

# SNOAR NEWS

MAY/JUNE  
1987

THE LEADER IN SPACEMODELING

\$2.00

## *A REAL MAN'S GUIDE TO ROCKETRY!*

**EXCLUSIVE!**  
Tormented  
Range Cat  
Contest  
Winners!

The  
Cat Flat  
Story

Clustering  
Composite  
Motors

Letters  
To The  
Editors  
(and Snappy  
Replies!)



# SNOAR NEWS

THE LEADER IN SPACEMODELING  
ROCKETRY'S LONGEST PUBLISHING, MOST CONTROVERSIAL NEWSLETTER

VOLUME XIII, NUMBER 3

## QUOTABLE

"I'd like to go to the Nats, even if only to meet the infamous Mary Roberts!"

Fred Fischer, MRC's model rocket representative.

## COVER STORY:

Real men aren't afraid to get the whole family involved. The family that flies together stays together, maybe? The Dixon family graces the cover of this issue, with a real man's monster composite rocket. Real men will also enjoy the winners of our "Tormented Range Cat" Contest. Photo by Chris Pearson.

## CREDITS:

Former Army Trained Killer, Editor, and Publisher: Matt Steele, 13011 Branscomb Rd, Huntsville, AL 35803; Real Man Evaluator: Robyn Palmer Steele; Heavyweight Champion: George Gassaway; Motorcycle Gang Leader: Chris "I Sold the Norton to buy a BMW Freak" Pearson; Able to Drink a Bottle of MD 20/20 in a Single Gulp: Mr. Maddog (Tony Williams); You wouldn't want to mess with any of these people: Vince Heugele, Mary Roberts, Randy Kelling, Terry (Asphalt) Lee, Chas Russell, Chris Johnston, J. Pat Miller, Jack Kobzeff, Mister Twister, Moose, Andy Robertson, Bob Ferrante, Bob Kaplow, Bob Gelodof, Heidi Smakula, Whoopi Goldberg, Jim and Tammy, Brad Bowers, Randy Redd, Jordan Pavlov, Sammy McNully, The Honorable Wasco Schafter, Robert Anderson, AND...

I'd like to introduce someone that has been inadvertently omitted from this space for the past four issues:

Mr. DAN KAFUN

Would you all please give him a big hand, folks!  
Sorry 'bout that, Dan!

**IMPORTANT STUFF**



## The Sticky Question of Insurance...

NAR insurance is once again in the news. It seems as though there has been an endless quest to keep the NAR's \$1,000,000 insurance policy in place for the past 10 years. Year after year, insurance premiums would rise and/or insurance companies would refuse coverage, resulting in an expensive and unsettled situation. Once again, the cost of this insurance (Continued on page 14)

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Any resemblance to any persons or cartoon characters, whether dead or alive in this publication is purely coincidental, and is just plain tough. So there!

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Published By: Graphic Solutions, 555 Sparkman Drive, Suite #1616, Huntsville, AL 35816



Dear Sirs:

I just LOVE model rocketry! It's just as much fun as sex! First, there's the anticipation. Then, you anxiously erect this long cylindrical model on its pad. Finally, when you push all the rrrright buttons, it thrusts forward, deeper and deeper into space until... ejection! Then it leisurely floats back to Earth. After a brief rrrrecovery, its rrrready to go again.

Dr. Ruth Freud

Dear Sirs:

Well, isn't that letter "special"? You think you can print anything in SNOAR NEWS, don't you? And who is the co-editor of all this? Could it be, maybe....SATAN?

Church Lady

Dear Sirs:

Please announce the following revision of NAR policy: Cat lofting, or the mixing of model rocketry and cats, is not sanctioned by the NAR, approved by the Safety Code, or covered by NAR insurance. Cats are to be restricted to separate sites three miles away or 48 hours later.

Pink Book  
Blue Ribbon  
Commission  
Committee

Dear Sirs:

I resent the new restrictions on cats. Animals have always been part of model rocketry and should be permitted.

Bunny

Dear Sirs:

I feel the same way. Model rocketry been bery, bery goot to me. Fly them funky rockets, white boy!

Moose

Dear Sirs:

The use of cats in rocketry is a blueprint for disaster. Cats have been known to fail at low temperatures or when reaching Max-Q.

Rodgers Commission

Dear Sirs:

What about Flat Cats? They always worked for me!

G. Harry Stine

Dear Sirs:

We're very happy about the new protection of cats. Those clothes pins really hurt.

Garfield and Felix

Dear Sirs:

What about me? Aaack?

Bill the Cat

Dear Sirs:

I have had a lot of offers from men's magazines to pose for them, but I haven't heard from you. I would really like to model rocketry.

Fawn Hall

*Fawn: Sorry, but model rocketry and sex just don't mix, as the illustration below demonstrates.*



Dear Sirs:

Your new graphics are great! They would be even more graphic if you considered the pornographic implications of your digitizer.

Mr. Maddog of Hollywood

Dear Sirs;  
You'd better not!

Miss Traci Reeves



Dear Sirs:

It isn't polite to make fun of other peoples' noses. Or to digitize them.

MRC

Dear Sirs:

Say what you want about me; at least I never sold arms to Iran.

Jerry Irvine

*But did he try? - Editors*

Dear Sirs:

How come you NAR guys aren't ever involved in sex scandals? Like, what's your secret?

Gary, Jim, and a couple of Marines

Dear Sirs:

Last night, I had a nightmare that Manning Butterworth came back to the United States and tried to take over the NAR. Pretty scary, huh?

J. Pat Miller

*Was Al Lindgren with him? - Editors*

Dear Sirs:

No, but Don Carlson and Steve Behrends's T shirt were there. Phew-we!

"Pat" J. Miller

Dear Sirs:

How'zit goin', eh?

It was NOT a fun weekend....

Mr. Ford LTD is alive and guzzling gas again (More so now than ever) after a carburetor transplant. Total cost: over \$200. Have you driven a Ford lately? Why?

The big GRIMM-XX celebration was a load of thrills...for my nephews Brian and Chris. I pranged a "Roadhouse Mama" D RG (loop-te-loop-te-CRASH!), lost an "Alpha Headroom" to the wind, thermalled away a "Longhorn-20t" (Didn't light the DT....it was ONLY a B4-2!) and was prepping an F Super Roc (Info Classified) when the OWNER of the field arrived, threatened to have us arrested, and escorted us off his property AT GUN POINT!

(The guy who leases the land had said: "Sure, go ahead, don't blow nuthin' up, Har-Har!")

I missed the Smurfs for THIS?

Mr. Maddog

*Well, that will teach you not to have Mutual of Miller's \$1,000,000 NAR insurance!- Editors*

Dear Sirs:

The public should understand that no rocketeer can get AIDS as long as they follow the NAR Safety Code.  
NAR Bored of Health

Dear Sirs:

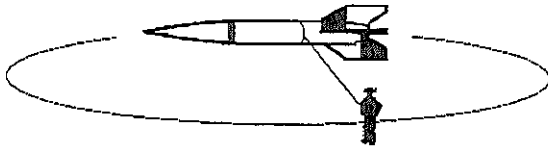
Yeah, as long as they don't bend over to recover a rocket in strange neighborhood!  
Watching for you

Dear Sirs:

Do you perform a "string test" on these high power models before flying? You know, where you swing them over your head. Just wondering...

Vern

Sure! See below! - Editors



Dear Sirs;

By the way, what's the reasoning behind some meets having a "best single returned flight" in F Super Roc Duration? I have theories....

1) High powered Super Rocs are expensive. No one should have to build two of the suckers for a crummy open meet.

2) (In "Right Stuff" terminology) The envelope is full of @#\$%&\* holes already... no need to push it!

3) Time may be limited (try and hit the freeway before the 'Bama/Penn State traffic)

4) Mars needs women.

5) The high power companies don't need money.

6) What's "Lots of Crafts" got to do with rocketry, anyways? I never see H motors next to needle point supplies!

NARC-O-MATIC

And finally, our letter of the month...

Dear Sirs:

If I don't get my credit restored and my ads run in AmSpam by July 1, the main office will "call me home".

Jerry Irvine

We'll pay for the call - Editors

**Bonus Plan!!!**

**EL CHEAPO  
Rack One, Rail One  
Launch System**

1/8" Dia. Steel  
Launch Rod

Rod Taped  
to Dowel

(2) Micro Clips

Clip Leads  
Taped to  
Dowel

To  
Launch  
Controller

1/2" Diameter  
36" Long  
Hardwood Dowel

Bottom of  
Dowel  
Sharpened  
for  
"Staking"

*Concept and  
original art by  
Tony" Maddog" Williams*

TORMENTED RANGE  
CAT  
CONTEST WINNERS!

INSPIRED BY MOOSE!

## THE SONOCAT™

By Andy Robertson

Losing models can be costly and time consuming, so put that tormented range cat to work in an effective manner as a SONOCAT™, the audible biological payload for large and dangerous rocketships!

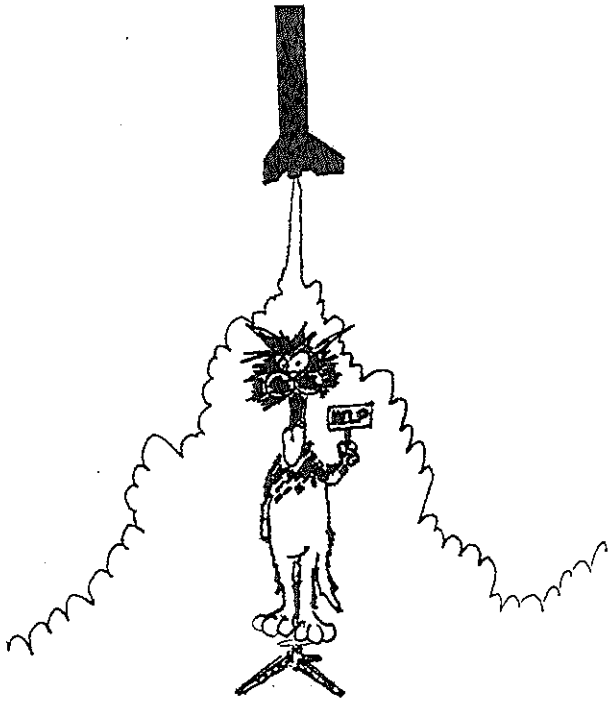
The output from a SONOCAT™ can be optimized for maximum ear sensitivity, by simply adjusting the noose around the cat's neck.

Does a cat ALWAYS land on it's feet? Fly a SONOCAT™ and find out!

WINNER

AARRGGRRRRR



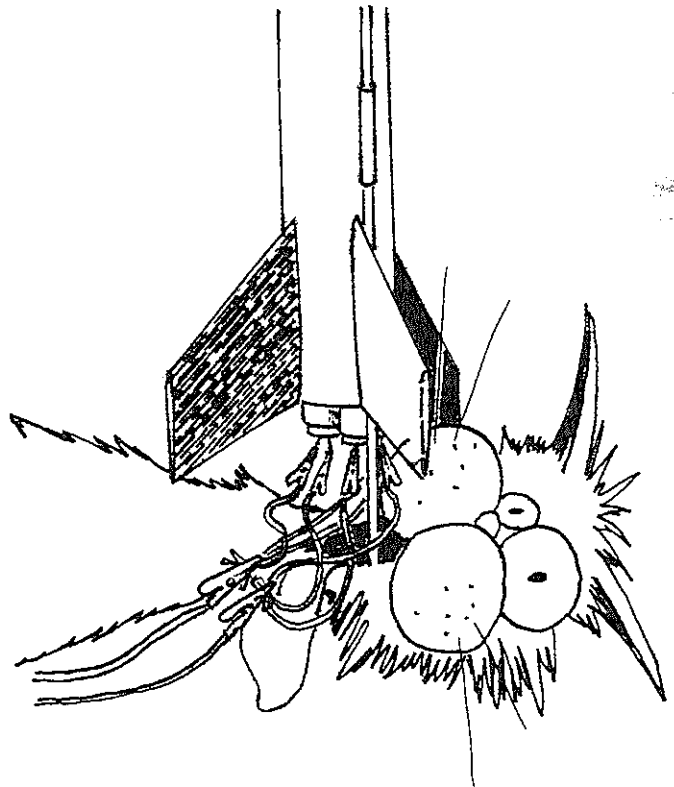


... Soak the cat in water and use as a blast defector... (Burnt cat hair smells like hell!)

Bullet Bob

.... Ignition leads never short out again....

Ron and Bert Roes



... You know where to stick the launch rod!

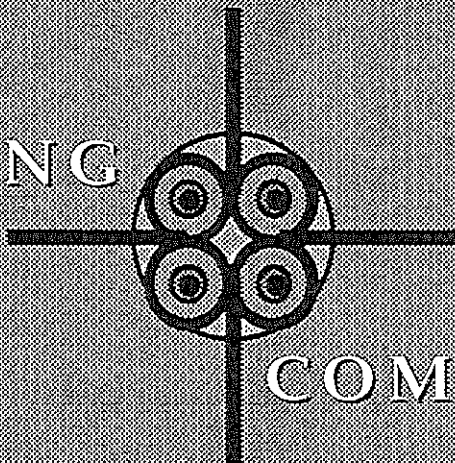
Mr. Strato

*(Yes, I do, but this is a somewhat family oriented NAR acceptable newsletter!*

*Mr. Maddog)*



## CLUSTERING



## COMPOSITES

BY CHRIS PEARSON

## INTRODUCTION

Clustering of composite motors is often used by advanced rocketeers as a method of custom tailoring a propulsion requirement for a special rocket that can not be done with just one motor. In the days before composite G motors were widely available, many times E or F motors would be clustered in an effort to get more lifting power. These techniques were developed during this time frame, and are still applicable today, even though high power motors have grown in impulse and reduced the need to cluster.

North Coast Rocketry recommends that you do not attempt clustering composite motors until you have had considerable experience clustering black powder motors. Clustered composite powered vehicles experience much greater stress during flight than your normal black powder rocket, so extreme care must be given to the construction of the rocket, along with all flight preparation.

## IGNITION INFORMATION

Until the introduction of the Aerotech line of composite rocket motors, composite motors such as the Enerjet and Composite Dynamics "Projet" traditionally had a very slow start up time, sometimes in the range up to 5 seconds. This allowed a little more leeway (read "slop") in the ignition process.

However, with the new generation of composite end-burners and coreburners, simultaneous ignition is not only desirable, but an absolute necessity. For example, the Aerotech F41 motor comes to peak thrust only 4 milliseconds after ignition. (That's a mere .004 seconds, sports fans.) Failure to get all motors ignited at once

can cause poor flight performance at best, or a crashed rocket at worst.

This report will detail the more accepted and safest methods of clustering composite motors. Following these methods will insure a safe, reliable flight every time.

## COMPOSITE MOTOR IGNITERS

This has come to be the most reliable method of clustered ignition today. Using the igniters supplied with the North Coast Rocketry motors or the North Coast Rocketry EP-1 igniters, a cluster up to 8-10 composite motors can be safely ignited. Follow the instructions for igniter construction, but assemble the igniters with the two lead wires only about 1/16" apart. Make sure that the lead wires are not shorting out. Constructing the igniters in this fashion allows the igniter to fire with less current than a normally constructed igniter, allowing for a quicker motor start-up.

These igniters can also be used for ignition of clusters of Aerotech or Vulcan endburning motors. Simply construct the igniters with the lead wires at one end of the wick. The long end of the wick is then inserted into the nozzle of the motor and as far into the grain as possible.

In the case of all motors, tape the lead wires to the side of the motor case. Do not block the nozzle in any way, as this can cause the motor to malfunction.

These type of igniters can be used in all types of mo-





tors, including black powder types. They provide quick and sure ignition of such "slow pokes" as the Composite Dynamics E20 or Crown F67. However, due to the age of all Composite Dynamic motors, we suggest that you not use them in clusters. The EP-1 or EP-2 work just as well in black powder motors, and clusters of composites and black powder motors.

Another similar method of electrical ignition that can be used for large cored composite motors (H class and larger) is to use the North Coast Rocketry SP-1 Special Purpose Ignitor or the PM-1 Pyrogen Electric Match.

The SP-1 is basically an enlarged version of the EP-1, but it comes with a large amount of a pyrotechnic substance on the head of the igniter. These are installed in the same method as the EP-1, and can be used to ignite single motors or motors in clusters. It has been fired in large clusters reliably, and comes with complete instructions, and is ready to use.

#### ELECTRIC MATCHES

Electric matches are great for clusters, provided that the head of the igniter will fit smoothly inside the nozzle. The PM-1 Pyrogen Electric Match from North Coast is an M100 electric squib coated with a high energy pyrotechnic coating. The advantage of this igniter is almost instantaneous motor ignition and can be used more reliably in clusters. It also features a smaller head than the FSI electric match, so it can be used in more applications. They are not continuity safe with all launch systems, however, so care must be exercised when using electric match type igniters.

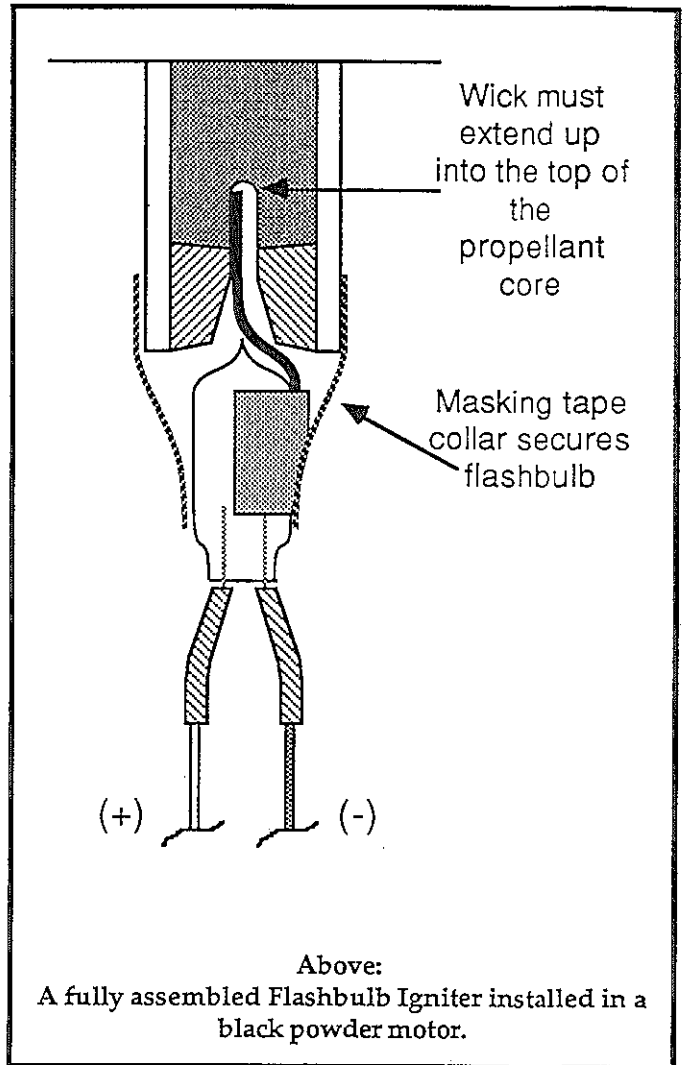
#### FLASHBULB IGNITERS

Early in the 70's, John Langford discovered that a flashbulb could be used to ignite the wick used in the Sure-Shot. Similar experiments proved that a flashbulb could ignite Thermalite. The advantage of a flashbulb igniter is that a very low current is required to set it off, making for a more reliable ignition system.

The way a flashbulb ignitor worked was simple. A piece of wick was placed in the motor's nozzle, a flashbulb placed on top of it, and the whole mess attached to the motors case with masking tape. The clips were either attached to the leads of the flashbulb or else a wire could be attached (wire wrapped or soldered) to the flashbulb leads.

Thermalite wick is the recommended wick for clustered composite models. It works as well as the now unavailable Sure Shots, and has a longer shelf life.

North Coast Rocketry offers flashbulb igniters with pre-soldered 12 inch leads, along with Sure-Shot Replacement Wick, which is suitable for use in all end burning black powder motors.



Flashbulb igniters can be assembled yourself using AG-1 flashbulbs or by breaking open a flashcube (not Magicube) and removing the flashbulbs. Lengths of 24 to 32 gauge wire are wrapped or soldered onto the leads of the flashbulb using a wirewrap tool (available at any electronic store along with the wirewrap wire). The wire can be any length you wish, but we recommend as short a length as possible in order to keep the resistance of the igniter low. A good length is usually 12 inches. This length makes it easier to hook up all the wires in a large cluster.

An important thing to remember is that flashbulb igniters are not continuity safe with most ignition systems. A good rule of thumb is to hook up a flashbulb to your system and then take continuity on it. If the flashbulb fires, your system is not continuity safe. It takes about 125 milliamps at 12 volts DC to fire a flashbulb, so some of the newer ignition systems which utilize active electronics for continuity check (and have current levels in the microamp range) are safe.

Common sense will tell you that if your system is not continuity safe for flashbulbs, that the same holds true for electric matches, which usually have a lower current firing threshold than flashbulbs do.

### THERMALITE IGNITION

This is another traditional method of ignition. A length of Thermalite ignition wick is inserted into the motor core. This in turn is ignited in some manner, which in turn ignites the motor. Thermalite comes in 3 burn rates; red (pink) 1.125 inches per second (IPS), green, 2.5 IPS and black/yellow, 5.0 IPS. Flight Systems uses the red wick and most other rocket companies use the green wick. North Coast Rocketry offers both the fast burn and the slow burn the wick. Be sure not to mix types of wicks with different burn rates as the results could be catastrophic.

The Thermalite is folded over 1/2 inch at one end, and a piece of heat-shrink or teflon tubing placed over the wick. The igniter is then inserted into the motor so that the folded over portion is at the top of the motor's core. About one inch is left exposed (not covered by the tubing) out of the nozzle of the motor.

The wick is then ignited by a flashbulb or Electric Match taped to the wick. Make sure the wick and flashbulb (or electric match) are taped securely to the motor case as not to fall out of the motor before complete ignition occurs. Sometimes a motor can spit an ig-

niter out before the igniter has fully fired. This can result in the motor mis-igniting or not igniting at all. Such events can result in underpowered liftoffs and can cause a fire hazard at the launch site. This is even more important in the case of clusters, as having one motor igniting late (or not at all) can have serious effects on the rocket's performance, causing it to veer out of control with the rest of the motors burning at full power.

An alternative method of igniting all the wicks at once is to join them all together in the center of the cluster and ignite them with one flashbulb or Electric Match. This is generally not as reliable and not recommended.

### MOTOR PLACEMENT AND SELECTION

Always place the most powerful motors in the center of the rocket and be sure the thrust is balanced on all sides of the vehicle. Some people have been experimenting with offset thrust patterns and have achieved some success. However, we do not recommend this for someone who is just beginning to cluster motors. Try to stay away from placing motors too far from the center of the vehicle. Those Buck Rogers rockets may look sharp, but any aeronautical engineer will tell you that it is bad practice to place motors in fin pods, away from the centerline of the rocket.

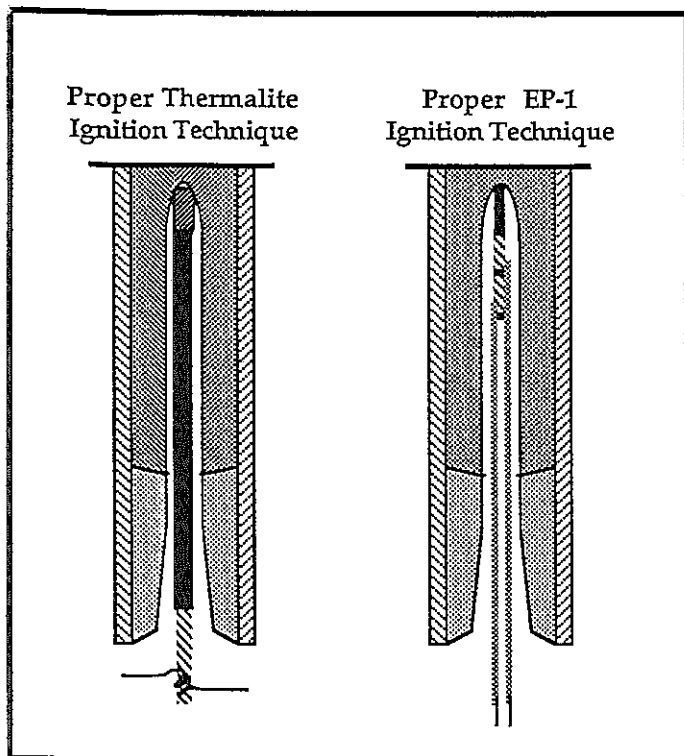
Be very careful in the types of motors you choose to cluster. Try and stick to one type (such as all E28-8's, for example) if possible. Two and triangular three motor cluster configurations should only use one type of motor. If you choose to "mix 'n match" on a three in a row or five motor configuration, choose a central motor with a moderate liftoff spike (such as an F41) with longer burning motors in the outboard mounts (such as E6's). For a "square" four motor cluster, use either all of one type motor, or pairs of identical motors, aligned so that they thrust evenly.

If you mix black powder motors with composites, insure that the composite(s) is/are the most powerful motor (s). Take precautions to insure all motors ignite simultaneously, using either Electric Matches or flashbulbs.

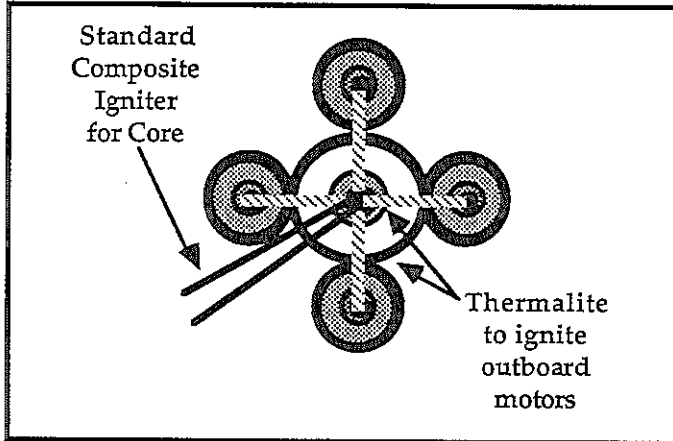
### "AIR STARTING" CLUSTERED MOTORS

Other motors in the rocket can be "air started", that is, ignited during the flight by electronic methods or by using fuse. Quite frankly, this is impressive. The igniter of the motor to be air-started are directed into the exhaust of electrically ignited motors as to effect a slight delay in that motor ignition.

Air-starting is a good idea for rockets which use a large Class C or B motor as principle power plant and a



cluster of smaller composite or black powder Class C motors. It is an attractive, reliable alternative to the complexity of a stagger launching system.



#### STAGGER LAUNCH SYSTEMS

Stagger Launching Systems are just what the name implies. That is, the ignition of some of the vehicle's motors are staggered, or delayed during the ignition process. The reasons for this are many. The principle reason is usually that one would want a single large motor to ignite before the cluster of smaller motors. Or else to insure that the composite motors ignite before the black powder motors do (owing to the fact that some composites have slow start up times, might chuff or mis-ignite).

Electronic stagger ignition is done using one or two microswitches triggered by vehicle movement, triggering relays, which in turn fire other igniters in the motor cluster, in outboard pods or start a delay system for lower stage ejection or upper stage ignition. This is something which is not recommended for beginners, as no commercial plans are available for such a system. It is up to your own experimentation, but be forewarned: Many have attempted such a system, but few have succeeded in making one work.

#### CONCLUSION

In conclusion, there are a number of techniques that one can use to cluster composite motors. Without a doubt, the most reliable method is the flashbulb technique, but other methods also work well. Clustering composites and/or black powder motors is for advanced rocketeers, and must be done in a well thought out manner. The results of such efforts can be spectacular, however.

*This report is also available as North Coast Rocketry Technical Report #02 (Catalog # TR-02) and is presented here as a service to our readers.*

The Story of the...

# CAT FLAT

A Rocket Boosted Glider  
from a parallel universe

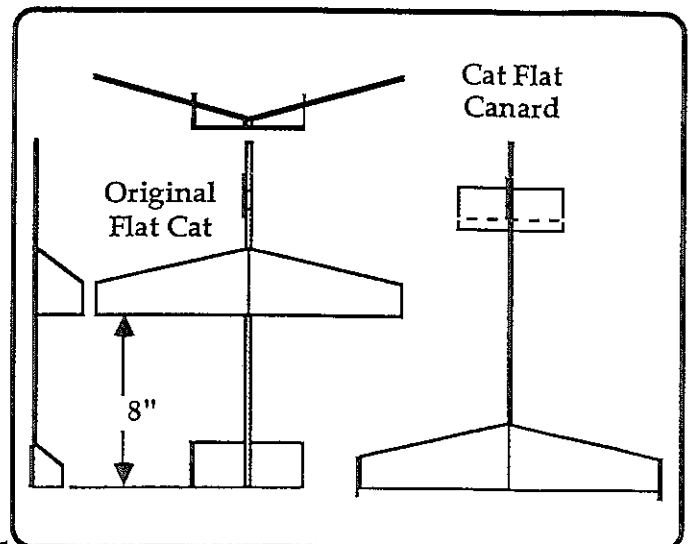
by G. C. Flanagin

This all began in late March when I had an urge to build and fly an old "classic" Boost Glider, and built a Flat Cat. Yeah, that's it! For those of you who don't know, the Flat Cat is a glider designed by G. Harry Stine around 1966 as a model for beginners, but also featuring the relatively new technique of using a pop-pod. It's use of twin rudders makes the Flat Cat fairly distinctive, like an old B-25 bomber.

The weather forecast seemed good for a change, no rain and not much wind, so it was out to the flying field to get in some Flat Cat flights. The first couple of launches went well, with some decent flight times all things considered.

The third flight started off well with a good boost and glide transition, but something unusual was going on. It seemed to get caught in a thermal, except this thermal was visible with silver and golden rays emanating from within. The Flat Cat seemed to disappear for a moment, then reappeared. The strange phenomenon dissipated, and the glider finally came down to land nearby.

But it wasn't the Flat Cat. Well, it DID have all the same basic parts of a Flat Cat, but they were all rearranged. The wings were at the back, the stab was up front, and the rudders were at the wingtips, flying



as a canard model. Even the colors were altered, red areas were now yellow and yellow areas were now red.

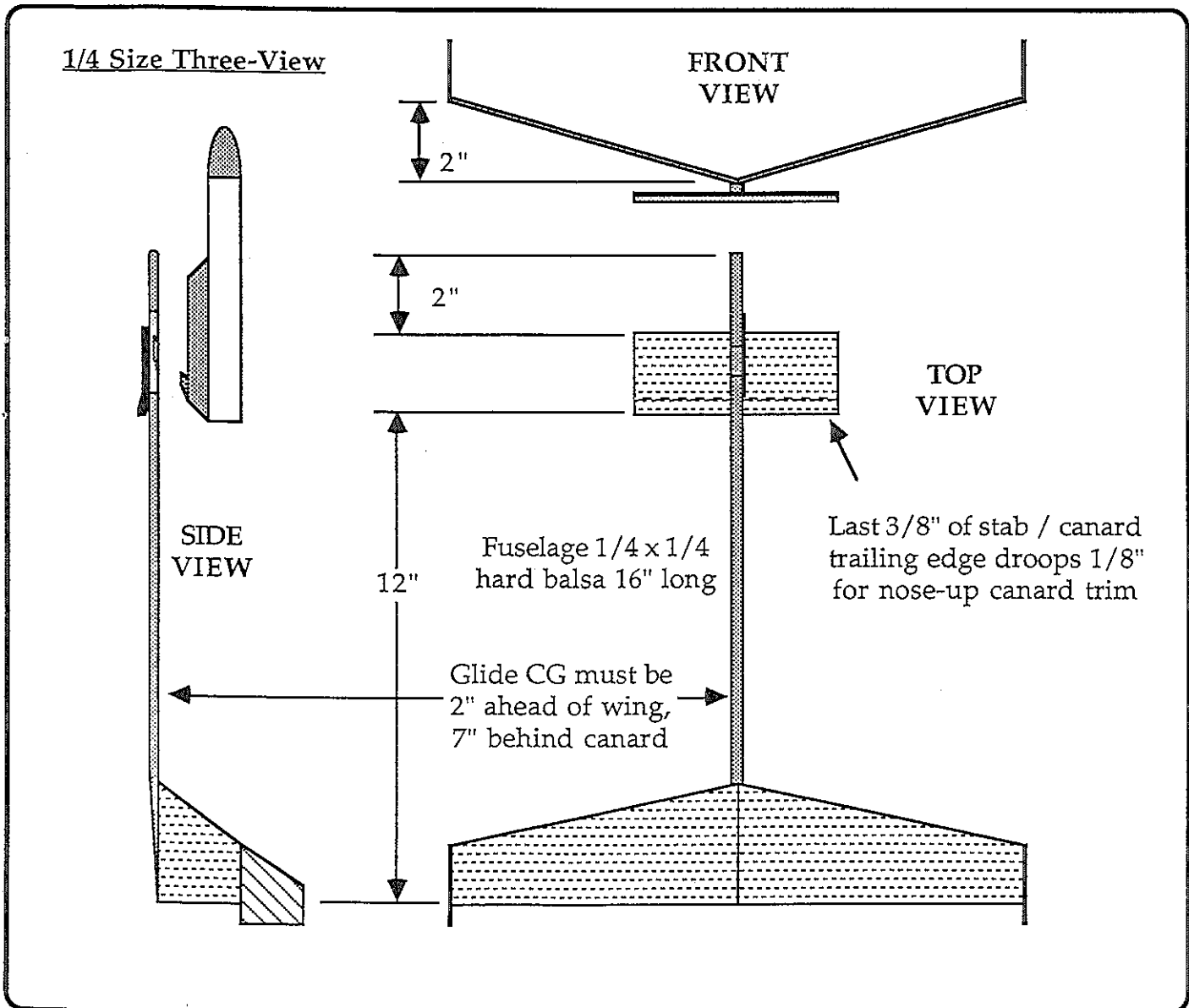
Unfortunately no one else witnessed this event, so it has been difficult to discuss with other modelers, let alone try to figure out what happened. The best theory so far is that that strange phenomenon in the sky was the window to an alternate parallel universe where the same people, places, and objects exist, but not necessarily in the same order or appearance as we have in our universe. At least that's how Captain Kirk explained it once.

I've spent some time studying the model and testing out a duplicate, and it does indeed fly OK in this uni-

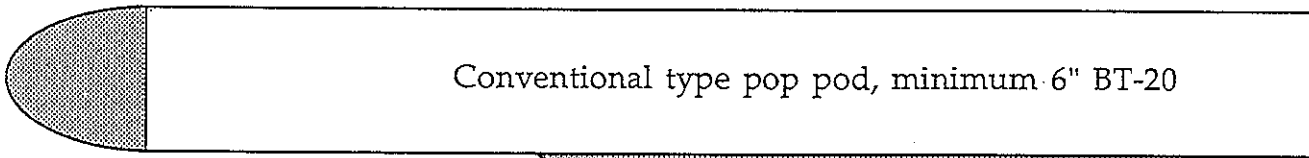
verse. The plans for this model have been drawn up and are presented here so that anyone who wants to can build and fly their own semi-alien Canard Boost Glider, the CAT FLAT.

Some of you may have trouble believing this story, but I will point out that on April 2nd, the day after this momentous event, Alabama had it's first snow in April, ever. That must've been some sort of side-effect.

And if you still don't believe me, just ask my brother, Tommy Flanagin. Or his wife, the lovely Morgan Fairchild. Yeah, that's the ticket!



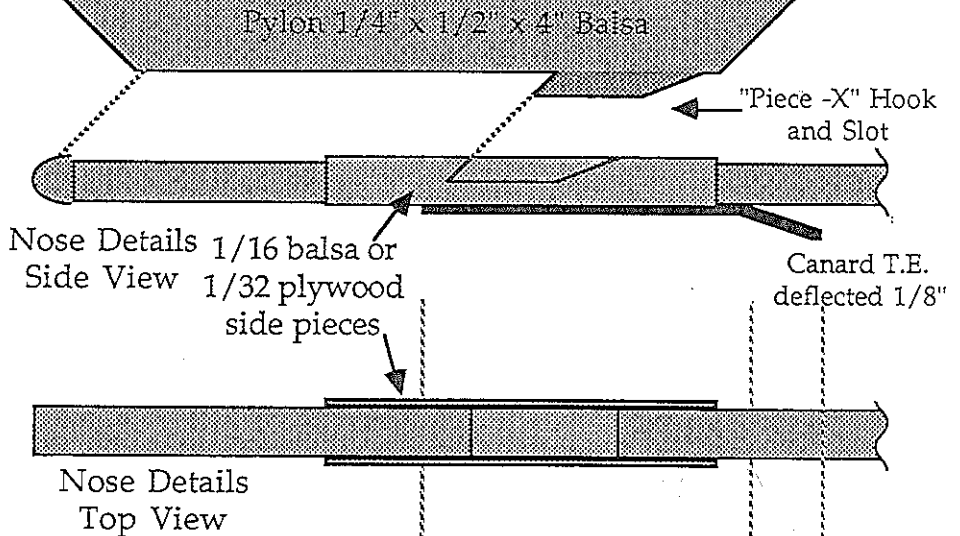
## Full Size Details



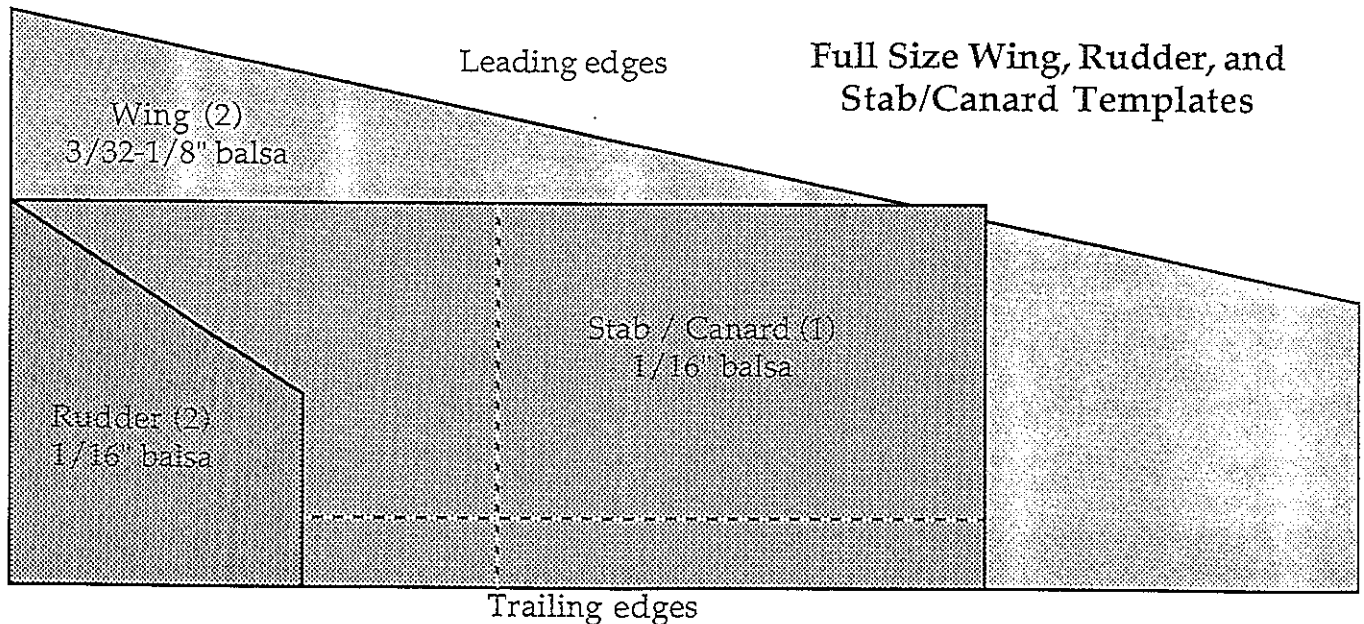
Construction is not unlike a conventional pop-pod B/G model, use strong glue fillets and 1/8" wood for the wing if B4 flights are planned. Leading edge of canard tends to get dinged, so try using strong wood along the L.E.

Pod should use a short shock cord and streamer recovery for best chance against a Red Baron, the canard tends to snag the pod's recovery system (1 Red Baron out of 3 boost tests).

Glide CG must be at least as far forward as indicated. If not, model may not have adequate yaw stability. If yaw stability seems marginal or negative, either add a sub-fin to the rear fuselage or increase the size of the twin rudders at the tips. If the fuselage height is more than 1/4" that could cause too much nose area to hurt glide yaw stability.



If the model seems to dive with the recommended CG location, try increasing the canard T.E. flap angle (this should not affect boost path significantly, unlike most models). Boost is arrow-straight. Glide is somewhat fast, but flat, and slightly nose-down. Not a world-beating model for contest flying, but decent. Best for sport flying, due to the increased likelihood of Red Baron. Suggested Power: A8-3 and B4-2



(CONTINUED FROM PAGE 2)

(which was once included in the NAR membership fee) has jumped, this time from \$5.00 to \$11.00 per year. It is a certainty that there will be considerable grumbling from the membership about this. However, it appears that the NAR has at last broken free of the whims and fancies of the insurance companies.

The NAR has a one million dollar bodily injury/property damage insurance agreement with the AMA (the model airplane folks) for insurance coverage. In the past, the NAR was simply a "rider" policy on the AMA's insurance, due to the large size of the AMA (about 60,000 vs 3,000 NAR members) and the cost advantage such size offered.

However, the premiums required to insure the AMA/NAR were simply too expensive for 1987. As a result, the AMA developed a 1 million dollar Self Insurance Reserve (SIR). This is the reason for the drastic increase in the cost of insurance. As a result of this agreement, the NAR had to agree to maintain a \$10,000 SIR of it's own. This \$10,000 SIR would be required on a yearly basis.

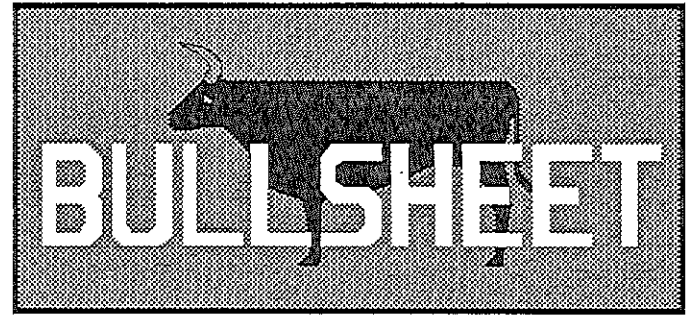
Under the new agreement, if there were a claim filed against the insurance, the NAR would pay the first \$10,000 and the AMA, through it's SIR, would pay the remainder. If a claim was filed for \$25,000 for example, the NAR would pay \$10,000 and the AMA \$15,000. If there was a second claim of \$8,000 in the same year (and for insurance purposes, this is 1 Oct to 31 Sept), the AMA would pay out the \$8,000 since the NAR is limited to \$10,000 per year under the plan. Both the AMA and the NAR would then have to raise funds to replenish the SIR's.

Of course, the above example is a vast simplification of the overall situation, but it does illustrate the insurance arrangements without having to attend Harvard Law School to understand things.

What does this mean to the NAR? Well, it means that the insurance situation is now likely to stabilize. Granted, the initial costs are high. But, in the long run, costs should decrease, especially if no claims are made against the NAR SIR. Given our outstanding safety record in the past, it is reasonable to expect no additional claims. Additionally, the NAR and the AMA are no longer at the mercy of the insurance companies who never seemed to be interested in how safe things are. Rather, now the AMA and NAR will directly reap the benefits of their members' safety.

So, go fly, but fly safely!

Matt & Mac SE



New Motors are on the way.... Vulcan Systems has sent some "Smoky Sam" E and F motors to NAR S&T for calibration. It appears that the E12 and F12 prototypes could be certified by NARAM-29. These motors, which burn with a dense, sooty smoke are very impressive in flight, according to our sources. Both motors will be 1.125" in diameter, with filament wound graphite cases. No firm word as to cost, but they are expected to be priced along the lines of Vulcan's other motors.

New Company on the way as well.... Sources that refuse to be identified indicate that a major model rocket company is being formed by some former experienced rocketeers. This is on the heels of MRC's debut in the hobby. We can't say who they are this month, but we can tell you that they will be based in Phoenix, AZ, if that's a hint. Watch this space next month for more mouth watering details.

New job.... for Dane Boles, who recently left Estes after 15+ years of employment. We hear that Dane intends to stay in the hobby market, but has not settled on final plans as of press time. We're sorry to see him leave Estes, and wish him luck. Did you get a promotion, Mary? Is there anything that we can do to help?

Another new job....went to J. Pat Miller, who got out of the super secret high tech business and into apartment...er, administration management with The Science Place, the Southwest Museum of Science and Technology in Dallas. Congrats on the move, Pat!

New NARAM site.... The 30th NAR Annual Meet will be Huntsville, AL, with yours truly as CD. Tentative plans call for a full blown tour of the Alabama Space and Rocket Center, which will have the only full scale Space Shuttle stack (the Orbiter Pathfinder, SRB's and ET) on display.

New Wife... for Brad Bowers, who will be getting hitched to long time companion Sandy at Thanksgiving. Way to go, Brad!



# NORTH COAST ROCKETRY

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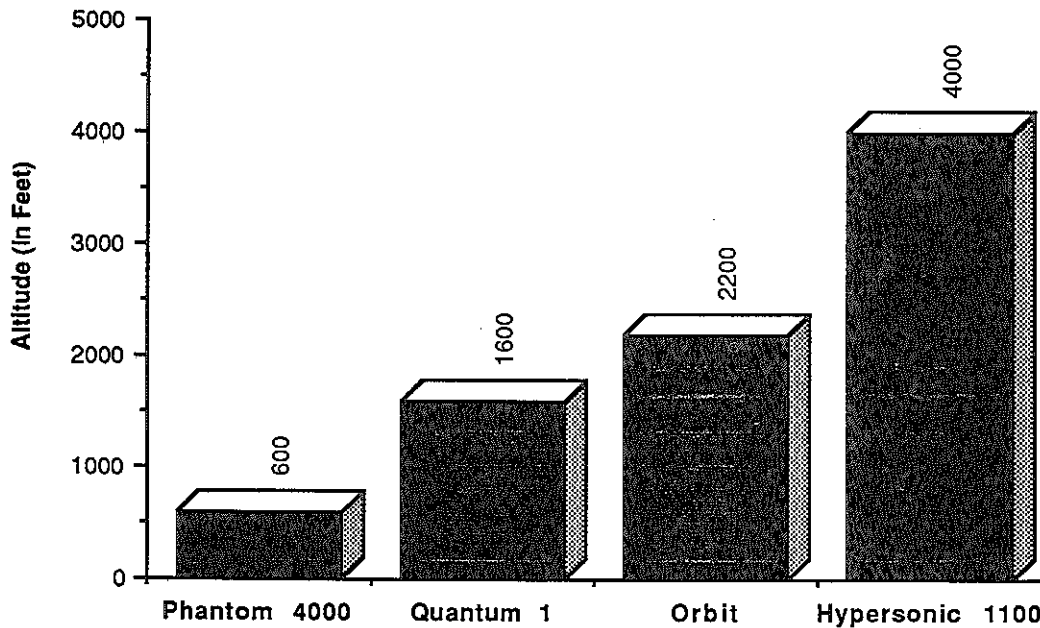
mile are within your reach. North Coast gives you the means to get there.

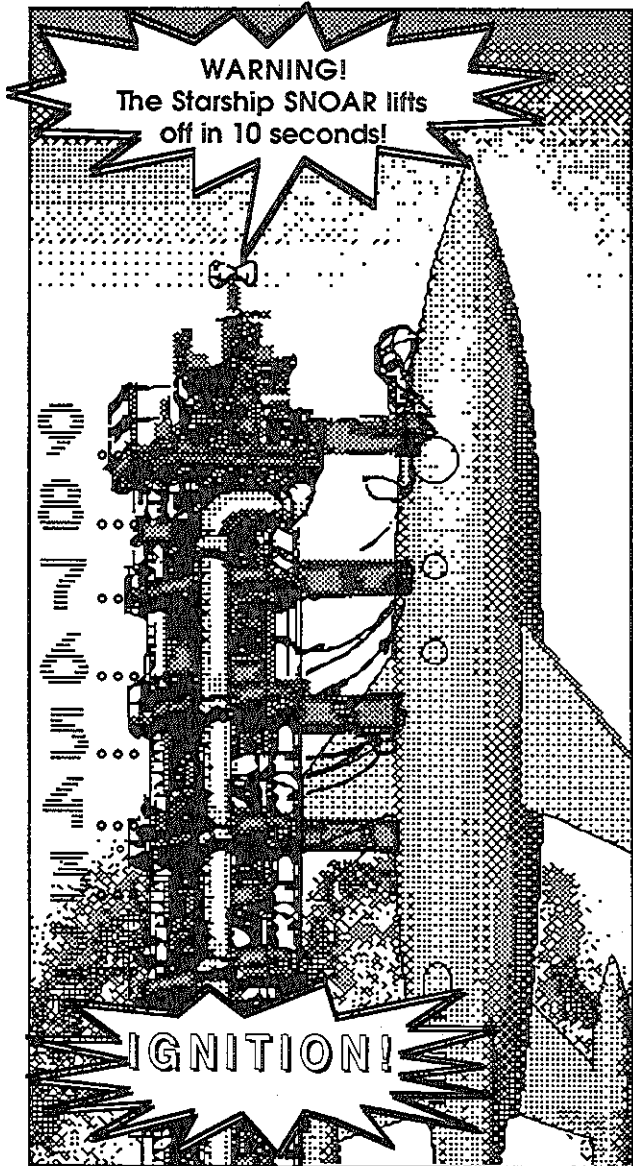
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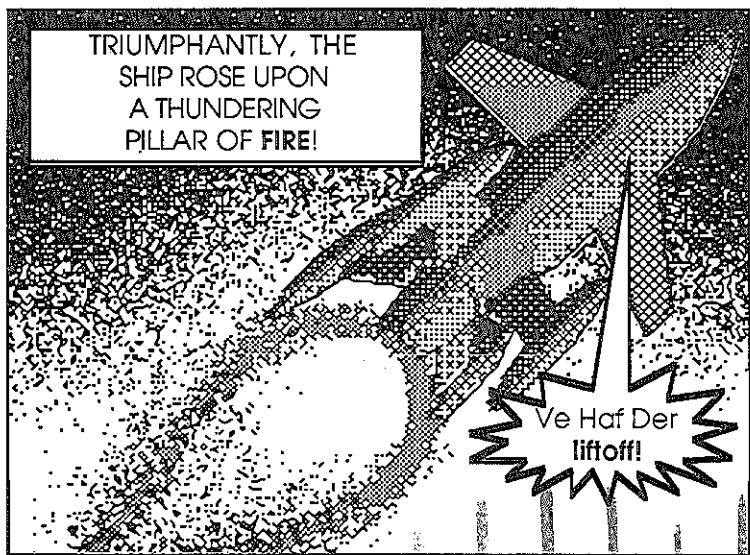
### Model Performance with Smoky Sam F40 Motor





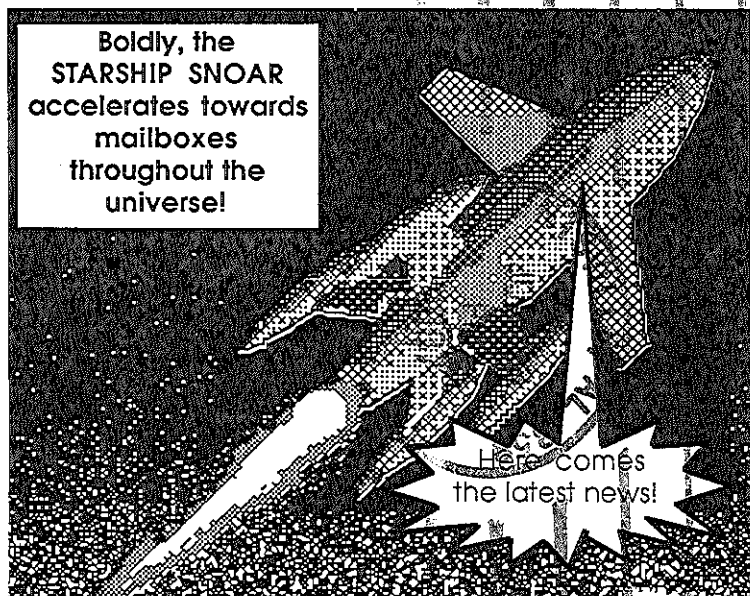
**WARNING!**  
The Starship SNOAR lifts  
off in 10 seconds!

**IGNITION!**



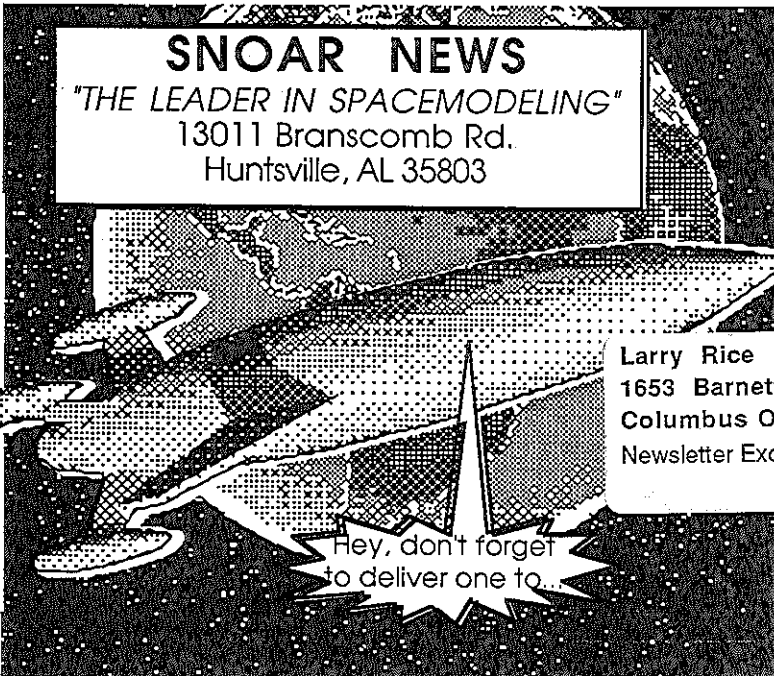
TRIUMPHANTLY, THE  
SHIP ROSE UPON  
A THUNDERING  
PILLAR OF FIRE!

Ve Haf Der  
liffoff!



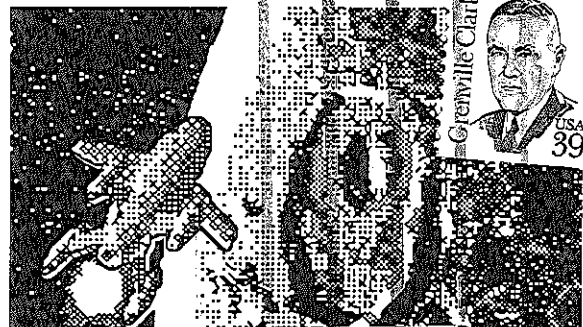
Boldly, the  
STARSHIP SNOAR  
accelerates towards  
mailboxes  
throughout the  
universe!

Here comes  
the latest news!

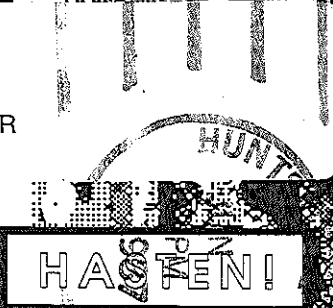


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