

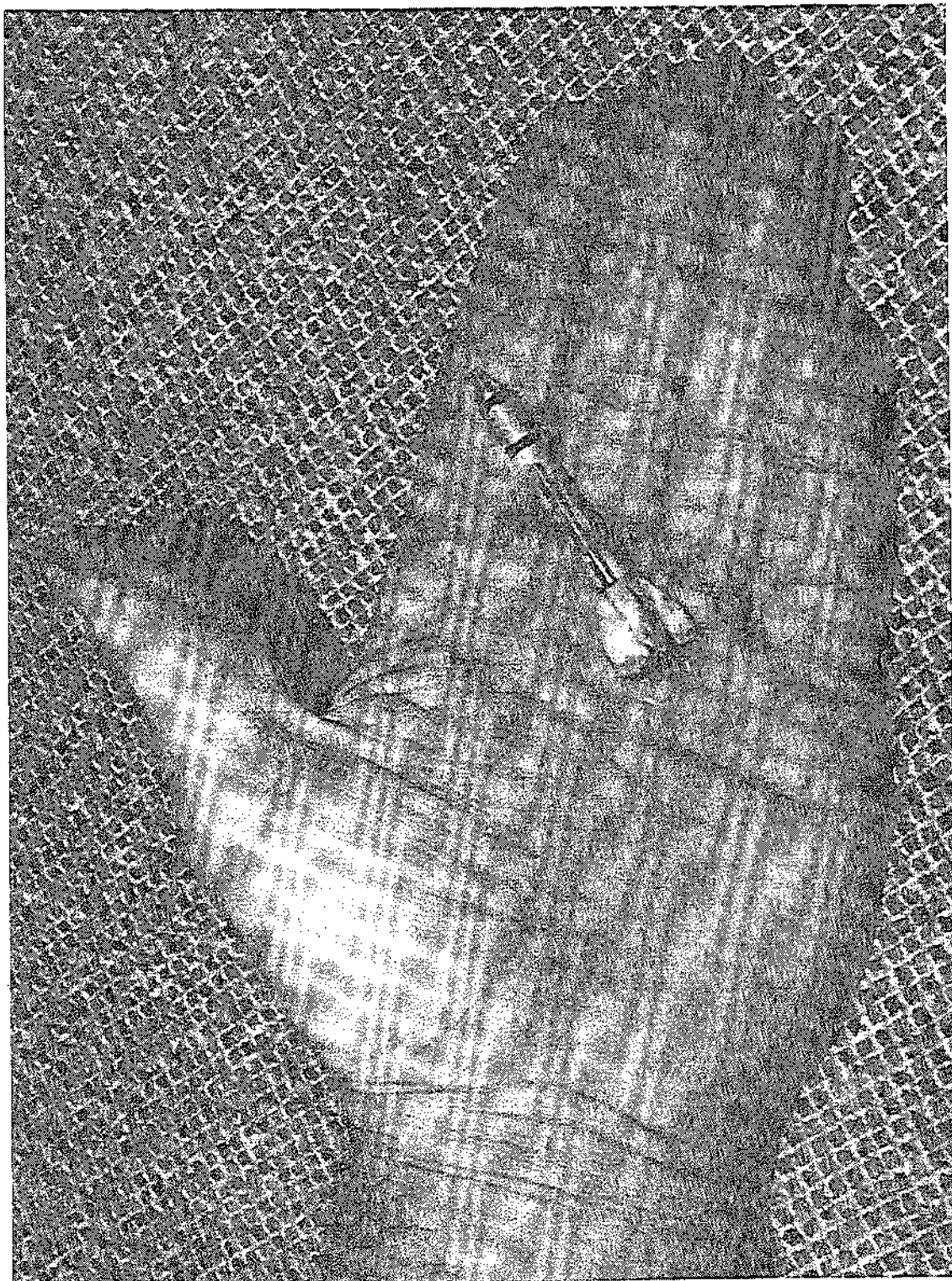
SUPER NEWS

March 1988

THE LEADER IN SPACEMODELING

\$2.00

SCALE UP THE THIOKOL LILLIPUT!



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Model Rocketry's Longest Publishing, Most Controversial Newsletter!

March 1988

Volume 14, Number 2



If You Can't Lick 'em, Lick 'em!

- Ted Nugent

Well, if the Pink Book committee has their way, the rules will change drastically in the upcoming Contest Year. Through skillful manipulation, the committee chairman has managed to put the "best returned flight" rule back in the book. If it holds up, it will set the NAR back 20 years.

One has to hand it to the chairman, Bob Karpow. He did a masterful job of insuring things would go his way. How could someone influence the voting? When the committee was reorganized, Bob insured that the voting was by region rather than one vote per member. That meant that the Pacific and Mountain Regions, with a combined membership at the end of two (3) had more influence (continued on Page 16)

Opening and Closing Credits

QUOTABLE

"For years rocket motor propellants have been technically limited to a specific impulse of 60-80 seconds (like a gasoline octane rating). ENERTEK advanced motors use a high tech State of the Art propellant with a specific impulse of 185-200 seconds!"

From the 1988 Energetek catalog.

Yeah, I think those years were 1957 to 1968!
Matt Steele, recalling the RDC and Centuri Enerjets.

COVER STORY:

Here's a bird that you'll have to scale up in order to make it a flyable model rocket! The Thokol Luliput was an actual motor, designed in 1964 for antipersonnel weapons. SNOAR NEWS presents exclusive scale data for what has to be the smallest professional rocket motor ever manufactured! Photo by Matt Steele.

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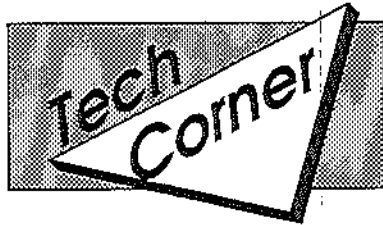
Publishing Funds: Courtesy North Coast Rocketry

Multi Staging Composite Motors

by Chris Pearson and Matt Steele

Introduction

Staging high power rockets powered by composite motors is one of the biggest challenges left in the hobby. Only experienced rocketeers should attempt designs utilizing staged composite motors. The higher powered motors can potentially cause a great deal of damage, so model reliability is extremely important. Still the performance potential of staged composites is too impressive to ignore.



Staging Techniques

There are a number of techniques that can be used to reliably stage composite motors. Three of the best are: Direct Fuse Staging, Indirect Fuse Staging, and Electronic Staging. Since Electronic Staging systems could fill an entire technical report (soon to be published by NCR), we will only touch on those systems here, and concentrate on Fuse Staging techniques.

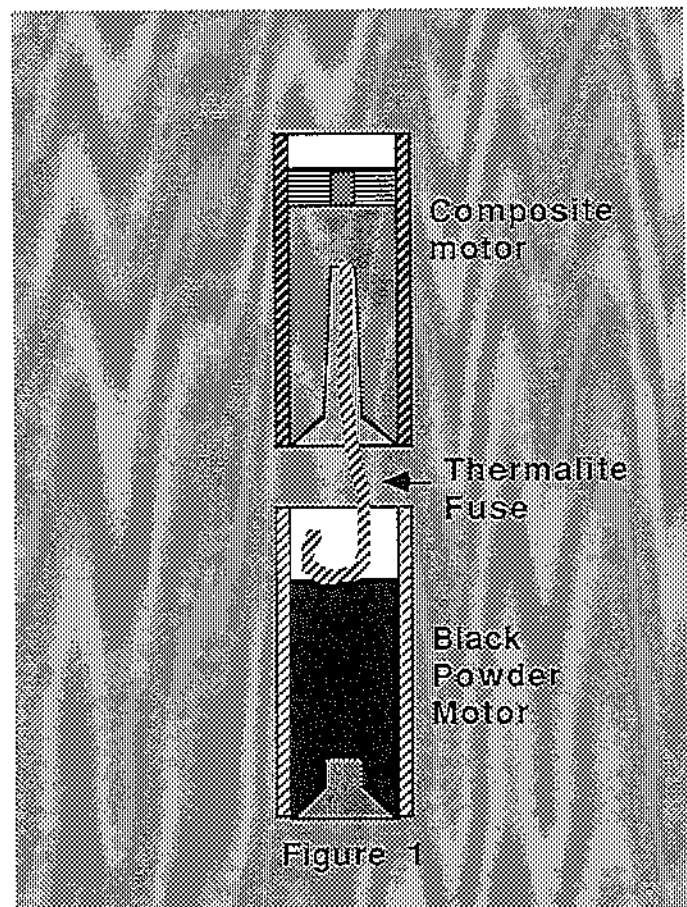
Direct Fuse Staging Techniques

One of the easiest methods to fly a staged model is to use a black powder motor in the lower stage, and a composite motor in the upper stage. Particularly impressive combinations include the D12/E6 or D12/E28, and F100/F12 or F100/F40. The advantage of using a black powder motor is that it allows for easy direct staging. Because the forward face of the black powder grain is used as a chamber bulkhead, when it burns through, it allows a lot of burning material to break free. This helps increase the chances to ignite an upper stage composite fuse. Also, no modifications need to be made to the model, which may also be flown as a staged black powder model.

Prepping such a model in relatively straight forward. First, prep the lower stage motor with the recommended igniter, and insert it in the lower stage. Then, measure the distance between the upper stage nozzle and the top of the bottom motor's grain. Determine the amount of fuse that needs to be inserted in the upper stage motor by test fitting a length of thermalite into the motor. Add those two lengths together, plus an

inch or so to get the total fuse length. Select a piece of fast thermalite and cut it to length. It is important that you use fast thermalite, as there will be a slight delay between bottom stage burnout and upper stage ignition. Be aware that E60's and F100's are particularly prone to delays. Carefully insert the fuse into the upper stage motor, and tape the fuse into place. If you don't tape the fuse into place, it may come out during staging, resulting in an upper stage misfire and a sure prang. Then, carefully put the two stages together, and be sure that the upper stage fuse is in contact with the top of the black powder motor's grain.

Figure 1 describes the arrangement of a black powder/composite staged model.



Flights from models like this are very impressive, and anyone considering flying a composite staged to another composite should try a model or two using this technique first.

If you are ready to progress to staged direct composites, be sure that you have purchased one of the spe-

cial Aerotech "XXX-0" booster motors. These are currently the only motors available designed with direct staging in mind. These motors are similar to black powder booster motors, except that they have a bonded bulkhead at the top. This is due to the higher chamber pressures that composites operate at. There is a hole in the center of the bulkhead that allows hot gases to blow through at motor burnout.

To prep an Aerotech booster for flight, insert the igniter into the motor as recommended. Once again, measure the distance between the upper stage nozzle and the top of the bottom motor's grain. Determine the amount of fuse that needs to be inserted in the upper stage motor by test fitting a length of thermalite into the motor. Add those two lengths together, plus an inch or so to get the total fuse length. Select a piece of fast thermalite and cut it to length. It is extremely important that you use fast thermalite. Remove the adhesive cap from the booster motor, and set it aside. Insert the length of thermalite into the small hole in the bulkhead. Apply a small bit of tape to the fuse to hold it in place. Carefully insert the fuse into the upper stage motor, and tape the fuse into place there, too. This is the tricky part of the operation, so take your time and do it right. It may take two or three times to get it right. Then, carefully put the two stages together, and be sure that the upper stage fuse is in contact with the booster motor. You may want to cut a small "view port" in the lower stage tube to visually inspect

the fuse after the stages are put together. If you do this, cover the hole with tape to maintain pressure at staging.

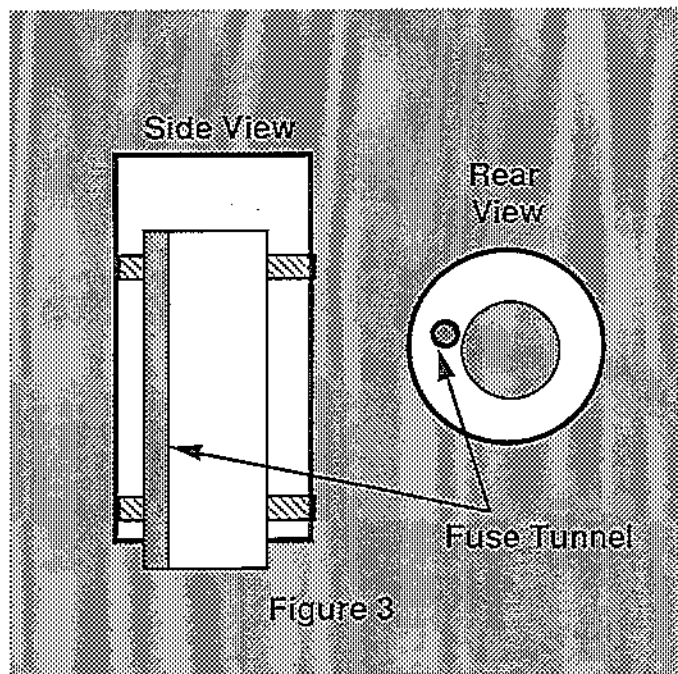
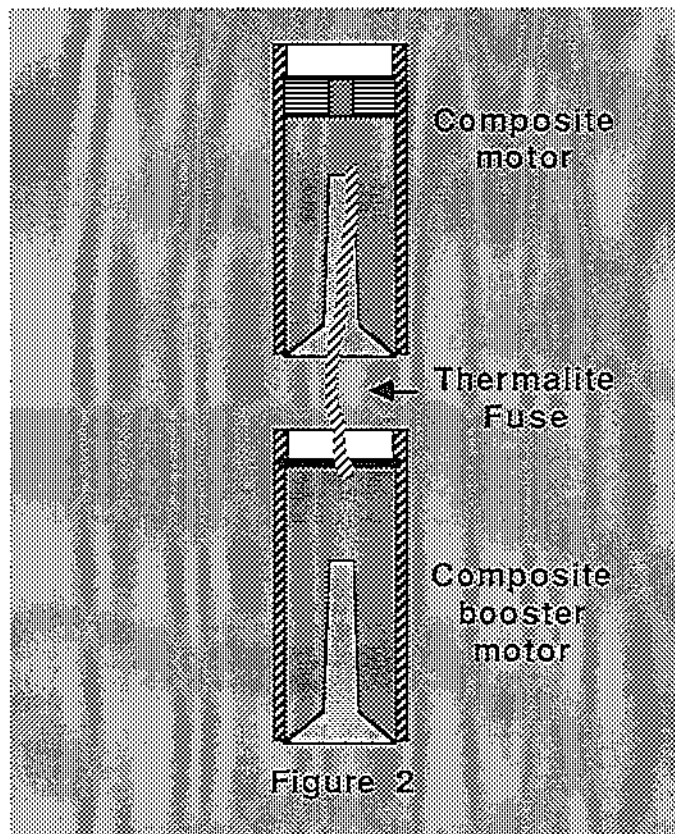
Figure 2 details composite to composite staging.

Indirect Fuse Staging

Indirect staging techniques are useful for using lower stage motors that are not designed for staging. These techniques all require a good amount of planning and design for the models that use them, but the results can be quite rewarding.

Indirect fuse staging is similar to direct fuse staging, except that indirect methods use the booster motor's flame to ignite a fuse rather than the burnout gases. This means that the upper stage fuse is burning simultaneously with the booster. Because of the variance in fuse ignition time, fuse burn times, and upper stage ignition delays, indirect fuse staging is not as exact as other methods. Also, models must be specifically designed to incorporate a fuse tunnel for staging. Lastly, the modeler must do some on the ground testing to insure that the proper fuse length is chosen.

To use indirect staging, a "fuse tunnel" must be constructed in the model. Usually, 3/16" or 1/4" aluminum or brass tubing is a good choice for the tunnel. The tunnel must allow the staging fuse to run along side the booster motor, and then lead to the upper stage motor. Figure 3 details how to construct a fuse tunnel on a booster stage.



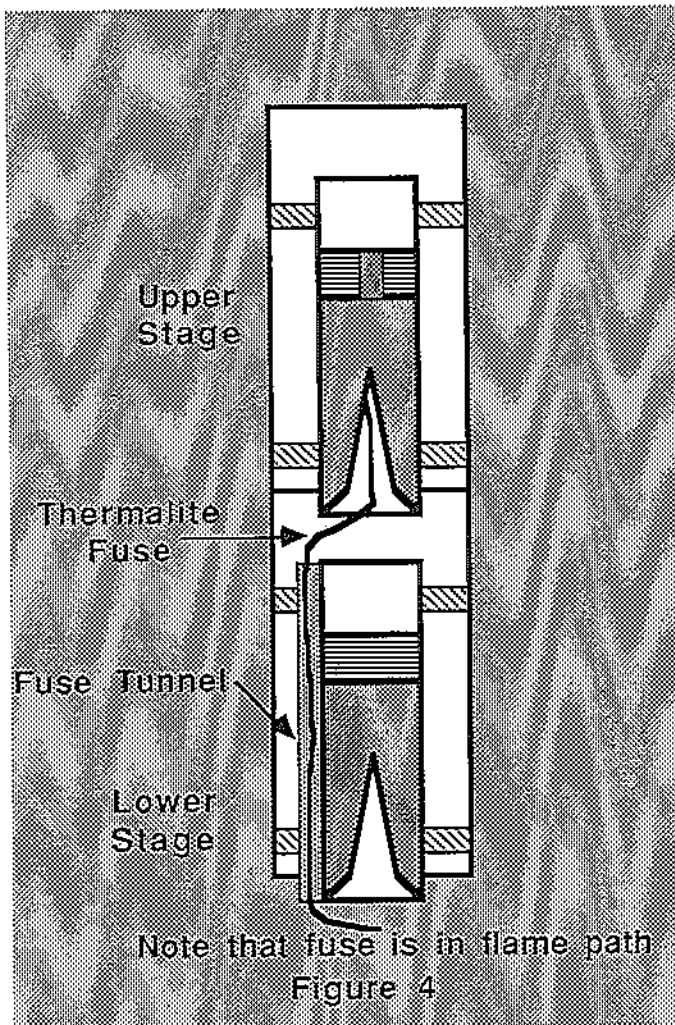
Before the model can be prepped, you have to know some information about the fuse and the booster motor. Find the booster motor burn time from the manufactur-

ers specifications. Cut a 3" length of fast thermalite test burn it, timing it with a stop watch. Divide the time by three to determine the burn rate in inches per second. (If you use a length shorter than 3", it is unlikely that you will get an accurate rate.) Do this every time you get ready to fly, as the characteristics of thermalite can change significantly with age, temperature and humidity. Then determine the amount of length you will need based on the following equation:

$$\text{Total length needed (inches)} = \text{Motor burn time (seconds)} \times \text{Fuse Burn Rate (inches/second)}$$

Just like a direct staged composite, you also need to determine the amount of fuse that will go into the upper stage motor. Once you have done that, insure that there is enough fuse to run the length of the fuse tunnel and insert into the motor.

$$\text{Total Length Needed (inches)} > \text{Fuse tunnel length} + \text{igniter fuse length} + .75" \text{ (to bend over into the motor exhaust)}$$



If not, you'll have to change to a longer burn booster motor or shorten the booster stage length.

Once you have done that, you can begin to prep the model. Prep the lower stage motor and insert into the model. Then, cut the thermalite to length, and insert it into the upper stage. Once again, tape it onto the motor to prevent it from coming loose during staging. Then, carefully snake the fuse through the stage tunnel, and put the two stages together. pull the fuse all the way through (a pair of hemostats is helpful here) and let at least .75" hang out. If you have extra fuse, leave it inside the model or fuse tunnel. Bend the thermalite over so that it will be in the booster motors exhaust when the booster ignites.

Figure 4 details how the model should look when prepped.

Electronic Staging Systems

There are a number of published electronic staging systems, although there are none commercially available. They are based on two basic premises: either a timer is started upon liftoff, and after a pre-programmed time, the upper stage igniter is set off, or a sensor of some sort is used to set the igniter off. Both types of systems are relatively reliable, and are easy to test on the ground. However, electronic systems are bulky and heavy, and not readily adaptable to some designs.

Timers typically use some sort of IC chip to count off a preset time before using either a battery or capacitor to set off a flashbulb or Solar Igniter. They usually detect the first motion of the vehicle by a "pull out pin" or a magnetic reed switch set up. Such systems are well adapted to composite/composite staging systems, since most composite motors have plenty of power to lift the extra weight.

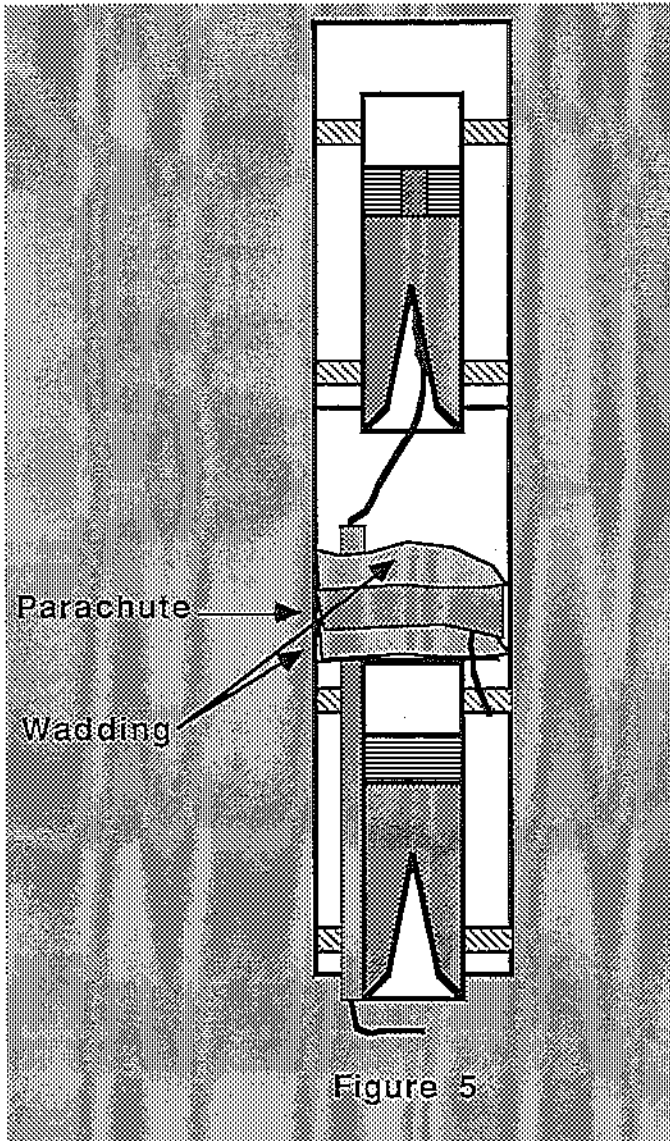
Sensor systems usually consist of a mercury switch that makes contact when the booster motor burns out. Such systems require safety precautions to guard against accidental ignition. Still, they are easy to use, and relatively fool proof. They also insure ignition quite close to actual motor burnout, rather than what the motor specifications claim, since it is a real time motion sensor, rather than a strict pre-programmed timed event.

Model Considerations

There are several key considerations to take into account when designing staged models. Because of the size and power of these models, safety must be first and foremost in your mind.

Because of the mass and size of the lower stages on staged composite models, you should consider install-

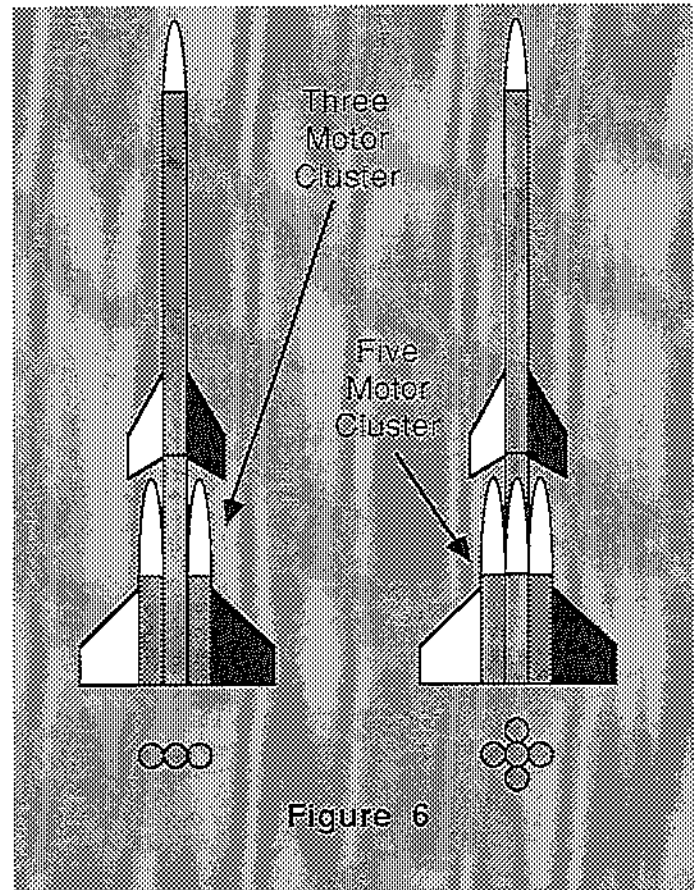
ing a recovery system. These birds are just too big to allow the to tumble down to the ground. Since indirect staged model or electronic staged models don't use a motor's ejection charge, they are particularly easily to add a parachute or streamer to. Figure 5 shows an indi-



rect fuse staged model with a parachute recovery system in place.

Also, pay attention to the strength and stability of the staged models. With composite motors, the need for strength can not be overstated. Additionally, the stability of the models must be checked prior to flight. Nothing is more terrifying than an unstable staged model!

Avoid clustering staged models, if possible. With the wide range of booster motors available, most applications do not require clusters. If you must cluster, only cluster the booster stage to a single motor upper stage. Figure 6 shows the best staged cluster combinations.



Pay attention to motor combinations. Stay away from long burn motors such as the F10, F12, F15, G10, and G25 motors on the booster stages, since they will cause the model to weathercock before staging. Good choices for the lower stage motors include the F41, F75, F80, G60, and G75. Upper stage motors can usually be any type, although you can get into trouble with the extremely long burn motors in the wind. Super combinations for most conditions are the F41/F41, the F75/F41, the G60/F41, the G60/F75, and the G60/G60.

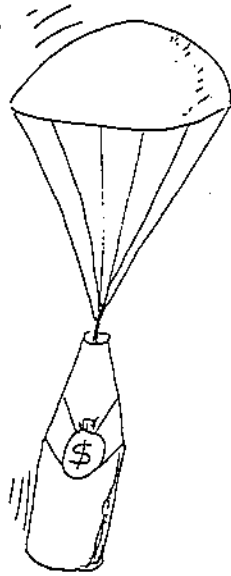
Conclusions

Staging composites can be a fun way to fly rockets. If you use care in the design and execution of such models, the results can be spectacular. Of course, these are just basic guidelines. Always be sure to take the proper safety precautions for the method you chose to use. Good flying!

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BARDLES & JAMES

PREMIUM
ROCKET
COOLER

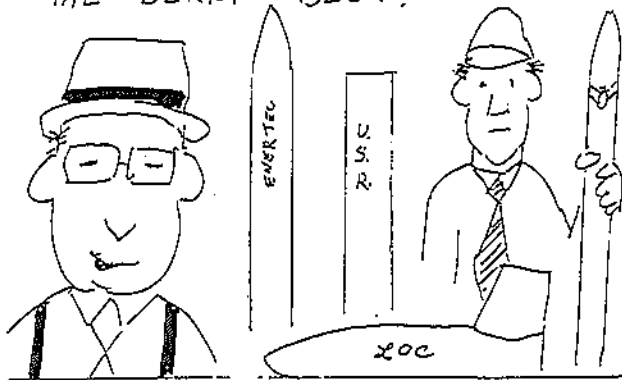


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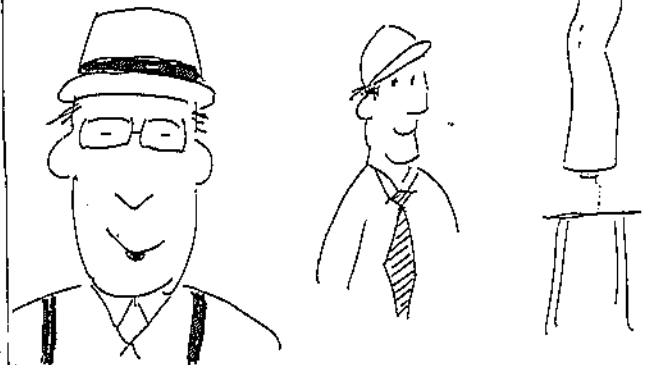
SINCE WE'VE JOINED THE HIGH POWERED ROCKET INDUSTRY, BUSINESS FOR ME AND ED HAS REALLY TAKEN OFF!



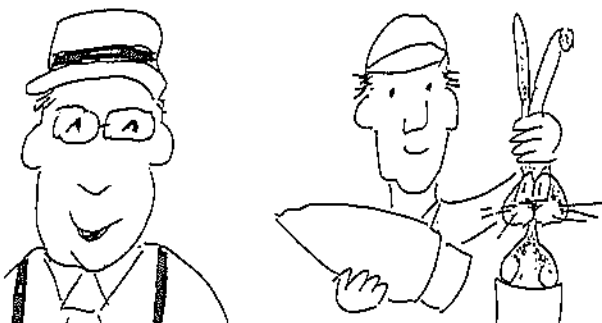
BUT WITH ALL THE PRODUCTS ON THE MARKET, ACCEPT NO SUBSTITUTES. INSIST ON THE ORIGINAL BARDLES & JAMES, THE BERRY BEST!



EVEN THE NEW PINK BOOK REGULATIONS FAVOR HIGH POWER. ED'S FAVORITE NEW EVENT IS 'F' LEG LOFTING.



ALSO THERE IS THE NEW LIVE PAYLOAD WAIVER FOR ALL YOUR CATS ROCKETRY NEEDS. I JUST LOVE SHOOTING RABBITS!



FOR A LIMITED TIME ONLY, WE'RE OFFERING A GOOD DEAL ON THESE PERSHING MODELS ED GOT AT THE AUCTION. WE THANK YOU FOR YOUR SUPPORT.

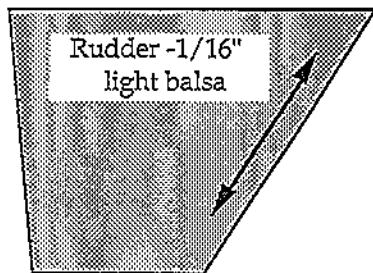
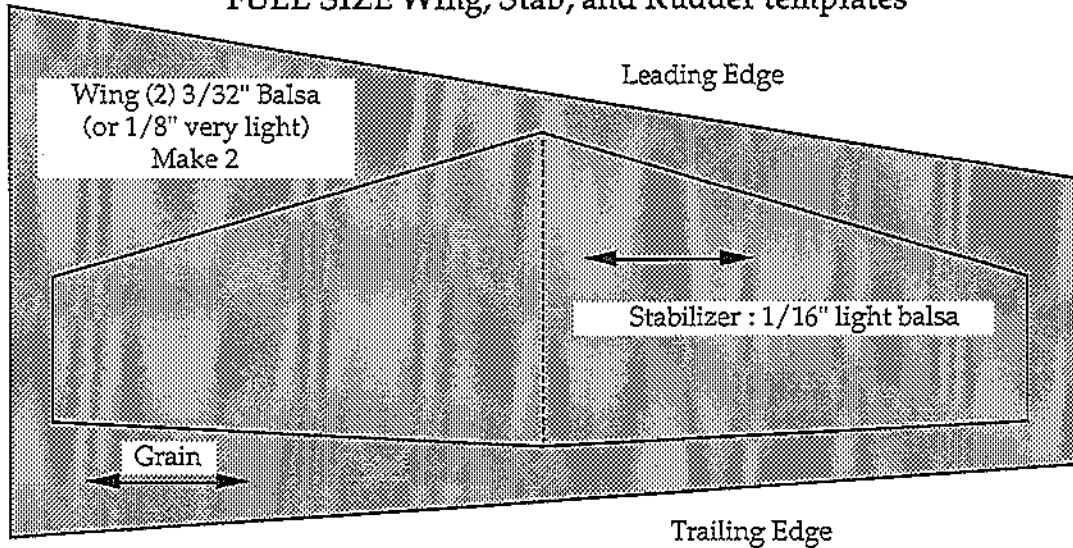


Big Fish N' Chips

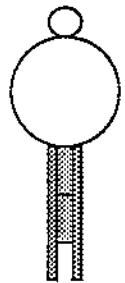
By George Gassaway

Adapted from Chris "Poot Face" Flanigan's original design

FULL SIZE Wing, Stab, and Rudder templates

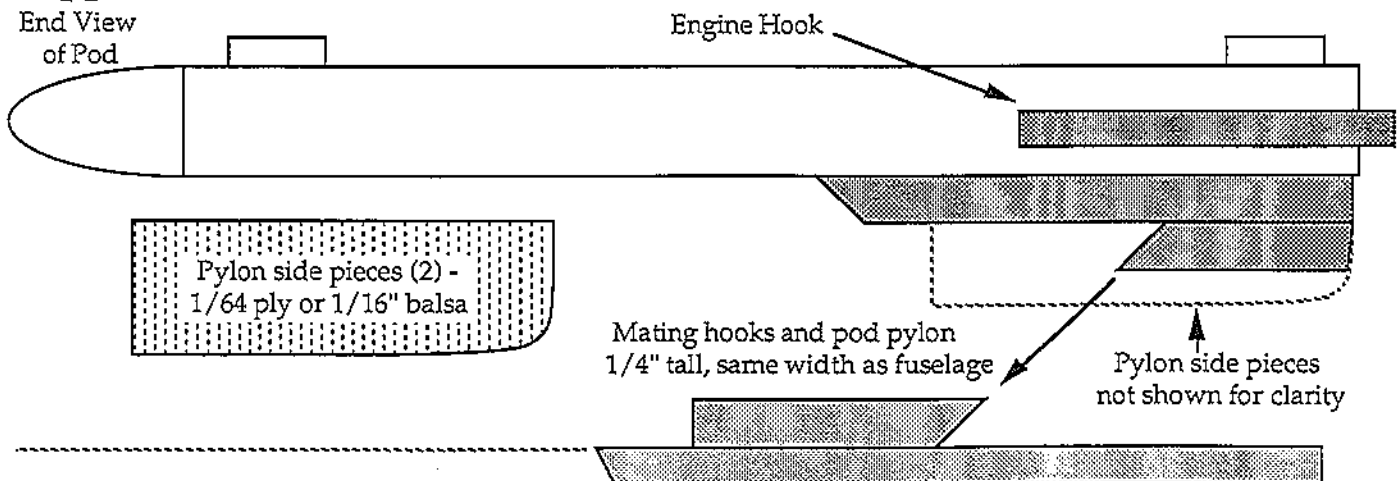


For 1/2A and A power: 1/2A3-2t and A3-2t
(possibly A3-4t, but not A10-3T!).

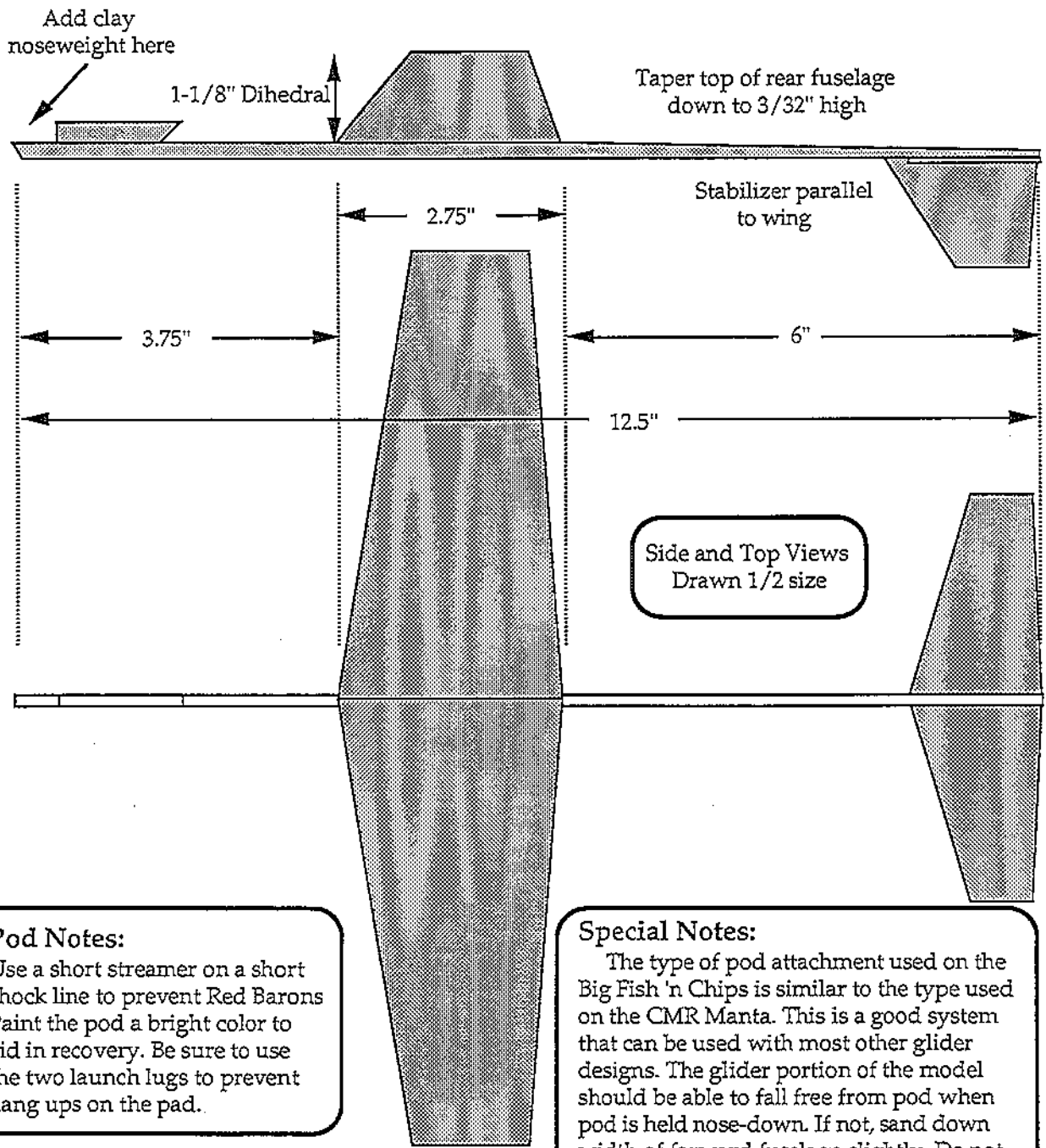


End View
of Pod

FULL SIZE Pod, pylon, hooks, and forward fuselage
Typical pop-pod, 6-8" of BT-5 with short nose cone, using
streamer recovery. Note two short launch lugs along top!



Fuselage - 3/32" wide spruce or 1/8" wide hard balsa, 3/16" high, 12.5" long



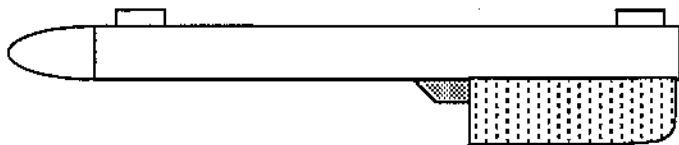
Pod Notes:

Use a short streamer on a short shock line to prevent Red Barons
Paint the pod a bright color to aid in recovery. Be sure to use the two launch lugs to prevent hang ups on the pad.

Special Notes:

The type of pod attachment used on the Big Fish 'n Chips is similar to the type used on the CMR Manta. This is a good system that can be used with most other glider designs. The glider portion of the model should be able to fall free from pod when pod is held nose-down. If not, sand down width of forward fuselage slightly. Do not sand too much, or you will get a side to side wobble that is undesirable.

The glider's stabilizer should be parallel to wing, but warp trailing edge of stab up slightly (about 1° or so) to provide just enough up elevator effect. This will help prevent the glider from death diving in.



BUILD THE...

THIOKOL LILLIPUT

The Thiokol Lilliput was an extremely small rocket motor developed in the R&D heyday of the Huntsville Division.

Also known as the L.A.A.M., or Little Anti-Anything Missile, the Lilliput was conceived as a rocket weapon similar to the Claymore mine. The TX-413 motor (all of Thiokol's Huntsville motors start with TX) was to be fitted with a fin unit, and about 250 of them would be packed into a small container. When the ignition signal was given (from a trip wire, for example) the whole canister would flash, and 250 little metal missiles would fly off towards the target. With a burnout velocity of 2000 ft/second (over 1300 mph!) and a range of 100 yards, these were potent little critters! The Lilliput never made it into production, however.

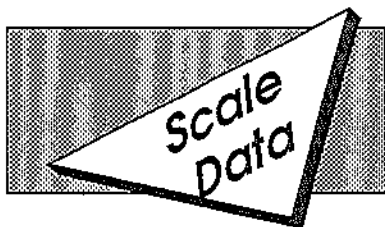
Still, this is no doubt the smallest rocket vehicle ever manufactured by a major aerospace company. The motor casing was a simple soda straw, but the nozzle was machined graphite! The nose slug was made from aluminum, and the whole thing was epoxied together. Of particular interest was the grain design. The motor was a two segment grain (technically a "segmented cylindrical perforation type"), similar to the Castor II motor developed at the same time (1964). The propellant was a special high rate HTPB composite.

Key specifications for the Lilliput are as follows:

Burn Time:	0.219 sec
Average Pressure:	570 psia
Average Thrust:	1.53 lb (6.8 N)
Total Impulse:	0.332 lb-sec (1.47 n-sec)
Specific Impulse (as measured):	193.4
Total Motor Weight	0.089 oz. (2.53 grams)
Propellant Weight	0.027 oz. (0.78 grams)

As you can see from the specifications, the motor was a "hot" 1/2A (which normally runs 1.25 n-sec) or a "low" A motor. Had the NAR tested it, it would have been given a designation of A7-0(P).

I have included the original motor drawing (Thiokol R42069) so everyone can see that it really did exist. Thiokol is a propulsion contractor, though, and as such, never put together a drawing of the completed vehicle. As such, I have drafted the Lilliput missile dimensions from an actual round that sat in my boss's desk for the last 24 years. I have taken the liberty of including



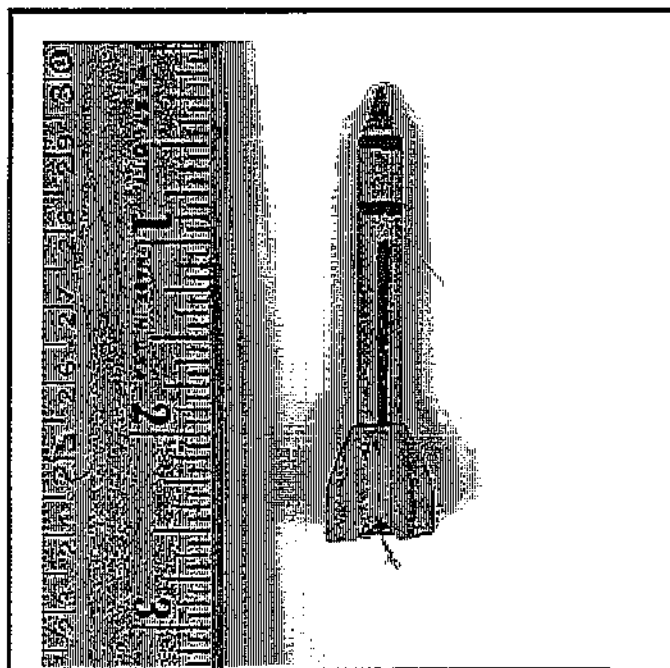
the details of the "as engineered" round as it existed in 1964, rather than the "as built and aged" missile as it now exists. This means that the true paint colors, not including the faded, yellowed, and dirty look that the bird now exhibits.

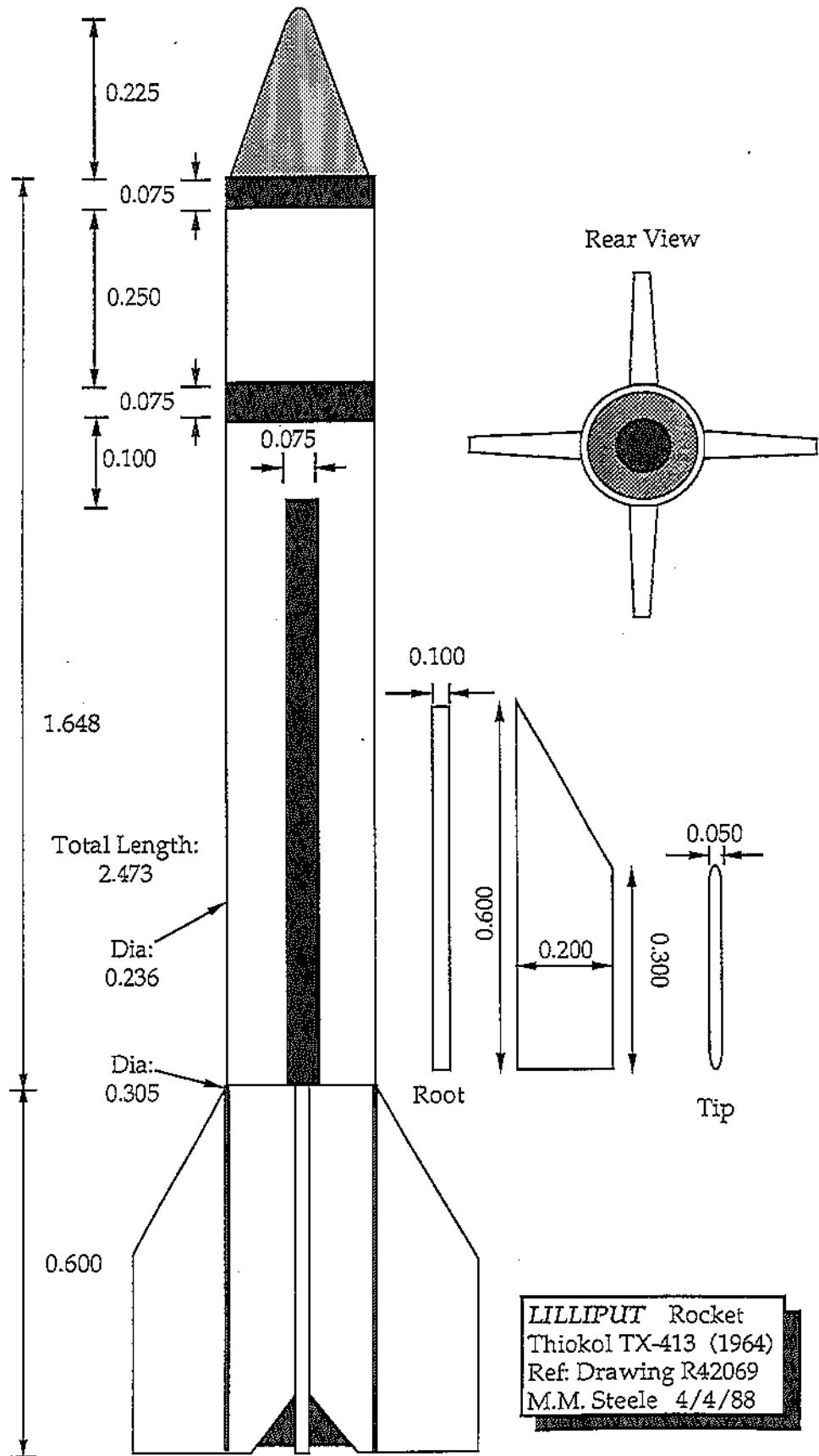
This is certainly a unique bird to model. First of all, no one can model it in actual size and fly it! There just aren't engines that small! Even the legendary AVI "Microjets" are too big! So, if you're a puritan, the way to go would be to model it around a BT-5, for about a 2:1 scale model. People like Mr. Maddog, though, would have to go to extremes, and build at BT-39 version, which would be a 17:1 model! It would also be almost 45" tall. However, it would fly on composite power, like the original.

Actually, the easiest way to model the bird is to use an RB-50/RB-52 or an RB-74/RB-77 setup, although those tubes may be hard to get these days. That way, you could make the fin unit with the larger diameter tube, and the main body with the smaller tube. The rest of the model would be pretty straight forward.

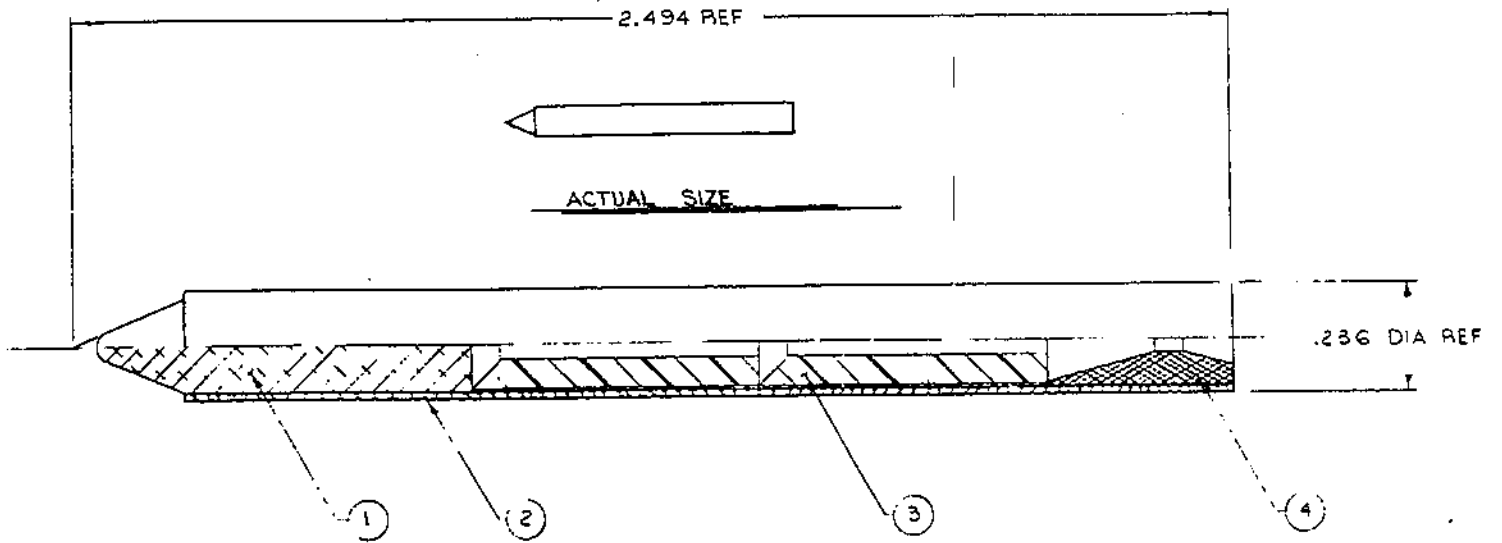
The Lilliput is a unique scale model that fulfills every rocketeer's secret dream: Building a scale model bigger than the original. Now, for Space Systems, you'd get the canister and the trip wire...

Below: This is a scan of the actual Lilliput rocket. Note the Pyrofuse wire igniter still in place!





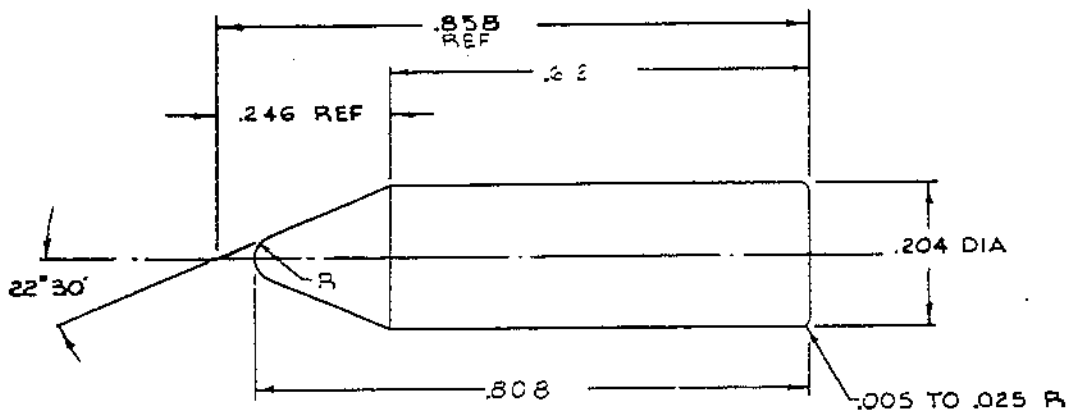
LILLIPUT Rocket
 Thiokol TX-413 (1964)
 Ref: Drawing R42069
 M.M. Steele 4/4/88



MOTOR ASSEMBLY

SCALE = 4/1

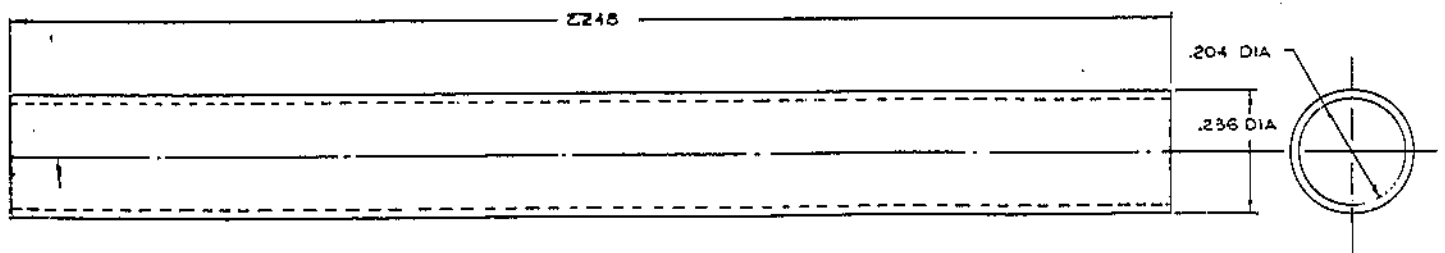
NOTE: BOND (1) AND (4) TO (2) WITH AN AVAILABLE EPOXY RESIN.



DETAIL (1) NOSE SLUG

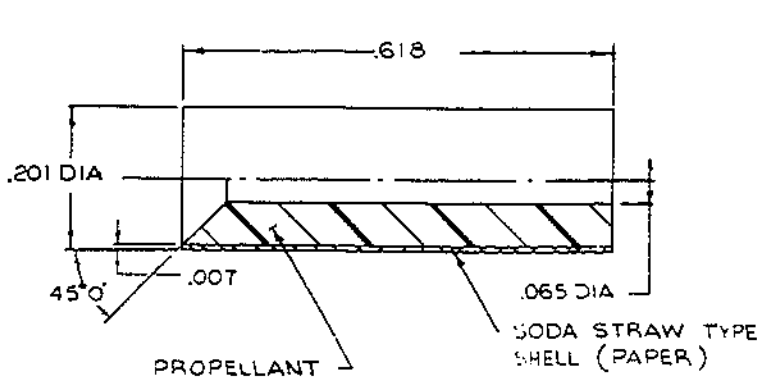
MATERIAL ALUM

SCALE = 6/1

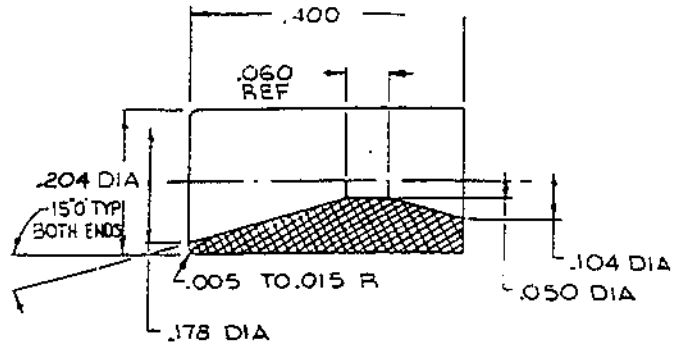


DETAIL (2) TUBE

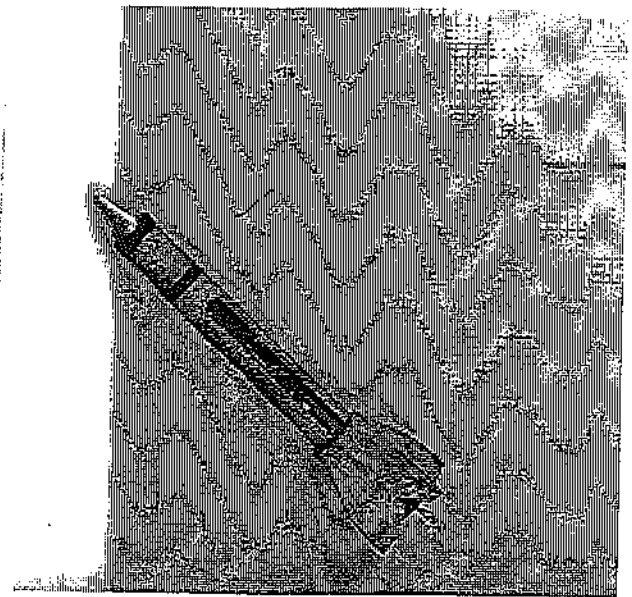
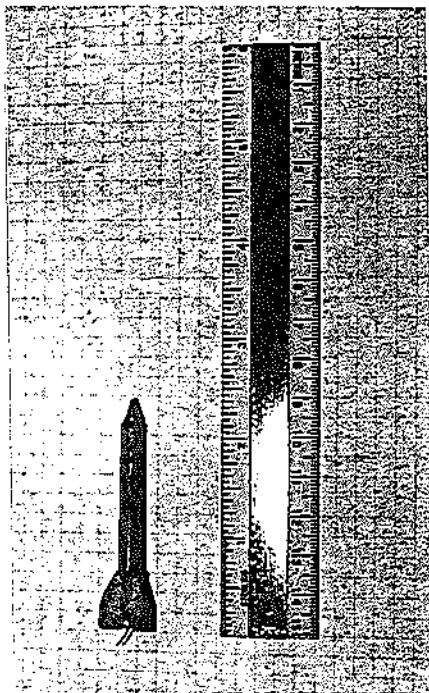
MATERIAL PAPER



DETAIL ③ PROPELLANT
SCALE = 3/1
2 REQUIRED



DETAIL ④ INSERT
MATERIAL MOLDED CHOPPED GRAPHITE CLOTH
SCALE = 6/1



PART NO.	NO. REQ'D	DESCRIPTION	STOCK SIZE	MATERIAL	SPECIFICATION
LIST OF MATERIAL TX 413					
UNLESS OTHERWISE SPECIFIED: 1. BREAK ALL EDGES TO 0.015 RADIUS 2. ALL DIMENSIONS ARE IN INCHES 3. TOLERANCES: 0.000 ± 0.002; 0.000 ± 0.001; ANGLES ± 0°-30' FRACTIONS ± 4. SURFACE ROUGHNESS IS TO BE MAX. PER MIL-STD-10 5. TOLERANCES ARE PER MIL-STD-8 6. THREADS ARE PER FEDERAL HANDBOOK N-28 & SUPPLEMENT 7. WELDING SYMBOLS ARE PER JAN-STD-19			BY DATE	CALCULATED WEIGHT: LILLIPUT ROCKET MOTOR AND DETAILS R42069	ACTUAL WEIGHT: PROJECT: 518-03-06 SCALE: 25 NOTED NEXT ASSEMBLY: FINAL ASSEMBLY: SUPERSEDES:
		DRAWN CHECKED ENGINEER PROJ USER		R42069 R42069	

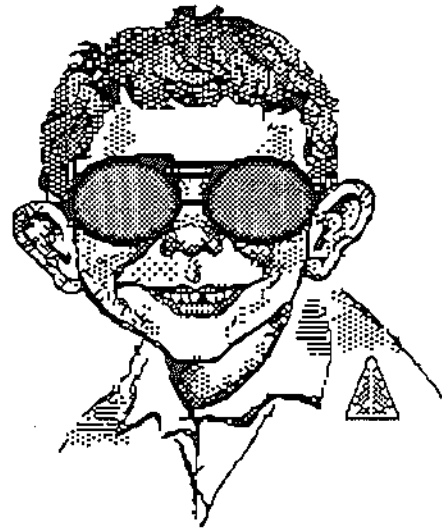
Would You Buy an Izuzu From This Man?

Hi! I'm Jerry Bovine,
of USSR Rockets!



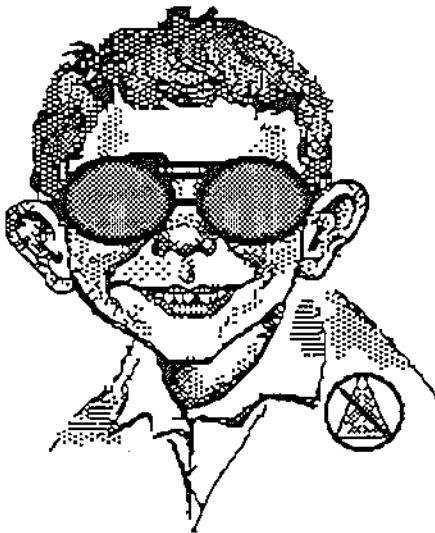
And I'd love to
pick your pockets!

I'm a big time rocket
company owner...



who has been sued
a couple of times!

I first talked about
the safety of high power...



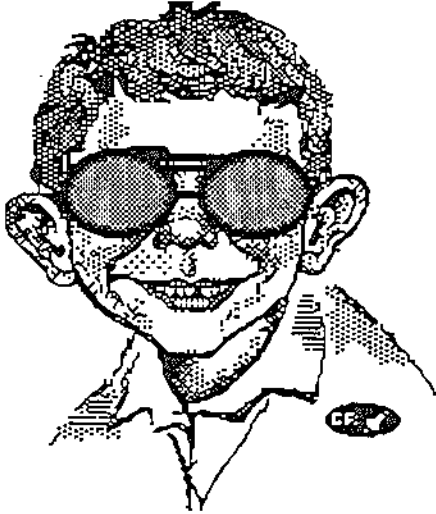
but I got kicked out of the
NAR for safety violations!

I took full credit for
the NAR approving high power!



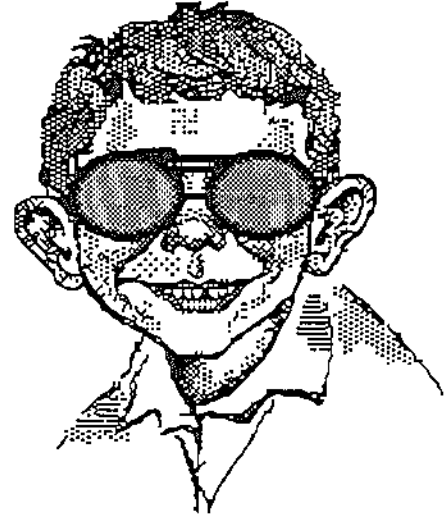
I also took all the cash
I could from high power
flyers!

I deliver my products on time...



If you count months,
not days!

I'm a leader in high technology...



particularly in
"Stealth" kits!!!

I'm an equal opportunity person...



I screw friends
and enemies alike!

Trust me!



There's a sucker
born every day!

From Your Sometimes Sober Editors

(Continued from Page 2)



than the Southland region, which counted three former national champions among members. Combine this with the fact that one of the Pacific members hasn't

flown a NARAM or significant NAR contest in 20 years (Humm...), and you can see that the forces that be allowed a slanted result. There isn't space to go into the other ways the vote was manipulated, but it was manipulated.

Going to such a rule is just plain stupid. Here are just a few reasons why:

It's discriminatory: Forcing return of all models greatly benefits those who have the physical ability and Easter egg-hunting skills to find a model. Fliers who are unable to easily chase models will have little or no chance of faring well in NAR contests now. This was supposed to be model rocket competition, NOT the decathlon. If you're old, fat, suffer from asthma, have knee problems, or have suffered a stroke, NAR competition is no longer for you. At least the current rules gave everyone a better chance to win. Now it's all or nothing.

It creates additional potential insurance liability problems: It stands to reason that the more effort expended to retrieve models, the greater the chance that something bad will happen as a consequence. The chances of a violent injury such as being hit by a car or falling out of a tree are increased. At the very least, this can lead to insurance claims for medical bills. The AMA has had some insurance claims like that, including at least one free flight flier found dead at Taft (died of heart attack while chasing a model).

The worst injury seen so far on a NARAM flying field was not due to a flight, but from a person falling out of a tree. Bernard Biales fell while trying to get a glider that had landed in a tree during a hand launch (Allentown 1981, US Team flyoffs). In that case, Bernard was trying to get the glider because he wanted to have it back for his use later in the day, it was not part of an official contest flight. But it could just as easily have been. Phil Barnes climbed at least 60 feet up a tree in Yugoslavia last fall to recover George Gassaway's flex-wing. The rules only allowed 2 models for 3 flights so it was important for contest flying reasons to get the model back (to ensure a flight in round three). Without such rules requiring return, the flex-wing would have been abandoned without a second thought. It is scary to think that someone could DIE trying to recover a model solely to meet contest rule requirements,

when otherwise common sense would indicate to forget the model. Indeed it seems some people will not be satisfied until somebody is seriously injured or killed trying to recover a model solely to get a "return" checkmark on their flight card. That's fun? This makes about as much sense as requiring a person hitting a home run to bring back the baseball or have the run turned into an out. Or disqualifying a race car for going too fast (with speed limits unknown at the time no less!)

It does not reward good flights: It is incredible that model rocketry has the only form of required return on models flown for absolute performance. The AMA knows better than to do that with their free flight events. They fly multiple rounds with maximum times, and their max times are short and flexible enough to adapt to flying site size so there is not a great chance of losing more than the allotted number of models. Most of their fields are very well suited to chasing, especially with small motorbikes (Something model rocket contests have seen very few of...yet). An AMA Contest Director would nearly be lynched if he held a major or national meet at a site like Allentown with 5 minute maxes or unlimited flight times. If return of models is required, NARAM should be planned for Johnson Space Flight Center in Houston or Taft, California. No past NARAM sites other than Houston are big enough if the rules are "return or else" (And Matt says he still thermalled away a number of models on that field!).

With model rocket flying sites getting harder to find and generally smaller, while flight performance capability has expanded greatly since the early 1970's, it is inconceivable that going back to return of all flights will mean anything. It is little more than Spot Landing Duration, or Russian Roulette Duration. With as much as can happen in the atmosphere, it is impossible to "make" a model land anywhere short of using radio control. And, oddly enough, even radio control isn't allowed at some meets by the same people who want the return rule. Flight performance means nothing when it is absolutely tied to return. The people who will argue otherwise are A) new flyers; B) old NAR types who remember the "good old days" but don't fly anymore; and C) poor flyers.

Model rockets get lost: I don't care who you are, you've lost a model sometime. Well, if you lose one at a contest, it's just tough luck. As if things weren't bad enough to lose the model already. The people who rally around the argument that "model rockets are reusable" don't understand that it means you can put another motor in them if you get them back. Model rockets are reusable, but not necessarily returnable.

Contests are supposed to be fun: But they won't be if everyone is out hoofing it in the woods looking for lost models. If I wanted to explore the wild, I'd buy a back-

pack, not a boost glider.

What can you do about this? Simple. Write your local contest board representative and let him know what you think. There's still time (though not much) to prevent this rule from going into effect.

In the Northeast, write: Art Rose, 8 Sandusky Rd., New City, NY 10956 (914) 634-5041

In the Southland, write: Ken Brown, 7021 Forrest View, Springfield, VA 22150 (703) 451-2808

In the Midwest, write: Jim Zingler, 324 W. Milwaukee, Tomah, WI 54660 (608) 372-5397

In the Southwest, write: Ron Goforth, 11647 Sage-meadow Lane, Houston, TX 77089 (713) 484-1083

In the Mountain Region, write: Gary Price, 708 E. 1700 South, Orem, UT 84058 (801) 224-1121

In the Pacific Region, write: John Joseph, 4902 W. 130th St., Hawthorne, CA 90250 (213) 644-3312

Please take the time to write. Things will be a mess for a long time to come if you don't.

Now, onto other matters....

Matt would like to thank all the folks out there who sent nice letters to him for his past work. I know I'll be counting on him heavily in the next few months to get up to speed.

Also, Matt thinks that a bug might have gotten into his software and screwed up his mailing list. Actually, I think he was under the influence one night when he was trying to process subscriptions, but what the hell. Anyways, there may be a few of you out there (and we have an idea who you are) who are getting notices saying your subscription expired when you really renewed last fall. If that's the case, please drop Matt a line and let him know.

I've been asked if the Postal rate hikes will affect the subscription price of SNOAR NEWS. The answer is no. We've had a substantial number of new subscriptions and renewals in the last six months, that we are running above our budget projections. So, at least for the time being (i.e., other costs don't go up significantly) the cost of a subscription will remain at \$10. Who says there aren't any good deals to be found anymore?

J.D. McNeil

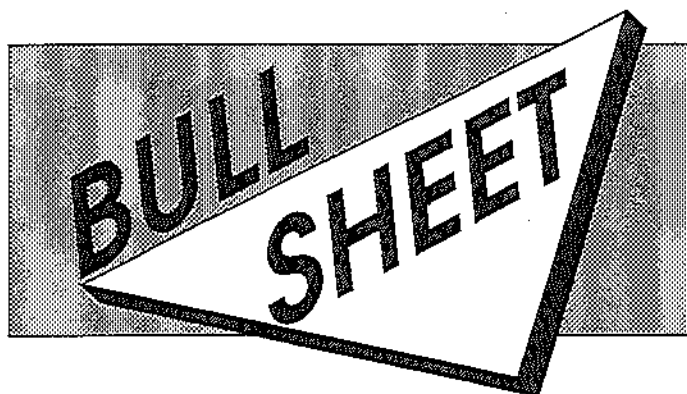
Robyn and Matt Steele Complete Scale Model!

That's right, Matt and Robyn just completed their first scale model together, an 8 lb. 5.5 oz. baby boy on February 25, 1988. The Steele model, named Cody David, was amazingly accurate, right down to his lack of hair. Robyn estimates she put 6,500 hours into the model, noting that the last 16 hours were the hardest. Final delivery occurred at 5:29 PM, Central Standard Time.

Cody David, or "CD" as his uncles call him, laid out at 22" long. Despite rumors to the contrary, he was not named with C.D. Tavares in mind. Still, a NAR number is in the works.

No word yet as to when the model will fly.





Don't hold your breath waiting for the first Ener-tek kits. A company spokesman stated that initial shipments have been delayed to mid-June. This is primarily the result of items returned to vendors for rework or replacement, as well as all the little things that can cause a startup company growing pains. There promises to be a big display at NARAM-30, so that's where most folks are likely to see the kits up close and personal for the first time.

Aerotech is still making motors, contrary to what was announced at NARAM-29. North Coast recently placed a huge order with Aerotech, so both companies, as well as consumers, will benefit.

The Vulcan/North Coast Smoky Sam motors exist... and are in stock! The E12, E20, F12, F40, F80, G50 and G100's are in stock. They have been submitted to S&T. There is no word yet if the G100 will be certified by the NAR in the very near future, since there are some proposals to go to an average thrust rather a burn time table under consideration.

The list of candidates for NAR Trustee is out, and there are a few surprises. Howard Kuhn is the only current Trustee who is not running again, sparing the Board from countless hour long recollections. Perhaps the most interesting "name" added to the list was last issue's cover girl, Connie Pursley. Had we known she was running, we would have held off on the photo a few issues in an effort to influence the race. The Pacific Region candidates (and one of these guys must be added to the Board) are Bryant Thompson (a blast from the past who has become quite active in the NAR again), Scott Doctor ("Mr. DQ" at NARAM-27), and "Hey, I tried to sue the NAR, and now I want to be a Trustee" Doug Frost. You go figure that last one out. The list includes current Trustees Pat Miller ("I will never be Vice President of the NAR"), Vern Estes, Matt Steele, Chas Russell, John Pursley, C.D. Tavares, Ed Muccio, Claude Greenlee, Scott Hunsicker, Jack Kane, John Worth, and Mark Bundick. One other new face is Michael Gasperi of Wisconsin. Don Carlson, Manning Butterworth,

Steve Behrends, Al Lindgren, Elaine Sadowski, and Mr. Maddog were all unavailable for comment.

The NCR LOFT-1 is still on hold, pending the outcome of legislation in Congress to reduce the required amount of insurance for the flights. E Prime President Bob Davis said that the flight is being structured in such a way to minimize any possible safety problems. This probably translates to a waiver of the insurance requirement at the Eastern Test Range in exchange for an isolated launch, with all spectators 3-5 miles away. This is the same place that has metal Loki weather rocket boosters come pranging into the beach, but no one seems concerned about them.

The NAR Board of Trustees finished its meeting in Colorado Springs in mid February. The most startling bit of news comes from our so-called "buddies" at the AMA. Effective April 1st (and this is NO joke) the NAR insurance will change to \$500K for bodily injury and \$500K for property damage for a total of \$1,000,000. Sections and flying site owners will stay at the \$1,000,000 rate per claim, however the ultimate goal is to reduce individual member coverage to \$100K per claim which is more than enough in the vast majority of the claims. (There has been only one claim which exceeded this amount to our knowledge, and it had nothing to do with model rockets; It was a model airplane accident.)

CMR is dead; no signs of life (or merchandise or returned checks) have been sighted in the past two months. North Coast is actively exploring bringing out a contest line, complete with vac-formed nose cones, if interest appears high enough. It's a natural fit, since both Chris and Matt have taken home a number of national trophies. North Coast will not bring out a new 1988 catalog, but instead they are gearing up for a Winter 1989 offering.

Tripoli has changed presidents, with Ed Tindell of Texas getting the nod. Hopefully he can get the LDRS dates changed so they don't conflict with NARAM-30. The Tripoli folks were informed at LDRS-6 when NARAM-30 was scheduled, and yet a conflicting date was chosen.

It appears that the USA/USSR Rocket Mania Meet is on, sometime after the 23rd of September. We're still waiting for the official word in writing, but that's what's been reported to date. If the US Team doesn't find a source for special motors, though, the whole thing will look like the Denver Broncos (USA) vs. the Washington Redskins (USSR). At least the Russians will get to visit a K Mart!

SNOAR IN ACTION!



Left:
Dan Kafun proudly displays his Sport Scale Scout model while Matt Steele looks on. Both Bob Ferrante and Dan have continued the age old (since 1978!) SNOAR tradition of heading south to Alabama for a spring meet.

Robyn Steele photo

Below Left: Mike Wagner, Ron Schultz and Chris Pearson all prep models at the Medina field.

Heidi Smakula photo



Right: "And then, the fire and smoke come out here!" Chris Pearson explains the finer points of a rare Bulgarian E motor while Jim Backlas wonders "Why did I ever fly that Enerjet D21??? It'd be worth \$250 now!" The Pearson/Steele motor collection, rumored to be the most complete in the world, will be on display at NARAM-30.

Chas Russell Photo



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