

SNOAR NEWS[®]

Quarterly

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1982 RC BG Flyoffs

US Rockets Kits Reviewed

High Power Ignition Technique's

First Place Winning R&D Report

Photo Pages Bullsheat Hell Night

"New Directions in Model Rocket Technology"

SNOAR NEWS® Quarterly

Volume 9
Number 1

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Our Motto: If we didn't bitch, who would?

Cover Story:

Chas Russell, Bob Ferrante, Matt Steele and Brad Bowers hold D Scale Altitude models at NARAM-23. Ferrante, of course, is the odd man out, with a Loki Dart. Chas's Sandhawk took first at NARAM-23 and Third at NARAM-24. (Photo by George Gassaway)

Credits:

Editor and Editorial Director: "Nuke 'em" Matt "The Man of" Steele, Editorial Assistant and Plans Editor: George "Fatcat" Gassaway, Generally in charge of a lot of Stuff: Chris "Norton Freak" Pearson, Art Director: Tony Williams, Contributing Artist: Patrick Henderson, Executive Janitor and Drug Connection: Bob Ferrante, Man about Town and Overdue Accounts Collector: Jim Backlas, Executive Secretary: Heidi Smakula, Office Cat: Cat, Office Hamster: Ethel, Wordhead and Mailing Services: John Alexander, Publisher: Mike Nelson and High Power Research.

>Important Sounding Stuff<

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1 payable to Chris Pearson. Special thanks to Becky Hayduk for letting Matt into her office to use her IBM typewriter!

From your sometimes sober Editors:

Well, greetings, rocketeers and clones!

Hope that the weather isn't as cold as the girl I took out last night. This is the Winter issue of SNOAR NEWS, and I'll guarantee that it'll keep you warm. If nothing else, throw it in the fireplace.

We're very pleased to be bringing you a variety of writers in this issue, and we'd like to thank all of our contributors. We'd especially like to thank Tony "Maddog" Williams for all of his creative work, especially since he wasn't aware that it would be published. Also, much thanks to Charlie, Geoff, and Chas for their contributions, as well as the regulars. If you're still out there sitting on your tush, get off of it, and write an article.

Also, there's been some confusion about Matt's address, and we'll see what we can do to add to that. Matt used to work at Service Battery, 3rd Battalion, 84th Field Artillery. Well, they redesignated his unit, and his current address is: C Co, 55th Maintenance Bn, APO NY, 09176. A three minute call to 07131-54069 will cost you \$10. This address should be good until January of 1984, EXCEPT that Matt has been selected as the 56th Field Artillery Brigade rep for the Pershing 2 operational tests. This means he'll be commuting between Ft. Sill, OK, and Orlando, FL for about three months, starting in mid-January. This job should include a couple of live firings.

Chris, on the other hand, hasn't moved.

Some times, they say, great minds converge. While this is obviously a truism, it's also obvious Tony Williams sent us his comments on the LAC (the what?) the same day that the SN editorial was drafted. We'll let you enjoy both points of view:

Mister Tony Williams of Jasper, AL writes and asks: "What ever happened to the Leader Administrative Council? Once the most active and visible of all NAR committees, today the LAC is, for all practical purposes, dead, and for some strange reason, nobody seems to care! The LAC was directly responsible for many good things: the Section Activities Manual, the Newsletter Award, development of several NARTS data paks, the Competition Handbook.... How could such an active, productive part of our association vanish? Are today's leader members not up to the challenge? Or is it that the association and the Model Rocketeer quit publicizing the council's vast array of projects? Something must be done."

Meanwhile, back at the SN studios: "What's going on with the LAC, and in particular, the Newsletter Committee? Hey, we're a NAR newsletter, and WE haven't heard anything! Who is the LAC this year? Who is on the newsletter committee? Who is the trustee in charge? Why hasn't it been published in the Rocketeer? Where are the "new, revised" guidelines available from? Why do we have to ask all these questions?"

What we'd like to see is a broadening of the committee to include the editor of the MR, as well as his subordinate editors. Also, why not include the section activities chairman? The idea behind involving more people is to give some semblance of continuity, rather than letting personal taste (or lack thereof) to decide the award. Certainly, there has been enough controversy and suspicion surrounding the prestigious award. It's time to settle a few questions, and get back to deciding the important stuff, like how to improve the quality and number of the newsletters that are in the rocketry circles today."

So, that's the way it looks from here. Remember to send your letter bombs to Matt, as he has plenty of uses for them.

Keep looking up!

The Man of Steele and Norton Freak

'Crazy Jim' Backlas sez:
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MONEY NOW! I'LL SACRIFICE
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Contest Report

1982 RADIO-CONTROLLED BOOST-GLIDER FLY-OFFS

By Geoff Landis

This report is an attempt to put down in writing some sort of account of the flying done at the 1982 Eagle flyoff in order that, perhaps, we can learn something from what went on. These notes are intended to be somewhat subjective.

The whole field of radio controlled Eagles is only five years old. The first such flyoff, in Kansas City in 1977, also known as the worst disaster in RC BG history. Since then, there have been two other flyoffs, and RC BG's have been flown at two world championships. Clearly, the flying at the 1982 flyoffs was the worst since 1977. Also, this was the first flyoff since 1977 that was not done with the F7 engine or a derivative of it. Aside from the ban on F7 use, an auxiliary problem was that the E5 engines available for this meet were markedly different from previous E5 engines. Whether this is an attempt by FSI to upgrade their engine specs to meet published catalog specs, or whether this is just randomness in the FSI production cycle is not known.

All of the contestants at the current flyoffs chose to use the FSI engine as a basic component of their engine choice. Due to the low impulse of the E5, an additional engine of at least B class needs to be added to bring the vehicle into E class.

Three strategies predominated: twin ("shotgun") E5's mounted side by side (as a variant, twin E5's mounted one above each other); E5/D12 cluster (mounted one over another by necessity), and E5/B6 or C6 cluster, the minimum impulse approach.

A secondary problem contributed to the problems experienced was the fact that, for the first time the event was rocket glider, not boost glide. This contributed to the problem in three ways: first, there was a relatively low level of experience in flying RG; second, it precluded engine strategies such as the D12/E5 staged (which was successfully exploited as a strategy with the same engine combination at NARAM 23); third, the lack of CG shift due to the pop pod or engine ejection made the models more unstable on boost.

The event was won by Bob Parks. Bob and Karen Dillon flew substantially identical designs. Engine strategy was twin E5's. The two engines were mounted on a crossbar bolted to the top of the fuselage just ahead of the wing, with one engine on either side of the fuselage. To avoid blast damages to the flying surfaces, the wing was mounted low and a flying "T" tail was used. Wing was built up and Monokoted; fuselage was a square box, remarkably subdued for a Parky design (it was designed so that it could be built by a relative new comer. Wing structure used a top and bottom spar with a shear web for the center section of the wing.

The engine arrangement had several advantages. First, the thrustline (average) went almost through the CG, thus resulting in little pitching moment due to the engine. This seemed to be critical to the flying. The engine pods are also easily interchangeable, to replace after a cato, to change engine sizes, or to remove for use of the glider as a slope ship or hi-start vehicle. Last, the engines were well separated from all critical structures, resulting in negligible damage due to engine blast in the event of a cato. This turned out to be important.

The engine arrangement also had several disadvantages. The main one is that the two engines are very far off the axis, so if one fails to ignite, the model is completely unbalanced and probably uncontrollable. If the two engines are not matched perfectly or if there is an ignition lag, there will be a vicious roll on boost.

It should be noted that this was one of two designs made by Parky for the flyoffs. The other, a flying wing, apparently had control problems on glide and ended up being destroyed by a cato on test flights.

All of Parky's flights exhibited a bad roll during the initial phase of the boost, typically about 180°. This is probably due to the failure of the engine peaks to hit at the same moment, resulting in yaw due to extreme engine offset. Nevertheless, they were the best boosts of the contest. Lift was existing, but not spectacular, enough for a couple of maxes. No other contestant maxed.

Flying the same design, Karen pranged on her first flight. Apparently, the prang was due to roll problems; as the model went over her head, she lost it while turning; immediately thereafter it went into the sun.

This cross bar engine design was the only one which had bad roll problems at the contest; however it was also the only design without some pitch problems.

Second place was taken by Geoff Landis. I also flew a shotgun E5 strategy. Engines were mounted below the wing, integral with the radio pod. This places them on the CG. A fibreglass bulkhead protected the radio pod from a possible cato fireball. The shotgun E5 pod was cut away to allow an adapter for test flights with a single C6 or dual C6's. The tail was mounted on a fibreglass (arrow shaft) boom below the engines. A conventional low tail and rudder was used with flexrods.

The advantage of this engine set up is that with the engines' thrustline on the CG, there is almost no pitch down effect. Boost was almost hands off, needing a little down elevator especially at the end. The disadvantage is zero CG shift from boost to glide, making the model very sensitive on boost. Another disadvantage is that the engines are integral to the fuselage, and that any cato results in major damage to both the fuselage and possibly the wing. Wing construction was balsa sheeted foam core, cut by hot wire, with a balsa spar running out about 4" from the center. Finish was tissue.

First contest flight was a cato on one of the engines, resulting in significant, but non-structural damage to the wing and a flight time of 85 seconds. As only one better time than that was recorded in the first round (Parky's), I elected to keep the score rather than refly. Second and third flights were somewhat erratic on boost due to elevator sensitivity caused by the far back CG position, but qualified. Light or no lift was found, and neither flight maxed. On one flight I tried to slope soar the hangars, with little success due to turbulence.

A back up model used a strategy of one E5 mounted on top center with two C6's on each side, also on top. To avoid pitch down problems, there was no pylon, and the engines were mounted on top of the wing on an otherwise conventional Eagle. This flew well on twin C6 engines alone. The only test flight with all three engines pranged, probably due to radio failure (the radio had been acting intermittent). Failure was nose down into the ground. I think the engine strategy would have been viable, though.

Third place was taken by Phil Barnes. Phil and Chris Morgan flew essentially identical strategies. Vehicle choice was a rolled balsa boom Dark Star V with a flying elevator. Power choice was D12/E5 vertically stacked in a conventional fixed pod position with a delayed ignition on one of the engines. This was a result of their earlier test flights with two E5's stacked, which both Phil and Chris found too hot to control.

Phil and Chris flew numerous test flights during the course of the NARAM in order to come up with an acceptable engine placement and timing on the staggered ignition. There was a major pitch problem associated with this arrangement, regardless of order of ignition. The best ignition strategy was to ignite the D12 first, on the bottom, and then the E5 at D12 burnout. Violent pitch maneuvers at the E5 ignition tended to rip off wings. In test flights, Phil ripped the wing off both of his ships a total of three times; Chris twice on test flights and then again on his first contest flight, destroying his last model and putting him out of the contest. In the competition, Phil DQ'd the first flight, flew an acceptable, but not long flight on the second flight, and elected not to fly on the third attempt, since it could not affect his standing.

Fourth place went to George Riebesehl (Jedi George) Jr. Jedi also flew a Dark Star V, using the minimum power of a single E5 plus a clustered B. The first flight was good, but a cato on the E5 blew a large hole in the wing, necessitating the model being brought down early. The second flight shredded, apparently due to the structural damage to the wing from the first flight cato. There was no third flight.

Mike Micci, Bernard Biales, and George Gassaway (flying unofficially) all had final scores of zero. Mike flew a vehicle with a built up, open structure tissue covered wing with a conventional triangular fuselage, using an E5/B4 combo. His original intent was to fly with a single E5, due to some confusion about power classification, and all of his test flights were done with single E5's. The first flight on an E5/B4 resulted in a nose down prang, destroying the model.

Bernard Biales flew conventional balsa wing ships left over from the 1980 world championships. His initial strategy was vertically stacked E5's, but later in the contest he flew E5/B6, when it became clear that almost any qualified flight would result in a place on the team. All three of his flights were nose down (outside) loops! The first flight did three outside loops under power! Remarkably, none of the flights intersected the ground under power. Bernard had done no test flying.

George Gassaway flew a slightly enlarged version of the Dark Star V, with a mylar coated wing, using a slide pod type arrangement of the D12/E5. The model hung up on the pad, fell over, and impacted on the road about 100 meters away, and was put out of action.

It is hard to draw conclusions from all of this. An initial conclusion is that, despite the poor results seen in the flying, the top three places went to experienced flyers, rather than "dark horse" flyers. This tends to uphold the idea that a fly off is a good way of selecting team members.

A second lesson is to underscore the effectiveness of a conservative strategy under adverse conditions. A total time of about 1/10 of the maximum would have been sufficient to get a spot. Almost any sacrifice of performance for reliability would have been acceptable.

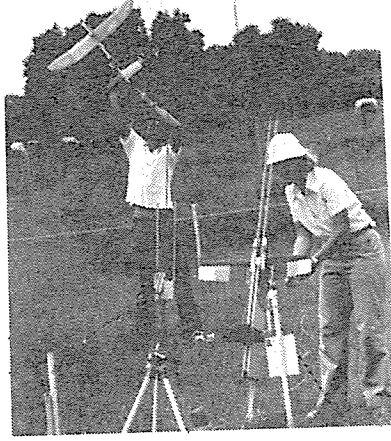
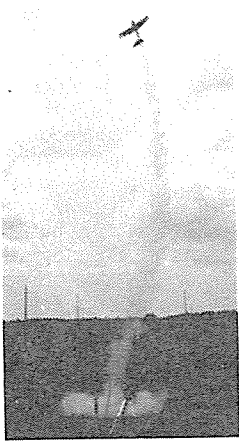
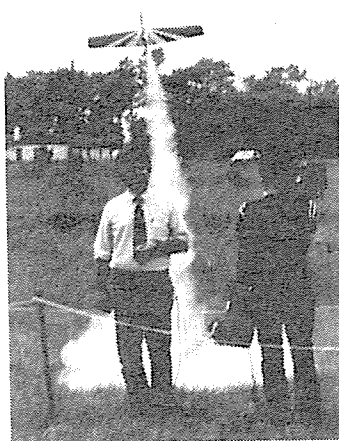
Third, the top two places went to people flying models with the thrust line through the center of gravity; incidentally, the only two models designed for RG rather than converted BG designs. This seems to be a powerful method for avoiding pitch problems on boost, at some cost of increased sensitivity of control. Parky solved this problem by having a trim change switch on the transmitter to switch from boost trim to glide trim. If the thrust line were exactly through the CG, the boost trim position would be constant at zero lift, and boost would be hands off at this setting.

Fourth, the problems underscore how dependent we are on engine availability. Flying a new engine combination should not be taken for granted! This will apply to the new composite long burn E engines when they come out as well. There will may be a long learning period to learn how to fly them.

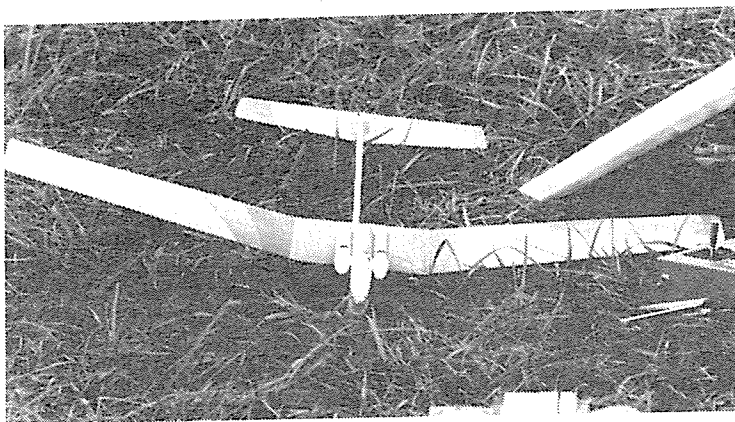
Fifth, Chris and Phil's experience emphasizes the need for a spar in the center portion of the built up wing. During high-G maneuvers the stress is really concentrated at the center of the wing, and in all six cases of wing folding, that is where it occurred.

Last, some discussion should be made of the advisability of variable geometry. In an RC RG the effectiveness of a geometry change such as an engine slide is really much less than in a free flight model since the engine is a much smaller portion of the total mass. A slide or flop wing might be more effective but at a considerable cost in reliability. It currently looks as if the most effective strategy will be to simply use a thrust line on the CG.

(EDITOR'S NOTES: As an addition in the name of accuracy, some corrections need to be noted: Riebesehl's flight was brought down early due to the fact that the cato blew a hole in the wing and caused the wing to fold in flight; Micci's model lost a wing panel on boost, not power pranged, as reported. Also, Gassaway had a successful test flight of nearly 5 minutes earlier in the week with the same model.)

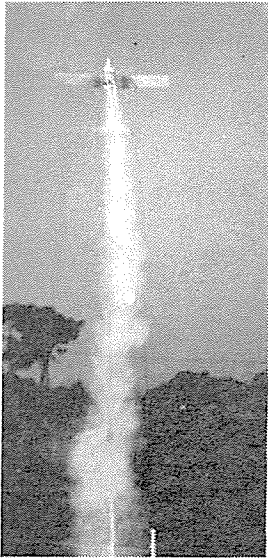


Above left: Phil's RC bird takes off the the newsmen. Center: A Parky boost in the second round. Right: Micci in the center, and Dillon at the far right prep their birds for flights in the first round. Unfortunately, both had prangs.

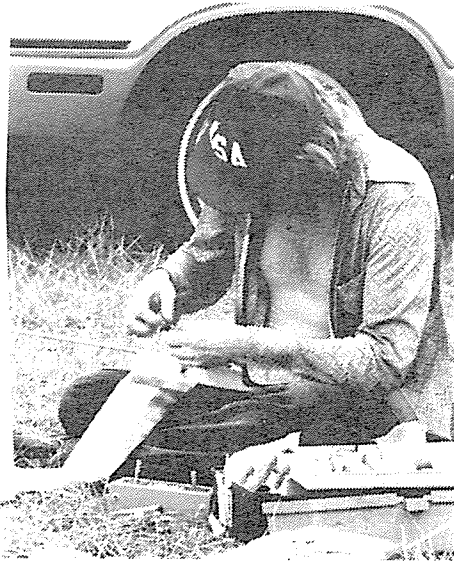


Above left: A close up of the Landis C5/E5/C6 bird before it pranged. Nicely finished, it looked more like a BG than a RG. Right: Phil Barnes, the 1982 Bumblebee winner poses for the photographers prior to a test flight. Phil managed to get on the local TV and in the papers with his colorful RC birds. Phil's model was powered by a delayed ignition (via FSI fuse) D12/E5 combination. Direct right: Bob Parks and Karen Dillon prep their unique birds for flight in round one.

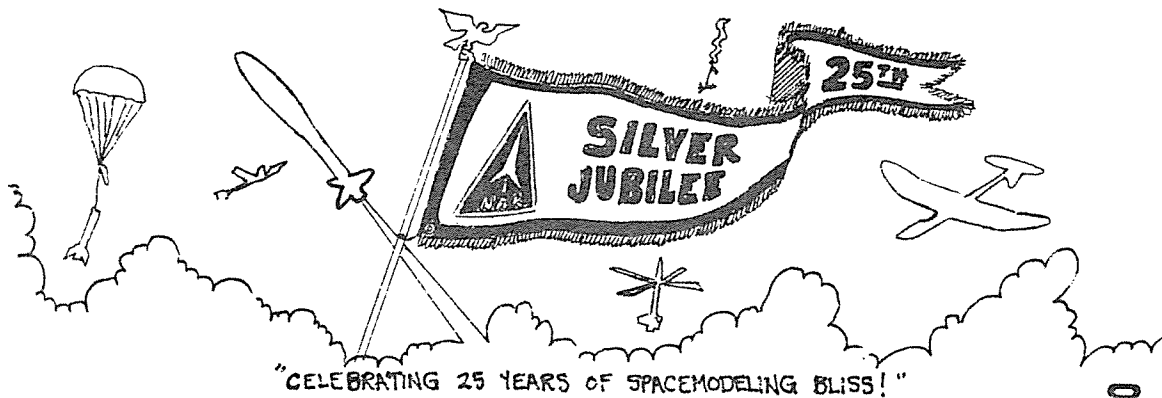
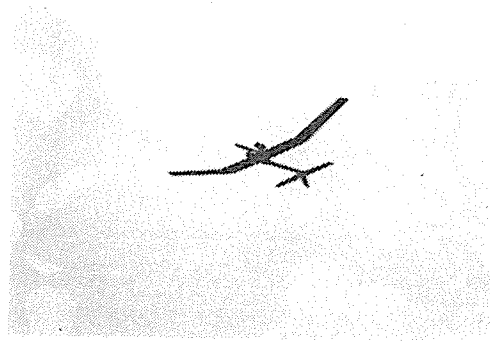




Left: Landis' back-up bird on a test flight with twin C6-3 power. Right: Hard at work, Geoff lets it all hard out for the benefit of the spectators. Here he works on repairing the damage an E5 imparted on it during the first round. Bottom left: Bob Parks "brings it on in" as he walks away with the flyoffs title and the top slot for the 1983 team. Bottom right: George Gassaway's Ariel slide pod RG in flight.



All photos in this article © 1982 by the Sunofark Blues Band Team.



AeroTech

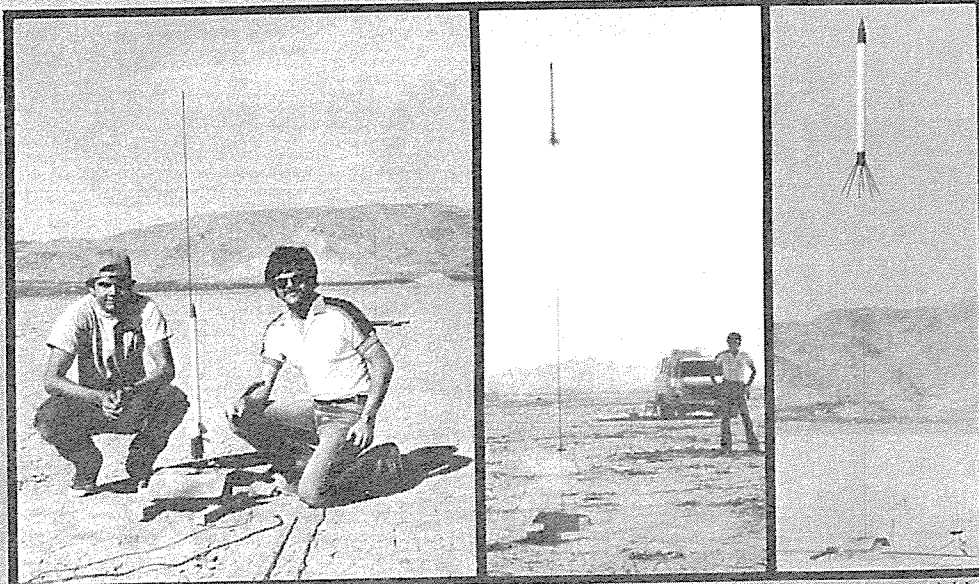
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Before: Gary Rosenfield of AeroTech and Greg Smith next to Greg's "Skint E6", a two stage E6 powered model! During: The Skint on its way to an estimated 8000' altitude! The AeroTech E6 is the first composite motor with direct staging capability.

ity. The ACE Squid kit flies straight and high under the power of the AeroTech F10. The high sustain thrust lifts even large models with minimal gravity turn! Photo 1 by Jerry Irvine. Photo 2 by Jerry Irvine. Photo 3 by Moose Lavigne. Copyright 1983 all photos.

E6 Specifications

Dimensions: 0.938" x 2.75"

Total Impulse: 40ns

Average Thrust: 6n

Sustain Thrust: 4.5n

Initial Weight: 39.7g

Propellant Weight: 21.5g

Burn Time: 7.2 seconds

Available Delays and maximum liftoff weights for each motor:

E6: 0/120g 2/250g 4/175g 8/120g

AD BY
JERRY
IRVINE

F10 Specifications

Dimensions: 1.125" x 3.5"

Total Impulse: 80ns

Average Thrust: 10n

Sustain Thrust: 9n

Initial Weight: 71g

Propellant Weight: 40.5g

Burn Time: 7.9 seconds

F10: 0/200g 2/453g 4/325g 8/200g

Prices: \$9.95ea 3/\$26.95

Prices: \$11.95ea 3/\$32.95

AeroTech is now delivering E6 motors. They received NAR safety certification on October 25, 1982. NAR Contest certification takes place on

January 25, 1983. The F10 will be shipped immediately upon NAR safety certification, so order NOW. AeroTech catalog \$1. \$5 shipping per order.

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THE STARBLAZER

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STARBLAZER TO BE SYNDICATED WEEKLY

In celebration of the Model Missile Association/National Association of Rocketry's "Silver Jubilee" - December 7, 1957-1982, SNOAR Publications is making different weekly editions of this newsletter available for syndication to any and all NAR Section periodicals. Newsletter editors who wish to partake of this FREE Public Service should contact THE STARBLAZER address (shown above) for the complete details.

So far, groups in Alabama, California, Florida, New Jersey, North Carolina, Ohio, and Utah have expressed interest in publishing this newsletter as a suppliment to their own. Why not join in on the fun?!

EJECTION CHARGE RECIPE FOR AMATEUR ROCKETEERS

Remember the Good Old Days when "amateur rocketry" meant metal-skinned spaceships loaded with zinc and sulphur that thundered into the skies in cascades of fire and smoke ... Lots of Fire and Smoke? When "shovel recovery" was The Way To Go and Model Rocket Technology was seeing how many D13's you could poke into the business end of a missile converted from an old carpet tube?

Boy, things sure have changed since then! Composite G Class engines are now safer and more reliable than Mini-Brutes (or so I am told) and NOBODY flies the higher power black powder thrusters for high performance (Fire and Smoke, yes; high performance, no)!

But you can still experience the thrill of that Golden Age of Amateur Rocketry by merely applying the following information to your next Big Project:

"One part is a powder, mostly amonium nitrate, a strong oxidiser, and a good garden fertilizer. The other is a liquid, mostly a nitroparaffin widely used as a paint stripper. Combine the two parts by pouring the liquid into the powder and you have manufactured an excellent high explosive, an act which requires a manufacturer-limited permit from the ATF (Alcohol, Tobacco, and Firearms), \$10 Blasting caps are necessary and require proper storage, but it is not difficult to meet ATF Class II indoor storage requirements for quantities of 100 caps or less."

-- from "Blasting" by Keith Britton
in THE NEXT WHOLE EARTH CATALOG

Other highly recommended reading for Amateur Rocketeers: EXPLOSIVES TRAINING MANUAL by Robert C. Friend and the DU PONT BLASTER'S HANDBOOK, both available from ABA Publishing Company, 406 West 32nd Street, Wilmington, Delaware 19802.

Come on, let's put some "FUN" back into non-NAR non-professional rocketry!!

NEW FLIGHT SYSTEMS MOTORS TO BE INTRODUCED SOON

The new line of 18 mm diameter engines from Flight Systems Incorporated are still undergoing NAR certification tests, but FSI President Lonnie Reese plans to introduce them at the HIA Trade Show in Anaheim in January. However, the motors will NOT be made in quantity until they are NAR Safety Certified.

In honor of the NAR's 25th Anniversary, we're introducing a new column devoted to the study of Model Rocketry's past and its relation to the present and the future. And, no, this isn't "NARoots: The Newsletter Version"; we simply call it....

RETRO-ROCKETS

"F B/G 257s 5/17/81 T Lee"

Noting the above entry in the current list of U.S. Model Rocket Performance Records as published in the October 1982 MODEL ROCKETEER, I wrote to former National Champion Terry Lee and asked if he had used a flex-wing glider to obtain the record. (Having heard that Terry had been experimenting with the East European "Opel" flexie design, I was anxious to learn if he had made any significant improvements.) Mistah Lee was kind enough to respond with the following information:

"I got the F B/G record flying a fixed wing, swept wing, fixed pod model called the 'Thunderbird'. The plans were in the MODEL ROCKETEER magazine about May 1970. I used three BF-50 pods, 1/64" plywood-reinforced wings (This may not have been needed), three E5-0 engines (...with this model you could use any delay as it doesn't matter) and streamer recovery for the engines. Definitely, this model wasn't State of the Art. Probably any flexie could beat it. (Bundick tried to beat it with a fixed wing model, but didn't.)"

So a THUNDERBIRD holds the current United States F Boost/Glider Record?? This might sound a little crazy to modern glider fliers whose sophisticated contraptions dominate today's contest scene.

I know I'll never forget my first successful Thunderbird flight. The August 20, 1978 edition of THE STARBLAZER (Vol. XI, No. 1) carried the story:

(P'WOODIA) (INS) - The modroc world was shocked today when Anthony Williams, an admitted former National Association of Rocketry National Champion (well, sort of), almost toppled the current US and FAI Eagle Class Boost/Glider Records held by Christopher Flannigan.

"I'll show ol' Poot Face who re-builds better gliders!" Tony shouted as he ~~lit the fuse and ran~~ electrically ignited the powerful Estes D12-5 engine that propelled his record attempting bird to approximately 300 meters.

The model, called "THUNDERBRICK II" (rebuilt from the remains of "I", a stronger, heavier version of the popular Thunder Bird Swift-Eagle B/G design), transitioned perfectly, and was timed for 117 seconds before it was lost from sight, still over one hundred meters up! It was speculated that the gliding craft probably stayed in the air for over 45 minutes longer, thus breaking the existing record of 2717 seconds held by Chris.

However, it was later learned that the Federation Aeronautique Internationale refused to accept Mr. Williams' claim. When questioned about this apparent "Communist block", Tony replied, "Well, I've officially beaten *ALAN*'s Fat Chance III Eagle B/G Record today...I'll get around to the OTHER big records later!"

Neither *ALAN* nor Mr. Flannigan was available for comment.

Amidst the wild record claims and attempted in-jokes (SPOTTER fanatics and former Church of the Bland cultists can relate to them) I was indeed thrilled with my first high-powered flyaway. Although I've had better gliders and better flights since, the "first time" can never be forgotten....

In the introduction I stated that this column was a study of the past and its relation to the present and future. Well, here's where the "future" comes in:

Despite the higher performance potential of pop-pods and flex-wings, I believe the Fixed Pod School of Boost/Glider Design is here to stay. If for no other reasons than (1) fixed pod gliders are easier to build, prep, and recover, and (2) they are more reliable. The fixed pod glider exhibits a design philosophy that's referred to as "elegant simplicity": It's easy to prep; there's only one piece to recover; there are NO pod hang-ups; NO broken shock cords; NO lost pods or boosters; NO premature separations; NO "Red Barons"... and so on.

11 Try a fixed pod glider for yourself. You may discover that the slight decrease in performance (if any) is more-than-compensated for by increased reliability, plus easier flying operations.

*** THE STARBLAZER * Special "Supplement to SNOAR NEWS" Edition * THE STARBLAZER ****

"SUPPORT YOUR NATIONAL PUBLICATION!"

That's the request we've received from MODEL ROCKETEER editor G.D. Tavares. It now seems that filling up the 16 to 20 pages of the NAR's Official Journal each month is rapidly depleting the ol' "future's file", while the 'ROCKETEER faces some stiff competition for solicitation of prime publishable material in the likes of CALIFORNIA ROCKETRY Magazine, the SNOAR NEWS Quarterly, and the Canadian SPACE MODELLER magazine. (Interestingly, the National Association of Rocketry doesn't regard CRM and SNOAR NEWS as Section newsletters. And maybe that's why you don't see some of their/our better stuff reprinted in the MR. Well, it's the NAR's loss....)

Responding to our grant of permission for the MODEL ROCKETEER to reproduce the best of IMPACT and THE STARBLAZER, Chris added, "For a real rush you can send me something that hasn't been pre-published ... because those are the things I like to rush into print most of all! Look at it this way -- writing for the MR gets you a much bigger audience, and you don't have to do the xeroxing and mailing!" (One wonders if Chris was so generous with unpublished material when he was a Section newsletter editor for the award-winning NOVAAR FREE PRESS!)

Anyway, never let it be said that SNOAR Publications doesn't support our national publication! In addition to numerous IMPACT reprints (some which actually received due credit!), our own George Gassaway has single-handedly (well, almost) been responsible for some pretty nice MR "exclusives": plans for the Lumb Duck IV B R/G (4/80) and the super sport Concorde SST semi-scale glider (7/80); information used to produce a flex-wing glider construction article (12/80); the expert Revell F-16A Plastic Model piece; and the Two Minute Egg B Eggloft Duration plan (7/82).

So we'll compare our track record for donating previously unpublished features to the MODEL ROCKETEER to that of ANY Section. The gauntlet has been cast!

In a related story....

AND THE LOSERS ARE....

Last season SNOAR Publications (SNOAR NEWS, IMPACT, and THE STARBLAZER) produced no less than thirty, let me repeat, 30!, different newsletters. This record-breaking performance evidently did NOT impress top NAR officials or the LAC Newsletter Awards judges. Ah, "screwed, blued, and tatooed" again!

Also ignored by The Powers That Be were the TARHEEL ROCKETEER (1981 Winner of the Rockwell International Trophy, Carolina Rocket Society, edited by Lawrence "Mr. Strato" Bercini), CALIFORNIA ROCKETRY (see above newsitem for the reason of its omission), and (in our opinion) the Best New Section Newsletter of The Year, SPACE COAST ROCKETRY (by Bob Koenn and Pat McCarthy), all deserving praise.

Far from belittling the works of those who WERE given recognition at NARAM-24 -- our heartiest congrats to one and all! -- it's just our opinion that some of us didn't receive just credit.

MADDOG TAKES OVER THE SOUTHLAND

Your humble editor-in-chief has recently been appointed Southland Regional Manager by NAR Section Activities Committee Chairman Mark "Bunny" Bundick. The newly reformed committee has already begun restoring lines of communication and redesigning Section materials. Also proposed is a major revision of the SECTION MANUAL for late 1983.

I'm looking forward to working with Bunny, the other Regional Managers, Southland Sections personnel, and individual NAR members throughout the South in getting Section participation going again. If you have a question or comment on the SAC, please drop me a line at the STARBLAZER address.

COMING SOON:

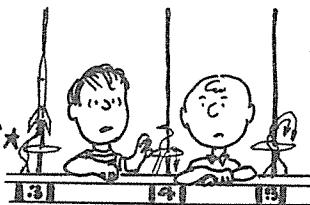
* "IMPACT VIDEO" *

* GRIMM '83 COVERAGE *

* "LOST IN SPACE SHUTTLE" *

* NEW WAVE CARTOONS *

* EXCITING PLANS *



* SPECIAL ALL-AMERICAN
COMPETITION ISSUE *

* EXCLUSIVE INTERVIEWS *

* MORE FILLER! *

AND LOTS MORE ALL IN THE
NEXT EDITION OF SNOAR NEWS!

12

International Report

Be strong of heart, sly as a fox, and have the balls of a brass monkey if you expect to survive SNOAR's...

HELL NIGHT

By Matt Steele

It was a damp, dark, cold night. The moon was full, but often obscured by swift clouds. In a large open field, a small group of would-be SNOAR members huddled about a small fire. This was hell night, the final night of initiation into the exclusive fraternity of SNOAR.

The group had been through much already. The initiation rites to the brotherhood had taken nearly a year to complete, with hell night climaxing the events. No one standing around the fire could forget those torturous weekends chained to the trackers, the all night, no sleep building sessions, nor the weeklong drinking endurance contests prior to NARAM. Nor could the memory of the past week itself, NARAM, be diminished in the eyes of those gathered around the fire. But tonight was the night; the main event, the really big shoe.

There were many in the crowd who had distinguished themselves at NARAM. Bob Ferrante passed himself off as a twenty one year old, and brought back to the club room at the motel two dazzling blonde bombshells. His moves on the dance floor apparently had convinced them of his other moves as well. It was two nights later when Bob finally emerged again, muttering something about Nirvana. We never did catch the other girl's name.

Bob Geier and Aaron Bernstein had caused quite a ruckus with their effigy of Bunny. The entire police department, fire department, and local offices of the FBI and KGB were kept busy for most of the week when the boys gave the dummy a "blow job", with a gross of M-80's. Funny thing was, Bunny turned up missing the same day. Bob and Aaron insisted publically that they had nothing to do with the kidnapping, even when the real thing turned up in a garbage dump. Boys will be boys, I guess. They never did say where they got the clothes for the dummy, though.

John Alexander had his "hands in pockets" act down perfectly; except that they were constantly in other people's pants! He ended up with enough masking tape to start his own store, let alone car keys, wallets, handkerchiefs, and the like. The club party fund looked like it would turn a profit this year, even in light of higher import prices, thanks to John's fundraising activities. John attributes his success to his usual early morning treat of doughnuts and Coke. He must not have noticed that the speckles on his doughnuts weren't sugar, but black beauties instead.

Bob Koenn and Pat McCarthy really came through for us. The semi-trailer that they arrived in was just loaded with these bales of "weed" stuff that just keeps "popping up" on the Florida coastline. Many modelers were seen sporting DT fuse, even during the altitude events. They also were the hit of the manufacturers' party with a little imported high quality white powder. Who says it doesn't snow in Florida? The stuff was really appreciated, since our usual warehouse supplies were running low.

Jim Backlas had finally made it the final week; before, he had usually dropped out at NARAM. This year he survived the tough humility training (which was based on each pledge's NAR number. Jim didn't really rough it due to his 4 digit status.) and was ready to make the final group. He had scouted some of the area's best restaurants for the club, and there wasn't a night that we weren't without caviar, champagne, prime rib, or lobster. Additionally, he demonstrated the finer points of "Pass the Check (to another table)", "Dine and Dash", and "Some one else's Credit Card". Many fine meals were enjoyed, at no expense to Jim or the club.

Tony Williams managed to get the whole club on the Tonight show so that it could be watched during the NARAM. It was the club's first national TV production, and talk of a TV sitcom and/or a Broadway musical was prominent. Johnny had scheduled a guest host, but at the last minute he sat in to see what SNOAR was really all about. Tony and Johnny seemed to hit it off right away. They jammed on the drums a bit with Doc and the band before Tony launched into his fabulous routines about "Why Booms Break", "My RC BG", "Model Rocketry Bern Bery, Bery Goot to Me", and "The Senile Rocketeer". In the only encore in the entire history of the Carson show, Tony, backed by the Zunofark Blues Band, came back to do "I Don't Get Me No Respect", "Mr. Maddog of Hollywood", and "Satisfaction", before dowing a six pack of MD 20/20 and passing out. It is a show that will be highlighted on the "Best of Carson" for years to come.

Chas Russell also scored some big points for the club, both on and off the field. He had managed to "lose" about 45 pounds of weapons grade plutonium from his local place of employment. Chris Johnston was absolutely delighted, and surprisingly, the Trustee's meeting went very smoothly after the announcement. Chas had also brought a large amount of "toys" that kept the hallways secure and the National Guard from entering the area. Granted, the RSO got a little pissed at the F15's and F16's that kept strafing the area, but security is security.

Yes, as a group, the pledge class had done their little bit to keep NARAM interesting. Sounds of laughter (no doubt nitrous oxide induced) filled the halls as the group recounted the successes of the previous week. Talk of the March Formal and Food Fight, the raid on NIRA HQ, and the purchase of Damon Industries also floated lightly, as the fire cast long thin shadows into the night. The group was anxious to keep the atmosphere as light hearted as possible, not knowing what lay ahead of them that night.

Suddenly, headlights swarmed the field from all directions and converged on the group. From each of the Norton 850's a dark robed figure stepped forward from the darkness, and several more appeared from what seemed to be about a half dozen armoured personnel carriers. Hand grenades exploded, and the pledge class hit the dirt. When the dust had settled, and a few of the braver ones looked up, all that could be seen was two dark figures where the fire had been.

"Bet that's Pearson and Steele", whispered Geier, and the air rang out with thunder as more explosives detonated.

"Silence!" said one of the figures in a strangely synthesized voice. "No one will speak again until the sun rises! You have chosen to enter the hallowed halls of SNOAR, the most secret and powerful spacemodeling society in the world. We must test you to see if the strength is in you to keep these secrets which each SNOAR member holds deep in his heart. Tonight, you will prove yourself. Do not cry out, no matter how great the pain, nor dare you question the ways of the club elders. Brother Tuskes will be your guide on the first segment of your journey. Do as he says. And remember: It is the sacred duty of each SNOAR member to explore model rocketry in all ways. He must examine new directions in spacemodeling!!!"

With that, the figures blurred and faded away, as though they had been teleported there. A roundish figure clad in a dark robe appeared behind them, and spoke in a similarly synthesized voice. "I am Brother Tuskes", it decreed. "I will be your guide. Follow me". And with that, the group fell into a single file and trudged on into the darkness.

After what seemed like a five parsec trek, the group suddenly stopped at the edge of a dark damp forrest. McCarthy whispered to Koern, "Whew! What a march!", and Brother Tuskes shot a look at Pat that stopped him dead in his tracks.

"Hmmm", thought Alexander. "These dudes are serious."

Brother Tuskes began to speak. "You are about to begin your test. You are standing here at the entrance to the Forrest of Horrors. Your third flyoff flight in world class PD has landed on the other edge of this woods. If you recover it, you will win the gold. You MUST get through this forrest to recover the model. Brother Wagner will meet you on the other side.....IF you survive!". With that, he stepped behind a tree, and vanished.

The group entered the pitch black woods. The briars were head high. Progress was agonizingly slow. After what seemed like hours, a clearing appeared ahead. As the group entered the clearing, a cougar pounced. Ferrante, Backlas, Koern, and Russell all wrestled it to the ground, but they could not subdue it until Williams, with MD 20/20 still on his breath, sneezed on the animal. It suddenly stiffened, convulsed violently, and died. Then, it vanished. When the group looked up, there was the PD bird clearly in sight. A small rabbit had it in his teeth.

The group chases it, many of them falling into the scattered piles of cow dung along the way. Finally, Bernstein lunged at the rabbit and managed to grasp it's tail. The rabbit was moving so fast that it skinned it self! Aaron was left holding only a rabbit pelt....and the PD model!

Brother Wagner stepped out from behind a large boulder and mumbled in a computer-like tone: "Congratulations. The test has been a success. You have passed. Follow me."

The group followed as Brother Wagner stepped into the armoured personnel carrier. The group was blindfolded, and taken for a wrenching, rattling ride. When the APC lurched to a stop, the group was led down what seemed to be an endless flight of stairs. At the bottom, Brother Wagner led them into a cold, damp room, and removed their blindfolds. They were strapped into chairs that seemed to be very well grounded and were of solid oak. They reminded the group of the now-outlawed electric chairs. Then again, the chairs had to go somewhere when the state turned them in. For the next two hours, spot lights shone down on them, and voices cried out asking questions about lawsuits, libel, illegal engines, live animal lofting, non-flameproof wadding, fuses, and other felonies, each time demanding an answer. The SNOAR pledge class did not answer to the men in the funny little leather suits with large triangular patches of red on them, despite the stinging of fire ants, the repeated electro-shocks, and the perching of the deadly burrowing owls. Suddenly, the lights went out. The questions stopped. Somewhat shell shocked, the pledge class was again blindfolded and led up a trail of steps, seemingly even more endless than the path on the way down. They trudged intowhat seemed to be a semi-trailer used for hauling pigs, and were treated to another jostling ride. The trip ended with the removal of the blindfolds, and now all they could see was Brother Gazur standing before them.

"Damn! What could be next?" Ferrante thought, but he dared say not a word.

Brother Gazur pointed to a stack of uncertified G engines that Brother Gassaway had just appeared with. The engines included Enerjets, Plasmajets, Toy Rockets, Mini-Maxes, and Coasters. Gazur spoke; "Very good. You have just completed the second phase of your --BUZZ CLICK--test. Now we will--SNAP-- pass into the third phase."

"Each of you will pick up an engine and hold it in your right hand", Brother Gassaway intoned. The group did so. "Now, take the clips at your feet and hook them up to the flashbulb ignite that is attached to each engine." Again, the group did so. "Pledges, turn sideways, and hold the engine out, at arm's length, nozzle downwards."

"If you fail -- BUZZ CLICK -- to hold on", Brother Gazur intoned, "or if you cry out, you will fail!" Each engine was gripped tighter at those words.

The countdown began. Five...four...three...two...one...IGNITION!?! FLASH!!! The bulbs went off just as planned, and the room filled with an orange light as each engine ignited. Teeth were gritted and muscles tensed, but no one let go. Chas almost dropped his when the short delay caught him by surprise, but managed to hold on.

When the smoke had cleared, Brother Johnston now stood before the group. Where there had previously had been a pile of G engines was now a pile of H engines.

"Very good." Brother Johnston spoke very slowly and deliberately. "Pick up these H engines and hook them up!" When that was completed, Brother Johnston spoke again: "Now, place the H engine in your mouth, as though it were a cigar. Ferrante, that means nozzle side out!"

Some what mystified, the pledges did just that, and another countdown began. The sweat was forming on many faces. At ignition, the room turned purple, then blue, and then exploded into orange, as the engines ignited and knocked the pledges to the ground, pinning them there. No one let go. As the delay train burned away, all eyes turned to Brother Johnston.

"Don't worry about the ejection charge" he stated. "They're all plugged". Then, with a flash, he was gone.

A huge explosion went off behind the group. As they turned to look, two figures emerged from the mushroom cloud. It appeared to be Brothers Steele and Pearson, although the smoke made it very hard to tell.

Simultaneously, the two figures spoke: "Now it is time to explore the most unique aspect of spacemodeling. This is the last phase of your test. Gentlemen, if you pass, you will indeed become true brothers in the sect of SNOAR. We will not guarantee that this will not happen to you again, but this rite should give you a fitting insight to the political world of spacemodeling. Are you ready? Good! Gentlemen, drop your drawers!....."

As the dawn broke, the group huddled around a campfire in the middle of a field. A group of cars and a Norton 850 slowly made their way to the group. Pearson, Steele, Johnston, Wagner, Gassaway, Gazur, Tuskes, and one unknown figure in a black robe gathered around the group, passing out tubes of Preparation H.

"Well, it looks like you made it through", beamed Johnston.

The class, now full fledged SNOAR members, each and every one of them, merely nodded wearily.

"Now it is time for you to know our secret. Meet our founder, our strength, our guiding force that drives us on".

And, out of the black robe stepped Orrville Carlisle, NAR #1.

EDITOR'S NOTE: The above story is true, as best we can determine. We went through a long and slow process of drinking a keg of beer to figure this out. The names of the people in the story are real, and if you're not named here, well, next time contribute a little bit more money to the club and see what it gets yer. Nothing, we repeat, nothing was changed to protect anyone, except for the illegal stuff, which probably means the whole story will have to be changed. Inspiration for this article was a good bottle of Jack Daniels, and Mary Roberts. Let's see her explain this one away at the good ol' Penrose plant. Special thanks to the Department of Defense for the pyro effects, and to Chris's pusher for the really great stuff that inspired this whole mess. Also, thanks to Johnny Carson for use of the show!

ARMY ANNOUNCES BUILD-UP PLAN

Attention modelers! You and your section can earn cash money, confiscated drugs, and merchandise certificates by building the latest model of the Army's Pershing missile! Yes, folks, the Pershing II is now available in kit form. Due to production problems with our main contractor, we are offering you a chance to earn big bucks. Sign up now, and we'll reimburse your club for each lot of six Pershing II missiles you build. All you have to do is to construct the missiles from components provided by Martin Marietta and ship them F.O.B. to: C Co., 55th Maint Bn, APO 09176. They'll do the final mating and arming there. Shipping weight is approximately 50,000 lbs. each and will require a Class B explosives permit. Plutonium not included. For more information, write: Pentagon, Dept of Fireworks, Washington, DC. Allow 2-4 years for delivery. Your club can become part of the military-industrial complex! Also, take advantage of our fire sale in late 1986! Available only in lots of nine each, buy nine Pershing Ia missiles. Never been used, although need some reworking due to 20 years of wind and rain. Launchers not included. We reserve the right to sell to the highest bidder who has the right political connections. Bribes are accepted.

Competition Article

STREAMER DURATION OPTIMIZATION

By Charles M. Sykor

This project was an attempt to build a streamer duration model for A engines that would be capable of duration times that would consistently exceed 120 second durations without the aid of thermal activity. I also hope then to apply the techniques that were successful for A engines to models that used 1/4A and 1/2A engines, and improve the average streamer duration time for these events.

BACKGROUND:

In the summer of 1979, a streamer time of 90 seconds would normally have won the A SD event. The material most commonly used on the winning models was the mylar that came from a Boy Scout Emergency Blanket. These times, however, were not good enough to compete on an International level and win. In the spring of 1979, I began the search for a new material that would substantially improve the times of streamer models. Trip Barber had done research and development on streamer materials in the past, but none of these materials were capable of two minute maxes with any consistency. I felt that the state of the art could be advanced if a new material could be found. I had been told that some Europeans at the 1978 Internats used silk and a "flexible type material" that was able to hold accordion type folds. The material I found that met this requirement was "tracing paper".

My first experience with tracing paper in an official NAR contest resulted in a 178 second flight with a C engine. In practice for NARAM 21 and the Internat flyoffs I had many outstanding flights with B and A engines using tracing paper. At NARAM 21, "Tracing paper" streamers were used on the winning models (Class B) in all three age divisions. One of the top four times for A SD during the Internats flyoffs were achieved with tracing paper streamers. My experiences with tracing paper at NARAM 21 and at the flyoffs indicated that this material had the potential to be the new state of the art in streamer material. With my selection to the Internats team I saw the development of a new streamer a must, and I decided that I would continue to experiment with this material in the fall of 1979. My test flights in the fall continued to demonstrate that times better than 90 seconds were possible and I decided in the spring of 1980 to continue the research and development on a more formal basis.

THE EXPERIMENTS:

Good streamer times are dependent on three major factors: wind and thermal activity; altitude of the model; and type of streamer. On the average, there is little a flyer can do about the air he flies in. The other factor can be influenced considerably more.

The modeler can improve altitude by using a piston launcher or a tower. For increased reliability, I did not use piston launchers. The effects of tower launchers will be discussed later in the report. The models should have a smooth finish and should employ the known techniques of reducing the drag coefficient. I used proven designs in my project and polished the finishes as smooth as possible. The models that I used during the control flights were 9" long of CMR, Estes and Centuri (.5" dia.) tubing and used hollowed balsa or CMR plastic nose cones. Each model at lift off weighed between 18 and 23 grams. The mass of the model was dependent on the size and type of the streamer material. The models with the tracing paper streamers weighed approximately 23 grams, and usually achieved less altitude than the lighter models. However, my personal opinion was that engine variation had the

most effect on altitude of the rocket. A smoothly finished model of 18 grams or greater was the only requirement for the model. Streamer material had the greatest influence on duration times.

The engines and materials for the models were donated by Estes and Centuri. The tracing paper was purchased by the roll and the cost of this material was about \$12. This was the major expense involved in the project. The cost for shock cord, snap swivels, mylar, etc., was another \$8.

All the models were flown from towers. The first models were flown from an 18" tower that had 3/8" aluminum guide rods. The last 25 flights of the test series were flown from a 30" tower with 3/4" guide rods. The longer tower seemed to account for more height for each model. I do feel that the longer tower was a factor in the duration of the models, as 13 of the last 25 flights were in excess of 120 seconds.

Each model was given a very smooth finish. However, various techniques were tried and I would recommend a finish of three coats of dope rubbed out with rubbing compound. Each model was numbered and a log of all flights was kept. After each flying session I would go over what had happened and how errors could be corrected. If the problem was critical to reliability, then it would be corrected before the next flying session.

All of the streamers were of 10:1 length to width ratio. I used five different grades of tracing paper: 1) 104 heavy white, 2) 107 light yellow, 3) heavy yellow, 4) Gernet yellow, and 5) 106 white. The paper streamers were folded with 1/2" accordion type folds. The white streamers were coated with a red water proof ink to add visibility. The ink was applied with a sponge.

Early in the test flights I confirmed that folds over 1/2" had a tendency to remain closed and did not unfurl. I had one DQ because of this problem. I originally started folding the streamers the complete length, but I noticed that the streamers did not fully unfurl at ejection and it took a few seconds for the model to stretch out the streamer. To correct this problem, I only put accordion folds on the bottom 2/3 of the streamer and then rolled the remaining paper around the folds. The cord that is attached to the streamer is then wrapped around that to prevent ripping at ejection. The streamer will easily fit into a .5" diameter tube, and is easily ejected.

Mylar streamers had 1/2" to 3/4" folds ironed into them to create the same effect. The folds were crunched together to give the mylar more wrinkles. However, you must wrap the mylar streamer in a piece of paper wadding to prevent it from burning.

All streamers were attached to the models in the same manner. An 18" length of 18 lb. squid line was epoxied into one of the fin fillets, and the end of the line had a barrel swivel. The swivel on the streamer and the swivel on the line were joined by tiny split rings. The lines were tied and "hot stuffed" to the barrel swivels. Snap swivels and hook type fasteners were often used as connectors, but these had a tendency to separate. I feel that split rings are a very reliable connection.

The shock line on the model was held tight to the body by a piece of chrome mylar at the model's center of gravity. This allows the model to come down parallel to the ground and adds a small amount of drag.

A 20" section of squid line is attached to the streamer. This is done by first wrapping the squid line in and out of the paper reinforcing and attaching the reinforcing and 2" of shock cord at one end. The line is attached with scotch tape or adhesive mylar.

DATA AND RESULTS:

During the test flights, I was never able to get a 2 minute time with a mylar streamer. In contrast, I had 18 flights over 120 seconds with tracing paper streamers. The various tracing paper streamers were able to get times in excess of 100 seconds 31 of 47 flights. The mylar streamers were only able to get better than 100 seconds on 1 of 11 flights made with this material. The white thin tracing paper (#106) obtained times in excess of 100 seconds 13 of 14 attempts. The other flight with this paper had an excessive delay of over 10 seconds and still managed 80 seconds. The #106 streamers were 4"x40" and achieved 120 second maxes 71% of the time. This was the consistency I was trying to achieve.

During the spring when flying in official NAR contests, I had the following performances:

POSSUM 1/2A International SD

Flight 1: 118 sec.

Flight 2: 70 sec.

Flight 3: 66 sec.

VACUUM 1/4A International SD

Flight 1: 28 sec.

Flight 2: 32 sec.

Flight 3: 26 sec.

The above times for the smaller engines are also considerably better than the previous winning times for these events. All the data from 66 flight tests are summarized in the data tables.

CONCLUSIONS:

I have concluded from my flight tests that tracing paper is far superior to mylar streamers in the SD events. From the data collected and my experiences with tracing paper streamers I would recommend the #106 white tracing paper from "Hunt Bienenfang", Edison, NJ, 08817, makes the ideal streamer material for the low power classes. Streamers from this type of material has given me consistent maxes without the apparent aid of thermals.

There are, in addition to using a tracing paper streamer, some additional items that are necessary to achieve durations of greater than 120 seconds with A engines. Listed below are my observations that will help improve reliability for streamer duration. Remember, a DQ is a zero flight time!

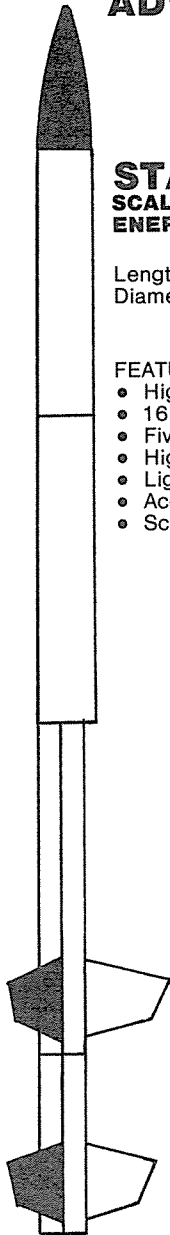
- 1) Don't use snap swivels! They are convenient, but have a tendency to come apart.
- 2) Don't use accordion folds on the entire streamer. The streamer will unfurl faster if you use 1/2" folds on the bottom 2/3 of the streamer (i.e., away from the attachment end), and roll the remainder around the folds.
- 3) Use split rings to join barrel swivels if you use them on both the shock line and the streamer cord.
- 4) Use 18 lb. squid line for both the shock cord and streamer cord.
- 5) Use a model with a low mass and low drag coefficient.

I feel that tracing paper is the streamer material of the future, however, there is considerably more research and development that can be done on the optimization of streamer size.

(The above report netted Charlie a first place in R&D at NARAM 22, and is a fine example of how to do an R&D report correctly. Charlie took fifth in A SD at the World Championships, hitting some poor air after two maxes. His team mates took the gold and silver using the streamers he developed.)

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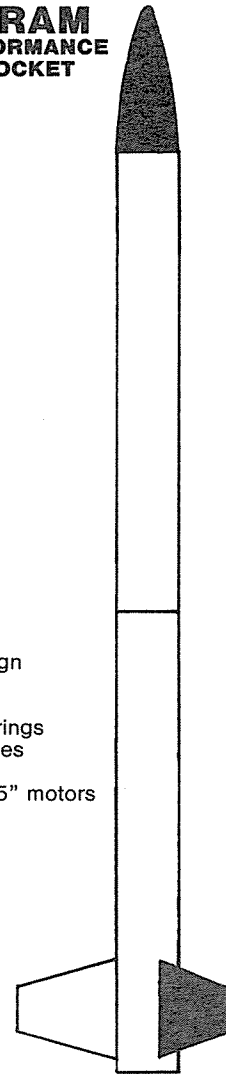
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SUMMARY OF FLIGHTS:

Streamer Material	MAX	FLIGHT TIMES (Sec.)						Total
		110-119	100-109	90-99	80-89	70-79	60-69	
104 White	6		8		2	2		18
107 Yellow	1		1	2		2	1	7
Mylar			1	3		4	3	11
Hvy Yellow	1		1			1	1	4
Gernet					2	1	1	4
106 White	10	2	1		1*			14
Total	18	2	12	5	5	10	6	58

Disqualified flights:

- 4 models unstable with new, heavier Internats engines
- 1 model's mylar streamer melted
- 1 broken spring hook
- 1 large folds/did not unfurl
- 1 lost rocket near darkness

* over 10 second delay on ejection charge

the dreaded space filler



"A lead payload?
I haven't seen one
of those in years!"

-CONTEST DEPT.-

GLRM-83

June 18-19, 1983, Medina, OH.
Events: Plastic Model (of course), C Streamer Duration, B Parachute Duration, C Egg Duration, 1/2A Helicopter Duration, B Boost-Glide, D Rocket-Glide, D Superroc Duration.
Contact: Chris Johnston, 26481 Shirley, Euclid, OH, 44132 for info.

MWW-1

July 23-24, 1983, Medina, OH.
The Mike Wagner Wedding-1 is an extravaganza you'll never forget! Best Man Matt Steele invites you all!! Events: Predicted Duration, Spot Landing, S & M, B & D, and Predicted Drinking. Ask for a kiss from Karen too!

LDRS-2

July 30-31, 1983, Medina, OH.
The second annual Large and Dangerous Rocket Ships launch would prove to be even bigger and better than last year! Come to fly or just to watch! Trustee types or Association zealots not welcome. Events are: Best Flight, Best Prang, Highest Impulse flown and Greatest Cluster flown. Attendance is by invitation only. For information, after March 1, write; Chris Pearson, LDRS Director, 37541 Grove Ave., #202, Willoughby, OH, 44094.

NARAM-25

August 7-12, 1983, Houston, TX.
Events (subject to change): 1/2A Parachute Duration, A Rocket-Glide, A Internats Streamer Duration, A Helicopter Duration, Predicted Altitude, B Boost-Glide (rigid wing only), B Internats Boost-Glide Duration (Flexwings only), C Superroc Altitude, B Egg-Loft Altitude, B Scale Altitude (A & B Division only), Super Scale (C Division only), Research and Development, Static Spacemodeling (special event). More info can be obtained from Ron Goforth, NARAM-25 Contest Director, 11647 Sagemeadow Lane, Houston, TX, 77089.

1983 World Championships

September 6-11, 1983, Nowy Sacz, Poland.
Events: S3A, S4C, S5C, S6A, S7, and S8E (thats E RC RG). Entry fee is \$250.00. For more information, contact Chris Flanigan.

**** Some Club Notz ****

At this point in time, the launch facilities are ready for next years contest flying, and plans for LDRS-2 are in the making. Club members should attempt to get more involved in club flying, as we had to cancel two contest launches last year because of poor attendance.

SNOAR should get a few more demonstration launches this year, as three of the four that we were supposed to get last year were cancelled because of weather. If any members want to participate with the Estes Build-Up plan, let Chris Pearson know.

The Art of Winning:

By Matt Steele

Altitude & Payload Events

Altitude and payload aren't flown too much anymore, most likely due to the hassles of tracking the small, fast moving models. Still, the events are challenging and few rocketeers have established themselves as "altitude" flyers.

The biggest problem with these events is PROVING that your model went the highest. This translates as getting a closed track. So few people realize how easy this can be, especially with the new equations. Ever notice that the people who set up the trackers seem to get closed flights. It is because they know where to fly their model where it will be seen in the sky and get zeroed in on. It is usually worth a trip to walk out to the trackers to check things out (taking a cold brew or two doesn't seem to hurt any, either.). Event better is to volunteer to track for a bit. The bottom line is to check out the situation before you waste a flight.

The second sore spot is tracking powder. First of all, forget about talcum powder. While it's great for parachutes, it's worthless for tracking powder. The big debate is which is better, tempura paint or chalk. This is one that Howard (CMR) Kuhn and I have gone round and round on for years. The both work well in the sky, but tempura is a little lighter, cheaper, and cleans up well. You should stick to two colors of tracking powder: red or orange for clear blue skies, and black for gray, dark skies. The red stuff gives areal nice cloud against a blue sky, which is especially nice when your model is in the 500-600 meter neighborhood. Black tempura is a little lighter than red, so you might want to try it for a second flight. Tracking powder is heavy; a typical load can be as much as 25 grams, which sometimes surprises people. As far as how much tracking powder is enough, it's more or less a SWAG (Scientific, Wild Ass Guess). On my first flight at Lakehurst, everyone saw the 20 grams of black that ejected from the model; it's just too bad no one saw the model.

Most altitude models are basically similar in design, so the difference between winning and losing is in the details. First of all, think lightweight and super finish. Granted, there is a trade off point between the two, but when you are building, one aspect tends to dominate. Start with a long section of body tube; look it over carefully. Body tubes are a lot like balsa; there are some with imperfections, and some without. Pick a tube with no dents or crimps in it, and look for one with nice tightly wound seams. Then sand the tube down with 220 grit sandpaper, working to 320 and 400. CMR tubes sand down quite nicely, although I haven't had a chance to work with the new Phenolic tubes, which should be even better. It's a good idea to do this with all your competition birds; you'd be surprised at the results. When the tube is sanded down, the tedious work of filling the tubes begins. I have had good luck using Pactra Balsa Fillercoat, Sig Balsa Fillercoat, and Polly S wood sealer to fill tubes. The Polly S stuff is hard to find, but I like it best from the standpoint that it cleans up with water.

Nose cones generally should be CMR ones. If you are really a fanatic for mass, like Bill Henderson of Toronto, you can make balsa cones that are a little bit lighter, but I really don't feel it's worth the effort. Recovery systems should be mylar, because it is both visible and lightweight. Fins should either be plastic, or plywood. Both can be finished with relative ease.

When it comes to painting altitude birds, there are about as many different ways as there are modelers. Dave Cook's method as described in the Internats issue of the Model Rocketeer gives very nice results. Both Chris Flanigan and myself feel that Dave's approach is a bit heavy, and we went to Sig or Pactra Dope instead. Spray dope is by far the easiest way to go. The key to this kind of finish is light coats, with a good sanding in between. My final coats are usually rubbed out with #000 steel wool, followed by #0000, and then Sig rubbing compound. As far as color schemes go, black is usually best. Orange is a good second choice. Flourescent colors look neat (ala Dan Winnings), but don't finish well at all. Generally, stay away from them.

For payload birds, the concept of optimum mass isn't really useful, because the payload usually is more than the optimum mass itself. That's not the case with altitude birds, though. For each model, there is a specific mass that will allow the model to reach maximum altitude. The best way to figure out what this mass is is to grab a copy of TR-10 and look for the peak in the engine curves for a given drag coefficient. Where that peak points out is the best mass for that model. Of course, it will take a bit of a SWAG to get the drag coefficient, but the mass doesn't vary that much. The best idea is to build the model light, and then bring it up to the proper mass by adding in the tracking powder.

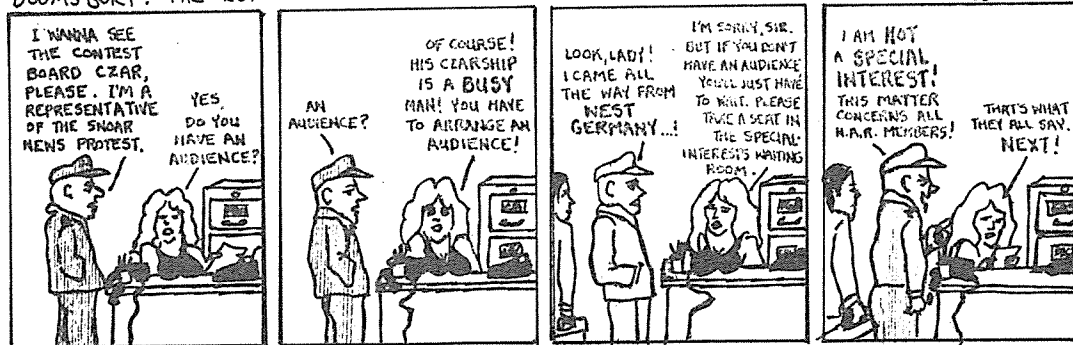
Depending on which method you are comfortable with, pistons, towers, and pop lugs can be used. I prefer towers for first flights and pistons for second flights as a rule. When using a tower, be sure the fins clear properly. I have seen where this wasn't the case more times than I care to remember. A lot of times this will happen at the field, because someone didn't check it out at home. Before you get to the field, everything should be checked and double checked.

Pistons can cause a lot of headaches if not properly constructed and cleaned. Don't be afraid to replace a tube if the seal doesn't seem to be right. I use adhesive mylar wrapped around the engine to minimize tip off. Test fit the engine a couple of times before flying the model. For payload birds, a piston/tower combo, similar to Art Rose's set up, is probably the best idea.

Altitude and payload events are not the most flown events in the Pink Book, but they can be among the most fun. Every one wants to know how high their model went, and if their's went the highest. There's no reason that the best models on the flying field can't be yours!

Miscellaneous...

DOOMSBURY: "THE BUNDICK MONARCHY"



SNOAR NEWS®

PRODUCT REVIEW

US ROCKETS HIGH-TEST 2650 As the flagship of the US Rockets line, this kit was supposed to be a limited run kit, but they continue to be made to this day, thus damaging the credibility of the company, who promised than only 50 would be produced. The 2650's claim to fame is a fiberglass main body tube, 2.80 inches in outside diameter. The kit boasts Ace tubes, and a hand turned Ace nose cone, plywood fins, fiber launch lugs and a six foot silk parachute. In the booster/payload kit you get an additional 12 inch long piece of fiberglass tubing, a large balsa coupler, booster tubes and fins. This kit is not cheap, \$50.00 for the basic single stage kit and \$65.00 for the two stage/payload version.

When building the kit, you notice that there is no gas baffle for the number 11 tubes, and no engine blocks. US Rockets recommends that you use the old kleenex and glue method, you may want to make your own plywood gas seal, however, as I did. You may also want to install upper stage engine blocks if you want to fly it two stage, and can't use the Ace method of engine mounting. The shock cord mounting system is a joke, and I suggest that you discard the wire shock cord, and the short length of elastic cord supplied, and substitute a longer length of 1/2 inch elastic cord and attach it directly to the gas seal or to the side of the tube itself. Regular epoxy will not stick to the fiberglass tube, and I suggest using either fiberglass resin or Stargate Super-Poxy, as they were made to stick to fiberglass. I also installed a hardwood dowel in both the nose cone and coupler to sink the snap swivel into. The fins in my kit were all poorly cut out and required truing on a belt sander before the airfoil was sanded on them, something that you shouldn't have to do with a kit of this cost. I also replaced the launch lugs in the kit with Ace Rockets 1/2 inch phenolic tubing.

When finished, the rocket is damn impressive, standing over seven feet tall, and is definately not a model rocket. On the first flight, you can use E60-6's or F100-8's which will provide much fire and smoke. These engines will provide a straight up flight and will take it nearly out of sight. This rocket can be flown with engine combinations ranging from E to H.

US ROCKETS HIGH-TEST 2225 At first glance, the 2225 appears to be a miniture 2650, but the 2225 has no payload and different fins. It is made to be flown with clusters of D to F engines. The kit comes complete with booster, and uses the Composite Dynamics/Stargate BT-72 for the main stage airframe, and Ace number 9 tubes for the engine tubes. Pre-cut plywood fins are supplied, and as in the 2650, they required some small correcting before sanding. The engine gas seal was mis-drilled, and I had to machine a replacement. I also replaced the shock cord line (not enough) and the launch lugs, substituting the 1/2 inch tubing for the 3/8 inch tubing in the kit, as I have a 1/2 inch launch rod. The kit came with a paper parachute (get serious!). US Rockets says that they work great, but I'm not so confident. I'll stick with my silk ones.

I also had a Composite Dynamics foam nose cone, which turned out to be a 'second', and was full of mold release. I had a hell of a time getting paint to stick to it. Jerry Irvine of US Rockets says that this is no longer a problem. I also supplied engine as I plan on sticking to D12's and E20's for my flights. The first flight in the single stage configuration can best be done with D12-7 engines, and will provide a great flight. In the two-stage configuration, use D12-0/D11-9 or E5-8 to give you a "totally awesome" flight. Install Jetex or Thermalite wick in the upper stage nozzles to insure ignition, or use Ignition Helper. The kit, priced at \$35.00, is not cheap, but built right, it will be a very impressive rocket, capable of out of sight flights.

US ROCKETS AERO-ROC AND AERO-ROC 3 The first of the US Rockets look-alike kits, the Aero-Roc is a single engine kit and the Aero-Roc 3 is three engine kit. Both utilize BT-72 tubes and nose cones, supplied by Stargate Rocket Systems of Canada. The same plywood fins are used on both rockets, and the only outside difference is that the AR3 is nine inches longer than the standard Aero-Roc (and two more engines of course). It incorporates all the usual US Rockets items, paper chute, 3/8 inch launch lugs, and excellent instructions. I felt that the tubing coupler was too small, and replaced it with a larger one. I also replaced the shock cord and parachute. You may not want to do these things, but it was my personal preference. The rocket performs well on any type of engine, from D to F. In my kit, I replaced the 24 mm engine tube in the Aero-Roc with a 29 mm tube, so larger engines could be flown.

Personally, I feel that the price of \$27.00 for the Aero-Roc or \$35.00 for the Aero-Roc 3 is a mite steep for so simple a kit, but US Rockets says sales are good, and the kit will continue to be produced.

Competition Chutes has just released a new series of cloth parachutes that feature a new light weight, rip stop nylon canopy material. The rip stop nylon will replace the line of parachutes made of polyester and nylon. Rip stop nylon is a thin, durable material. It is both heat and tear resistant. The parachutes also feature a braided shroud line material that is either sewn into the canopy or tied through metal eyelets, depending on the size of the chute.

The rip stop nylon weighs in at 0.75 oz. per square yard, as opposed to almost 1.90 for the older style nylon. CC offers six color chutes, but sometimes receives colors not listed in the catalog. Ten different styles are available. Among the more interesting are the 12 panel (in three sizes), the Shroud Line chute featuring lines that run along inside the canopy (four sizes), and the 4 Panel (six sizes). Top of the line is the Ribbon Chute, with two sizes and priced between \$13 and \$15.

I evaluated an 18" 4 Panel chute that has the shroud lines attached with metal eyelets. The eyelets allow easy replacement of the shroud lines. At first look, the material is impressive as it is very tough and colorful. It is more translucent than polyester. It is also a bitch to fold as it is quite stiff. CC's Joan Kuczek says that the initial crispness will eventually break down with some use and that the cloth becomes very flexible. This appears to be the case. With a bit of experimentation, it became easy to fold the 18" chute into a bundle that fit easily into a length of BT-50 that was less than 5" long. Flight tests of the chute have not been made as of yet. I have reservations about how the chutes will act in cold weather. CC states that all styles of chutes were tested before they were marketed. (Ed Note: You might want to throw the chute in the old washer/dryer with your dirty underwear to loosen up the material some)

Joan remarked that 75% of those who ordered chutes were choosing the rip stop nylon. There's a message in there somewhere. I would recommend CC chutes for heavy scale models, plastic models, dual egglofters, as well as those monster sport models. A catalog is available for 75¢ from: Competition Chutes, c/o J. Kuczek, 49354 Bay Lane, New Baltimore, MI 48047. Tell them SNOAR NEWS sent you.

Now you can tell the
"Powers-that-be" where to go!!



Have you been recently reprimanded or expelled from the Association? Do you violently disagree with the rules and policies of the Board of Trustees? Does J. Pat Miller personally write you nasty letters? Then you should be wearing a official

SNOAR NEWS 'Nuke the NAR!' T-Shirt!

Be in the center of raging controversy by wearing this highly visible symbol of civil disobedience, for only \$5.00 (plus \$1.00 for postage and handling). Shirts are 100% cotton, yellow with black art work. State size, S, M, L or XL, mailing address, and make checks payable to: Chris Pearson, 37541 Grove Ave., #202, Willoughby, OH, 44094.

HIGH POWER IGNITION TECHNIQUES

By Chris Pearson

Nothing can piss you off more than spending big bucks and a whole lot of time in that large scale model or that high-power rocket only to have it perform poorly or crash because of mis-ignition of the engine (s).

We've all seen it.....composite engines that chuff or end burn, even poorly performing FSI E60's and F100's. Ever wonder why this happens? Read on.....

We must first discuss the difference between composite and black powder fuel. Suffice to say, without getting into the intricacies of motor design and propulsion chemistries, they are very different. Black powder engines, which are every engine except those made by Crown, Canaroc, Composite Dynamics, Aerotech, High Altitude Research and High Power Research, ignite about 20 times faster than composite engines, are easier to ignite and much more forgiving about mis-ignition. More care must be taken when igniting cored black powder engines, such as the E60 and F100. A noticeable difference can be noticed in performance of the engine, if the engine in question is ignited at the top of the propellant grain or the bottom. Peak engine performance can only be achieved by top of grain ignition. With FSI engines its easy, just use a Electric Match, a real trick, though expensive proposition, as they now retail at \$1.50 a crack. For a cluster rocket, they are a must.

If Electric Match'es are not up to your taste, or they scare you, as they do some people, one can use the fuse method. FSI provides fuse with all their engines, but its not long enough, doesn't burn fast enough, and in almost every case will usually provide improper ignition.

The reason for this is as follows. When ignited, the fuse, which is touching the grain along almost the whole length of the grain, will ignite the propellant as soon as it clears the nozzle, thus resulting in a end-burning engine. To prevent this, do the following: Get some heat shrink or teflon tubing either 3/32 or 1/8 inch in diameter and insulate the fuse along almost its whole length, except for 1/2 inch at each end. Fold one end back on itself and insert this end into the engine core. Do not block the nozzle with anything, as this can result in pressurizing the chamber and blowing the fuse out the end of the engine before ignition. Instead, tape the tubing to the side of the engine. Attach a Solar Ignitor or a flashbulb to the exposed end with tape, and ignite in the usual method.

FSI recommends just attaching the ignitor clips to the fuse, thus causing the enclosing wire to heat up, this in turn, igniting the fuse. This is real nice, but you must have a top-notch ignition system capable of delivering a high amperage to the ignitor. In other words, don't try

it with your Electro-Launch. The manufacturer recommends passing 140 volts at 10 amps through the wire to ignite it, voltages not common to many launch systems. Thus the use of the Solar Igniter.

For clusters, flashbulbs are substituted for the Solar Igniter, using one flashbulb per engine. Flashbulbs require little current to fire, and easily ignite the fuse. Prep the rocket in the standard flashbulb cluster method, substituting the fuse for the traditional Jetex wick, now out of production and unavailable. This is why you don't have to sweat it about your dwindling Jetex supply.

The fuse that FSI uses, as well as Composite Dynamics, Crown and just about every composite manufacturer, is Rapido 'Thermalite' wick, and is commercially used by professional pyrotechnicians and demolitions people. It is made by CXA Ltd., in Canada, and commercially goes for about \$12.50 American per 100 foot roll. Don't go writing them though, as they sell only to bulk dealers in lots of 300 rolls, and you have to have a Class B Explosives permit. It comes in three burn rates, five ips (inches per second), 2.5 ips and 1.15 ips. FSI uses the slowest burning stuff, but the best type is the medium burning rate, which was used in the Composite Dynamics CDI type igniters. Thermalite can be purchased from US Rockets and AAA Aviation Fuels at the truly outrageous price of \$1.00 per foot. The burn rate is pretty consistant, but incasing it in the tubing increases the burning rate by 0.5 ips. By substituting the faster burning fuse for the slower FSI type, you will increase the chance of simultaneous engine ignition.

For composite engines, most of the previous items are still valid. Top of the core ignition is a absolute necessity with composite core-burning engines, as a end-burning engine will cause the rocket to stagger off the pad, if at all, or more likely, sit on the pad for 10 seconds, thrusting, which will either burn a hole in the casing, or cause the casing temperature to exceed the flash point of the paper engine tube, starting the rocket on fire.

With composites, it is essential that the nozzle not be blocked. If it is, the core will flash ignite under pressure, and then go out when the pressure drops as the obstruction is blown out. This is called a "chuff" (although a chuff is really something else) and can blow the rocket several inches up the rod, or in the case of very light rocket, totally off the pad, before the engine really ignites (loads of fun).

Many of the igniters that the manufacturers provide for composite ignition are real shit. Composite Dynamics went through about five different igniter designs in two years, and Crown with three in the past four years. In both cases, the first was the best, but too expensive and time consuming to produce. Both then came out with a square type, which were totally useless, and still are, as extremely poor reliability forced them off the markets. Composite Dynamics then brought out the CDI Thermalite type igniter, which was great, and the Electro-Match, which sucked. Crown now includes a hunk of Thermalite in their engines, with instructions on how to use it right. Still, the best and most reliable method to ignite composite engines is with fuse in the beforementioned methods.

Some problems encountered with composite engines are the fault of manufacture and not mis-ignition. As composite engines age, the air exposed cores become more difficult to ignite, although various anti-oxidants are incorporated in the fuel mixture to prevent this. Some resin rich batches of propellant seep resin onto the core grain surface, thus causing harder and slower ignition. Early Composite Dynamics E20 engines did not have a ignition pyrogen at the top of the engine core (Figure 4) making it possible to ignite the delay train, but not the engine. This was very easy when using CD's Electro-Matches. Later CD recommended bending the tip of the ignitor so it touched the end of the grain. Some experiments have been done using lengthened Solar Igniters, and have been somewhat successful, but it is not a method that I would recommend for the average modeler.

Canaroc engines are a special case. They are a paraffin based composite propellant and somewhat more difficult to ignite. If the standard wire igniter that they provide with the engine is not available, use the old standard, Thermalite wick with a Solar Igniter. Clusters can be flown in the usual manner.

FSI Electric Matches are generally not usable for composite engine ignition, unless you do the following. Take the Electric Match, dip it in clear dope, and then coat it in Grade FFF black powder (not gunpowder) that is available in most firearms stores, and is used in replica flintlocks and the like (I told the store owner what I was going to do with it and really blew his mind). After the dope has hardened, shake off all excess loose powder and coat with another layer of clear dope. These can be used in 24 hours. I do not recommend doing this procedure to ignite anything but clusters of composites. Make sure the wire ends of the Electric Match are twisted together and that you are well grounded before you handle either the powder or the Electric Match. Black powder can be bought in 8 ounce cans, but be prepared to spend about eight bucks for it. This should last you at least the rest of your life though. I don't have to tell you not to smoke when using it, do I? Handle and install as a standard Electric Match, making sure that it is at the top of the engine core, and do not block the nozzle. You will see your composite powered rocket leave the pad faster than you ever thought possible using this method, and it works extremely well with clustered composites, or when mixing black powder and composite engine together, something not generally done with any great reliability.

Black powder can also be used to beef up the somewhat pathetic ejection charges of some composite motors, but only add about one-half gram for best results.

Many different methods have been discussed in flashbulb ignition, but the best and most reliable I've found (and the cheapest) is to use standard Ma Bell wire (28 gauge) and solder it to the flashbulb wires, after wrapping it around them. Have your leads about 12 inches long, and strip about one inch off the clip end to facilitate twisting them together when clustering.

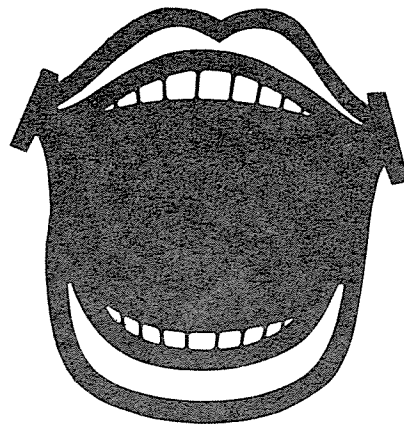
One thing that I would not recommend using is that green underwater fireworks fuse usually sold in hobby shops, which is very slow burning, and very easy to damage. Another is the use of 1/4 or 1/4A engines to ignite a cluster of black powder or composite engines. You can blow the rocket off the pad before total engine ignition, or have one or more

engines not ignite. This method has been used in the past to ignite very stubborn composite engines, but when used improperly, can cause great damage to the rocket itself, and is generally not needed with today's engines because of their greater reliability and higher quality.

For those of you uninformed in the fundamentals of large and dangerous rocket flying, or composite engine basics, we recommend obtaining the Ace Technical Reports on composite engine ignition and clustering, available from Ace Rocket Mfg., P.O. Box 5472, Mission Valley, CA, 91345.

Guest Editorial

SNOAR NEWS provides this opportunity for other members of the model rocketry community to present their views on various aspects of the hobby in an effort to improve communications between all modelers, bring possible problems to light, develop solutions to existing problems and implement them, and generally act as a soapbox for anyone who has anything worthwhile to say concerning model rocketry.



Piss & Moan Dept.

(Editor's note: We got this reply from Pat Miller in response to some questions raised about model rocketry, amateur rocketry, and LDRS-1. Here is Pat's reply.)

I appreciate your input in the amateur rocketry business. The Association is tracking this situation very closely to determine its nature and extent. This is not the only time in the NAR's history that this issue has arisen. The question is whether it is time for the NAR to change its rules.

The answer to that question is unknown at least for the present. What I would prefer to see is for the amateur people to organize their own group and establish their own constraints, safety procedures, and the like. Once this is done the NAR would be happy to sit down and discuss the possibility of joint membership. Presently, there are no uniform safety procedures in place.

In any event, you can expect to see the NAR sit back and watch what happens. When it becomes clear there must be a change in the rules, then a change will begin.

Also, you can expect the NAR to place itself as opposite the dipole that it can with amateur rocketeers. In the event that there is an accident the Association will be in a better political situation to handle it. It will be the NAR which has to handle it despite coming from within or without. The Washington, DC death (Ed: as well as the Shea Stadium fatality) with a model airplane clearly illustrate this point.

BULLSHEET

The 1983 World Championships will be held in Poland. That's no joke! The Poles were originally to host the meet, but internal tensions clouded the issue, and it was assumed that Bulgaria would have to step in and hold the meet. But, with things seeming to calm down, the Poles will indeed host the meet. The events will be the same as the previously announced list, so this will cause no major changes to the plans of the US team. It will probably prove to be a little cheaper for the team, as the location of the meet is in a small town south of Krakow, about ten kilometers north of the Czech border. The date is set for 6-11 September, 1983, with the following countries expected to participate: Bulgaria, Hungary, Yugoslavia, Czechoslovakia, Romania, Greece, Turkey, West Germany, Canada, Great Britain, and the USA.

Also to come out of the FAI meeting were two rules changes for the 1984 season. In the PD and SD events, the max time for each round will increase by one minute. This means in A PD, for example, the max times would go 120/180/240, with a flyoff round of 300 seconds. This move was apparently motivated by the fact that the recent European meet saw seven (count 'em) flyoffs before a winner was declared. This has also been a problem for our model airplane FAI flyers. The second rules change was to make the minimum tracking base line length for an event to be at least 2/3 the world record. Want to know how the Commies set their outstanding records? Well, try using a short baseline and then almost bottom out the trackers. The difference between a one degree measurement could mean as much as 150-200 meters. Nice, huh? Also, the Bulgarians were going to try and fly a lower class of BG, but when they were told they had to fly C BG, they remarked, "Well, we don't have a good engine for that event."

At latest word, the NAR Witch Hunt added the names of Curt Hughes, Warren Sisco, and Warren Sisco to its list of who's who in amateur rocketry. Seems the evidence was in the form of photos in California Rocketry. It's a good issue, by the way. More on this as it develops.

The January MODELAR (edited by O. Saffek) has the results of the last European championships. Since we don't have a translator on the staff yet, we'll just have to give you a rough account. E RC RG was won with a model that took third last year, looking very similar to the standard Warsaw pact design and using a 18mm x200 mm engine. Times went from 875 (1), 745 (2), 622 (3, Jordan Pavlov, last year's winner and 80 World Champ), 600 (4), 418 (5), and 4 total DQ's. Scale was won by a Czech, Gerencer, only 6 points in front second place and nine points in front of third. Bulgaria won the team championship in both RG and scale, although there is no mention of two time world champ Maisich anywhere. The winning scale prototype was a Saturn 1B.

Flexwings apparently dominated the C BG event, but this year only two contestants made perfect three max flights. PD saw 4 people involved in a flyoffs, and SD had nine! The top score in C Scale Altitude was 1339, probably by a Meteor. Other scale prototypes seen at the meet included the Saturn V, Sonda, and Ariane.

Reaction Technology has discontinued shipping as of 1 December 82. They plan on filling any outstanding orders up to that date, and orders recieved after that date will be returned. Mark Weber has sold his share of the company to his partner, J.P. O'Connor. Any inquires concerning RTI should be sent to him, and not Mark Weber, as reported in the Model Rocketeer. J.P. O'Connor can be reached at 3332 Alamo #6, Cincinnati, OH, 45241. Reasons given for the failure of the company include Mark getting a new job in which he is on the road most of the time, and the poor economy. RTI dumped big bucks into engine development and then had to dump the project because of mounting costs and unforeseen problems.

A new name in the world of model rocketry is Acme Rocket Company. This company, founded by former Centuri boss Grant Boyd; will probably offer products from many of the companies that have ceased operations in the past few years, as AVI did in the 70's. RTI has sold much of their stock to them, along with Astro-Dynamics. Acme Rocket Company can be contacted at P.O. Box 28283, Department CRL3, Tempe, AZ, 85282.

AAA Aviation Fuels has announced the availability of their own line of body tubing. Similar to the BT-70 of Estes fame, it has the same inside diameter, but is thicker to give better rigidity. A catalog is one buck, and available from AAA Aviation Fuels, Large Scale Rocketry Division, RD 6, Box 172, Edwards Ave., Clarks Summit, PA, 18411.

Another new name in the world of high power is PowerTech. A new company based in Milwaukee is run by the owner John Rimondi. He stresses that the engines that are under development now are only experimental, and the final configurations may be much different. Under development now are two E engines and a F engine. Reports from The Midwest Rocketeer state that the F18 engine is only .76" in diameter and 3 inches long (!).

Ace Rocket Company has a new catalog out (is that the one you promised for NARAM-23?). And Korey Kline, president of Ace has brought out a whole series of new, lighter weight and NAR legal kits. He has also announced availability of his entire series of high strength tubing and parts. Ace Rockets has recently announced merging with AeroTech, maker of high technology composite end-burning engines. The merger should help promote both companies.

Speaking of AeroTech, they now have two engines both DOT and NAR certified for sport and ocnest flying, with a third, a F44 soon to be available. Full specification and ordering availability can be found in a ad elsewhere in this issue. Look to AeroTech for a whole line of new motors that you have never before seen in rocketry.

High Power Research is marketing a line of kits to go along with some of the high power engines they sell. The first is a Tri-Power Research Vehicle. This rocket looks somewhat like a Enerjet 2650, but is up-scaled to use 1.5 inch tubes for the motor tubes (bitchin!). The whole rocket is huge, and moderately priced. Full specifications and prices can be obtained from High Power Research, P.O. Box 73, Cuba, OH, 45114.

Model Rocket Technology is now offering high power kits. A free catalog is available from them. Not much else is known about them, although many people have thought that SHOAR is running the operation (totally unfounded rumors). A catalog can be obtained by writing; Model Rocket Technology, P.O. Box 5189, Akron, OH, 44313.

A last minute call from Sam Phillips tells me that the Michigan Sapcm modeling Convention is now on for keeps and is scheduled for April 30 and May 1, 1983. It will be held in Warren, Michigan. Information can be obtained from Sam Phillips, 11351 Dale, Warren, MI, 48089.

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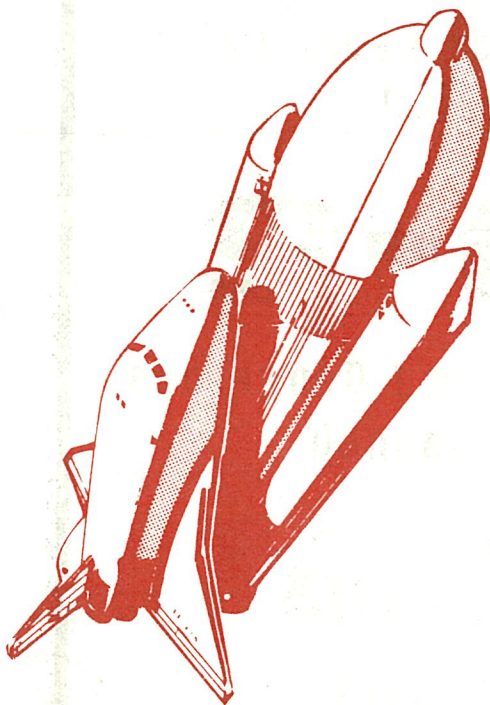
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