



# 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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November 2004

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Volume 11 Number 7



AP Photo/Laura Rauch

Scaled Composites' SpaceShipOne successfully flew into space on September 29<sup>th</sup> and October 4<sup>th</sup>, winning the Ansari X Prize in the process. (Main - AP, left - Ansari X prize, right - Aero News Network)

## Club Officers

**PRESIDENT – Bruce Lee**  
Phone Number: (402) 691-8420  
E-mail: [bruce.lee@tripoli.org](mailto:bruce.lee@tripoli.org)

**VICE PRESIDENT – Greg Rothman**  
Phone Number: (402) 891-5706  
E-mail: [garothman@msn.com](mailto:garothman@msn.com)

**TREASURER – Larry Drake**  
Phone Number: (402) 895-1583  
E-mail: [thor\\_rocketry@yahoo.com](mailto:thor_rocketry@yahoo.com)

**SECRETARY – Richard Burney**  
Phone Number: (402) 553-5816  
E-mail: [rcburney@cox.net](mailto:rcburney@cox.net)

**TRA NEBRASKA PREFECT – Kevin Trojanowski**  
Phone Number: (402) 292-4101  
E-mail: [troj@cox.net](mailto:troj@cox.net)

**NAR SECTION #562 LEADER – Bruce Lee**

## November 2004 Calendar

### November

**Event:** November Meeting.  
**When:** Tuesday the 2<sup>nd</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Low Power Launch.  
**When:** Sunday the 7<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** High Power Launch.  
**When:** Saturday the 20<sup>th</sup>, 9:00 AM to 5:00 PM.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**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*

## THOR Rocketry Hotline

**Phone Number (Local):** (402) 896-2069  
**Phone Number (Toll Free):** 1-888-546-0396

## 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/index.cgi>  
Rocketry Online is an excellent source of model and high power rocketry related news and information.

<http://www.flyfast.net/>  
Flyfast Industries is the latest onsite vendor for THOR's high power launches.

<http://www.giantleaprocketry.com/>  
Giant Leap Rocketry has been THOR's main vendor at our high power launches for several years.

<http://www.kloubusters.org/>  
Home page for the K.L.O.U.D.Busters Tripoli Prefecture of the state of Kansas.

## **LAC Award...**

In the latest issue of *Sport Rocketry* magazine (September/October 2004), the winner of this year's **LAC Award** was announced. The LAC Award is awarded to the best NAR Section newsletter. This year's winner was the **ZOG-43** by the **NARHAMS** section out of Maryland (<http://www.narhams.org/>). After just a little over a year-and-a-half of submitting this newsletter to the three judges, **THOR's Hammer** was one of the runners-up! Though THOR's Hammer was ultimately not the prize winner, it was definitely an honor that this newsletter has already received this recognition. Hopefully, THOR's Hammer will come out on top next year!

Though it may sound like advertising for the competition, I would recommend checking out the ZOG-43 and the other clubs' newsletters that are available online (hopefully, THOR's Hammer will also be available online in the near future). It's always interesting to see what the other clubs are up to and what unique features they have for their newsletters.

## **Volume 11, Number 8...**

Once again, due to all the developments with SpaceShipOne, the ATF up to its shenanigans again, and all the recent THOR activities and events, the normally bimonthly November/December issue will be broken up into two issues. The December issue will mainly focus on the great launch we had on September 25<sup>th</sup>. ✨

## Message from the TRA President October 6, 2004

Dear Fellow Rocketeers:

As a follow-up to the joint TRA/NAR statement about our upcoming court action with the ATF, I wanted to provide TRA prefects and members with more detail, and an urgent plea.

By now you have probably seen and discussed the "Frequently Asked Questions" about rocketry that were published by the ATF in August. In these FAQ the ATF made their viewpoint quite clear--they still consider rocket motors containing over 62.5 grams of propellant to be in their purview for regulation.

On Thursday, September 2, on short and inappropriate notice, an ATF agent arranged an on-site inspection of AI's Hobby Shop, in conjunction with their application for renewal of their LEDP. This "inspection" turned into no fewer than five more visits, during which the ATF agent behaved in a very difficult manner (despite, or maybe because of, the agent's apparent lack of technical knowledge of rocketry materials). During the inspection, the agent stated that all the high-power single use motors need to be in their explosives magazine. The agent was referred to the court rulings and our general instructions on PADs from last April and this August. The agent maintained that TRA/NAR's interpretation is wrong, and that she was applying the FAQ guidance with respect to weights (all single use over 62.5 g in a magazine).

We of course feel that the judge's ruling was clear - assembled rocket motors of any size are Propellant Actuated Devices and as such are exempt from storage and other requirements. It is obvious to us that ATF has stepped far beyond their bounds in publishing their FAQ and is way out of line in attempting to enforce an untenable, illegal position that is inconsistent with Judge Walton's ruling of April 2004.

We have followed the developments at AI's Hobby Shop, which have stretched over several weeks and involved two ATF agents. We have documented various "rulings" by these agents which appear to be draconian in nature. As the details unfolded, the TRA/NAR legal counsel was apprised, and a written deposition was prepared, which was submitted to Judge Walton; this has resulted in our upcoming Federal Court hearing. What we will be seeking is (1) clarification as to the PAD exemption for motors with over 62.5 grams APCP; and (2) a ruling that the FAQ's violate the APA and should be withdrawn. We may also seek sanctions, consistent with whatever is warranted for these ATF actions.

But folks...this takes time and it costs money. The legal team can afford to operate only as long as we pay them. Donations are way down from last year, and it's TRA's turn to submit the next payment to the legal team. PLEASE donate. The cost of a J-reload from each rocketeer on the TRA mailing list would go a long way toward offsetting the legal costs. Donation procedures, including online capability via Pay Pal, are found at: <http://www.tripoli.org/donations.shtml>. Also, if you or other TRA members in your area can initiate any creative fundraising efforts to help the legal fund (e.g. raffles, 50-50 tickets, etc.), it would be tremendously appreciated. Consider that we pursue an activity that burns money, and if every flyer would forgo burning one high-power motor,

submitting the value of that motor to the legal fund, it will help us fight to ensure you can still buy these motors now and in the future.

It is abundantly clear that some elements of the ATF do not feel that they need to follow legally promulgated rules, and the TRA and NAR leaders are resolved not to stand by and let our members and dealers who support us be bullied. This outrageous behavior must be answered in the strongest manner. Help us fight the fight for rocketry and freedom, and donate now!

Regards,  
Ken Good  
TRA President, and on behalf of the TRA Board of Directors✦

## TRA and NAR Petition U. S. District Court

*Courtesy of Rocketry Online -[www.rocketryonline.com](http://www.rocketryonline.com),  
October 7, 2004*

ROL Newswire) -- TRA and NAR have petitioned the U. S. District Court in Washington, DC for an acceleration of the planned December 17, 2004 status conference. The full text of the petition can be found here (<http://www.tripoli.org/documents/batfe/UrgentMotionforEarlyStatusConference.pdf>). The Court has agreed to a revised date of October 15, 2004, for this important conference.

Our request was triggered by two events: the publication of a "Questions and Answers Hobby Rocket Motors" document at the ATF Explosives website (<http://www.atf.gov/explarsen/0504rocketryqa.pdf>), and an apparent attempt to enforce these illegally promulgated regulations on at least one motor dealer.

In light of these events, we again suggest that members need to be vigilant for attempts by any ATF personnel attempt to impose conditions on rocketeers which are counter to the April 2004 Court opinion or for which legally promulgated regulations do not exist. Members who experience treatment similar to that outlined above or who are threatened with or receive enforcement action should immediately contact [KJGood@aol.com](mailto:KJGood@aol.com) TRA President Ken Good via email or at 412-260-4223, or [president@nar.org](mailto:president@nar.org) NAR President Mark Bundick via email or at 630-293-9343 and provide full details of those action or threats. It will be important to record your experience in as much detail as possible so counsel can then seek the appropriate relief from Judge Walton's court.

As always, we appreciate the comments, input and support of TRA and NAR members in this fight. And, as our case proceeds, we will continue to need your financial support. We urge you to make a donation to the Legal Defense Fund (<http://tripoli.org/donations.shtml>) today, in whatever amount you possibly can contribute. Your support and generosity will be recognized and acknowledged, and you'll be able to say "I supported the fight for an unregulated sport rocket hobby."

We will report the results of this conference to members as soon as possible after it concludes.

Ken Good, President  
Tripoli Rocketry Association

Mark Bundick, President  
National Association of Rocketry✦

## Mercury Astronaut Gordon Cooper Dies at 77

Monday, October 04, 2004, Associated Press

VENTURA, Calif. — **Gordon Cooper**, who as one of the original Mercury astronauts was a pioneer in human space exploration, has died. He was 77.

Cooper died Monday at his home in Ventura, NASA officials said in a statement.

"As one of the original seven Mercury astronauts, Gordon Cooper was one of the faces of America's fledgling space program," said NASA Administrator **Sean O'Keefe**. "He truly portrayed the right stuff, and he helped gain the backing and enthusiasm of the American public, so critical for the spirit of exploration. My thoughts and prayers are with Gordon's family during this difficult time."

Cooper piloted the final flight of the **Mercury program**, the United States' first manned spaceflight program that had the primary goal of putting a man in orbit around Earth.

Born March 6, 1927, in Shawnee, Okla., Cooper was selected as a Mercury astronaut in April 1959. The astronauts became heroes in the space race between the United States and the Soviet Union.

Cooper's cocksure attitude was immortalized in Tom Wolfe's book "The Right Stuff" and the 1983 movie of the same name.

Cooper gave his signature line during a 1995 reunion of surviving Mercury astronauts. When asked who was the greatest fighter pilot he ever saw, Cooper enthusiastically answered, "You're looking at him!"

On May 15, 1963, Cooper piloted the "Faith 7" spacecraft on a 22-orbit mission that concluded the operational phase of the Project Mercury. He flew for 34 hours and 20 minutes.

Two years later, he served as command pilot of the Gemini 5 mission, during which he and Charles Conrad established a new space endurance record by traveling more than 3.3 million miles in time of 190 hours, 56 minutes.

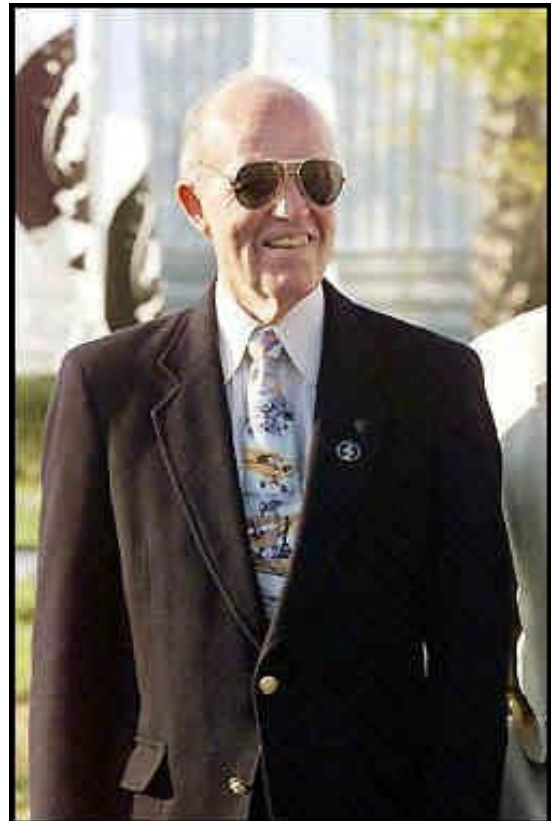
The flight proved that humans could survive in a weightless state for the length of a trip to the moon. It also tested a new power source for future flights -- fuel cells.

Cooper joined the Marines during World War II and transferred to the Air Force in 1949. He flew numerous flights as a test pilot in the Flight Test Division at Edwards Air Force Base.

"Gordon Cooper's legacy is permanently woven into the fabric of the Kennedy Space Center as a Mercury Seven astronaut," said Kennedy Space Center director Jim Kennedy. "His achievements helped build the foundation of success for human space flight that NASA and KSC have benefited from for the past four decades." ✦



Astronaut Gordon Cooper is shown in his space suit, in this July 1965, file photo. Cooper, one of the original Mercury astronauts who were pioneers in human space exploration, has died. He was 77. Cooper died Monday, Oct. 4, 2004, at his home in Ventura, NASA officials said in a statement. (AP Photo/File)



Picture taken 1998 of Gordon Cooper, one of the original Mercury astronauts who pioneered the US role in outer space. Cooper died at his home in Ventura, California. (AFP/File/Tony Ranze)

## Minnesota History Center Features High Power Rockets

Courtesy of Rocketry Online –  
[www.rocketryonline.com](http://www.rocketryonline.com)

Four rockets, including the “Miss Riley” rocket from the movie “October Sky” have “landed” at the Minnesota History Center. The rockets are a new addition to the ongoing exhibit, “Going Places: The Mystique of Mobility,” which traces the American passion for movement. The gantry-enclosed rockets and accompanying stories reflect the success of one Minnesotan to go farther, faster and higher. Former Hollywood stuntman and inventor Ky Michaelson of Bloomington has been working since 1995 to blast an amateur rocket into space, which is officially defined as 62 miles above the earth. His first two attempts in 2000 and 2002 failed, but the third time was the charm. On May 17, 2004, the Go Fast Rocket, built by Michaelson and an all-volunteer collaboration of about 25 teachers, students and rocket scientists called the Civilian Space eXploration Team, soared 77 miles above the Black Rock Desert in northern Nevada, becoming the first privately funded rocket to reach space.

The rockets on display include the recovered tail of a 17-foot, 500-pound Primera rocket, which was the Civilian Space eXploration Team’s second attempt to send a rocket into space. Also displayed is the “Miss Riley” rocket that was built by Michaelson for “October Sky,” a 1999 film based on the high school days of Homer Hickam, who went on to become a NASA engineer. Michaelson has more than 200 movies and TV shows to his credit as a Hollywood stuntman and designer, and has built a fleet of rocket-propelled contraptions that have set land speed records.

Michaelson’s rockets and story join a 1950s-era, 22-foot rocketship, reflecting earlier ambitions for leaving the earth behind with ever-increasing speed. Visitors can immerse themselves in “Reaching for the Stars,” a multimedia show inside the silver ship that spans the earliest attempts to fly, including Charles Lindbergh’s historic flight across the Atlantic, through the 1950s imagination for space travel to the first NASA space walk. Photographs, advertising, children’s illustrations and personal anecdotes about air and space

travel surround the rockets. Michaelson will appear at the History Center for a Thanksgiving break program on Nov. 26 from 1 to 4 p.m., where visitors can hear about his inventions and make “Retro Rocket Hats.”

The Minnesota History Center is located at 345 Kellogg Blvd. W. in St. Paul. Hours are 10 a.m. to 8 p.m. Tuesdays, 10 a.m. to 3 p.m. Wednesdays through Fridays, 10 a.m. to 5 p.m. Saturdays and noon to 5 p.m. Sundays. Admission is free. Auxiliary aids and services are available with advance notice. For more information, call 651-296-6126, 1-800-657-3773 or TTY 651-282-6073.

The Society’s calendar of events is posted on the Internet at [www.mnhs.org](http://www.mnhs.org). The web site also has information about all of the Society’s programs and historic sites. ✦



## SpaceShipOne Was Not Out of Control, Builder and Pilot Say

By Leonard David - Senior Space Writer (posted: 29 September 2004 07:04 pm ET)

MOJAVE, CALIFORNIA – The frightening spin of SpaceShipOne during its trip into space Wednesday was caused by a known deficiency and at no time led to an out-of-control situation, officials said today.

The privately built and financed suborbital vehicle shot to an unofficial altitude record of 63.9 miles (102.9 kilometers) during a flight that had ground controllers and webcast viewers worrying for a few tense moments as the craft went into an unexpected series of rolls.

Assuming the altitude is verified, SpaceShipOne is one step away from winning \$10 million Ansari X Prize, which will be given to the first team that can send a three-person craft 62 miles (100 kilometers) up within two weeks.

A decision on whether to attempt the second flight as early as Sunday will be rendered by late Thursday, officials said during a post-flight press conference.

### 'Kind of cool'

Roaring straight up through the sky after release from the White Knight carrier plane, SpaceShipOne began rolling at the top of its flight, with pilot Mike Melvill at the controls.

"I didn't actually have any discomfort," he said. "I thought it was kind of cool."

Using the craft's reaction jets, Melvill was able to tame it for the high-speed plunge back to Earth. He figures he did about 20 turns, some at high rates.

"It was a fast roll. And a spectacular view out the window watching the world go around there quickly, Melvill explained. "I even had time to pick up a still camera and take some pictures out of the window."

Melvill stressed that the roll rate was very controllable. "I'm not sure what kicked it off," he said. "It probably was something I did." He said that at no time was the control of SpaceShipOne an issue.

### Change of pilot

According to Gregg Maryniak, Executive Director of the X Prize Foundation, radar data from the neighboring Edwards Air Force Base tentatively pegged the craft's top altitude at 337,500 feet.

Confirmation of the exact altitude reached, tying together several sources including an onboard "gold box," is expected shortly, Maryniak said, but the flight went above the X Prize qualifying altitude.

Burt Rutan, head of Scaled Composites, the firm that designed and built the rocketplane, said that Melvill was not the pilot slated for today's flight.

The planned pilot fell ill at the same time his wife was giving birth. That unidentified individual felt he was under too much stress to undertake the flight and give a full 100 percent, Rutan said.

The pilot change was made two weeks ago, Rutan said, although Melvill's name was not announced until early this morning. Melvill flew SpaceShipOne into space the first time in June, in a test run for this week's X Prize attempt.

### Spin-stabilized roll

The unplanned corkscrew maneuver Wednesday was characterized as a "spin-stabilized" roll. Rutan said there's a "known deficiency" in SpaceShipOne that caused the roll.

Wind that hits an airplane from the side causes the craft to roll as a corrective technique, Rutan explained. The same thing applies to SpaceShipOne as it pierces the upper reaches of the atmosphere, although the rocketship "rolls much too much to correct for that," he said.

Despite the deficiency, Rutan said SpaceShipOne is an extremely robust setup. "Any system that will ever go out there and fly space tourists needs to be 100 times or more safer than any manned spacecraft that has ever flown."

There is a clear goal in mind here. Earlier this week, British entrepreneur Richard Branson said he plans to contract for a modified version of SpaceShipOne to carry paying customers into space as early as 2007.

"We are extremely confident that we are going to be able to produce the first space tourism commercial spaceliner that will start out service with reliability, I believe, significantly better than the first airlines had when they started to offer service decades ago," Rutan said.

### Ashes of mother flown

After the flight, a ground survey of SpaceShipOne's overall health showed that there is nothing to fix on the vessel, Rutan said.

"You can't believe how happy I am right now," he said.

Rutan revealed that SpaceShipOne carried the ashes of his mother, Irene Rutan. She passed away a few years ago.

"I only thought of doing this last night. We rounded up her ashes...she flew today," Rutan said, his eyes tearing as he spoke.

"I was very, very proud to have carried her," Melvill said. ✦



Before sunrise, last minute preparations were underway before the anticipated launch. Deteriorating conditions, which included fierce winds delayed the launch of SpaceShipOne. There was widespread speculation that the weather would cause the flight to be postponed or cancelled. However, the wind speeds slowed down, the sun came up, and pilot Mike Melvill boarded SpaceShipOne with the intent on reaching the edge of space. (Jim Campbell, Aero News Network)



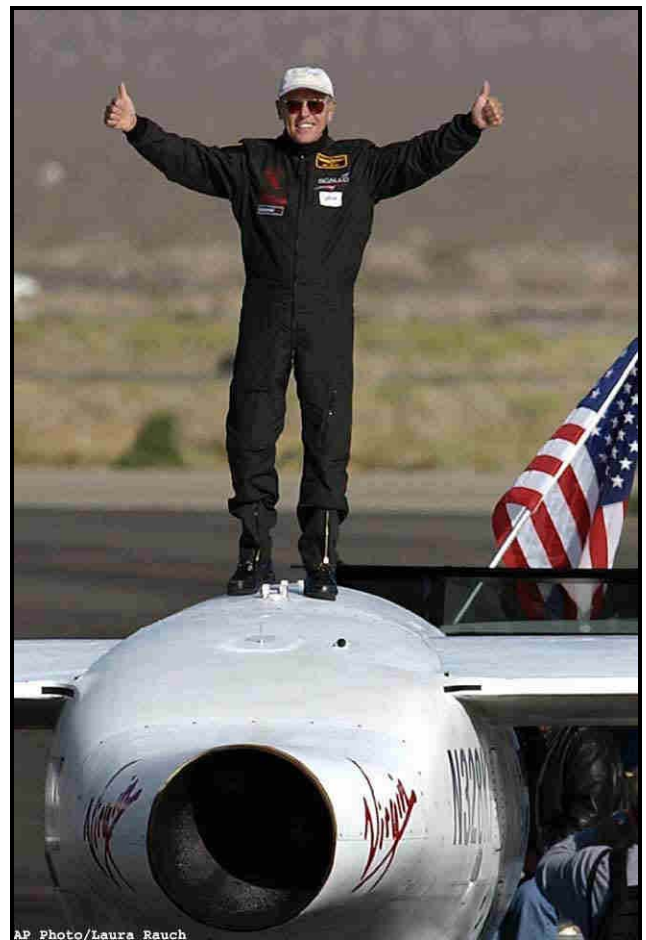
High-altitude separation of the two ships is shown in the picture. SpaceShipOne dropped for a harrowing few seconds, then rockets skyward towards its destination – Space. (Ansari X Prize)



SpaceShipOne takes off, attached to White Knight, as the Mojave Aerospace Ventures Team attempts to win the Ansari X Prize in Mojave, Calif. on Wednesday, Sept. 29, 2004. (AP Photo/Laura Rauch)



Another view of White Knight, as it streaks across the sky with SpaceShipOne attached to its belly. (Jim Campbell, Aero News Network)



Civilian astronaut Mike Melvill made his second foray into space on Sept. 29, 2004, when he piloted the privately built spacecraft SpaceShipOne on a suborbital flight. (AP Photo/Laura Rauch)

## SpaceShipOne Wins \$10 Million Ansari X Prize in Historic 2<sup>nd</sup> Trip to Space

By Leonard David - Senior Space Writer [posted: 04 October 2004 10:56 am ET (Updated 12:32 p.m. ET) at [www.space.com](http://www.space.com)]

MOJAVE, CALIFORNIA – Human flight took a significant step forward today as the privately built SpaceShipOne flew into suborbital space for the second time in five days, securing the \$10 million Ansari X Prize.

With pilot Brian Binnie at the controls, SpaceShipOne rocketed to an unofficial height of 368,000 feet, setting a new altitude record for the craft and proving that private industry can build a viable vehicle for sending paying passengers to space.

"This is a milestone for humanity," said John Spencer, president of the Space Tourism Society in Los Angeles.

Shortly after SpaceShipOne became airborne this morning, Spencer told *SPACE.com* the flight represents "the kickoff of the space tourist industry."

Seconds after being released from the White Knight carrier plane somewhere above 46,000 feet, Binnie ignited SpaceShipOne's hybrid rocket motor, boosting the craft above the target point of 62 miles (100 kilometers) required by the X Prize Foundation of St. Louis, Missouri in order to win the cash prize.

The top altitude was confirmed by radar while SpaceShipOne was gliding back to Earth. The craft touched down like a regular airplane at 11:14 a.m. ET.

### On a roll

The Ansari X Prize is a \$10 million purse for the first privately built vehicle that can safely haul a pilot and the equivalent weight of two passengers to the edge of space -- then repeat the feat within two weeks.

Last week, SpaceShipOne, under the controls of pilot Mike Melvill, coasted above the 62-mile (100-kilometer) altitude point and successfully completed the first of the back-to-back X Prize flights.

That Sept. 29 flight -- dubbed X1 -- saw SpaceShipOne soar to a reported 337,500 feet. Melvill's rocket ride was not without incident. The craft rolled nearly 30 times in an unplanned manner as it shot faster than a bullet out of Earth's atmosphere.

Melvill was able to dampen out the roll, re-enter the atmosphere, and make a controlled glide and landing at the Mojave Spaceport. This flight was deemed by a team of judges as a successful first flight for the Ansari X Prize.

Today's clinching flight went off without any apparent hitches. It reached 69.7 miles (112.2 kilometers), well above the minimum target.

"This was a sweet ride," said noted science fiction writer Jerry Pournelle. "I've been around since they were stuffing people into Mercury capsules. This is great stuff."

SpaceShipOne was under the control of a single pilot in both flights, but it was weighted as if two additional people were aboard.

There is significant additional performance in the craft's hybrid rocket motor, its designers say, enough to propel it on an even higher suborbital trajectory.

"We might have gotten to 370,000 feet if my mother-in-law hadn't spilled about a pound of coffee on me this morning," Binnie said after stepping out of the space plane. "A little accident added to the drama of the day."

### The competition

SpaceShipOne's apparent success is not expected dull enthusiasm of other rocketeers building suborbital vehicles, predicted Peter Diamandis, head of the X Prize Foundation, in a pre-flight interview with *SPACE.com*.

"If the Ansari X Prize is won...I think you'll see the first Canadian, the first Russian, the first British, the first Romanian...all the X Prize teams outside the United States will continue their work to become the first of their nation to carry out a first private flight into space," Diamandis said. "I think that's still huge news."

Brian Feeney, who leads a rival X Prize effort called the da Vinci group, wished the SpaceShipOne team well this morning just prior to the flight, and he vowed not to stop his own effort.

"Even if the prize is won today, we will fly," Feeney told *SPACE.com*. "We're moving our program as fast as we can. We'll announce a launch date in a short period of time."

Feeney was wearing a gold-colored outfit to promote GoldenPalace.com, the sponsor of his Canadian team. But Feeney's mission has been a largely volunteer effort, while SpaceShipOne is backed by Microsoft co-founder Paul Allen.

"Not everyone has a billionaire available to them," Feeney said this morning.

### Next step

With today's flight, Binnie became just the second civilian pilot to earn his astronaut wings, along with Melvill. The 51-year-old Binnie is a program business manager and test pilot at Scaled Composites, the firm that built SpaceShipOne.

That firm is led by Burt Rutan. And he has plans.

The company made a deal last week to build a new rocket plane for British entrepreneur Richard Branson, who will market space tourism flights to the public under the name Virgin Galactic.

"What you've seen here is a research and development program to look at new ideas on how manned spacecraft can really be significantly safer ... and there will be new ideas out there," Rutan said after today's flight. "We will be developing new ideas also on SpaceShipTwo."

*SPACE.com's Robert Roy Britt contributed to this report.* ↗



Second private, civilian astronaut to go into space, Brian Binnie.



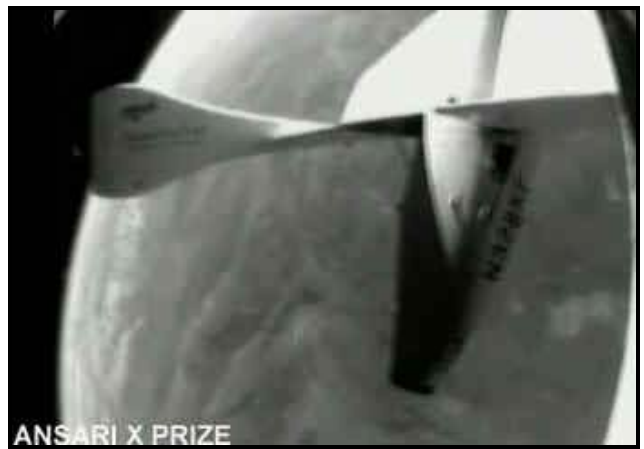
Pilot Brian Binnie waves from a porthole as SpaceShipOne is carried underneath the White Knight aircraft as it taxis to takeoff in its quest to win the Ansari X Prize at Mojave, Calif., Airport, Monday, Oct. 4, 2004. (AP Photo/Reed Saxon.)



With pilot Brian Binnie at the controls, SpaceShipOne rockets skyward towards suborbital space during its second flight in less than a week in pursuit of the Ansari X Prize. (Ansari X Prize.)



Spectators watch as pilot Brian Binnie launches toward suborbital space in SpaceShipOne. (Ansari X Prize.)



SpaceShipOne is shown heading back into the Earth's atmosphere after winning the \$10 million Ansari X Prize for private spaceflight and breaking an X-15 altitude record set by X-15 pilot Joseph Walker in 1963. That altitude was 354,200 feet (67 miles or 107.9 kilometers). (Ansari X Prize)



After a successful Ansari X Prize winning flight, pilot and commercial astronaut Brian Binnie guides SpaceShipOne to a smooth landing while a chase plane looks on. (Ansari X Prize.)

## Offutt 2004 Air Show

August 21<sup>st</sup> – 22<sup>nd</sup>

Article and Pictures by Richard Burney

This year marked the third time that THOR had a display at the **Offutt Air Force Base** air show/open house. Throughout the two day duration of the show, a few hundred mini editions of THOR's Hammer along with promotional materials provided by NASA's Space Place program were handed out to interested spectators. For those who saw the air show program, Bruce had a one page article about our group and a few pictures of ***Our Stinkin' Rocket***. This was a great way for the club to get exposure to thousands of people in the Omaha metropolitan area.

A special thanks goes to Offutt AFB for once again having THOR as its guest, Nancy Leon of NASA's Space Place program, and a special thanks goes to all THOR members who ran the display throughout the weekend. ✦



The THOR display drew spectators through out the entire weekend.



One of Offutt's E-4B's passes by. The E-4B is a specially modified 747 that would be used by the president in the event of an all-out war.



Bruce strikes a pose with *Our Stinkin' Rocket* of Discovery Channel's *Rocket Challenge* fame.



Richard Burney and an F-16 Fighting Falcon. I have attended every single air show Offutt has hosted since 1986 (I was just 12 at the time!) and I hope to see many more!



An A-10 Thunderbolt II (*Warthog*) and a P-51 Mustang fly in formation as part of the Air Force's Heritage Flight program.



Randy Ball rolls his MiG-17 over the crowd. This was the first time a MiG-17 was on display or in the air at the Offutt air show.



The Commemorative Air Force's B-17 Flying Fortress aka *Thunderbird* makes a simulated bombing run.



Randy's MiG-17 taxis past the crowd. In recent years other classic jets to have flown at Offutt have included MiG-15's, F-86's, and F-104's.



The four-plane diamond formation of the Thunderbirds passes overhead.

## AIRFest 10

Article and pictures by Richard Burney

### “WINDFest 10”...

This past Labor Day Weekend (September 3<sup>rd</sup> – 6<sup>th</sup>) marked the 10<sup>th</sup> annual AIRFest for the KLOUDBusters prefecture of Kansas. For those of us from THOR who have attended launches at the Argonia site (usually for AIRFest or LDRS) it always seems to be a literal hell on earth with highs usually well over a 100 degrees. With this summer being unseasonably cool for the Midwest, the high each day barely broke 90, so for once most of each day was pretty pleasant. But the tradeoff unfortunately was the constantly windy conditions EVERY day of the launch. At least the flat terrain and the mostly plowed farmlands help make rocket chasing a little easier!

### Friday...

For those who flew on Friday, it was very windy, with the wind coming out of the south. Nothing under a B size motor was flown; in fact only 2 black powder motors under E were burned! Since Friday was a work day and since some were en route to Argonia, it was the slowest of the three commercial days. A total of **47** flights were accomplished. The motors burned were as follows: **B-1, C-1, E-3, F-3, G-9, H-11, I-6, J-4, K-4, L-2, and M-3**. As for myself, I was heading down to Kansas on Friday with my father following me in his car. Before getting to Harper, we had the opportunity to check out the **Cosmosphere** in Hutchinson, Kansas.

### Saturday...

Saturday, again, was windy with the wind coming out of the south. But those who flew early experienced the best conditions. I myself flew my AMRAAM 4 on a Pro38 J330... first J flight for me this year and a nice way to celebrate my 31<sup>st</sup> birthday! I had a pretty long walk to retrieve it, but fortunately it landed on a nice flat stretch of plowed up field and was visible from a very long distance away. I have flown my AMRAAM 4 at nearly every launch I have attended at Argonia going back to 1998. Bill Richardson's PML Endeavor blasted its way up to over 9,700 feet on the new Pro54 L730. Though Bill lost the signal to the transmitter on board, somebody found his rocket and got it back to him before the end of the day. Other THOR members, such as Rick and Sherri Bosworth and Larry Mills, were also in attendance during the weekend.

Just like LDRS last year, there was a **From the Ground Up** style contest being held on Saturday. However, unlike the **Rocket Challenge** contest, the building materials allowed were much more primitive and crude: cardboard, hard Styrofoam, and a sheet of plywood were among the building materials. Only the motor tube (for a Pro54 K445 or an AeroTech K550) was the only “standard” rocket part! A few of the participants from last year's contest, such as “Rocket Babe” Karen Wiley, were involved with some of the teams.

All together, there were a total of **185** flights for Saturday. The motors burned were as follows: **A-13, B-**

**28, C-33, D-16, E-17, F-14, G-13, H-7, I-15, J-10, K-10, L-4, and M-5.**

That evening, most of the flyers along with friends and family got together at the public swimming pool in Argonia for some swimming and some barbeque. A nice way to end a great day of flying!

### Sunday...

As for Sunday, well, it was windy again! Unlike Saturday which was only slightly breezy in the early morning, Sunday was plain windy from the get go. Also, though most of the weekend had been sunny, clouds and rain sat off towards the west and northwest ready to move in by the afternoon.

Though it was windy, I was dead set on flying my first L motor. Like Bill Richardson and a fair number of other flyers that weekend, I was going to give the Pro54 L730 a spin. Having flown it on the Pro54 K660 a few months earlier, I decided to fly my **Mobile Rocket Gundam** with it. After arcing slightly into the wind, **Gundam** reached an altitude of 3,310 feet... this was just a mere 20 feet more than when I flew it with the smaller K660! Obviously the wind had an impact on performance. After landing a half mile or more to the north, my dad and I took off in our vehicles and found it within a few minutes. **Gundam** was in great shape and is ready to fly again.

With the weather looking questionable and since my dad was heading back to Omaha anyway, I decided to cut my trip one day short and headed back to town also. By the early afternoon, the wind caused the flight range to be closed at one point. There was also some scattered rain.

The total number of flights for Sunday was **92**. The motors burned were as follows: **A-3, B-10, C-15, D-5, E-10, F-4, G-9, H-11, I-7, J-9, K-3, L-1** (*I guess that was my flight!*), **M-3, and N-2**.

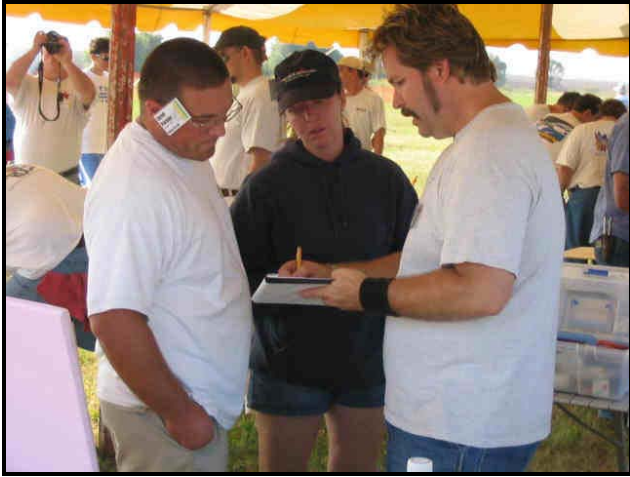
### Monday...

I didn't stick around, so there isn't much to report! Based on the forecasts, I believe Monday was supposed to have been an improvement over Sunday. Monday was experimental day for those with their own “homebrewed” motors. The total number of flights for Monday was **36**. The motors burned were as follows: **G-3, H-4, I-2, J-11, K-3, L-8, M-3, and N-2**.

### Conclusion...

This AIRFest will be memorable to me since it was the first time that my father had the opportunity to see my high power model rockets in action including my very first L flight. This was the biggest rocket event he has been to. I also had the chance to show him the Cosmosphere which I have wanted to show him for years.

A special thanks goes to all who were involved in the planning and operations of AIRFest 10. I have flown from this field on five different occasions (3 AIRFests, 2 LDRS's) and I look forward to flying here again. And a special thanks goes to Lance Lickteig of the KLOUDBusters for providing me with all the stats for the launch. ✦



Jacob Pursley, Karen Wiley, and Terry Smemo discuss their plan of attack to build their rocket.



The Smemo team's rocket nears completion.



Jacob starts sawing the fins from a sheet of plywood while Karen steadies the board.



All of the finished rockets. The big blue rocket's nose is formed by folding up the top!



Just like Terry's team, this team used their hard Styrofoam to make the sides of their rocket.



The participating teams head out to the pads to load up their rockets.



The competing rockets are loaded up on their pads. The Smemo team rocket is on the left pad.



The Smemo team rocket completes its first loop in its unstable flight. Most of the other flights were like this or had less than spectacular recoveries. But it still was a cool event!



Larry Mills and his Nike Smoke and Maverick. Both rockets are all-aluminum construction! Note the removed panel on the Maverick revealing the AeroTech 1706 motor case!



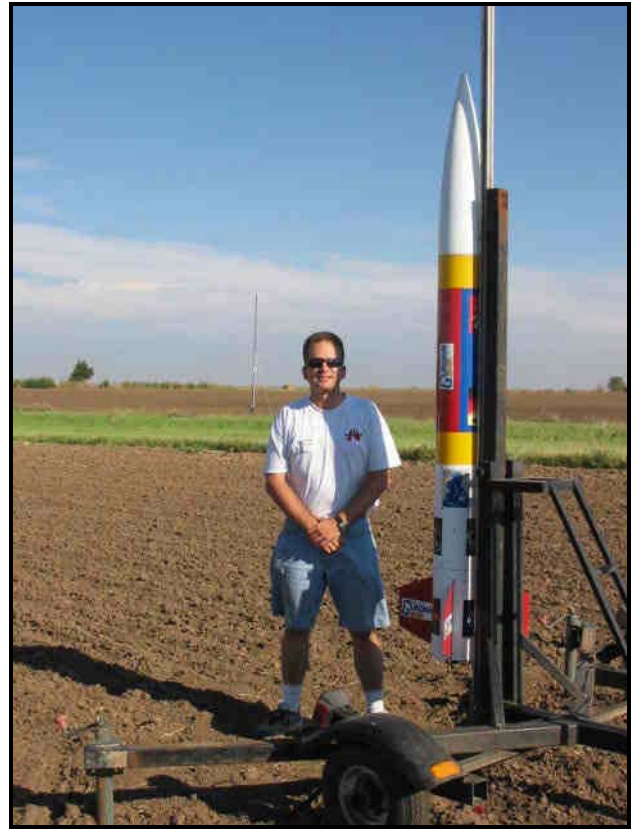
Bill Richardson and his carbon-fiber finished PML Endeavor. A Pro54 L730 took it to over 9,700'! Bill's highest flight yet!



This 1/4<sup>th</sup> scale V-2 was made mostly from cardboard and was flown several times on Saturday. This flight was on a J415.



Andy Limper and his *High Anxiety*. Andy, who's from Minnesota, has attended several of THOR's Fire On The Farm launches in the past.



Richard Burney (me!) and his *Mobile Rocket Gundam*. This rocket's maiden flight, on an AeroTech K700, was at this same field last year.



*High Anxiety* lifts off on a mix of a central M1315 and two J570's. Awesome flight!



Liftoff on the new Pro54 L730. *Gundam* reached an altitude of 3,310 feet. My first L!

# NASA's Space Place

<http://spaceplace.nasa.gov/en/kids/>

## Resisting Retirement: Earth Observing 1

by Patrick L. Barry

The Hubble Space Telescope isn't the only satellite that scientists have fought to keep alive beyond its scheduled retirement. Scientists also went to bat for a satellite called EO-1, short for Earth Observing 1, back in 2001 when the end of its one-year mission was looming.

The motivation in both cases was similar: like Hubble, EO-1 represents a "quantum leap" over its predecessors. Losing EO-1 would have been a great loss for the scientific community. EO-1, which gazes back at Earth's surface instead of out at the stars, provides about 20 times more detail about the spectrum of light reflecting from the landscape below than other Earth-watching satellites, such as Landsat 7.

That spectral information is important, because as sunlight reflects off forests and crops and waterways, the caldron of chemicals within these objects leave their "fingerprints" in the light's spectrum of colors. Analyzing that spectrum is a powerful way for scientists to study the environment and assess its health, whether it's measuring nitrate fertilizers polluting a lake or a calcium deficiency stressing acres of wheat fields.

Landsat 7 measures only 8 points along the spectrum; in contrast, EO-1 measures 220 points (with

wavelengths between 0.4 to 2.5  $\mu\text{m}$ ) thanks to the prototype Hyperion "hyperspectral" sensor onboard. That means that EO-1 can detect much more subtle fingerprints than Landsat and reveal a more complete picture of the chemicals that comprise the environment.

As a NASA New Millennium Program mission, the original purpose for EO-1 was just to "test drive" this next-generation Hyperion sensor and other cutting-edge satellite technologies, so that future satellites could use the technologies without the risk of flying them for the first time. It was never meant to be a science data-gathering mission.

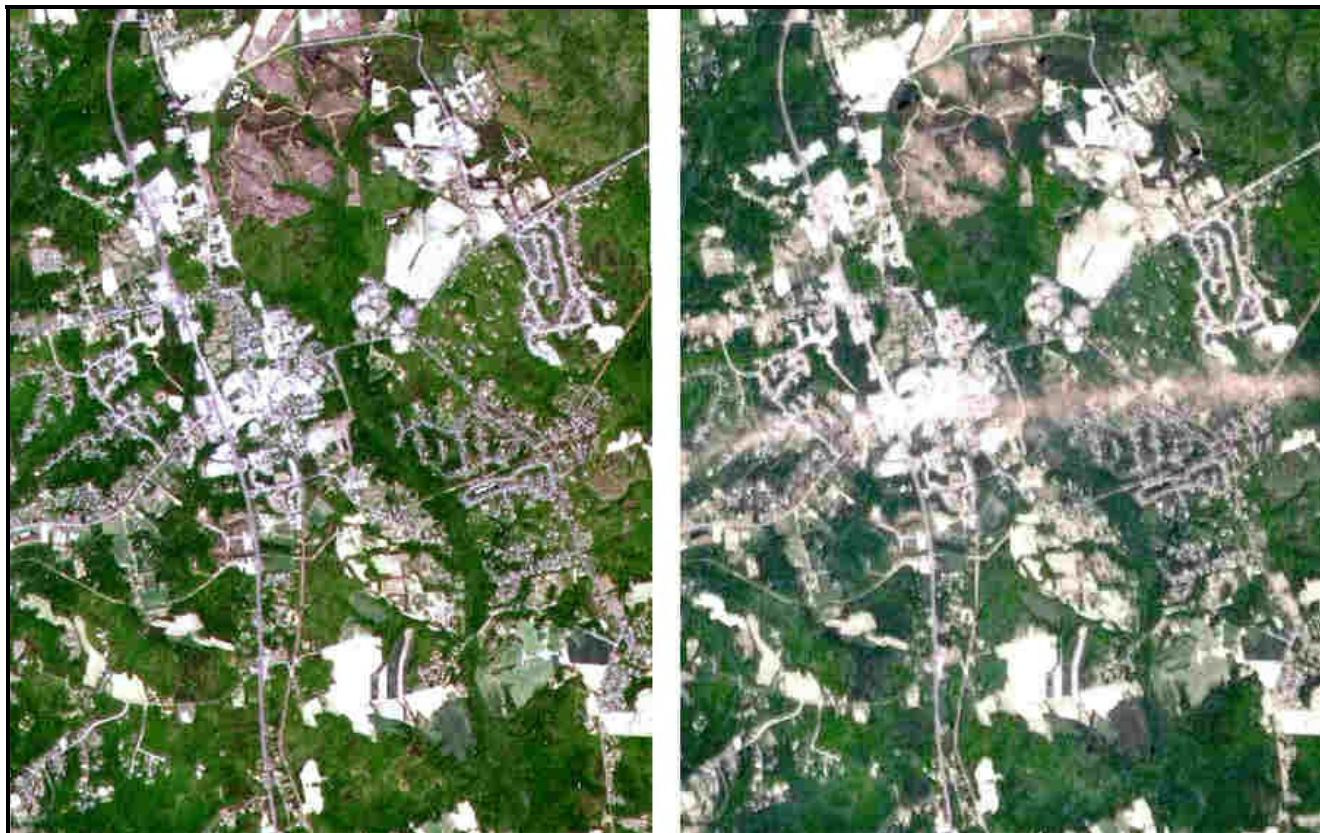
But it has become one. "We were the only hyperspectral sensor flying in space, so it was advantageous to keep us up there," says Dr. Thomas Brakke, EO-1 Mission Deputy Scientist at NASA's Goddard Space Flight Center.

Now, almost three years after it was scheduled to be de-orbited, EO-1 is still collecting valuable data about our planet's natural ecosystems. Scientists have begun more than a dozen environmental studies to take advantage of EO-1's extended mission. Topics range from mapping harmful invasive plant species to documenting the impacts of cattle grazing in Argentina to monitoring bush fires in Australia.

Not bad for a satellite in retirement.

Read about EO1 at [eo1.gsfc.nasa.gov](http://eo1.gsfc.nasa.gov). See sample EO-1 images at <http://eo1.usgs.gov/samples.php>. Budding young astronomers can learn more at [spaceplace.nasa.gov/eo1\\_1.htm](http://spaceplace.nasa.gov/eo1_1.htm).

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



These images, made from EO-1 data, are of La Plata, Maryland, before and after a tornado swept through May 1, 2002.

## THOR Meeting Minutes

Compiled by Richard Burney, Secretary

### THOR Meeting Minutes 9/7/04

**Attendance:** Richard Burney, Bruce Lee, Tony Nicklin, Denis Gilbert, Arley Davis, Jon Damme, Jeff Moon, Andrew Wimmer, Ann Beckenhauer, Ann Jones, Matt Jones, Kevin Rich, Thomas Kernes, Rick Bosworth, Barry Conner, John Kuchar, and Larry Drake .

#### **Meeting starts at 19:15.**

Current ATF issues are discussed.

Bruce built a minimum diameter rocket which will take an odd-sized 92mm M class motor; will fly this at Balls this weekend. Another search will be made for the booster section of the CSXT this Friday.

Rick Bosworth and Richard Burney talk about what went on at AIRFest.

Larry talks about the cruise he and his wife went on near Alaska.

John Kuchar is introduced to the club (Barry Conner's brother-in-law). John is building an upscale of the AeroTech Mustang.

Barry Connor shows his Level 3 project which is basically an upscaled PML Ariel. It will fly on an AeroTech M1315.

Rick Bosworth shows some damaged parachutes he got at AIRFest.

Kevin Rich talks about the finer points of "finger trapping" tubular nylon shockcord. The strength comes from the finger trapping itself and not the sewing (acts like a Chinese finger trap).

Andrew Wimmer discusses the rules for the NAR's 2005 **Team America** contest. This time it involves landing an egg loft on the ground as close to 60 seconds as possible.

Jeff Moon shows the Trumpeteer model of the Chinese Long March rocket which he hopes to do a model rocket conversion. Plans on redoing his Level 2 flight soon.

Arley shows some of the new Estes and Quest kits coming out soon. Shows some of his rockets which he's currently building.

High power launch for October to now be a two day event (16<sup>th</sup> and 17<sup>th</sup>).

Richard Burney shows the pictures he took at AIRFest using his digital camera.

#### **Meeting adjourned at 21:40.**

### THOR Meeting Minutes 10/5/04

**Attendance:** Richard Burney, Bruce Lee, Doug Buhrman, Arley Davis, Doug Holverson, Kevin Trojanowski, Ann Jones, Matt Jones, Denis Gilbert, Jon Damme, Sherri Bosworth, and Rick Bosworth.

#### **Meeting starts at 19:15.**

Yesterday's successful flight of SpaceShipOne (flight 3 into space, second and last flight needed to win the X-Prize) is discussed.

Bruce reports the ATF will be taken back to court by Tripoli and NAR as soon as this week in response to them skirting the **Propellant Actuated Device (PAD)** exemption.

Next year's LDRS (up in Canada) is briefly discussed.

Rich talks about some of our recent launches including our high power launch on the 25<sup>th</sup>. Rich talks about the need for more people to actually show up at the low power launches.

Jon talks about English to Metric conversions.

Kevin Trojanowski had the nosecone for **Lusty Corn Maiden** returned to him recently after it was found at **AIRFest**. Kevin might try flying it on an M again as soon as our launch on the 16<sup>th</sup> and 17<sup>th</sup>. Third time's the charm!

Doug Holverson talks about his trip down to Florida. Doug got to see former THOR/ORC (**Omaha Rocket Club**) president John Carroll. Doug was able to get out of the state before Hurricane Frances hit. Doug shows some of his recent rockets including a video transmitting camera rocket which he flew several times at our recent launch. Doug shows the footage he recorded from all three C6 powered flights. Nice!

Arley shows the work he has done on his PML Little Lunar Express. Arley wasn't satisfied with PML's design for mounting the fins so he took the extra effort to use epoxy, JB Weld, and PML's expanding foam to lock things solidly in place.

The now two-day launch for October will be on the 16<sup>th</sup> and 17<sup>th</sup>.

Rich shows some of his digital pictures from the launch on the 25<sup>th</sup>.

#### **Meeting adjourned at 20:55. ✦**



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

**The Heartland  
Organization of  
Rocketry**

**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 *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 one low power launch (1/4A – F class) and one high power launch (1/4A – N class) each month. Low power launches are held at the soccer fields south of 66<sup>th</sup> and Harrison in La Vista, NE. High power launches are held east of Pickrell, NE which is 30 miles south of Lincoln. THOR conducts two three-day high power rocketry events each year: **Fire on the Farm** and **Nebraska Heat**.

**THOR's Hammer...**

*THOR's Hammer* is the official newsletter of THOR. On average, it is published on a bimonthly basis. *THOR's Hammer* is available to THOR members in PDF format (via e-mail) 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) 896-2069** or toll free at **1-888-546-0396** (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  
13828 Washington Circle  
Omaha, NE 68137**

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