

SNOAR NEWS

OCTOBER 1985

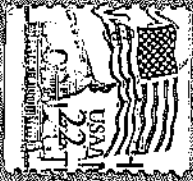


Winner of the 1985 IBC Newsletter Award

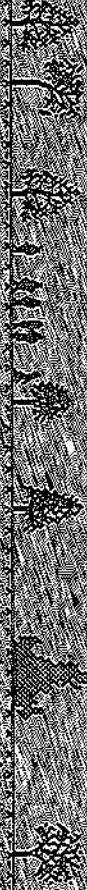
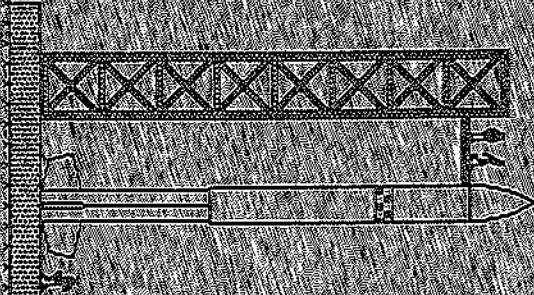
SNOAR NEWS

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SNOAR NEWS

October 1985
VOLUME 11 NUMBER 8

1985 LAC Newsletter Award Winner

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COVER STORY:

"Did You ever have nightmares like this?" This is the ULTRA DIG BERTHA, the cemented branch of John Pombro and Chuck Lund (R to L) Power provided by 3 B and 3 1/2 AeroTech motors on it's maiden flight and by a single Vulcan motor on it's second. Talk about a liver-juicerin mother!

CREDITS:

Former Captain... You should see him when he's drunk National Champ, International Traveler, Genuine Con Artist, and usually Editor and Proof Sheet

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Rocketeers who have contributed to this mess (NOTE: \$20 and/or an unsolicited article gets YOUR name HERE): Chas. Russo, Chris Johnston, Bob Geier, Pat Miller, Jack Kobzer, Ron Shultz, Debbie Shultz, Mike Wagner, Wayne Bendricks, Jerry Lee, Randy Kelling, Moose, Bob Ferrante, Harold (Chris's girlfriend), Brad Bowers, Randy Reed, Gary Price, the Mormon Tape Machine Choir, and Multi-Megabytes or others.

SNOAR NEWS is published (not around 8) times a year by the evil SNOAR Empire, NAR section #337. The actual number of issues to be published is in the noise level. This is Volume 11 Number 8, SNOAR SNOAR NEWS, and IMPACT copyright © 1985 by the SNOAR DYNASTY, Matt Steele, Emperor. Subscription office is SHIT \$7.50 in HARD CURRENCY or INTERESTING SOFTWARE. Make your check out to Matt Steele, not SNOAR NEWS. (A few people did last month. The next guy to do it, I'm going to publicly embarrass.)
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Well, hello!

It's back in the saddle again! It's good to be back in print. We've got the long-awaited LDRS Issue here for your reading pleasure. We got so many good photos from the staff that we couldn't resist running a bunch of them. I'd also like to thank everyone who came out to LDRS, whether to watch or fly. The quality of craftsmanship and sportsmanship was outstanding. Do you realize that LDRS is the biggest launch of the year, again? It certainly was a fun time, and it was good to see you all out there. Sorry if I didn't get to talk to everyone as long as I would've liked. A special thanks to Chris Johnston who was drafted to write the LDRS article. And a great big round of applause goes to Chris Pearson for pulling off yet another fantastic meet. Also, Mike and Karen Wagner, and the whole Wagner family should be thanked for all their help with the field and facilities.

The answer to the July/August Issue's mystery cartoon was: "We don't have the best craftsmanship or skill...but we sure have the technology to beat the crap out of the commies!". There were no winning entries, so the jackpot will double.

Thanks should also go to George, who honcho'd last issue, and did a fine job. It sure made it easy to get an issue out. By the way, the SNOAR MAC family has grown: In the far east, Bob Geier has acquired one, and way out west (even farther west than Utah, if you can imagine that!), Aaron Bernstein has landed one as well. Hopefully, we can all get together on the software! If anyone else out there has one, let me know. And if you don't, well, shame on you! (Especially Chris Johnston, who recently bought SOMETHING ELSE!).

That brings us to this Issue's funny story. See, NAR Headquarters is buying a computer, and they settled on an IBM. So George wrote Pat Miller a letter, and at the end, wondered if the NAR had settled on the IBM so as to be "SNOAR Incompatible". Well, Pat didn't realize this was a joke, and replied with a lengthy justification. Oh, well, Pat, just go ahead and work with outdated machines. By the way, Bunny is in charge of the computer project. You say you wouldn't have guessed?

Matt & Mac

LDRS-4

Snoar's Summer Super Shoot!

by the real Chris Johnston (with help from Deb Schultz)

For the fourth year in a row the faithful of the First Church of Compositology met in Medina, Ohio for their annual meeting, LDRS-4. Over 125 participants attended (bigger than MARAM again!) from all over the country, and occasionally from Canada. The weather on Saturday was hot and the skies clear, making for perfect sunburn weather. Sunday saw rain in the morning, but things cleared up enough to fly by noon.

As usual, the range was set up with one six-wide launch rack near the range table used for small (AKA model) rockets and a set of larger launchers 100 or so feet away for the bigger models. The range ran smoothly due in part to a set of headset walkie-talkies borrowed from Vince Bonkowski & Co. in Michigan, and the new SNOAR PA system. The range was set up parallel to the long edge of the field and left a long downrange area to drop the rare model with problems into. This year North Coast Rocketry, the event's sponsor, had special tripod launchers with every rod size known to man available, making launching smooth and easier than in past years.

The quality of the models was again quite good as we have come to expect from high power people. You just don't see the number of garbage rockets that you get used to in model rocketry. This may be because of the size or cost of the models or, more likely, because the people that fly high power have been around quite awhile and don't like to show up at the High Power National Meet with sleazy looking rockets.

There were a number of really incredible rockets flown over the LDRS weekend. One of the most unique was Korrey Kline's monocopter. It was based on an old model airplane design, and Korrey substituted model rocket power for the airplane motor. The monocopter was a wing about 3 feet long with a pivot tube mounted at midchord of the root. An engine mount (with the thrust line in the plane of the wing, parallel to the root) was positioned on the far left side of the pivot. Korrey would use a G10 for rotation, and a G15 for lift. The model looked like it would balance on the pivot sleeve. When the engine ignited, it began to spin around the pivot. The wing began to lift and the model lifted vertically and flew off. When the engine quit, it began to slow down, eventually stopping and counter-rotating before touch-down. Flown one or two stage, the model flew well, and was a crowd favorite.

Meteor 7 flew with its typical cloud of smoke and shower of D12 casings, living to fly again at LDRS-5. A semi-scale Sidewinder (about 4' long) made a scale flight, turning 90° at about 100 feet up and screaming off downrange parallel to the ground. A Kline Air-Breather (A "normal" model built with an outside airframe to allow the air to flow through it) ended up as a Corn-Breather, one of the few victims of the range cornfield.

The most unique payload was a model with an on-board computer. This machine was based around an RCA 1802 CMOS microprocessor. It took data from a scratchbuilt accelerometer and programmed an EPROM during flight. This is a real advance over the similar computer system shown at KentCon a few years back because, using the EPROM, only the chip itself has to survive the flight. You can lose the batteries and even destroy the computer as long as the EPROM is intact.

The Lots of Crafts folks, Deb and Ron Shultz, brought their usual load of nice models. One of their new ones, the "Mini-Magg" (short for Magnum), looking like a sawed-off V-2, *really* moves on an I engine! It is built around LOC's BT-56 tubing (5.6" diameter). Topping all the manufacturers, Lot of Crafts flew nearly 4,500 newton-seconds of power at the meet! Debble also showed up with "Leggs", a pink rocket with black face, that got everyone's attention on the field. It certainly was the sexiest rocket on the field.

The real high point of the meet was Chuck Mund's and John Holmboe's Great Big Big Bertha. Imagine a 10" tall 40 pound yellow Big Bertha, if you can! I'm sure Vern must have had nightmares about something like this! This monster flew on Saturday morning using a cluster of engines and carried two Kodak Disc cameras, two movie cameras, and a radio-controlled ejection system. A minor prepping error caused the ejection system to fire while it was on the pad and resulted in the nose section being impaled on the launch rod. After patching up the hole and resetting the ejection system, the rocket made a spectacular flight on three Aerotech H and three I motors. It took three 6' diameter chutes to bring it down. It made a return on Sunday, flying on one Vulcan "L" engine (Mr. Maddog, where are you?) and without the R/C system. It was a successful flight, lumbering off the pad (it certainly wasn't overpowered!!!) and landing near the rangehead.

Manufacturers were in force at LDRS-4, with Aerotech, Vulcan, Ace, Lots of Crafts, Reaction Technology, AAA, and, of course, North Coast Rocketry. Korrey Kline flew some of his experimental "Visijet" motors that had a neat red/purple flame, while Aerotech and Vulcan pulled out all the stops with their respective motor lines. One notable (and welcome) absence was that of Jerry Irvine and his various dubious companies. Dan Meyer represented the NAR Blue Ribbon Commission, and spent a lot of time talking to people, and taping the event for other commission members.

Overall, the trend has been to bigger, single motor models, as opposed to the clusters of G's and such seen at previous meets. With the availability of reliable high power motors, most people seem content to go this route. It also appears that the total newton-seconds flown at a LDRS is roughly constant; there were fewer flights this year, but they averaged more power per rocket. The big thrill of flying a G motor only three years ago (was it only that long ago?) has been replaced by the big H and I motor models. Parts and kits are more available, yet we have seen a great deal of creativity in various designs. And, the birds are getting bigger, too! A lot of people showed up in vans this time around.

Probably the best part of LDRS-4 was the relaxed laid back atmosphere that made things a lot of fun. LDRS is not only a rocket launch, it's a social affair, and it's got to be some of the most fun a high power freak can ever have. If you didn't make it this year, start planning and saving for LDRS-5. It's not that far away!

This is an admittedly incomplete description of what went on at LDRS-4. You would have more detail if Chris & Matt weren't off wandering around in Commie Land - Chris Johnston.

METEOR 7 FLIES AGAIN!!!

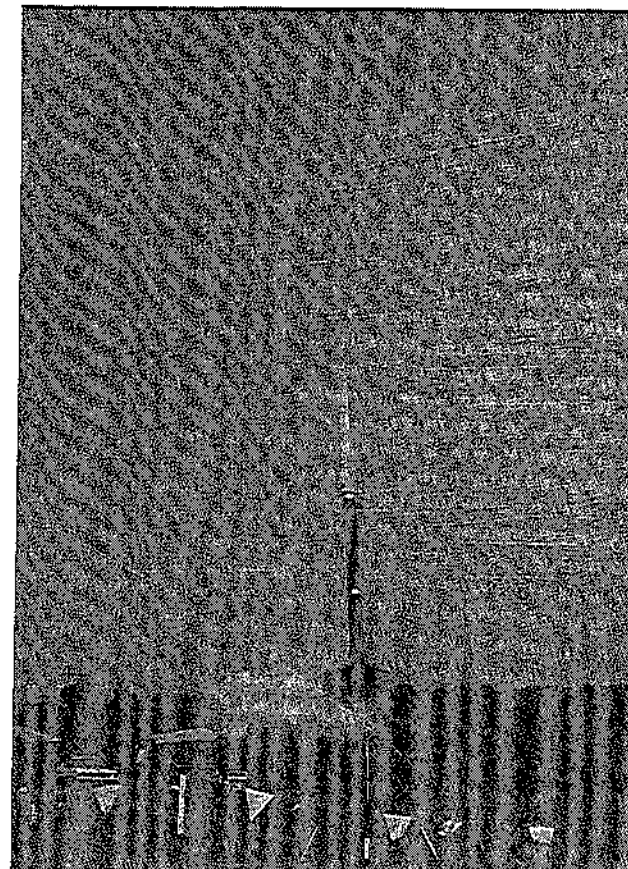
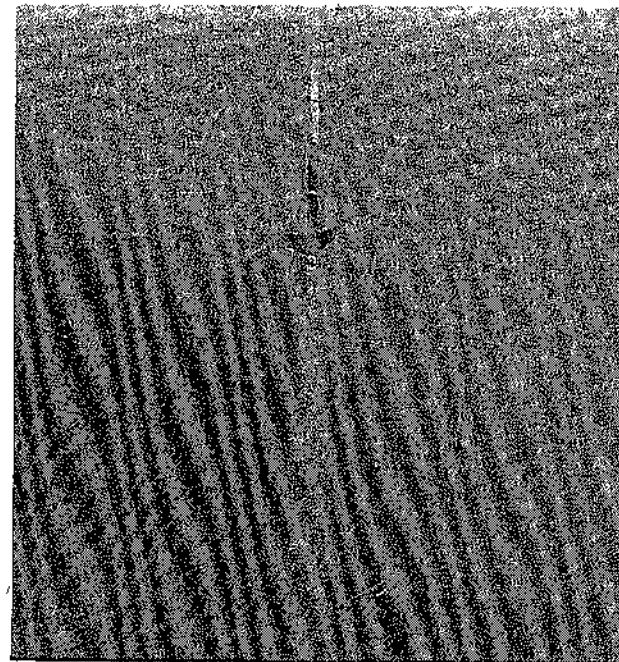
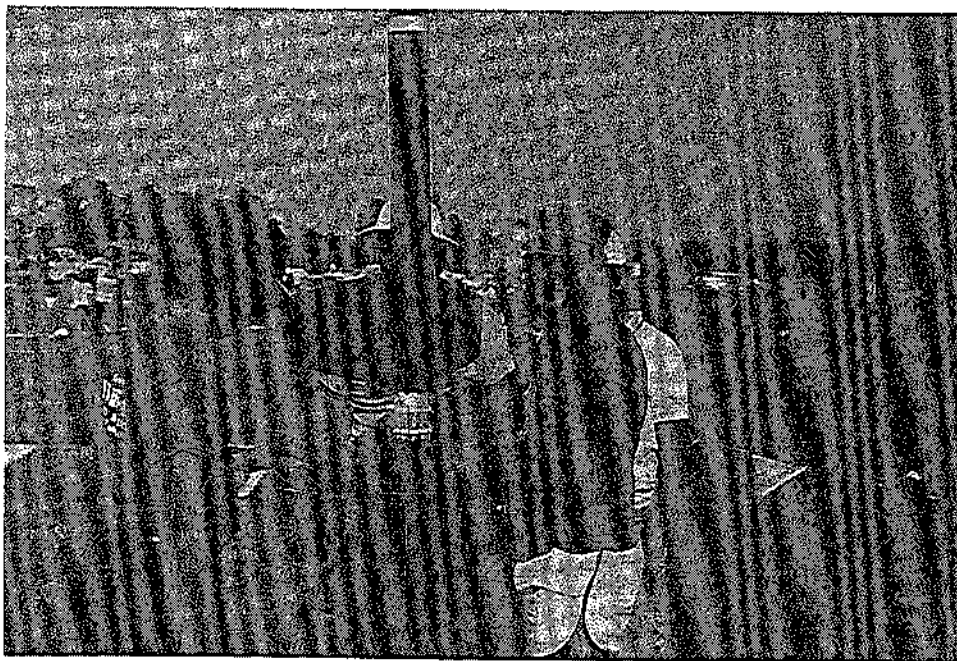
Chris Pearson brought out the infamous Meteor 7 to fly it again at LDRS-4. This is one BIG bird, using three sections of NCR 6T-39 tubing to stand over 10 feet tall. Power is by D12's, using ten boosters drop staged to ten more sustainer motors. This was the biggest cluster of black powder flown at LDRS, and is a crowd favorite.

Below: Chris Pearson and Matt Steele make final preparations prior to launch. Note the stack of D12's extending from the rear of the Meteor. Range Safety Officer Jim Backlas can be seen behind the rocket insuring that everything is OK.

Opposite Page, Bottom: Meteor-7 lifts off with a huge cloud of smoke.

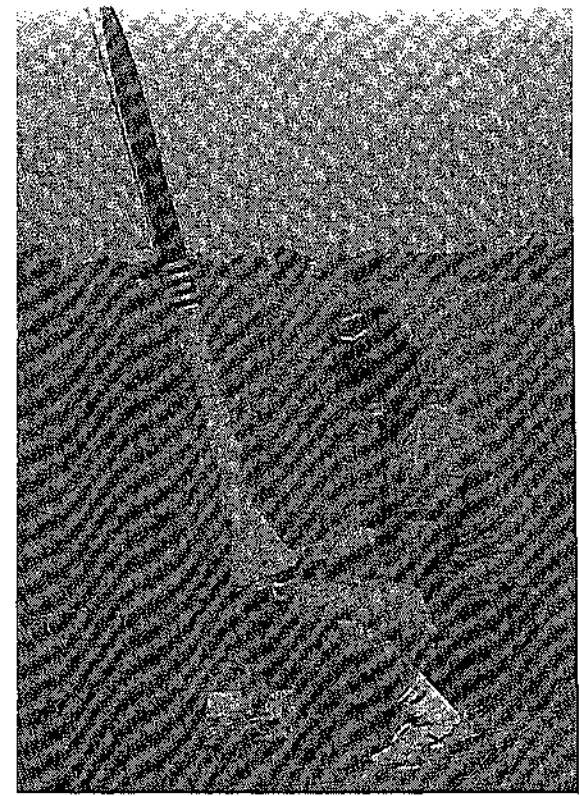
Opposite Page, Top: Meteor-7 just prior to the burnout of ten D12-0's, and the inevitable shower of casings.

Our thanks to the LDRS photographers who helped out with pics for this Issue: Chris Pearson, Brad Bowers, Deb Schuitz, Ron Schultz, and Matt Steele.





The California contingent showed up in force for LDRS. Korrey Kline (above) brought a number of unusual rockets, including this variation of the old "Luna Swift". Powered by an F15, this bird glided rather nicely. Moose (below) was flying his super-stick movie camera on anything that would boost it, seen here hiding behind an Ace Fugue.

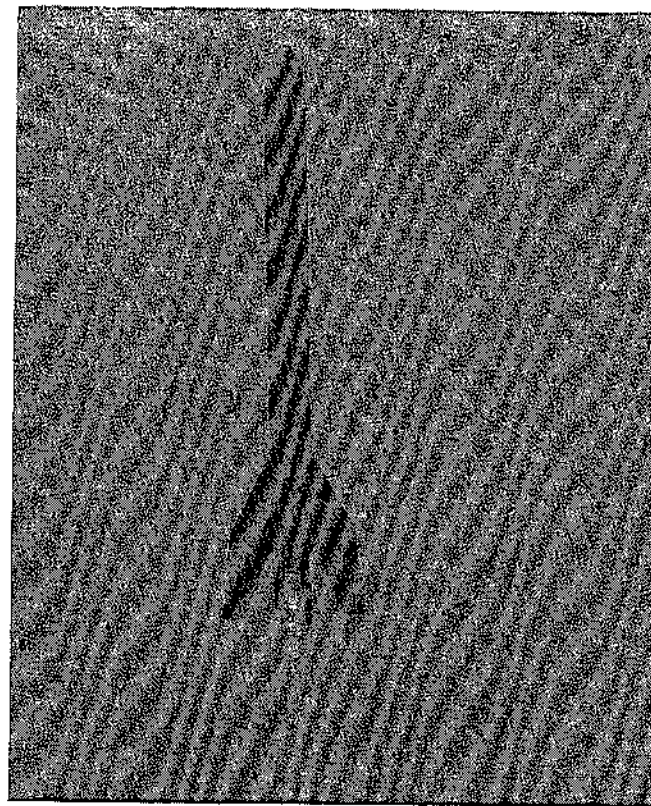
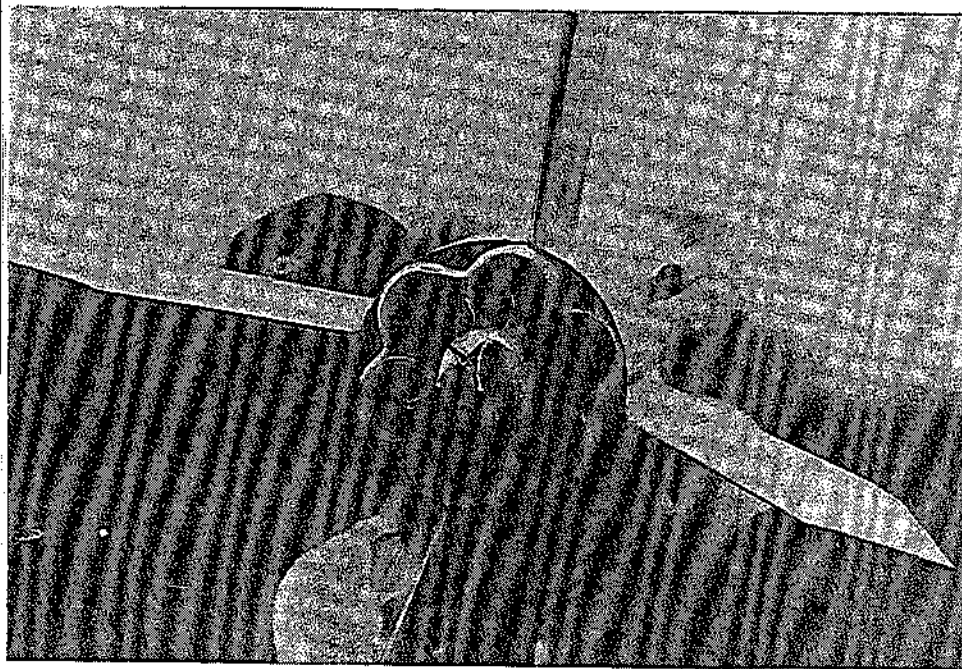


Bill Barber (above), another California rocketeer, brought a number of impressive models. Here he preps one of his smaller birds to "test the wind". Proving that they are the premier high power club in the nation, SNOAR was out in force (below), as evidenced by Ron Schultz (kneeling), Don McPherson, Chris Johnston, and Matt Steele getting ready to fly a G powered screamer.



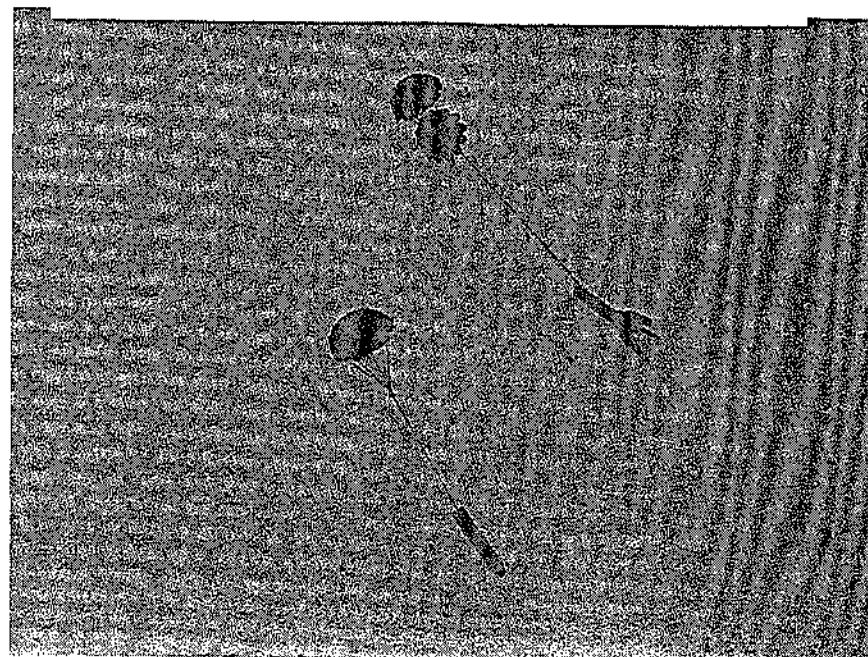


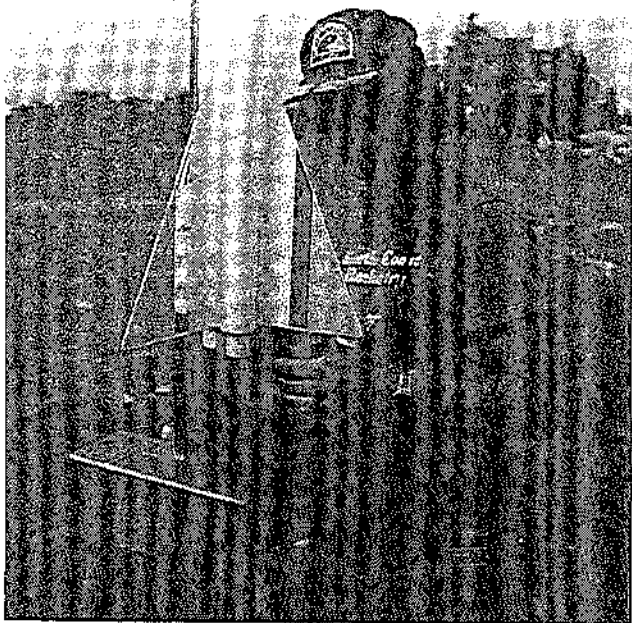
The King Viper III is a handful (above), even for LOC owner and designer Ron Schultz. Power was by three Aerotech 1 motors. Below: The business end of the Great Big Big Bertha. John Holmboe has it hoisted on his shoulder.



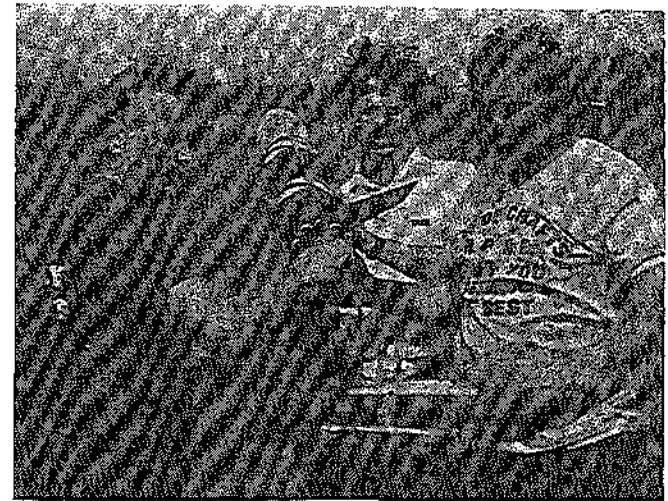
Above: The Big Bertha flew well on the Vulcan L motor.

Below: The Bertha was safely recovered by three huge parachutes. By far, the flights of this monster Estes kit were the highlight of the meet.

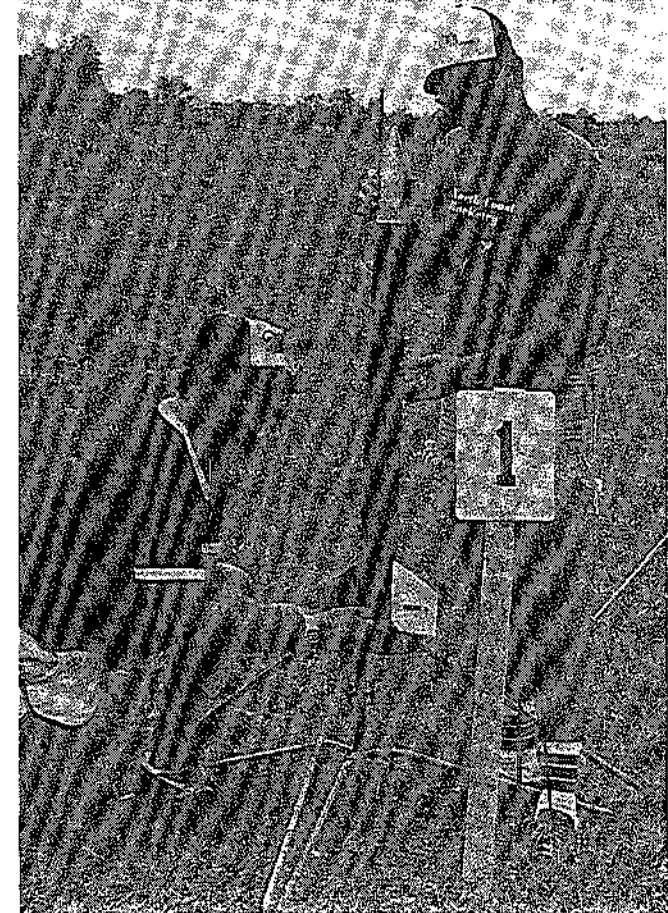


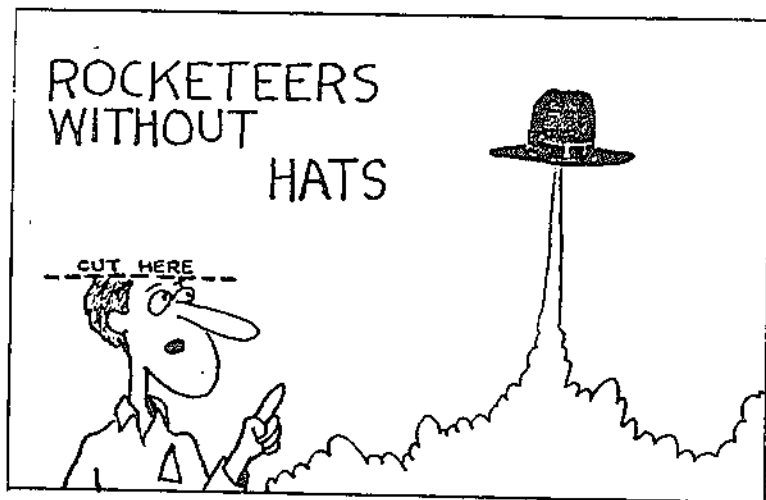


Above: Chris Pearson did an outstanding job of organization for LDRS, and was also seen flying quite a bit, including this immaculate Allegro Largo. **Below:** Korrey Kline poses with his huge VisiJet powered design.



Ron Schultz worked with Gary Rosenfield (left and center, above) to build this special I powered Magnum in an Aerotech paint scheme. Don McPherson, right, helps load this beauty onto the pad. **Below:** Bob Ferrante helps Matt Steele load an NCR Aerobee HI-Test onto the pad. This bird flew well on an North Coaster F75, but ended up in one of the few trees on the field. It was later recovered.





ROCKETEERS WITHOUT HATS THE MODROC VIDEO SOUNDTRACK

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DEAD SKUNK IN THE MIDDLE OF THE FIELD
MY HEROS WERE ALL CONTEST JUNKIES..
FERNANDO AND J. PAT
HIGH POWER BLUES (a salute to Slim Whitman)

VLADIMIR AND NICKI
BRICK SPACESHIP (instrumental)
TO ALL THE ROCKETS I HAVE FLOWN BEFORE
WHAT THE ROCKET WOULD SAY
ALPHA III (instrumental)
ROCKET'S ROLL
CHICO

QUINN THE ESKIMO (Don't ask me why....)
OLD MAN KUSHNERICK
HIGH POWER BLUES - REPRISE
NOT MUCH ELSE ...!

FUTURE ROCKET ENGINE DEVELOPMENTS

by Dan Meyer

Extracted from the High Power Blue Ribbon Commission Report

Before the 80 N-sec engine explicit power limit is dropped and engine power is limited only indirectly by propellant mass, it is important to estimate the long-term upper limits of power which this permits. It is power, not propellant mass, which determines rocket performance and hazard. This paper summarizes a lengthy study of model rocket propulsion trends written by Blue Ribbon Commission member (and professional propulsion engineer) Dan Meyer. It presents an excellent overview of future model rocket motor developments.

PROPELLANT BINDER

High power (E and above) model rocket engines almost all use a modern propellant made up of about 16% elastomeric binder (hydroxyl-terminated polybutadiene, HTPB) and 84% solid oxidizer (ammonium perchlorate, AP) with a few trace-quantity additives. This propellant's energy per unit weight, or specific impulse (Isp) is about 215 sec, compared to 90 sec for the black powder used in D and smaller engines (Estes Industries engines) and some older-technology E and F engines (i.e., FSI and the old AVI E and F motors).

Current professional propellant technology has found no non-detonable binder with higher energy than HTPB. Since detonable propellants will not be classified by DOT as Class C regardless of quantity per engine, they cannot be used in model rocket engines. Only one area of binder improvement is available: adding nitroplasticizing agents. These are currently prohibitively expensive for hobby use, but could possibly add 5% to propellant Isp over the next 20 years if they become cheaper.

PROPELLANT OXIDIZER

The oxidizer of choice in professional industry for the last 30 years has been ammonium perchlorate. Despite significant research efforts, no non-detonable oxidizer with higher Isp and acceptable storage qualities has been discovered. None is foreseen for the next 20 years.

ADDITIVES

Model rocket engines today do not use metal additives (aluminum or magnesium) in more than trace quantities. Aluminum is widely used in professional motors, in place of up to 20% of the AP. Such large fractions require giant engine chambers to ensure their complete combustion prior to exhaust, but there is promise for even engines as small as model rockets in propellants with up to 5% aluminum. Some of the energy addition from the aluminum is negated by an increase in two-phase flow losses from its solid-phase reaction products, but there is potential here for a gain of up to 4.6% in Isp over the next 20 years.

OTHER IMPROVEMENTS

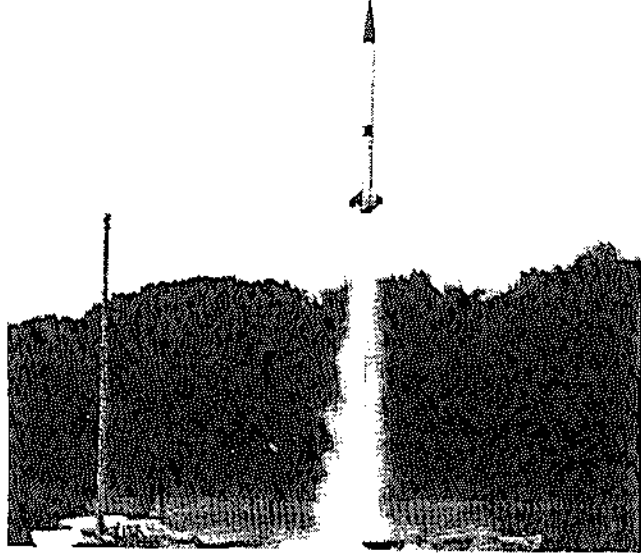
Two more avenues are available for future increases in model rocket propellant performance: increasing the fraction of AP from 84% up to 90%; and increasing the engine combustion pressure from 500 psi up to 2000 psi. Both would increase the already significant difficulty and expense of manufacturing high-power model rocket engines for consumer use.

Propellants containing more than 84% solids become very thick and paste-like, and packing them into an engine casing would be much more difficult than the casting process currently used. An increase of up to 3.5% in Isp is available if a 90% solids loading can be achieved.

An increase in engine operating pressure is the easiest method to improve model rocket engine efficiency. Current lightweight casing materials burst at around 2000 psi. They operate at large safety margin in today's model rocket engines, where even the highest-thrust engines do not exceed a peak pressure of 750 psi. An increase in combustion pressure to 2000 psi would require heavier nozzles to properly expand it. The payoff would be an increase of up to 11.5% in the Isp of high-thrust engines. Operating low-thrust engines at this pressure would require very small nozzle throats which would be difficult to manufacture and easy to clog during operation. If engine thrust is limited as proposed elsewhere in this report, a full 11.5% gain in Isp from operating pressure is therefore not available.

CONCLUSIONS

Using the technology demonstrated today in model rocket engines, an engine of up to 133 N-sec power is theoretically feasible with 62.5 grams of propellant. The most efficient design on the market actually delivers 130 N-sec. Multiplying all of the most optimistic estimates of future performance described here shows that an engine of up to 158 N-sec is potentially feasible in the next 20 years, probably at greatly increased expense. A full "G" of 160 N-sec is the absolute upper limit achievable with DOT Class C model rocket engines which are limited to 62.5 grams of propellant.



"I'LL SUE THE BASTARDS!"

- ANONYMOUS N.A.R. OFFICIAL

"SCANDALOUS!"

- M. ROBERTS

"WHERE CAN I GET A COPY?"

- M. STEELE

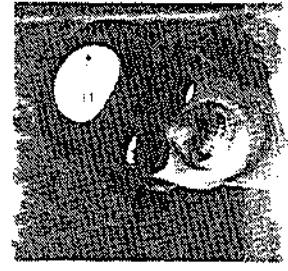


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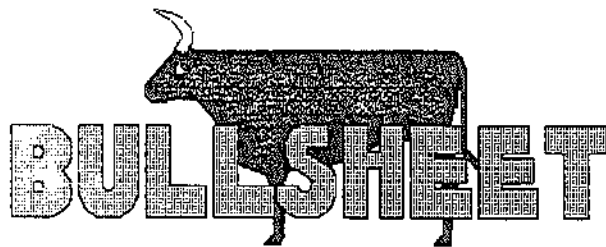
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BULLSHEET

Phil Barnes and Art Rose win gold medals at the Sixth World Spacemodelling Championships in Bulgaria! Phil repeated as World Champion in E RC R6, maxing in all three competition rounds. Despite the heavy winds, Phil flew his trademark arrow-straight boosts, and found enough lift to be the only competitor to max all three rounds. Jim Wilkerson flew well enough to capture the bronze in the event, and that gave the US a silver team medal. Art Rose, flying a D Region Tomahawk and an Aerotech micro-C motor, set a new world record in C Scale Altitude, soaring to 1084 meters! With the 9th place finish of Matt Steele, and the 11th place finish of Dan Winnings, the US won a team bronze in the event. Trip Barber won an individual bronze in B altitude with a flight of 705 meters. Trip used a two stage "dart" type model powered by two A motors. Trip also finished 6th in A SD. Ken Mizof finished third in A PD, but didn't win a medal due to a first place tie. Charlie Sykos wound up fourth in C BG, which went into four flyoff rounds to decide the winner. The US won team bronze medals in B Altitude and A SD, which was a very good showing, all things considered. All members of the US team that flew won some sort of medal. The Russians kicked ass, and surprised everyone, particularly the host Bulgarians, who were second. The US and Czechoslovakia were tied for third. True to form, the scale kit building team was at it's best, as Jeff Vincent spent many sleepless nights scraping together a model, and Chris Pocock came nowhere close to completing a model. Complete coverage, including a sample of the dreaded Bulgarian national fruit (%&*** tomatoes), will be in the next issue of SNOAR NEWS, thanks to your intrepid reporting crew of Chris Pearson, Terry Lee, and Matt Steele. Watch for it at your newstands!

Chas Russell has been named a NAR Trustee to replace Jay Apt, who had to resign following his appointment as an NASA astronaut. For such a long time, SNOAR had no voice on the Board, and now we have two! Have we sold out? Not likely! Chas will also replace Jay on the new Blue Ribbon Commission that is interacting with the LDRS committee. Way to go, Chas!

NARAM-28 will be held in Champaign-Urbana, IL, and hosted by NIRA. Our favorite competitor, Bunny, will be the contest director. Events tentatively will be: 1/2A PD, 1/2A SD, F B6 (Ooh! Too bad it's unofficial and best single flight!), D HD, B BG (no flexies, of course), Design Efficiency, C Eggloft Altitude, D R6, C Eggloft Duration, Scale (Sport Scale for A division), and R&D. Connie Pursley will direct NARCON-3, which promises to be pretty big this time around. The prize program will be in full swing, too, with \$100 and \$50 door prizes expected to be awarded, as well as an all-expense paid trip to NARAM-29. By the way, the leading candidate for NARAM-29 seems to be the LARS section in Los Angeles. We'll keep you posted

Contrary to any rumour you might have heard, LDRS-54 will be held in Medina, Ohio, in mid-July. Meet Director Chris Pearson, who will announce the date near Christmas for those of you who need to make reservations early. Dates will not conflict with NARAM for those of you who want to go to both. SNOAR is also in the process of attempting to find a bigger location site, but nothing is certain yet.

Vulcan Systems, Inc. has released their new catalog, and it is very complete. Vulcan offers a wide range of Class E and Class B motors, at reasonable costs. In their 20mm series, Vulcan offers the E26, E30, E72, E52, and E54. The 29mm series includes the E38, F30, F39, F67, F459, G44, G58, and G100. Vulcan offers three B motors (H75, H142, and H116) and one F motor (the F265), all Class B. Vulcan also offers a number of hi-tech boosters including filament wound tubed glass/epoxy sheet stock boosters, delays, and adhesive systems. Vulcan will also offer a small digital electronic delay timer, available after the first of November. For more information, write: Vulcan Systems, Inc., P.O. Box 6099, Colorado Springs, CO 80934.

Lots of Crafts has released two kits, one in honor of LDRS. The Mini-100, a cut-down version of the L80 Magnum, is 45" tall, and 5.5" in diameter. The baby tiles on 667 and larger motors, and 5815 for 340. The EZI-65 is a prefab high power kit, made especially for the Aerotech 165 motor. Construction features include slotted through the wall pin mounts. The EZI-65 has a diameter of 40" and stands 60" tall. It sells for 449.00. Kits can be obtained through North Coast Rocketry, or writing LOC, 11042 Highway, Macedonia, OH 44056.

Aerotech is experimenting with smoky core burner motors. SNOAR NEWS expects to test fly some of the prototypes within the next month, and will let you know how they look. This could be a big move ahead in composite motor technology.

Estes has dropped the Saturn V from production. Get'em if you can, as they supposedly don't have many of the shells in Penrose. Estes is continuing to drop Skill Level Skills, but don't construe this as Estes turning it's back on the NAR. In fact, the opposite is true. The Estes distributor is producing an average membership growth of 66 members a month, which means the NAR should be over 2,000 by New Year's. Estes is also working with the NAR on a number of fund raising and membership programs. This is truly a turnaround from previous years, and Estes should be applauded for their recent efforts.

If you ordered a catalog from Acme (ie, Grant Boyd) in the past year or so, and want a refund, write and let them know. Acme has with a little NAR arm twisting agreed to refund anyone who wants one rather than wait for their long-delayed catalog.

By the way, SNOAR finished fourth overall in NAR section competition last year, mostly on the strong flying of Matt Steele and Chas Russell. Combined with the success of LDRS-54, the LAC Newsletter Trophy, and the many NAR sport launches, it has been a whale of year. Look for it to be a kick-ass Christmas party. More details to follow, but you'd better start getting in shape to beat SNOAR's grand champion US's Deb Schmitz.