



**T.H.O.R.**

**The Heartland  
Organization of  
Rocketry**

**THOR's Hammer**

*The official newsletter of The Heartland Organization of Rocketry!*

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**Fall 2007**

**---FREE---**

**Volume 14 Number 4**



**Craig Brumbaugh preps his rock *Uncle S.A.M.* at the September 15<sup>th</sup> launch at Pickrell. (Richard Burney)**

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## Internet Links of Interest

<http://www.nerocketry.org/>

THOR's official web page. Has information on our club, launch dates, and history.

<http://www.tripoli.org/>

Home page for the Tripoli Rocketry Association.

<http://www.nar.org/index.html>

Home page for the National Association of Rocketry.

<http://www.rocketryonline.com/>

Rocketry Online is an excellent source of model and high power rocketry related news and information.

<http://www.the-rocketman.com/>

Producer of some very excellent parachutes and rocket gear. Ky has been a long time supporter of THOR.

<http://www.giantleaprocketry.com/>

Giant Leap Rocketry has been THOR's main vendor at our high power launches since 2002.

<http://www.kloubusters.org/>

Home page for the K.L.O.U.D.Busters Tripoli Prefecture of the state of Kansas.

## December 2007 – March 2008 Calendar

### December

**Event:** December Meeting.

**When:** Tuesday the 4<sup>th</sup>, 7:00 to 10:00 PM.

**Where:** La Vista Community Center.

**Event:** Christmas Party.

**When:** Friday the 14<sup>th</sup>.

**Where:** Denis Gilbert's house.

**Fee:** Free... but make sure to bring food and drinks.

**Description:** THOR's annual Christmas party!

**For More Information:** Final details for the party will be determined ahead of time. A map for directions to Denis' house is posted on the THOR web page.

### January

**Event:** January Meeting.

**When:** Tuesday the 8<sup>th</sup>, 7:00 to 9:00 PM.

**Where:** La Vista Community Center.

### February

**Event:** February Meeting.

**When:** Tuesday the 5<sup>th</sup>, 7:00 to 9:00 PM.

**Where:** La Vista Community Center.

### March

**Event:** Low Power Launch.

**When:** Sunday the 2<sup>nd</sup>, Noon to ?

**Where:** 1100 Lincoln Road, Papillion, NE.

**Fee:** Free.

**Description:** Low power sport flying.

**Event:** March Meeting and Auction.

**When:** Tuesday the 4<sup>th</sup>, 7:00 to 10:00 PM.

**Where:** La Vista Community Center.

**Description:** Besides being the March meeting, this is also THOR's annual auction where members can auction off and bid on rocketry related goods... it's eBay the old fashion way! 10% of the money made from each member's auction, unless arranged differently, will go to the club.

**Event:** NARCON.

**When:** Friday March 14<sup>th</sup> through Sunday the 16<sup>th</sup>.

**Where:** Rochester, MN.

**Description:** NAR's annual convention.

**For More Information:** <http://www.narcon2008.org/>

**Event:** High Power Launch.

**When:** Saturday the 15<sup>th</sup>, 10:00 AM to 4:00 PM.

**Where:** Pickrell, NE.

**Ceiling:** 15,000' MSL (13,650' AGL). Window to 23,000' MSL possible with 72+ hour advance notice.

**Fee:** \$5.

**Description:** High power and low power sport flying.

**For More Information:** Check the rocketry hotline for any delays or cancellations if weather looks questionable.

## Editor's Hammer

By Richard Burney, Secretary and Newsletter Editor

### **\*WANTED\* - New Editor and Secretary!...**

At the October meeting I officially announced my "retirement" from the two positions I have held in this club for nearly a decade. With everything going on in my life these days, changing priorities, and the desire to enjoy rocketry as an actual hobby again, I decided that now was the time to let go. I feel that what I've done for this club has run full circle and I am going out on top. The Fall 2007 and Winter 2008 issues will be my final issues.

My nine year run as secretary makes me not only the longest running officer for a single position within the club, it also makes me the last club officer left from the 1990's. Combined with the four years that I was one of the newsletter's biggest contributors during 1996-2000, my eight years as the editor of *THOR's Hammer* brought to this club a pretty consistent publication (at least through 2005) that was always increasing in quality. *THOR's Hammer* not only provided news, information, and historical documentation to the members of THOR, it also acted as a promotional flyer. I have personally supplied all the hobby stores in the Omaha and Lincoln areas with copies of *THOR's Hammer* for most of these eight years. Copies of *THOR's Hammer* have been used at public events that THOR has attended such as the Offutt AFB air show. In 2004 and 2005 *THOR's Hammer* was twice a runner-up for **NAR's LAC Award**; not only did this bring national attention to our newsletter, but it also helped bring attention to our club.

Though this ends these contributions of mine to THOR, I will continue to serve the club in other ways. I will continue to take high resolution digital pictures at our launches and will provide those to those who ask. Recently I created a **Facebook** account which allows me to create picture galleries which I can share with other people. The club's history page which I rebuilt from scratch a year ago is something I plan on continuing to maintain for the foreseeable future; in the Winter 2008 issue I will be presenting that material in newsletter form.

Just as I stepped up to the plate to take on these duties at the start of the decade, somebody else has decided to do so. Right before the election at the December meeting, **Barry Conner** announced that he was going to run for the secretary position. On the night of the meeting and election itself, Barry further announced that he also wanted to take on the role of newsletter editor; this is something both him and his wife plan on doing together.

I would like to thank Barry for coming forward and offering his services this way. Though my support from the members of this club have varied regarding materials submitted (pictures, articles, etc.), I hope all of you will support Barry in what ways you can. I know I will support Barry with the fine pictures I take.☺

### **Earl Cagle Jr. Interview...**

Besides some of my coverage from the September and **Bob 2** launches on the next few pages, the big focus of this issue is my interview with **Earl Cagle Jr.** of **Point 39 Productions** fame which I conducted with him for *Extreme Rocketry* magazine over two years ago. After doing my interview with **Kevin Trojanowski** earlier that spring, I approached **Brent McNeely** about the possibility of doing this interview with Earl since one had never been done before. Brent gave me the green light and I contacted Earl during August 2005. The interview was conducted over a several hour period on a Sunday afternoon that September. Over the next few months I replayed through the interview a few times, broke it done into multiple sections, typed up much of the content, then reedited it into a readable, printable form. The article was submitted in December and was printed in the March 2006 issue of *Extreme Rocketry*.

Though the interview took a lot more work than I could have possibly imagined, it was something I was glad to have done. When I got back into model rocketry in 1995, much of my early exposures to high power rocketry was because of the awesome tapes that Earl had put out. In 1997 I met him for the first time at Hartsel, CO for LDRS 16. I again met him in Argonia, KS in 1999 and 2003 for LDRS 18 and 22 respectively. As someone who was a fan of his works, it was a great privilege to have been the one to have conducted his interview for *Extreme Rocketry* magazine, but it was also great to have had the chance to get to know him better. Up until the interview I had only known him for his Point 39 Productions work. I had no idea about his involvements with some of the Apollo 11 anniversary celebrations! It was also interesting to find out about his actual rocketry exploits besides what he has done as part of video production.

Just as Earl's efforts through Point 39 Productions (video journalism) was an inspiration for me to report and cover our hobby in my own way (print journalism), hopefully the work I have done has been an inspiration to others... in the case of Barry Conner, I think it has.☺ ✦

## High Power Launch Pickrell, NE – September 15<sup>th</sup>

Article by Richard Burney  
Pictures by Richard Burney and Greg Rothman

On the next two pages are a few pictures I took at our September launch. It was a cloudy and cool day with a wind pushing from the south. Due to the club trailer having to leave early at 2:00, time for flying was limited. Personal highlight for me was

that this was the final flight of my PML AMRAAM 3 which I built back in the spring of 1997 and flew my Level 1 flight that Memorial Day weekend. It was done at this same field using the very same AeroTech 38/240 case which was used on this very same flight, though the reload was the much newer AeroTech H148 Redline as opposed to the H123 I used back then. Unfortunately, the payload section got severed in half at ejection. I decided that this would be its final flight. Time to build some new rockets! ✨



Craig Brumbaugh's *Uncle S.A.M.* takes off on an AeroTech F25. (Burney)



**Richard Burney's PML AMRAAM 3 powered by an AeroTech H148 Redline. This rocket first flew back in May 1997 as part of my Level 1 Certification. (Main - Rothman, Inset - Burney)**

## Bob 2

Article and pictures by Richard Burney

THOR's second **Bob** launch was held the weekend of Friday October 19<sup>th</sup> through Sunday the 21<sup>st</sup>. For Saturday, it was a sunny and warm day with quite a bit of a breeze from the south, but even

with the winds there was a pretty good turn out with quite a few flights. Due to my schedule I was only able to be there for part of the day on Saturday getting in a few flights of my own. I did get in a few pictures, in particular the spectacular cato of Denis Gilbert's HyperTek K flight. Greg Rothman suffered a virtually identical cato with a HyperTek M at LDRS a few months earlier. †



Joe Michel's upscale of the AeroTech Arreaux heads up to an altitude of 8,200' on a Pro54 K530.



Denis Gilbert's *Super Bee* was severely damaged as a result of its HyperTek K240 catoing.

## Earl Cagle Jr. Interview

By Richard Burney

Pictures by Earl Cagle Jr. and Richard Burney

*Editor's Note: My interview with Earl Cagle Jr. originally appeared, in edited form, in the March 2006 (#52) issue of **Extreme Rocketry** magazine. This was my final cut before submission.*

Earl Cagle Jr., through his company Point 39 Productions, has produced a video almost every year since 1991 chronicling LDRS, Balls, and several large projects. Though he is mainly known for his video production efforts, Earl's interest in model rocketry and space exploration goes back to when he was a child. Earl has also been involved with several Apollo 11 commemorative launches at the Kennedy Space Center.

### **When and where were you born and raised?**

I was born in Atlanta, GA in 1962 at Georgia Baptist Hospital. My parents were from the north Georgia area and they had moved to Atlanta around 1960. We lived there until 1970 at which time we moved to Augusta, GA. We have been in the Augusta area pretty much ever since.

### **What did your parents do for a living while you were growing up?**

My father was in procurement for Georgia Tech and then at the Medical College of Georgia when we moved here (Augusta). My mother was your typical standard housewife. She worked a little bit outside the home during the 60's, but not very much. During the last 30 to 35 years her health hasn't been real good in general and has gotten much worse the last six or seven years. My parents divorced in 1985; I had just gotten out of college at the time and had started working at the DuPont Savannah River Site and that pretty much put me as the head of the household as far as my mom and younger sister were concerned. Since my mom did not have a career outside of the home and since she was on a limited income, I became the primary bread winner in the family. My dad eventually moved back to the Atlanta area to work at Georgia Tech again and is now retired.

### **Since you were born right at the start of the 1960's, what memories do you have of the landings on the moon and America's space program in general back then?**

As far back as I can remember as a little kid my attention was always captured by whatever was in the air – airplanes, birds, anything that flew. My dad, while he was at Georgia Tech during the 60's, would sometimes take us kids to the Georgia Tech college football games. College football games are really exciting and the attention is focused on the field, but I, as a young boy, had my attention on the blimps and the airplanes pulling the banners behind them flying over the stadium. I can remember on more than one occasion my dad would kind of give me an elbow about, "Hey, don't you want to watch the game?" I was more interested in what was flying over the stadium than what was going on in the stadium!

The event that really nailed down my rocketry and space interests was the first lunar landing. I can remember some of the Gemini missions and the early Apollo missions. I can remember the Apollo 7 mission a little bit which was the first manned Apollo flight into space in October 1968. And then Apollo 8 in December 1968 was the first time we orbited the moon, Frank Borman and his crew, and that's when Borman read out of Genesis from the Bible on Christmas Eve while in lunar orbit. But I still remember very vividly that Sunday night of July 20<sup>th</sup>, 1969 when sitting there in the living room for what seemed like hours waiting for Neil Armstrong to come out of the lunar module and descend that ladder. But finally, close to 11:00 that night, those first faint, high contrast, black-and-white images came on the TV as Neil came down the ladder. That event of that evening just mesmerized me so that I could hardly believe it. It just seemed such a fantastic thing that we could land this foil covered, four-legged spacecraft on the surface of the moon; these guys in their gleaming white suites; this monstrous Saturn V with this terrific roar and smoke and fire and everything; there they are walking on the moon; and just a few days later splashing down in the ocean. It just seemed to be the greatest adventure one could go on and I was just mesmerized by the whole thought of that process. From that point forward, my interest in things that flew primarily centered on rockets and spaceflight and in particular the Saturn V.

### **When did you first get into model rocketry?**

The interest started shortly after we moved to Augusta. There was a friend in my third grade class in the fall of 1970 who both of us together sent off for a Centuri model rocket catalog out of the back of an issue of *Boy's Life* magazine; I still have that catalog packed away somewhere. Since we were so interested in rockets, the Saturn V in particular, and we had seen these ads in *Boy's Life* for model rockets so we each ordered a catalog. Sure enough there was the 1/100<sup>th</sup> scale model of the Saturn V in the Centuri catalog. Back in those days of model

rocketry a three-and-a-half foot tall, four-and-a-half inch in diameter model rocket was about the biggest thing you could get and that was a huge rocket. But it was \$19 and in 1971 \$19 might as well been \$1,900 so the idea of getting a Saturn V was out of the question. From that point forward I wanted to get a model rocket kit of some type. My friend and his dad did and they started shortly thereafter in late 71/early 72.

My dad, though he was a mechanically minded kind of guy, for some reason at the time wasn't keen on me getting into model rockets at nine years of age; I guess he maybe didn't feel that was quite old enough. Since my mother was starting to go through her health problems, he maybe didn't have time to supervise me. My friend and his dad did so for the next several years; they were building and flying rockets and were making some home movies of some of their rocket flights. I would see those flights and even though I wasn't building or flying any model rockets, I had an interest in model rocketry pretty much from that point forward.

In the early spring of 1976 we were relocating in the Augusta area. I was packing things in my bedroom and I came across some of those Centuri catalogs from the 71-73 time frame and got re-interested in getting a model rocket set. I was several years older so I thought that whatever issue that my dad had in the past wouldn't be the same. So I put in a request for a new Centuri catalog after we had moved and the new catalog arrived in June 1976. Looking through that catalog, they had a starter kit that was available here in town at a local store. That next day, a Saturday, I had my dad drive me down to that store and I bought that which was the *Screaming Eagle* starter kit. I still have that rocket to this day. I eagerly built everything and that next day, Sunday June 6<sup>th</sup>, we went to the ball field of my junior high and I launched the Screaming Eagle twice that day: the first time on an A8-3 and the second time on a B4-6. That began my official entry into the model rocketry hobby. Again, my initial interest began in the fall of 1970, it just took me five years before I could fly anything.

**What was your most memorable rocket or project you built during this time?**

My memorable ones were when I started to get into some D motor flights in the latter 70's and I wanted to fly some electronic payloads of some type. I had a set of walkie-talkies and I thought, "Wouldn't it be neat what it sounds like on board the rocket when it's flying." I took one of the walkie-talkies out of the tube, stripped it down to just the bare electronics, made a payload section for it, and built a custom rocket for it to fly with Estes D12 motors. I would take that rocket out and put the transmitting walkie-talkie inside the payload section, turn it on, and the other walkie-talkie was set in "receive" mode

with a cassette recorder right by it covered by a box so that so that the only sound the cassette recorder was picking up was the sound transmitted from the rocket. I flew that a handful of times and you could hear the transmitted sound from onboard the rocket as it took off, coasted upward, as it ejected and the parachutes unfurled, and as it drifted down and impacted the ground; you could hear all of this on the recording. I still have some of those cassette tapes to this day.



**Earl Cagle Jr. sends off one of his early model rockets circa 1979. (Cagle)**

**Did you lose interest in model rocketry at any point?**

It wasn't so much that I lost interest, but just didn't have the time to devote to it as much as I wanted to and that was during my college years. I graduated from high school in 1980 and in early 81 started at August State University. I was still interested in model rocketry and was still building flying some, but not as active as I was simply because I didn't have the time and I was paying for my education so money was pretty tight. But in the fall of 82, one thing that I did do which was a real splurge for me at the time, I thought "Well, I always wanted the Centuri 1/100<sup>th</sup> scale Saturn V and I really like scale models" so I wanted to get one for my birthday. During that summer when I was working for my grandfather in northern Georgia like I had done previous summers, I ordered the kit for my 20<sup>th</sup> birthday and had it sent to my parents' house.

When I got back at the end of the summer, that Saturn V was waiting for me. I decided I was going to take my time building this kit and I was going to make this as nice of a scale kit that I could make it. I started on it in December of 1982 and did not finish it until December 1983. It turned out really well with all the paint patterns and everyone who saw it would say "Oh man! That is just too pretty to fly! Are you going to fly it?" I would say "Well, one day I will, but I'm a little too chicken to right now and I'm kind of afraid that if something were to happen to it would really break my heart." It sat on a shelf for six years before it finally flew and it's most memorable flight was at the Kennedy Space Center for the 20<sup>th</sup> anniversary of Apollo 11.

### **Where did you go to for high school and college?**

I went to high school locally in Augusta at Butler High School and graduated from there in 1980. I really was not that focused of a student in high school. Like a lot of kids at that time, I had gotten into guitar playing during my junior year and was really involved in that by my senior year. I wasn't as focused on school work as I should have been and I finished up high school as a mediocre academic student with no real idea of what I wanted to do with the rest of my life.

I didn't decide on college until a number of months after I had been out of high school. I enrolled at Augusta State University at their business school and began during the winter quarter of 1981. I told myself, "You really need to get as much out of this that you can, because you are having to pay for this yourself. You need something to differentiate yourself once you get into your working life." I really started focusing on academics during college and devoted as much time as I could. I wound up graduating magna cum laude and graduated with honors in 1984; I was a guy who graduated high school with a middle C average, but once I really applied myself I found out I could do something and could accomplish something good if I just work at it. I finished with a 4.0 GPA in my major and a 3.75 overall. I made just one C during my four years of college and during my junior and senior years I made straight A's.

### **What did you end up doing professionally?**

Immediately after college, I began working locally in a procurement department as a buyer for a local chemical manufacturer in Augusta and was there for seven months. In the spring of 1985, I interviewed with the DuPont Company across the river in South Carolina. At that time they were a prime contractor to the Department of Energy. The Savannah River plant was a defense nuclear facility where they made plutonium, radium, and tritium for

our nation's nuclear stockpile. I was hired on as a procurement officer and did that for four years. I did some contract related stuff for seven years after that. During 1989, Westinghouse took over the plant, and I have been their employee ever since. Having started Point 39 Productions about six years earlier, I had an opportunity in early 1997 to switch over into the video production group at the site and have been there ever since.

### **During your post college years, when did things really start picking up for you in model rocketry? How did your first NARAM go?**

In the mid to late 1980's, I was still maintaining my NAR membership and was still interested in rockets and model rocketry. In 1986, the Challenger had exploded and that had brought a lot of attention back to the space program. I followed that whole investigation very closely throughout the year of 1986 as to what had caused the explosion and the work into getting the shuttle up to flight status and all.

In early 1988, I remember seeing in *American Space Modeler* magazine that NARAM 30 was going to be in Huntsville, AL that August. I had always wanted to go to a NARAM as a kid, but they were always so far away. I always thought that it would really be neat to go to a NARAM and talk to all of these people about model rockets and see all these model rockets flown. I hardly knew anyone locally who flew model rockets so I thought this would be the neatest thing in the world. Since I was in my mid 20's now and since I could afford to go travel to something like that, I decided I would go. I thought it would be neat to meet these people I had read about in *American Space Modeler* or *The Model Rocketeer* as it was previously known.

On Tuesday August 9<sup>th</sup> of 1988, I took a flight over to Huntsville early that week of NARAM and got there that evening. I ran into a little bit of a snag... the day that I left Augusta was August 9<sup>th</sup>... August 9<sup>th</sup> is my birthday. Unbeknownst to me that day, my driver license expired. So when I flew into Huntsville and when I went to get a rental car, they said, "Sorry Mr. Cagle, we can't rent you a car because your driver's license expired." Sure enough it had expired that day. I was planning on being in Huntsville all week, but now I had no way of getting a rental car. So I took a cab to the host hotel.

When I got to the hotel, I had originally requested of Matt Steele, who was the contest director that year, that I share a room with somebody because I thought that would be the best way to get to know someone by sharing a room for the week. When I checked into the hotel, I found out I was assigned to a room by myself. I went down to Matt's room to check in for NARAM and checked to see if he knew if someone was looking for a roommate. Matt told me that there was another guy from

Georgia by the name of John Cato and that he was looking for a roommate, too. So I went back to my room, called the front desk, and they connected me with this John Cato. I explained the expired license situation to him, that I didn't have a way around at all, that I wanted to share a room with someone, and that a ride would be appreciated. He said that wouldn't be a problem. I told him I would stop by his room the next morning to work out the details.

That next morning on August 10<sup>th</sup>, I went down to John's room and we shared rooms for the rest of that NARAM week. I got a ride from him to and from the field each day in his Blazer. We came to find out that both John and I shared a common interest in the Apollo program and the Saturn V and he had built a 1/100<sup>th</sup> scale Saturn V like I had. That summer he was doing a lot of research into the launch towers that had been used to launch the Saturn V's and all the launch towers used at Launch Complex 39 at the Kennedy Space Center. He had gotten into model rocketry when he was younger and hadn't flown a whole lot in more recent years. The fact that NARAM 30 was so close by was why he had come, but we both had no idea of each other's existence at all; he lived about 170 miles south from Augusta. We got to know each other pretty well that week. At the end of the week, we exchanged addresses and phone numbers. I remember thinking, "There goes a nice guy, but we'll probably never see, talk, or get together again."

I enjoyed the week there and got to meet a lot of people which I had seen their pictures in the NAR's magazines. I got to meet Vern Estes in person and that was fun and interesting. I came back from NARAM 30 kind of rekindled in model rocketry to some degree, but didn't actually fly anything until early the next year.

#### **How did you and John Cato end up flying together?**

In early January of 1989, John got in touch with me about a field he found a few miles from his house. John was in the process of building a 1/100<sup>th</sup> scale Apollo Saturn V launch pad. He wanted to do a Challenger remembrance launch on January 28<sup>th</sup>.

That first launch we did together was on that January 28<sup>th</sup> from that field. Though it was a Saturn V and not a space shuttle, John flew his Saturn V model off of his scale launch pad and tower which was pretty impressive. This was the first launch that either John or I had done in three or four years. That weekend of the 28<sup>th</sup> and 29<sup>th</sup> was what got both of us actively building and flying rockets again. We have continued doing that commemorative launch on January 28<sup>th</sup> every year since then and we haven't missed one since 1989. At 11:38 in the morning, we have a commemorative flight to remember the Challenger crew, but in the last

couple of years it has expanded to also remember the Columbia crew and the Apollo 1 crew.



**Earl and John Cato's Saturn V shortly before its commemoration flight at the Kennedy Space Center on July 16<sup>th</sup>, 1989. The Vehicle Assembly Building where the actual Saturn V's (and today's Shuttles) can be seen in the background. (Cagle)**

#### **How did you and John get involved with the Apollo 11 20<sup>th</sup> anniversary celebration at the Kennedy Space Center on July 16<sup>th</sup>, 1989?**

I knew that the 20<sup>th</sup> anniversary of Apollo 11 was coming up that summer and I got to thinking about a month after John and I had done that Challenger commemoration about my Saturn V which I had completed nearly six years earlier, but I had never flown it. It was always nagging me in the back of my mind that the rocket was incomplete until I flew it at least once.

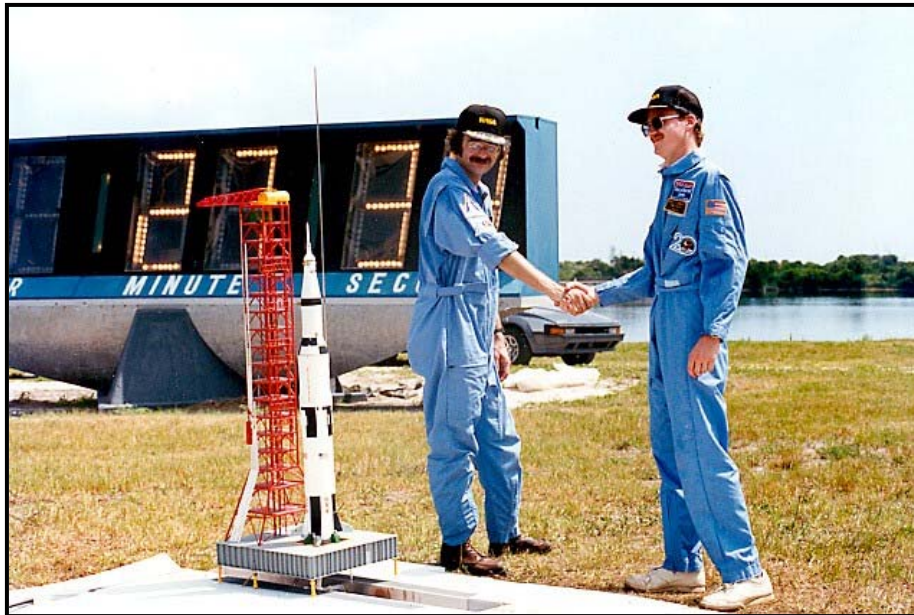
That March, John and I made a trip down to the Kennedy Space Center to photograph and document the actual launch tower from Apollo 11 which had at that time been cut up into sections and

stored in a storage yard on the KSC property. We took hundreds of photographs on that first trip.

Before that trip, in light of our Challenger commemoration using a Saturn V, I brought up the idea that we could bring up to the KSC people the possibility of using John's launch pad and tower and my Centuri Saturn V (John's Saturn V had crashed during the Challenger commemoration weekend) and putting on a launch recreation on July 16<sup>th</sup> if they were going to have any ceremonies for the 20<sup>th</sup> anniversary. John thought it was a good idea so we put a proposal together and during that trip to the KSC we went by the Public Affairs office and dropped off our proposal which included photographs and everything and said that we would like, if the NASA folks were willing, to put on this commemorative launch out at the Launch Complex 39 press site by the countdown clock and have the audio replay running of Jack King (who was the voice of Apollo launch control back in those days). We waited for several weeks to hear back from them.

A few weeks later we were told that we had been given the approval to do our commemorative launch. As it turned out, they were not only having celebrations for the 20<sup>th</sup> anniversary of Apollo 11, they were going to have an open house that day of July 16<sup>th</sup>. Since it was on a Sunday, they were expecting well over 50,000 people to be in attendance.

From early April through mid July, we worked our butts off trying to get everything ready. We were going to use my Saturn V which had never flown: I had to modify it to take a five engine cluster and did two test flights in June to make sure it would fly okay, come up with flight procedures for the launch, simulate the nine second build-up of the real Saturn V under the launch pad, and make it as realistic as we could make it. It took us four months of solid work preparing for that. We made another trip down to Kennedy to talk with the safety folks and presented to them what we would be doing that day, what the rocket would look like, how it would recover, and so on. We assembled a ground crew comprised of our friends. I was in charge of the vehicle and John was in charge of the launcher.



We headed down to Cocoa Beach on Friday July 14<sup>th</sup> and got there that evening. We spent the next day doing some tour stuff and started preparing everything that afternoon and evening. On Sunday morning, we drove out to the launch complex and picked up our press credentials. We got out to Launch Complex 39 just as the sun was rising. It was exactly the same kind of weather as it was 20 years ago that day; it was hot and clear.

We got as much done as we could by 9:00 and then broke from our preparation and went across the street to the Vehicle Assembly Building (VAB) and saw the ceremony with the Apollo 11 crew. This was the first time I had seen Neil Armstrong or any of the rest of the crew in person. There were around 7,000 people in the VAB parking lot for this ceremony to welcome these guys. It was a big thrill to see them all together at one time; they don't get together as a crew very often anymore. That ceremony finished up at 10:00 and our

launch was scheduled for 11:00 just one hour later so we scurried back across the street and made our final preparations to the vehicle and pad. The countdown clock had been running since we had got there that morning and it was counting down to reach "0" at 11:00 AM so there was

no way we could stop anything for a delay.

That last hour was a blur. The press folks were beginning to descend upon us. Cameramen wanted to do interviews with us. People were gathering up in the press stands behind us to watch us because this was going to be NASA's official 20<sup>th</sup> anniversary, launch recreation. We wanted it to go perfect; we wanted it to be as good as we could make it. We were tickled to death to be there and just thrilled to pieces. It couldn't be as exciting as a real Saturn V launch, but we wanted to try to bring back some of that excitement. About 15 minutes to 11:00, George Diller, who was one of the voices of shuttle launch control, introduced us to the crowd. He let each of one of us make a comment to the crowd. At three minutes before 11:00, the audio replay of Jack King from 20 years ago began. We got into our positions. John manned the controls for the device in the flame trenches which would simulate the build-up of the real F-1 engines of the

Saturn V. At T-0, I would flip the launch switch for the Saturn V itself. With all that was going on and that we were doing this for NASA, we were very nervous.

It got down to the last minute. Then the last 30 seconds. Then 15 seconds... "Guidance is internal"... 12, 11, 10, 9... "Ignition sequence start"... at that point, John threw the switch for the device in the flame trench which started spewing flame and smoke at both ends... 3, 2, 1... "Liftoff!" I threw the launch switch for the Saturn V. There was this "pfffffft!" and a fizz and pop and then nothing for like two or three seconds. We were like, "Oh no! We had a misfire!" Then slowly there was a "phssssshhhhh" and just when Jack King said "Liftoff of Apollo 11", my Saturn V came off the pad, rose and arced over the crowd, popped its chutes, and landed between us and the press stand. We were totally unprepared for this, but as the rocket went up, the crowd just cheered like crazy; you would have thought it was 20 years ago and that these people were watching the Apollo 11 go up.

From a symbolic standpoint, it made me think back to all those years earlier when I flew my first model rocket at a junior high ball field and thinking back years before that when I watched Neil Armstrong step on the moon for the first time when I was six years old; it brought it all full circle for me. That flight is for me personally the most memorable highlight in my rocketry career that I'll probably ever have. Both John and I basically did the same thing again for the 25<sup>th</sup> anniversary in 1994 and the 30<sup>th</sup> anniversary in 1999.

### **When did you get into high power rocketry?**

Right after we had finished the Apollo 11 commemorative flight, John and I were thinking, "What can we do to top that?" Around this time of the late 80's, high power rocketry was beginning to come out more and more. I was aware of it and so was John, but neither one of us had seen a rocket fly on anything larger than an F motor.

On Labor Day weekend of 1989, we were going to get together at John's for a Labor Day weekend launch just to fly some black powder stuff. I got down to John's that Friday night and he told me that he had gotten a call from Tom Binford and Paul Gennrich. They were from a Tripoli group (Tripoli Coastal Georgia) near Savannah, GA and they were having a high power launch at Fort Stewart. The invitation was made for both of us to attend. I thought it sounded interesting so the next morning we headed to Fort Stewart. The launch was being held on what was normally a tank artillery range. We met Tom and Paul, who was the Prefect for the group, and there was about 10 Tripoli folks there for this launch.

They were flying some H and I motors and stuff like that and these were the first high power

flights that we had ever seen; motors 2 inches in diameter, some of them 8 to 10 inches long, AeroTech motors with the multi-port Medusa nozzles, J125's, K900's, and those kind of size motors and we were just flabbergasted at what we saw. We spent the afternoon flying with them even though we didn't fly anything of our own.

I had purchased a video camera during the spring of 89 and throughout the year I had videotaped our launches. During that Saturday, I videotaped a bunch of the launches so that we could watch them later. All my video taping at that point had been strictly just to document an event. No thought of doing video production or anything like that.

We went out and did some flying of our own at our local field the next day. I had brought my first G motor with me to fly that weekend down at John's. I had planned on this G motor to be a big deal, but after having seen these high power flights the day before, this G motor was anticlimactic at that point. But we knew at that point that high power was something we really wanted to get into.

### **When did you become a "confirmed" Tripoli member?**

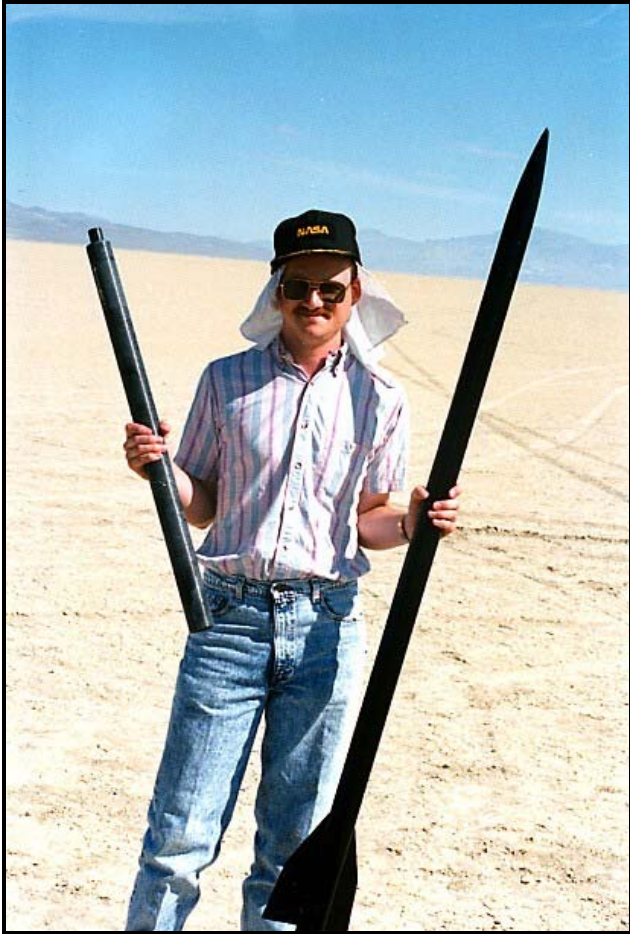
Late in December of 89, we invited Tom and Paul over to our field to fly high power with us. We spent that whole Saturday flying. I had joined Tripoli in October. Earlier in the year, I had built a North Coast Phantom 4000 which would hold up to H engines if you would push it a little bit. I bought an H70 motor from Tom, put it in that Phantom 4000, and sent it up. Since Paul was a Prefect and witnessed my flight, I became a confirmed Tripoli member that day. Back in those days, there weren't "level certifications"; to become a "confirmed" Tripoli member, you had to successfully fly an H motor or higher. At that point, you were free to jump to an L or M if you wanted to.

### **When did you attend your first LDRS?**

I almost went to LDRS IX in Colorado in 1990, but couldn't arrange things that summer. But in 1991, there was going to be a pretty good group of us going out to LDRS X, which was the first Black Rock LDRS. It was myself, Tom Binford, John Cato, and a couple of other Georgia guys. Most of us were going to be flying minimum diameter rockets with L750 motors. This was going to be my first LDRS and we were all excited to be going out there.

The big thing to me about this LDRS being at Black Rock was all this big open space. I had never been a big altitude freak, but I thought that this was the place to go for shear, all-out altitude. That's why I wanted to do this minimum diameter, L750 rocket. I also did a minimum diameter, K250

powered rocket as well. I wanted to see how high I could put a "model rocket". I also brought out my Fisher Price Pixel Vision camera that I had previously flown, and sent that up in a K500 powered rocket. I think I flew a J125 on my EZI-65.



**Earl and his Vulcan L750 powered rocket at LDRS X. (Cagle)**

My big flight for LDRS X, was this minimum diameter, all fiberglass rocket with an L750. Few people would realize it, but I have flown rockets to 19,000 feet. This was the second highest flight of this LDRS. The only person to beat me was a student from the University of Central Florida who flew an L750-to-L750 two stager to about 21,000 feet. The 19,000 feet I got from my flight was the highest flight ever done by a single L750. The K250 rocket I flew went to about 12,500 feet, but it sheared off the front end of it at Max Q. If it hadn't torn the front end off, I think it would have come close to my L750 flight.

**How did the idea of making a marketable LDRS X video tape come about?**

I shot about five or six hours worth of personal video at LDRS X just documenting our Georgia flights and everyone else's flights. That fall

of 1991, I started wondering what more I could do to enjoy the high power rocketry hobby. I had been to my first LDRS, flew to three-and-a-half miles, and flown video cameras on K500 motors; I needed more of a challenge in the hobby.

Someone just a couple of months before had asked if I had ever thought of making any video productions. I had written a couple of articles for *The Tripolitan* at that point, some launch articles and some other things. I had responded saying that I hadn't and that I didn't think I was interested. By the fall of 1991, I started thinking that that would be certainly something different and would still be dealing with high power rocketry. It would be an area where I hadn't had any formal training in, but I've liked writing and that's kind of like telling a story and video production is kind of like telling a story. I thought that would be interesting to do.

Throughout late 91 and into early 92, I started gathering up the equipment I thought I would need to edit together a decent production of LDRS X. The problem being I had not shot that footage with the original intention of making a video production out of it. It was not the absolute best quality footage to use, but I thought I could scratch out enough to make a decent production. I knew I wanted to have some music in it, some titles, and some decent production values. Something people would be interested in seeing and buying and something I could be proud of. Something that would tell the story of LDRS X. I knew how hard it was for me as a kid to try to go to NARAM. If I could have gotten a tape of a NARAM as a kid, I would have been tickled to death.

I started editing the stuff together. I spent about three weeks editing this thing together which at the time seemed like an atrocious amount of time not knowing that down the road, in four or five years, I would be spending three or four MONTHS editing a video production. By the spring of 92, I released the LDRS video not knowing if it would be accepted.

**When did the name "Point 39 Productions" come into use? What was the "Point 39" a reference to?**

The first flight John and I had together was that Challenger commemoration launch in January 1989. The launch complex model John had built of the Apollo launch tower and bay and Saturn V were all done in 1/100<sup>th</sup> scale. Since everything was based on Launch Complex 39, but in 1/100<sup>th</sup> scale, we eventually dubbed our flying field "Launch Complex .39"; we moved the decimal place over by two. We would be like, "Hey let's run up to '.39' and fly some rockets" or "We're going to have a launch at '.39'" and so on.

When I was trying to come up with my first ad for Bruce Kelly for *HPR* magazine, I had to come up with a name for the business. I couldn't think of a brain storm of a name. I had done two years of

video taping at our “.39” field and at one point “.39 Productions” popped in my head and it had a ring to it. But instead of writing it out as “.39”, I decided to write it out as “Point 39”. I came up with the Point 39 Productions name with the thought that I would go back and change it to something else down the road, but the name stuck and stayed from that point forward.

The ad came out in *HPR* and the orders started coming in. Frank Hunt up in Utah was my first customer; I remind Frank about that every time I see him!

### How did the next LDRS go?

In the early summer of 1992 I bought a brand new video camera, a Canon L1, for \$2000 and started shooting footage with it. I went to LDRS XI which was also at Black Rock. This was the LDRS which had the 850 pound *Down Right Ignorant* which was built by Dennis Lamothe, Chuck Sackett, and others. This was the first time the Kansas guys flew their full scale Patriot. Some really big rockets flew there at LDRS and I got some really good footage. Since I had shot footage specifically for use in a production, the LDRS XI production was much better than the LDRS X production. The LDRS XI tape went out in November and that one did really well.



Earl and Apollo 13 astronaut Fred Haise at the Apollo 11 25<sup>th</sup> anniversary celebration in July 1994. (Cagle)

### How did this affect your own rocket flying? Have you been able to do anymore flying?

I flew some rockets at LDRS XI; the main reason for me to go was to fly rockets, but I was working a little more on video stuff. By the time I went to LDRS XII in Kansas, I think I took a rocket with me, but didn't get the chance to fly it. The video stuff was really beginning to take over. Things continued to grow each year and I was spending three, four, or even five months editing, writing the

narrative, coming up with the concepts for the opening, and so on. Just like building a rocket where you want your latest rocket to be better than the last one you built, it became a never ending quest to make each video better and it really took over my spare time. I was involved in rocketry more so than ever, but I wasn't building or flying as much. I had no intention at the beginning of starting Point 39 Productions that it was going to grow as it did.



Earl with Space Shuttle Columbia (external tank just barely visible) the day before its July 1997 launch. (Cagle)

### How did the video *Monster Rockets*, which chronicled “Project 463” and “Stratospheric Dreams”, come about?

Chuck Sackett and Mike Ward began working on those two projects in 1994. Both had worked with Dennis LaMothe on *Down Right Ignorant*. They knew who I was at that point and Point 39 Productions was becoming a pretty big name in the rocketry field. They wanted to know if I wanted to be their official chronicler for these two projects. In the spring of 95, I went down to Florida to cover both projects which were being worked on

in Chuck's machine shop. We did a complete walk down of both vehicles and spent a whole day there covering all the details of both projects. Once they got out to Black Rock for the actual launch in August of 95, I spent a lot of time with those two projects. Both rockets flew at the Balls part of LDRS XIV.

Between the visits there at Chuck's machine shop and the actual setup and flights at Balls, I had a ton of footage. They were so monumental – Chuck's *Project 463* which was 1,200 pounds and stood over 40 feet tall, and Mike's *Stratospheric Dreams* which was powered by an S motor with 200 pounds of propellant – that during the LDRS XIV production I thought that both of these deserved a production all their own.



Earl interviews Bruce Lee regarding the Nebraska Heat rocket at LDRS XVI at Hartsel, CO, August 9<sup>th</sup>, 1997. (Burney)

**During the last several LDRS's, you had to cut your attendance short. What happened?**

Over the last 20 years my mom has been my direct responsibility since my parents divorced. About seven years ago she had stomach cancer. She has since been diagnosed with Parkinson's disease, has bad arthritis in her knees, and requires a lot of care. During the past few years the ability for one person to provide that care around the clock while I'm gone five or six days at an LDRS or anywhere is very difficult. I was up in New York for LDRS XXIII for just one day and the very next day she was hospitalized for blood clots in both legs so I had to return home immediately. When I was in Amarillo, TX in 2002 she took a sudden turn for the worst and that was on the morning of the first day; I had left Augusta knowing that I might not be able to stay very long. LDRS this year I didn't even try to go; this was the first LDRS I had missed in 14 years. It was a hard decision to make, but family comes first. It has been frustrating to me as far as the Point 39 Productions and rocketry stuff goes.

**How were you able to put out these last several videos?**

The LDRS XXI (Amarillo) video came out largely due to volunteer input. 17 people sent in footage and that video turned out better than I could have ever imagined. The Gates brothers sent in 10 hours worth of footage just on their stuff alone. It took me a pretty good while to do that one; it wasn't finished until March of 2003. LDRS XXII (Argonia) I was able to stay longer for that one, but I had volunteer input for that one as well. That was the last LDRS video I have issued. LDRS XXIII in New York last year I was able to stay a couple days and I had some volunteer input, but I have not gotten enough volunteer input from that one to do that video as of yet. That video and the *Project Liberty* video are the ones in progress right now; I have enough video coverage of *Project Liberty* and that video will eventually be done.



Earl interviews Bruce Lee regarding the 1/3<sup>rd</sup> scale Mercury Redstone at LDRS XVIII at Argonia, KS, August 2<sup>nd</sup>, 1999. (Burney)

**As you continued to produce these videos during the years, what ways have you improved your filming, video editing, and production?**

I just try to cover as much as I can at each given event. I have added more cameras. Adding the "pad cam" as I call it, starting with LDRS XVIII, has been a nice touch that people like. On the post production side, I've tried to introduce as much quality as I can into the production, especially with the introduction each year. I want an introduction which captures people's attention from the get go.

**What event or project was your favorite to shoot?**

Picking any one would be difficult, but as far as just overall number, size, and scope of projects, probably LDRS XIV/Balls 005 in 1995 up in Black Rock was probably the single biggest one when it

came to big projects and all that happened at that launch. There was a lot that transpired over the course of those five days.

### **What future plans do you have for Point 39 Productions?**

For the last several years I've been experimenting with the DVD technology and working with that a lot. LDRS XXI is out on DVD now as we speak and I am going back and working on the more recent ones and getting those authored into DVD. As time permits, I will get all the other productions onto DVD format, but it's going to take some time. It's not just a simple matter of dubbing it to DVD from beginning to end and then making copies of it. It has to be authored with menus, menu programming, menu design, box designs, and all that. I've been looking at compression technologies in order to get the best image quality.

### **Do you have any future rocket projects or ideas of your own?**

My dream project would be to do a 1/10<sup>th</sup> scale Saturn V. It would be 37 feet tall and 3.3 feet in diameter on the first stage. I would probably want to make it a fully functional Saturn V with three working stages. I think that would be a lot fun. On a smaller scale, back when Estes reintroduced the Saturn V kit in the late 90's I bought a dozen of them. I've thought of taking one or two of them and do a full three-stage version; five engines in the first stage, five engines in the second stage, and one engine in the third stage.

### **What do you like most about rocketry?**

First and foremost it would be the interaction with a lot of the wonderfully talented and intelligent people you get to meet, share ideas with, see their work, see their ideas, see how they think of things, see their craftsmanship, and see what they are doing. It's always a lot of fun. The other part is seeing something you have built, fussed over, designed, sketched out, sweated and toiled over, and to see that liftoff and head into the sky and perform the way you had designed it. There is a great sense of accomplishment and

freedom that your brain could conceive of the idea and your hands can fashion that idea into hardware and make it all work. That's why rocketry is such a great thing for kids to get into because it can give them that sense of accomplishment.

### **What do you like least about rocketry?**

Obviously in more recent years, as far as the high power stuff goes, the regulations and the more difficult focus on the hobby as result of the high regulations. It is certainly not helping the hobby at all. Knowing the barriers to entry for new people coming into the hobby, that has been disappointing to see. I can only hope that over time that we can get more and more of that out of the way, but in the reality of the world we live in these days it may be difficult to repeal some of those things.

### **What recommendations can you give to someone starting into the hobby?**

Take your time, take it slowly, and don't try to jump into the biggest thing you can do right off the bat; that seems to be the temptation especially in high power. A lot of times the journey is half the fun and the journey is where you learn the most. Pace yourself as you start off. Start with something you can have a good successful beginning with, learn from that, and build from there. ✦

**Earl (left) and John Cato at the 30<sup>th</sup> anniversary celebration of Apollo 11. Unlike the 20<sup>th</sup> anniversary, the 25<sup>t</sup> and 30<sup>th</sup> celebration flights by Earl and John were done at the Visitor Center at the Kennedy Space Center. (Cagle)**





<http://spaceplace.nasa.gov/en/kids/Going My Way?>

Not many endeavors require that you plan the mode of transportation before you even know what it is you are transporting. But weighing the physics and economics of getting any sort of cargo to space is a major part of designing a space mission.

It's one of the first issues that NASA's New Millennium Program (NMP) considers when planning a new mission. NMP has the forward-looking job to identify promising new technologies for space exploration. It then helps to mature the technology so it will be available to space missions of the future. If the technology cannot be tested adequately on Earth, the last part of this process is to actually send the technology into space. With carefully documented test results, future mission planners can confidently incorporate the new technology into their designs.

But where to begin? On call from the start, Linda Herrell is the New Millennium Program Architect. Given a list of proposed technologies, she has the job of figuring out the feasibility of wrapping a mission around them.

"We might be considering six or more technologies,

anything from solar panels to imagers to masts for solar sails to more intelligent software. Of those, we may choose four. My job is to answer the question—can the selected technology be transported to and operated in space within the constraints of a low-cost technology validation project?"

Along with the list of possible mission payloads (the technologies), Linda also has a list of spacecraft to put them on, as well as a list of launch vehicle parameters. All she has to do is try them out in every

possible combination (of which there are thousands) and see what might work.

"Fortunately, we have a software tool to help with this analysis," says Linda. When it comes down to it, her job is primarily to figure out how to get the technologies into space.

"Sometimes, it's like figuring out how to get across town when you don't have your own car. You have to get creative."

She keeps a database of all possible options, including riding piggyback on another spacecraft, hitching a ride on a launch vehicle as a secondary payload, or sharing a launch vehicle with other NASA, Department of Defense, or even commercial payloads.

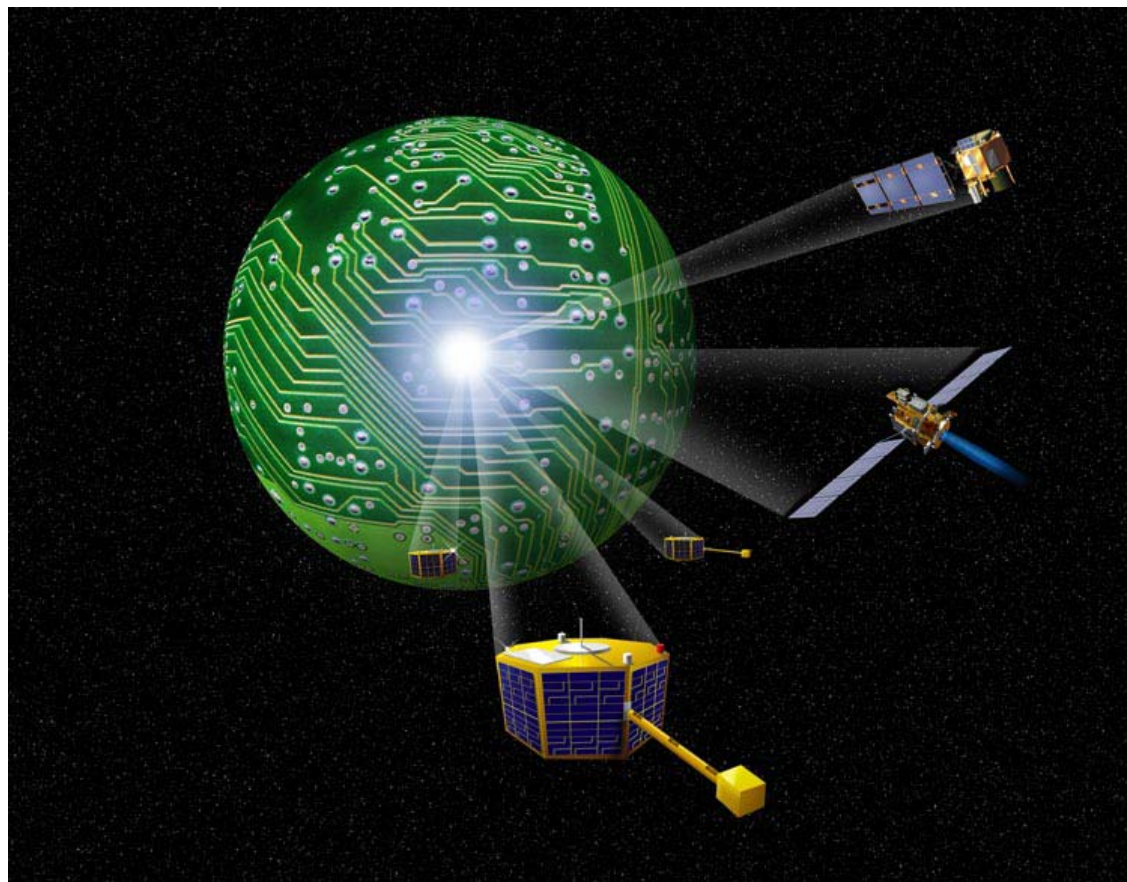
Her assessment is but one of a gazillion factors to be considered in planning a mission, but it is indeed one of the very first "details" that forms the foundation for the rest of the mission.

Find out some of the technologies that NMP has already validated or is considering at [nmp.nasa.gov/TECHNOLOGY/innovative-tech.html](http://nmp.nasa.gov/TECHNOLOGY/innovative-tech.html).

Kids will enjoy watching Linda's cartoon alter-ego talk about her job at [spaceplace.nasa.gov/en/kids/live](http://spaceplace.nasa.gov/en/kids/live).

*This article was written by Diane K. Fisher and provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration. ✦*

**NASA's New Millennium Program selects breakthrough technologies that will be of the greatest use to future space and Earth science missions and that are perceived to be risky to the first user.**



## THOR Meeting Minutes

Compiled by Richard Burney, Secretary

### THOR Meeting Minutes 9/4/07

**Attendance:** Richard Burney, Greg Rothman, Lisa Rothman, Arley Davis, Donald Johnson, Soren Johnson, Denis Gilbert, and Doug Holverson.

**Meeting starts at 19:15.**

**Lisa Rothman** says there will be food provided at the **Bob 2** launch in October; prepared by Lisa and others.

**Richard Burney** passes around the latest issue of **Rockets** magazine, the latest issue of the newsletter, and the May 1998 issue of **High Power Rocketry** magazine (featured **LDRS 16** and **Nebraska Heat** coverage). Richard discusses the work for his Level 3 ricket.

**Donald Johnson** and his son **Soren** are introduced to the club.

**Arley Davis** passes around a new **Estes** RTF kit. The newer Estes kits have reverted back to using elastic rubber bands as in the old days of the hobby. Arley demonstrates some model rocket repair techniques he has developed over the years. Arley passes around his **Binder Design Thug** he built around 10 years ago and relates some stories about it.

**Doug Holverson** talks about his own personal developments.

**Greg Rothman** shows a minimum diameter rocket he is working on that will take 38mm G through J motors. Greg shows the P motor case (P9000) from the **1/4<sup>th</sup> scale Redstone** which was flown yesterday (September 3<sup>rd</sup>) in Argonia, KS. This was the same **Pat Gordzelik** case that was used for the two **1/5<sup>th</sup> scale Delta III** flights.

**Meeting adjourned at 20:22.**

### THOR Meeting Minutes 10/2/07

**Attendance:** Richard Burney, Greg Rothman, Doug Buhrman, Denis Gilbert, Kevin Trojanowski, Jon Damme, Mark and Sharon Weiss, John McAtee, Doug Holverson, and Larry Drake.

**Meeting starts at 19:10.**

**Richard Burney** mentions that **Rockets** magazine is now available at the La Vista HobbyTown; an upcoming issue will have an article by Rich on the **Nebraska Heat 10** launch. Richard officially announces that his time as the club's secretary and newsletter editor will come to an end at the end of the year. There will be two more

issues of the newsletter done by him (*including this one*). Richard will continue to maintain the club's history page for the website and will contribute to the club in other ways.

**John McAtee** is finishing work on his Level 1 rocket – a LOC Minie Magg. John gets some construction advice for it.

**Mark Weiss** talks about his rockets and other things he's been up to.

**Jon Damme** talks about what he's been up to. Jon hopes to make Sunday's launch.

**Denis Gilbert** had a **Roadrunner** F60 motor cut in half right down the middle. Denis passes the cross-sectioned parts around. Denis confirms that the annual Christmas party will be held at his house on Friday December 7<sup>th</sup>.

**Kevin Trojanowski** is building an all-wooden rocket (including the skin) called **Woody**.

**Doug Holverson** shows an old **Centuri** launch pad he got off of eBay.

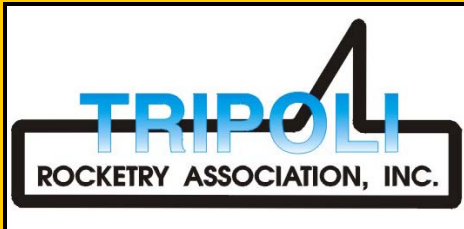
**Larry Drake** talks about what he's been up to.

**Meeting adjourned at 20:50. ✦**

### **1/3<sup>rd</sup> Scale Mercury Redstone**



**Here is a picture of Kevin Trojanowski and team's Mercury Redstone on its successful flight at AIRFest at Argonia, Kansas. (Kevin Trojanowski) ✦**



**What is THOR?**

The Heartland Organization of Rocketry (THOR) is both an officially sanctioned Prefecture of the Tripoli Rocketry Association (Tripoli Nebraska #46) and Section (#562) of the National Association of Rocketry. THOR strictly adheres to the safety guidelines established by both rocketry associations.

THOR has been actively involved in the hobby of model rocketry (low power, high power, and experimental) in southeast Nebraska and southwest Iowa since the early 1990's. THOR members, along with their projects, have appeared on national television programs such as *Master Blasters* (The SciFi Channel), *Rocket Challenge* (The Discovery Channel), *Extreme Machines* (The Learning Channel), *Junkyard Wars* (TLC), and *Ripley's Believe It Or Not* (TBS).

**When and where does THOR meet?**

Meetings are usually held the first Tuesday of the month at the La Vista Community Center at 8116 Parkview St., La Vista, NE – turn east at the Sinclair Gas Station on 84<sup>th</sup> St. and go a block east (look for the big US flag). Visitors are welcome to attend.

**When and where does THOR fly?**

From March through November, THOR conducts at least one high power launch (1/4A – N class) each month. High power launches are held east of Pickrell, NE which is 30 miles south of Lincoln. THOR conducts at least 3 three-day high power rocketry events each year. A low power sport launch is held the 1<sup>st</sup> Sunday each month at the old golf range on West Lincoln Street just west of 84<sup>th</sup> Street (South Washington Street) in Papillion, NE.

**THOR's Hammer...**

*THOR's Hammer* is the official newsletter of THOR. On average, it is published on a quarterly basis. *THOR's Hammer* is available, in PDF format, through its website (<http://www.nerocketry.org/>) or is mailed to those without Internet access. Members are welcomed to contribute articles and pictures to the newsletter.

**For additional information...**

For any additional questions or to check on the status of an upcoming launch, call THOR locally at (402) 505-3721 (there is a voice mail option at the end of the message). Interested parties may also write their inquiries to the address at the right and are also welcome to contact any of THOR's officers.

**THOR Membership Application  
Personal Information**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone Number: \_\_\_\_\_

E-mail: \_\_\_\_\_

**Hobby Information**

How long have you been in model rocketry: \_\_\_\_\_

Do you belong to a national rocketry organization - enter your membership number to the applicable organization:

NAR# \_\_\_\_\_ TRA# \_\_\_\_\_

Are you certified for high power rocketry – check mark your applicable TRA and/or NAR Certification Level:

Level 1 \_\_\_\_\_ Level 2 \_\_\_\_\_ Level 3 \_\_\_\_\_

**Membership Rates**

Half year membership rates will be divided by 2 and will add \$1. Write you check payable to "The Heartland Organization of Rocketry" or "THOR". Mail check and form to the below address or bring to the next meeting.

- Family Membership - \$36
- Senior Membership (18 and over) - \$24
- Junior Membership (18 and under) - \$12
- Correspondence Membership (members over 50 miles away from Omaha) - \$10

I agree to comply with THOR's policies as pertains to the safety guidelines set forth by Tripoli and the NAR. Failure to do so or conduct deemed unbecoming may result in expulsion from the club.

Signature: \_\_\_\_\_

Dated: \_\_\_\_\_

**The Heartland Organization of Rocketry  
625 Walnut Street  
Hickman, NE 68372**

**Membership in The Heartland Organization of Rocketry is open to all interested parties.**