCENT ERROR

NEXT TRACK OK? YES/NO



NCR is a new company that caters primarily to the very high power (over 80 Nt.-sec.) people, but does have much of interest to model rocketeers. Clearly the most interesting items from NCR are two motors available from no where else, the E28 and F41. Both are full power composite motors as shown below.

To use these motors (as well as Aerotech motors) NCR has 14 LARGE kits. The smallest kit is the 31" long, 1.85" dia. MINI-FUGUE. A single engine model that can use anything from a "D" to a "G". The largest being an amateur rocket, the CHROMATIC FUGUE. An 84" long, 4" dia. model using a four engine cluster. Also available are the various parts needed to build your own huge models. A large selection of ignitors

are available for both composite and large black powder motors. A replacement for hard-to-find sure-shot wicks is made available at a reasonable price.

In general prices for parts, motors and accessories are quite reasonable. The prices for the kits may make you choke a bit though! Prices run from \$28.00 for a STARBURST to \$50.00 for a CHROMATIC FUGUE, among others. I must say though that the kits are well produced and look very good.

If you are interested in very large sport rockets (model or amateur) then NCR is the company for you!

NORTH COAST ROCKETRY  
37541 Grove Ave. #202  
Willoughby, Ohio 44094

Catalog is \$1.00 (I think!)  
Tell them the Leading Edge sent you.

E28

F41

Total Impulse	40 N-sec	79.6 N-sec
Burn Time	1.4 sec	1.8 sec
Initial Thrust	5.85 lbs	7.30 lbs
Peak Thrust	9.30 lbs	15.4 lbs
Motor Diameter	.938"	1.125"
Motor Length	2.75"	3.50"
Propel. Mass	18.9 gms	37.8 gms
Delays	4,8,12 sec	6,9,14 sec
Price	\$7.75	\$7.75





BASIC BUILDING,  
or,  
Tips Toward More Rocket Fun  
by Bunny

Now that winter is upon us, it's time to start doing two things. (a) Asking Santa for all the hobby goodies we want to see under the tree, and (b) getting ready for the next flying season. Hopefully, this short series of articles will benefit you old and new NIRA members. We'll be trying to print even more simple, easy to remember tips and hints for more enjoyable flying in later issues.

While some nuts will ignore Ric Gaff's advice to stay inside for the winter, most of us put the trusty launcher away. WAIT! Before you do, check things over. Are your wires shot to pieces? Are your battery clips rusted and poorly attached? Have your micro clips seen better days? I know mine have. How about spending a few minutes cleaning up that mess and repairing the abuse of the long flying season?

Not enough launch system left to salvage? Why not take the easy way out and look through the Estes catalog and ask Santa for a new one? I'd suggest the "Astron Launch Control System". It uses a car, lantern or Gel-cell battery for power. Those provide more power than the alkaline battery powered launchers. You'll have fewer frustrating misfires. Its wire is heavier gauge stuff, too, so it'll last longer.

Launch system OK, you say, but the batteries have had it? Try getting one of those nifty Gel-Cell batteries. A good RC hobby

shop has them and chargers for them. A good quality 6 volt, 4 amp-hour cell and charger will run about \$25. It's cheaper to use those AA cells, but remember all those non-launches at Ackerman Park this summer? You really don't want to do that again. A reliable power source is a rocketeer's best friend.

While cleaning the launch system, check out the launcher as well. Clean off all that exhaust residue. It's terribly corrosive, especially to metal. Your launch rod and blast deflector will be "grody to the max" next spring if you don't clean up now. If your launch rod is rusty or bent, replace it with 1/8" dia. steel music wire. It's available at good hobby shops. You can get 3/16" dia. as well. If you're really tired of cleaning launch rods at every launch, go to a good welding shop and get some stainless steel rods. They never rust, and can be purchased in lengths longer than 36".

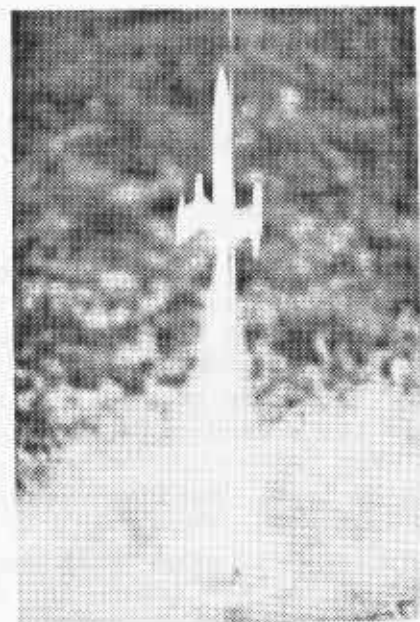
Everybody can use motors, right? OK, so put some on Santa's list. If you have motors left over, it pays to store them right for the winter. Ask Mom to let you have an empty coffee can and plastic lid. These are great storage containers. They keep engines dry, and dry engines work better. If you put a label on the lid with the engines listed on it, you don't have to rummage thru the can to see if you have a B6-4 for your "Starburst Special". Your engine list will be right there for you.

If you take launcher, launch system, battery and motors and store them in a single box, they won't get

kicked around the basement and garage this winter. If you label the box, you'll be able to find it and be completely ready to truck out to the launch field come springtime.

Lastly, you should look over your "fleet". Broken fins, smashed body tubes, missing launch lugs and forgotten decals are all good canardates to start your winter building session. If you fix all those tangled, burned and "shroud-line-missing" parachutes now, you can store away good, flyable models for next year's first launch. Reviewing the status of your models is also a good way to list either parts or kits Santa could put in the stocking for you.

Now that we've cleaned up this flying season's activity, and prepared our list for Santa, we'll move on to our warm, cozy workshop. Next issue we'll discuss building better kits and making your own kits. Till then, dodge them snowflakes.



## SHROUD LINE ATTACHMENTS AND THEIR STRENGTH

by "Jedi" Larry London

I tested a variety of shroud line attachment methods to try and see if there were differences in their strengths. This could be very important for heavy models, like egglofters or plastic model conversions.

My parachutes were all made from aluminized mylar. I used nylon shroud lines. The following adhesive materials were used to attach the lines to the mylar: sticky backed aluminized mylar, Estes tape discs, scotch tape, trim Monokote, masking tape and strapping tape.

To test the breaking point, I clamped the mylar onto a table, then pulled on the lines until they failed. I attached a spring scale to a loop at the end of the shroud lines. The scale was modified to record the exact breaking point in grams with a ball point pen.

When I was done with the tests, I got the following rankings:

MATERIAL	BREAK FORCE
Strapping Tape	- 1168.75
Masking Tape	- 1056.25
Aluminized Mylar	- 1018.75
Estes Tape Discs	- 887.50
Scotch Tape	- 828.12
Trim Monokote	- 371.88

It's easy to see that strapping tape was the strongest and trim Monokote the weakest. However, it is hard to decide between masking tape and aluminized mylar, and between Estes tape discs and scotch tape. Further testing is required. You might also want to test other attachment methods, like tying on the

lines or looping the lines over the chute. Other areas of investigation include different shroud line materials, and how weather and time might affect the strengths of various chute attachment methods.

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### NIRA'S CLUB LIBRARY by Ric Gaff

#### AERODYNAMIC DRAG OF MODEL ROCKETS, TR-11, by Dr. Gerald M. Gregorek:

A more-than-casual discussion of drag and how it effects altitude performance. An excellent book but is not for light reading! The section on Drag Reduction Techniques (#7) though is must reading for anyone serious about rockets.

**AEROSPACE EDUCATION AND MODEL  
ROCKETRY** by Daniel F. Saltrick, Alfred M. Kubota and Robert L. Cannon: This is a guide to aid teachers in running a model rocket course. Lightly covers some basics of motion and model rocketry. Similar to other publications of this type.

**THE ALPHA BOOK OF MODEL  
ROCKETRY:** Short, simple guide to the why and how of model rocketry for beginners. A good booklet to give a friend who is becoming interested.

**THE ALPHA MINI-BOOK OF MODEL  
ROCKETRY:** Similar to the ALPHA book above, but cut to the bone. The absolute minimum basics of model rocketry. This would be a great item to give away at the Labor Day Launch!

**ALTITUDE PREDICTION CHARTS,  
TR-10, 1971:** Booklet of graphs designed to help a modeler determine altitude of a model. Some what more difficult to use than Altitude Computer (see above) but also more accurate. Short discussion of drag and its

important in altitude prediction. Five examples given to practice using charts. Changes over the years have rendered some of the charts obsolete.

**COUNTDOWN: Mathematics and  
Model Rocketry** by Dr. William E. Schall: This is a study guide for using model rockets in a Grade/High school math/science course. Very nice actually, makes me wish my teachers had had something like this! Includes a section of ideas for model rocket projects.

**ESTES ALTITUDE COMPUTER:** Easy to use "slide rule" for calculating altitude of model using any standard size engine up to a D12. Can be fairly accurate.

**GUIDE FOR AEROSPACE CLUBS:** OK, so you're a member of a club right now, but what if you weren't? How do you START a club? This booklet will tell you the first steps to take to do just that and it works too! This booklet also outlines possible future projects that a club can undertake. If you've wondered what a club can do for you, read this booklet.

**THE LAWS OF MOTION AND MODEL  
ROCKETRY** by Robert L. Cannon: A short and easy discussion of the three laws of motion refreshing low on math. What DOES a rocket push against? Includes 3 tests.

**MODEL ROCKET CONTEST GUIDE** by Robert L. Cannon: Similar to the Guide for Aerospace Clubs this booklet is a quick course in how to plan and hold a competition type contest. Finding a field, picking events, running the "show" etc. are lightly covered.



PARSEC-33 EGGLOFTER  
by "Bullet Bob" Kaplow

The PARSEC-33 Egglofter uses a full tapered shroud to hold a big parachute and cut drag. It also uses a custom egg capsule to hold the egg and save on weight. The original model took the United States D Eggloft Duration record at NOM-3 in July 1984 with a 760 second flight.

While the capsule and retainer ring were custom vacuformed to hold a minimum diameter egg, a CMR "Humpty Dumpty" capsule and ring would be a suitable commercial replacement. You might be able to get Bunny or Gaff to tell you how to build a PARSEC-33 with Easter Egg capsules as well.

To build the shroud, cut eight gores from light "A" grain balsa. Hot Stuff them together to form a big balsa wedge. You'll have to adjust the length of the gores to adjust for your construction errors, or to handle different sized capsules. Soak the "wedge" in hot water until it is soft and flexible. (Boiling water is best, but BE CAREFUL! - Bunny) Now roll the wedge into a cone. Wrap the balsa cone with a paper cone taped to hold its shape. Let the cone dry overnight. Remove the paper cone, and Hot Stuff the edges together. Tissue cover the thing to fill in the grain and add some strength.

Use an AR-2858 as an engine block in the BT-58 tube, and make sure the D12 sticks out 3/8" or 1 cm. Now put an AR-5855 centering ring about midway up the BT-58, but don't glue it

onto the BT-58 yet. Fit the BT-58 into the cone until the engine end is even with the small end of the cone. The AR-5855 will stop in the right place when it hits the inside wall of the cone. Hot Stuff the BT-58 to the rear end of the cone. Hot Stuff the AR-5855 in place as well.

Mark the outside of the cone for three fins. Cut the fins out of plywood, and sand to an airfoil shape. Cut through the cone, and glue the fins directly to the BT-58. When dry, fillet them to the surface of the cone.

You can put the shock cord mount on the inside or along a fin root on the outside. I had some problems with shock cords burning on the inside, so the record setting flight had the shock cord mounted externally. If you use squid line for shock cords, make sure you have an elastic bungee. For altitude flights, you can recover the model in two pieces.

The other end of the shock is threaded through a hole in the edge of the egg retainer ring, knotted and Hot Stuffed securely to the inside of the egg capsule. Make sure the cord is clear of the egg and the ring. This joint should be filleted well. There's a lot of stress on the cord at ejection. The back half of the egg retainer ring has four wedge cuts in it to allow for easy insertion while still holding the capsule tightly closed.

For flying, fill the top of the BT-58 with tracking powder and wadding. Wrap the mylar chute in more wadding, and place it in the

top of the cone. For altitude flights use a 12" or 38 cm. chute for the egg and a 8" or 20 cm. chute for the body. A streamer can also be used to recover the booster. For duration flying, the model must be recovered in one piece. On the record setting flight, I used a 78 cm. (24") chute, though there's room for a 188 cm. (36") chute.

The model was flown with a D12-5, but an E6-4 or E20-7 could be used. Make sure the motor fits snugly, and wrap a layer of tape around both the rear of the cone and the motor to make sure the motor doesn't kick out. Carefully fit the capsule and retaining ring into the cone.

The PARSEC-33 can't be launched from a rod, pop-lug or piston alone. Fly it from a tower. You'll need a "Landis Loop", a section of BT-78 with three slots cut in it for fins. Slide the "LL" down the tower, then put in the model, and fit the fins in the "LL". The model won't wobble in the tower now. This little trick allowed my PARSEC-33 to boost higher and straighter than any other egglofter at NOM-3.

Due to its light weight and low drag shape, this model is capable of out-performing any other D or E egglofter. The D altitude is predicted at near 580 meters and E's go in excess of 980 meters. Look out, Uncle Al!

# PARSEC-33

A U.S. Record Setting  
D Eggloft Duration Model

NOM-3, July 1, 1984

768 seconds

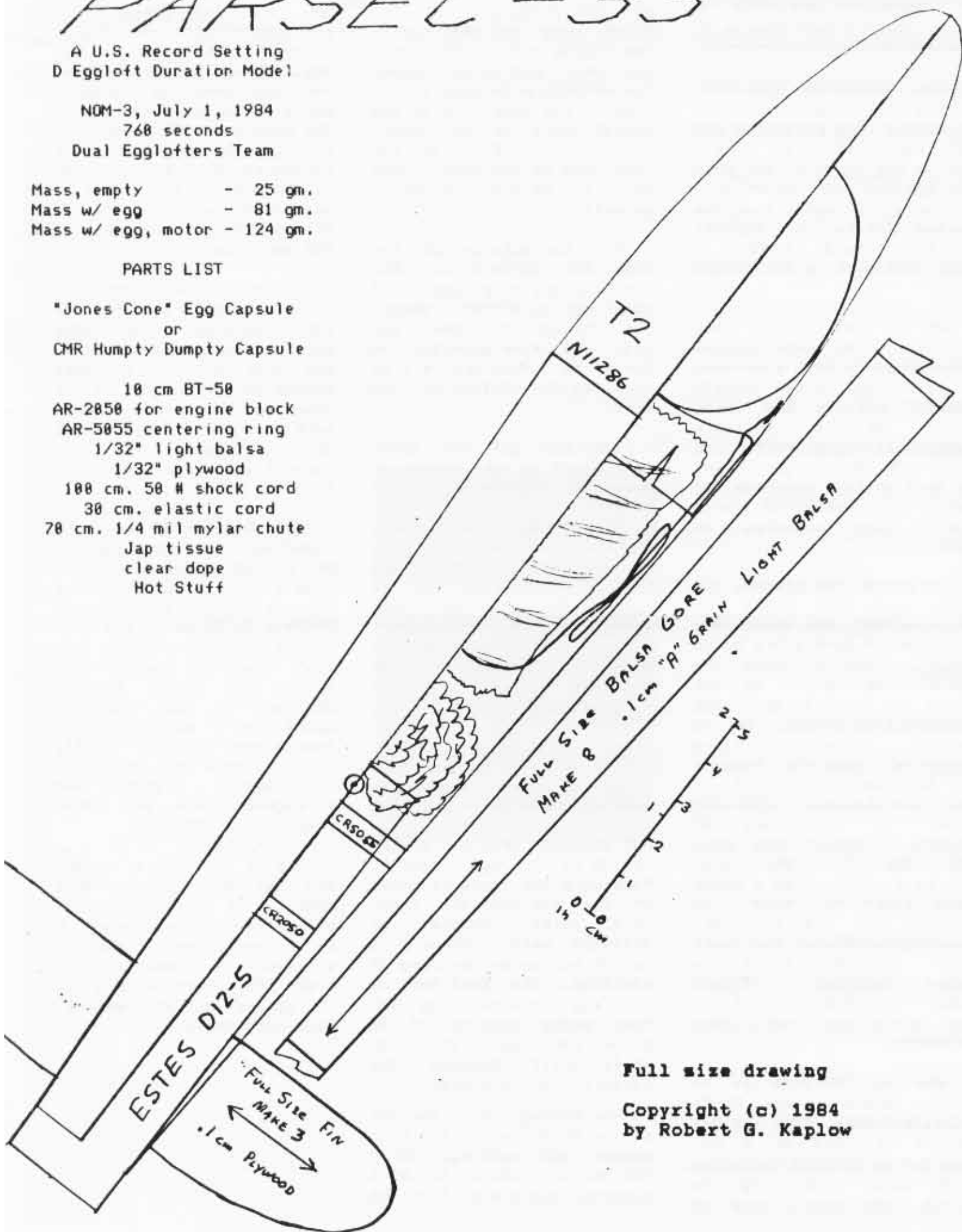
Dual Egglofters Team

Mass, empty - 25 gm.  
Mass w/ egg - 81 gm.  
Mass w/ egg, motor - 124 gm.

## PARTS LIST

"Jones Cone" Egg Capsule  
or  
CMR Humpty Dumpty Capsule

18 cm BT-50  
AR-2850 for engine block  
AR-5055 centering ring  
1/32" light balsa  
1/32" plywood  
100 cm. 50 # shock cord  
30 cm. elastic cord  
70 cm. 1/4 mil mylar chute  
Jap tissue  
clear dope  
Hot Stuff



Full size drawing

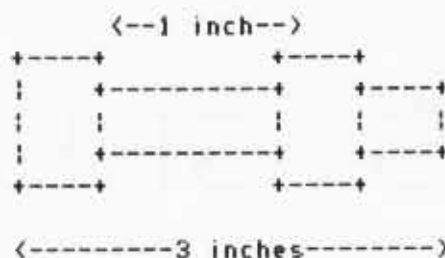
Copyright (c) 1984  
by Robert G. Kaplow

**CONVERT IT!**  
by Larry Mika

This article is for beginning and intermediate rocketeers who fly only Estes rockets. The club still has a number of FSI kits for 48% of list price. They may not be as pretty in the package as the highly commercial Estes line, but you can be creative and make up your own colorful paint patterns. I think the main reason some of you may not have picked up these sport rocket bargains is because Estes engines won't fit into an unmodified FSI rocket.

FSI motors come in two diameters, 21mm and 27mm. An Estes C size motor is 18mm while the D12 is 24 mm. What you need to do before you start building an FSI kit is plan for a new engine mount. You can even make the model convertible between several engine sizes with a bit of planning. Here's how to make motors fit the FSI Kits.

If you get an FSI kit with a 21mm tube, you can only power it with standard size motors. Get a 3" long section of BT-28 and an engine clip. Attach the clip so it extends 1/4" past one end of the tube, just like the standard Estes kits. Now start wrapping masking tape around the other end of the BT-28. Wrap tape for a while, then test fit the "engine mount" into the FSI motor tube. Wrap tape until the fit is snug. Repeat this process about one inch from the "engine clip" end. When you're done, you should see something like the diagram below.



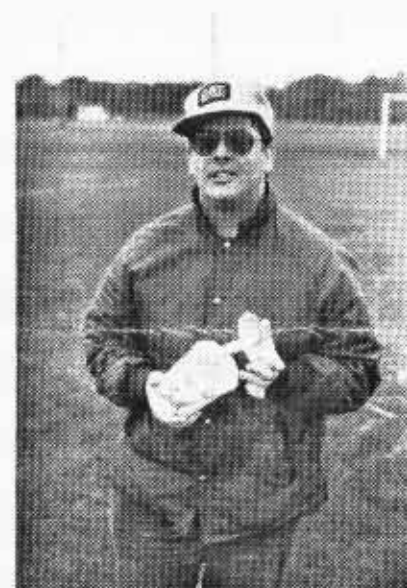
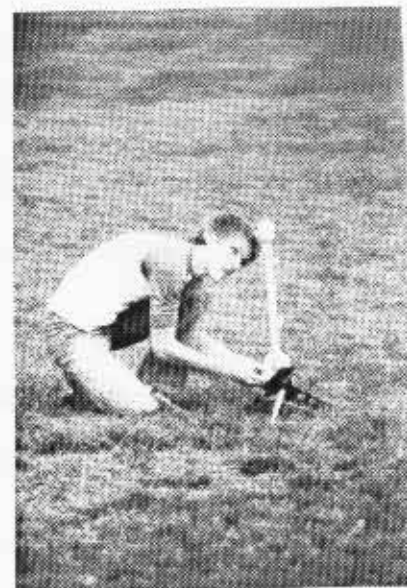
Now smear glue on the inside of the FSI tube, and push the engine mount in, just like an Estes kit. That solves the problem of the 21mm tube. What about the 27mm tubes?

You have two options. Do you want to fly with D's or C's?

You will need a 3 inch piece of BT-58 for the first step. You can get two AR-5855 centering rings, and peel the outside of the rings down until they fit into the FSI tube. Use the "peeled" rings to make an Estes-style D engine mount. Another way to make a mount for "D's" is to use the wrapped masking tape method shown above. Only this time you use a BT-58 tube to hold the engine.

If you want to fly with "C sized" engines, use one of the above methods to adapt the FSI tube down to a BT-58, but DON'T install an engine clip in it. Make an Estes EH-2858 by the instructions, and install it in the BT-58. If you can't find an EH-2858, then make an engine mount from 3 inches of BT-28, an engine clip and two AR-2858 rings.

Just remember, if you can build and install an Estes engine mount, you can adapt a mount to fit those Estes engines in our cheap FSI





SEASONS GREETINGS

TO YOU ALL FROM

N - I - R - A

RIC GAFF  
331 THIRD ST.  
NORTHFIELD IL  
60093

