



# 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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January/February 2004

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Volume 11 Number 1



The last THOR high power launch of the year featured inside! From left to right: Mark Havel's *Erin's Angel*, Tom Kernes *Big Roy II*, and Kathy McGinnis' *PML AMRAAM IV*. (Richard Burney)

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**Phone Number (Local):** (402) 896-2069  
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### Internet Links of Interest

<http://www.nerocketry.org/>  
THOR's official web site. Has information on our club, launch dates, and history.

<http://spaceplace.jpl.nasa.gov/index.shtml>  
Home site for NASA's Space Place program of which THOR currently participates in.

<http://www.tripoli.org/>  
Home site for the Tripoli Rocketry Association.

<http://www.nar.org/index.html>  
Home site for the National Association of Rocketry.

<http://www.rocketryonline.com/index.cgi>  
An excellent source of model and high power rocketry related news and information.

<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 site for the K.L.O.U.D.Busters Tripoli Prefecture of the state of Kansas.

### January/February 2004 Calendar

#### January

**Event:** January Meeting.  
**When:** Tuesday the 6<sup>th</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

#### February

**Event:** February Meeting.  
**When:** Tuesday the 3<sup>rd</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Full 2004 calendar on page 9.**

**\*\*\*ATTENTION!!!\*\*\***

Just a reminder that membership dues are due for most members at the beginning of January. Either mail your check to the address on the back of the newsletter or bring it to the next meeting.

### **AeroTech Files for Chapter 11**

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

Due to the incredibly high cost of litigation against Clark County and the Clark County Fire Department, AeroTech, Inc. and its parent company, Industrial Solid Propulsion (ISP), Inc. have filed a petition for relief under Chapter 11 of the Bankruptcy Code.

The companies believe that the current operations can be profitable and that there is value in the existing business which will provide, at least, some payment to their creditors. In addition, the continued operation of the business will allow the companies to continue to provide for its customers until the business is reorganized or sold. Under Chapter 11, all current bills will be paid in the ordinary course of business. Pre-petition bills will be paid pursuant to a Plan of Reorganization.

All pending litigation will be stayed by the bankruptcy. The companies will evaluate at a later point, with creditor input, which litigation they will pursue and which litigation will be resolved without further legal proceedings. ✦

## Editor's Hammer

By Richard Burney, Secretary and Newsletter Editor

### What's in a Name?...

2004 marks the tenth year anniversary of this newsletter. Back in 1994, this newsletter was started in order to cover and promote the activities of the then newly founded **Omaha Rocket Club (ORC)**. During its first two years, it was edited by Jim Piunti; the Tripoli Nebraska Prefecture had its own informal newsletter that then Prefect Bruce Lee would usually put out before a high power launch. In 1998, both ORC and Tripoli Nebraska were brought together as a single organization – **The Heartland Organization of Rocketry (THOR)**; ORC's newsletter became the voice for this new organization.

One thing that has bugged me for quite some time has been the lack of a name for this publication. There are numerous newsletters out there that do not use a name at all and instead just use the name and/or logo of the organization on the front page. However, since many a NAR/Tripoli group does have a name for their newsletter, I figured that it was time that a name should be selected.

Starting with this issue, this newsletter from here on out will be known as **THOR's Hammer**. **THOR's Hammer** was one of the names that Tony Cochran suggested when both he and I were assembling a team for the "From the Ground Up" contest at LDRS XXII. Though Tony left the team, the name stuck. When **Rocket Challenge** was aired this past November, **THOR's Hammer** ended up getting recognition as a result of the team's members appearing in both the "From the Ground Up" contest and the Spot Landing contest. Besides the team's namesake, **THOR's Hammer** obviously has tie-ins with the club's name and the Norse god of thunder, Thor (not to mention the Marvel Comics interpretation!), so the name is perfect.

With this name change, I have even decided to rename my column, too!

### Doh!!!..

For the last several weeks, word has been flying around about the ATF's efforts to smear model rocketry as a **potential terrorist weapon** literally "going up in smoke". Here's the latest word on what happened:

*There is a rumor floating around about ATF "blowing up" a truck during the Utah tests. Most of what is being said is inaccurate. Here is what we know.*

*ATF, through the USAF, hired an independent contractor to conduct some tests. ATF purchased a number of J350, G80s and other motors for these tests. They also purchased some kits from at least 2 manufacturers. The tests, being conducted here in Utah (off I80, north of mile marker 60) have been taking place most of November through last week.*

*Supposedly, they affixed a launcher in the back of a van and were launching from the van. As to why, we can only speculate. They also had numerous reloads in the same van while launching. One of the J350s catoed and ignited the rest, burning the van to the ground. (It did not blow up, it just burned up.) So much for hired experts who supposedly should know better.*

*This, of course, begs a question: If APCP is explosive as they claim, why would they be igniting motors near other motors - with people sitting in the van? Would they have conducted tests in this manner if the materials being tested were TNT based? Hmmmm...*

### Some food for thought...

Keeping the above article in mind, I was recently watching a program on the History Channel about the 100<sup>th</sup> anniversary of Orville and Wilbur Wright's historic flight. One interesting fact that was brought up was how the Wright brothers were able to design, build, and fly their first powered airplane with about **\$1,200 of their own money**. Noted scientist and aviation pioneer Samuel Langley failed to get a flyable aircraft off the ground before the Wrights (his Aerodrome A crashed into the Potomac River just days before Wright's flight); Langley spent approximately **\$70,000 in government loans** (as in tax payer dollars) with no success.

Today, there are numerous enthusiasts/aviators who are on the verge of putting the first civilian manned and unmanned rockets to the edge of space. These people, with their well thought designs, are about to create history using a fraction of the money that either NASA or the military would use on equivalent projects. These people may be this generation's Wright brothers or Robert Goddard.

If we want this to happen, we must continue to fight for and remain supportive of the hobby of model and high power rocketry. If the Wright brothers had a government entity like the ATF breathing down their throats (imagine if the ATF made claims then like, "the 1903 Wright Flyer is a potential terrorist weapon!" or "the Wright's flyer is powered by *explosive* fuel so it must be regulated!"), how many more years would it have been before an airplane powered by a combustion engine would have taken to the air? Furthermore, instead of two **Americans** having the credit of flying the first powered airplane, would the credit have ended up to **someone of another country**?

### Redstone Reloaded...

With the 2004 calendar and other materials eating up space, I am going to have to hold off on reprinting my article that I wrote about **THOR's 1/3<sup>rd</sup> scale Mercury Redstone** that was flown at **LDRS XVIII** back in 1999. It's hard to believe that it was **five years ago** at this time that a bunch of us were plunking away at one of the largest private, civilian rockets ever built. My write up of the project originally appeared in the November 1999 issue of this newsletter (**Mercury Redstone: Project Complete**) and appeared, along with several other articles covering this project, in an issue of *High Power Rocketry* in early 2000.

Since there have been so many new faces that have joined THOR in the years that have followed, I would like to use this as an opportunity to present to them the largest project our club has tackled. It was a project that I have a lot of pride in saying that I was part of and I hope that THOR might take on a project like this once again. ✦

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

Article and pictures by Richard Burney

The 2003 flying season came to a close with the November 15<sup>th</sup> launch at the Pickrell site. For a mid-November launch, the conditions were quite good: highs in the mid to upper 50's, winds in the 5 to 10 MPH range, and a mix of clouds and sun. We were quite fortunate this past year to have had very favorable conditions at nearly all of our high power launches.

A grand total of 57 flights took place in which a total of about 68 motors were burned. The motors burned in each class were as follows: **A – 2, B – 3, C – 18, D – 3, E – 3, F – 8, G – 12, H – 2, I – 10, J – 3, K – 3.**

Rick Bosworth was the most prolific flyer of the day generating nine flights. With the exception of F and H, Rick used at least one or two motors in each class ranging from B to I. Rick's most powerful flight of the day was his scratch built *Red Rogue* which was powered by a Pro38 I285. The rocket used a reversed coupler set up. After a successful flight, the parachute got hung up inside the forward body tube due to the parachute being attached too far up the shock cord. The rocket landed hard on its side, but other than some slight damage to one of the fins the *Red Rogue* is repairable and will fly again. Rick's last flight of the day was an Estes Baby Bertha which he converted to take 29mm motors. The flight was on a G40... believe it or not, he got the rocket back!

The most powerful flight of the day went to Bruce Lee and his Nebraska Cornhusker themed *Big Red*. Bruce had configured *Big Red* to be flown at LDRS as part of the **Rocket Challenge "One Ton Drag Race"** on a seven motor cluster (one central K700 which would airstart four I340's and two I284's – nearly an equivalent to an M!). This contest was cancelled and Bruce held off on flying it until our August launch. Due to high winds, the 18 foot tall rocket and the launch pad fell over breaking the rocket in several places. After several months, Bruce finally got *Big Red* repaired and it was ready to fly again. Though the winds were not a problem this time, the length of all the extension cord caused some difficulties in igniting the rocket. Once the problem was fixed, *Big Red* finally leapt off the pad. Most of the I motors successfully lit in mid air. The flight was truly fantastic. Though *Big Red* disappeared from site, Bruce had a transmitter on board and was able to successfully find it and the rocket was recovered with out incident. Too bad things didn't go so well for the real Nebraska Cornhuskers football team which would lose to Kansas State just 30 miles away that very afternoon.

The second most powerful flight of the day went to Matt Jones. Matt was one of the first people to get their hands on Cesaroni's brand new Pro54 K660 which is nearly a full K. The rocket for the flight was his scratch built *Dunno* which he has successfully flown on numerous K's over the last three years. *Dunno* stands seven feet tall, 7.5 inches in diameter, and weighs 25 pounds. A Missile Works RRC2 was used for parachute deployment. Most of the flight went well, but the forward section was pretty badly zippered and will require some work before it flies again. Matt also had two G powered flights on two other scratch built rockets.

The other K flight of the day went to Rick Epp and his Pro54 K570 powered Yank (LOC) AIM-54 Phoenix. This was Rick's very first K flight. This Phoenix stands 57 inches tall, 5.5 inches in diameter, and weighs 20 pounds. For electronics, Rick used an adept DDCS2 and a Missile Works RRC2. The flight of Rick's Phoenix went quite well. Welcome to K power, Rick!

Two of Joe Michel's flights involved upscales of classic German themed Estes kits, Blue Bird Zero and Der Red Max. Blue Bird Zero, which was upscaled to a BT-60 tube, was flown on a cluster of three C6-5's. Der Red Max is a 2.5x upscale of the old kit and was powered by an AeroTech H210 Redline. Towards the end of powered flight, the motor chuffed resulting in the delay element being extinguished. Der Red Max lawn darted into the nearby weeds. Due to its use of PML Quantum tubing and its strong construction in general, only its nose cone was damaged. Joe also flew an Estes Fat Boy with a cluster of three C6-5's.

Some of Andrew Wimmer's flights were for the purpose of testing ideas for his entry in NAR's **Team America** program. On the first flight, Andrew flew a G64 powered AeroTech Arcas with two eggs on board. The flight went well, but the parachute got hung up. The Arcas landed in thick weeds which prevented it from being damaged (don't know about the eggs). Andrew was able to fly the Arcas again later with another two egg payload, but this time using a G80. This time the flight was successful.

Kathy McGinnis flew her AMRAAM 4 on an I211. This was Kathy's first high power flight in over three years. The flight up went well, but the rocket ended up lawn darting several hundred feet away. Kathy realized later that she had forgotten to pour in the ejection charge. Doh! Though Kathy had no more flying to do for the rest of the day, Kathy served chili, brownies, and other food and drinks to those in attendance. A special thanks goes to Kathy for performing these services for our launch.

A special thanks also goes out to all who attended the launch and helped end our flying season on a good note. ✨



Andrew Wimmer and his Aerotech Arcas which he is using to test ideas for his entry into the NAR's *Team America* Program.



*"Greetings, Mr. Gilbert!"* Denis Gilbert and his rebuilt PML Matrix... *The Matrix Reloaded!*



Liftoff on a G64. Though the parachute hung up, the Arcas was undamaged and flew again.



As Keanu "Neo" Reeves would say, *"Whoa!"* A straight up flight on an H242.



Rick Epp and his Pro54 K570 powered Yank (LOC) AIM-54 Phoenix; Rick's first K flight!



Larry "AMRAAM" Mills and his J350 powered PML AMRAAM III. How high will it go?



Liftoff!



Larry's AMRAAM reached 5,100'; nearly a mile!



Steven Sanderford and his Estes Executioner.



Bruce Lee and one of his most famous rockets, *Big Red!* For this flight, *Big Red* was flown on a cluster of a K700 which airstarted seven I's.



Liftoff on a D12-3. Steven's Executioner was flown several more times on E9's and an F39.



*"Go Big Red!!!"*

## Estes 1/10 Scale Patriot Review

Article and pictures by Joe Michel

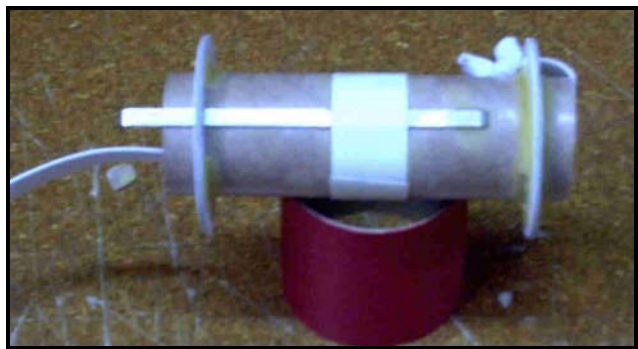
### **Brief:**

Estes Enduring Freedom M-104 (1/10 scale) Patriot.  
18MM, 12" parachute recovery.



### **Construction:**

I built the kit pretty much stock with a few exceptions. The first change involved replacing the stock shock cord with 30" of 3/8" elastic mounted through the forward centering ring. The stock shock cord is not adequate for a BT-60 sized model. Next, I replaced the 18mm motor tube with a 24mm tube. The stock centering ring was opened up with a 50-grit sanding drum to accept the 24mm tube. Last, I modified the engine hook to look like an "old-style" hook. I never liked the new style hooks, as I feel they clutter the finished look of a rocket. I just cut off the extra hook part with a Dremel, and mount the cut end in the forward position.



One thing that I did not like about this kit was the 3 separate body tubes that it came in. It adds complication and weight in my opinion. On the positive side, it makes a stronger body tube and allows you to add a payload section if you wish. The tubes were joined with 30-minute epoxy, and the motor mount was epoxied in as well. The fins were carefully cut from the sheet, and a problem was encountered. One of the fins was about .100" shorter than the other three. Not having any 3/32" balsa on hand, I had to shorten the other 3 fins to match the short one. I have never experienced this

with Estes kits before. I filled the fins with Fill 'n' finish, and mounted them to the tube with wood glue. Each fin was filleted three times. The launch lug was added just before paint.



### **Finishing:**

After the body tubes were joined, but before the fins were mounted, I skim coated the body tube with Fill'n'finish to fill the spirals and tube joints. After sanding smooth, the fins and launch lugs were added. Painting this rocket takes awhile. First I sprayed on 2 coats of primer and sanded that smooth with 400 grit paper. Next, I went 2 coats of white. Next, the tube was masked to paint the fin section red. After that, more masking to paint the yellow section up top. Finally, I masked the entire rocket except the top 1" to paint the red stripe. After all painting was complete; the entire rocket was finished with 2 coats of clear. Decals were applied after the clear coat had dried.



### **Pros of the kit:**

Looks nice when finished right  
Low cost

### **Cons of the kit:**

Wimpy, too-short shock cord  
Decals are hard to work with  
Multi-body tube construction adds complication and weight  
Die-cut fins were not cut properly

### **Conclusion:**

Rating 1-10 scale.....7

I'm a sucker for the M-104 Patriot in any form. It's one cool-looking rocket. The Estes M-104 is a low-cost, good looking kit that is durable, and even more so with a few modifications. ☺ ✦



## THOR 2004 Events Calendar

Compiled by Richard Burney, Secretary

Below is the events calendar for 2004. As the year progresses, I will continue to update the calendar to reflect all changes, additions, and/or subtractions. If you have any questions, contact either Bruce or myself.

### January

**Event:** January Meeting.  
**When:** Tuesday the 6<sup>th</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

### February

**Event:** February Meeting.  
**When:** Tuesday the 3<sup>rd</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

### March

**Event:** March Meeting and Auction.  
**When:** Tuesday the 2<sup>nd</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:** 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:** NARCON.  
**When:** Saturday the 13<sup>th</sup> through Monday the 15<sup>th</sup>.  
**Where:** Kenosha, WI.  
**Description:** NAR's annual convention.  
**For More Information:** <http://www.wooshrocketry.org/>

**Event:** High Power Launch.  
**When:** Saturday the 27<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.

### April

**Event:** Low Power Launch.  
**When:** Sunday the 4<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** April Meeting.  
**When:** Tuesday the 6<sup>th</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Fire on the Farm VII.  
**When:** Experimental day on Friday the 30<sup>th</sup>. High power commercial flying on Saturday May the 1<sup>st</sup> and Sunday the 2<sup>nd</sup>, 9:00 AM to 5:00 PM each day.

**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** TBA.  
**Description:** THOR's annual three-day, high power, spring launch.  
**For More Information:** Final details will be set by the April meeting.

### May

**Event:** May Meeting.  
**When:** Tuesday the 4<sup>th</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Low Power Launch.  
**When:** Sunday the 16<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** High Power Launch.  
**When:** Saturday the 22<sup>nd</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.

**Event:** National Sport Launch.  
**When:** Friday the 29<sup>th</sup> through Monday the 31<sup>st</sup>.  
**Where:** McGregor, TX.  
**Description:** NAR's annual sport launch.  
**For more information:** <http://aarg.org/nsi/nsi.html>

### June

**Event:** June Meeting.  
**When:** Tuesday the 1<sup>st</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Low Power Launch.  
**When:** Sunday the 6<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** Nebraska Heat VII.  
**When:** Experimental day on Friday the 18<sup>th</sup>. High power commercial flying on Saturday the 19<sup>th</sup> and Sunday the 20<sup>th</sup>, 9:00 AM to 5:00 PM each day.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** TBA.  
**Description:** THOR's annual three-day, high power, summer launch.  
**For More Information:** Final details will be set by the June meeting.

### July

**Event:** LDRS XXIII.  
**When:** High power commercial flying from Thursday the 1<sup>st</sup> through Sunday the 4<sup>th</sup>. Experimental flying on Monday the 5<sup>th</sup> and Tuesday the 6<sup>th</sup>.  
**Where:** Geneseo, NY.  
**Description:** Large and Dangerous Rocket Ships number 23! This is TRA's big, national high power launch of the year.  
**For More Information:** <http://www.ldrs23.org/>



**Rick Bosworth and his NCR Bomarc at Nebraska Heat VI. Rick's dad was involved in the Bomarc program. Also, Rick discovered that NCR used the Bomarc on display at Beale AFB as the reference for their model. (Richard Burney)**

**Event:** July Meeting.  
**When:** Tuesday the 6<sup>th</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Low Power Launch.  
**When:** Sunday the 11<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** High Power Launch.  
**When:** Saturday the 24<sup>th</sup>, 9:00 AM to 5:00 PM.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** \$5.  
**Description:** Mainly a high power event, but regular model rockets are flown, too.  
**For More Information:** Check the rocketry hotline for any delays or cancellations if weather looks questionable.

**Event:** NARAM 46.  
**When:** Saturday July 31<sup>st</sup> through Friday August 6<sup>th</sup>.  
**Where:** The Plains, VA.  
**Description:** NAR's week of model rocketry competition. Typically there is a lot of sport and some high power flying, too.  
**For More Information:** <http://www.naram.org/>

### August

**Event:** Low Power Launch.  
**When:** Sunday the 1<sup>st</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** August Meeting.  
**When:** Tuesday the 3<sup>rd</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** High Power Launch.  
**When:** Saturday the 21<sup>st</sup>, 9:00 AM to 5:00 PM.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** \$5.  
**Description:** Mainly a high power event, but regular model rockets are flown, too.  
**For More Information:** Check the rocketry hotline for any delays or cancellations if weather looks questionable.

### September

**Event:** AIRFest IX.  
**When:** High power commercial flying from Friday the 3<sup>rd</sup> through Sunday the 5<sup>th</sup>. Experimental flying on Monday the 6<sup>th</sup>.  
**Where:** Argonia, KS.  
**Description:** This is the awesome high power launch held each year by the Tripoli Kansas Prefecture. The Kloudbusters have a very excellent field to fly from and this site has been used for several LDRS's. Many members from THOR have attended the AIRFest launch in the past.  
**For More Information:** [www.kloudbusters.org/airfest.html](http://www.kloudbusters.org/airfest.html)

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

**Event:** Low Power Launch.

**When:** Sunday the 12<sup>th</sup>, Noon to ?

**Where:** La Vista Sports Complex.

**Fee:** Free.

**Description:** Low power sport flying. This is also HobbyTown's *Field of Wings* event which will be held in conjunction with our launch.

**Event:** Balls 2003

**When:** Friday the 17<sup>th</sup> through Sunday the 19<sup>th</sup>.

**Where:** Blackrock, NV.

**Description:** The big, national, experimental high power rocket launch of the year!

**For More Information:** <http://www.ahpra.org/b2k.html>

**Event:** High Power Launch.

**When:** Saturday the 25<sup>th</sup>, 9:00 AM to 5:00 PM.

**Where:** Pickrell, NE.

**Ceiling:** Our 15,000' MSL (13,650' AGL).

**Fee:** \$5.

**Description:** Mainly a high power event, but regular model rockets are flown, too.

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



**Richard Burney and his K695 Redline powered Mobile Rocket Gundam at last October's launch.**

**October**

**Event:** Low Power Launch.

**When:** Sunday the 3<sup>rd</sup>, Noon to ?

**Where:** La Vista Sports Complex.

**Fee:** Free.

**Description:** Low power sport flying.

**Event:** October Meeting.

**When:** Tuesday the 5<sup>th</sup>, 7:00 to 10:00 PM.

**Where:** La Vista Community Center.

**Event:** High Power Launch.

**When:** Saturday the 16<sup>th</sup>, 9:00 AM to 5:00 PM.

**Where:** Pickrell, NE.

**Ceiling:** 15,000' MSL (13,650' AGL).

**Fee:** \$5.

**Description:** Mainly a high power event, but regular model rockets are flown, too.

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

**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:** Mainly a high power event, but regular model rockets are flown, too.

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

**December**

**Event:** Christmas Party.

**When:** Friday the 3<sup>rd</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.

**Event:** December Meeting.

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

**Where:** La Vista Community Center. ✦

**Other Stuff**

Ky Michaelson recently passed along this picture to Bruce Lee of his latest creation: a rocket powered tricycle! It's supposed to be not only big enough for his son Buddy to ride, but also for a grown adult, too! ✦





## Musical Satellites

By Tony Phillips

If light were sound, then chemicals would play chords.

Water: C major. Cyanide: A minor. Chlorophyll: G diminished 7th. (Please note that the choice of chords here is only for the sake of illustration, and not meant to reflect the actual spectra of these chemicals.)

It's a loose metaphor, but an apt one. Musical chords are combinations of frequencies of sound (notes), while chemicals leave unique combinations of dips in the frequency spectrum of reflected light, like keys pressed on a piano. Spectrographs, machines that recognize chemicals from their "chords of light," are among the most powerful tools of modern chemistry.

Most earth-watching satellites, like the highly successful Landsat series, carry spectrographs onboard. These sensors measure the spectra of light reflected from forests, crops, cities, and lakes, yielding valuable information about our natural environment. Current satellites do this in a fairly limited way; their sensors can "hear" only a few meager notes amid the symphony of information emanating from the planet below.

EO-1 could change that. Short for "Earth Observing 1," EO-1 is an experimental NASA satellite in orbit since 2000. It's testing out a more advanced "spectrometer in the sky"-the Hyperion hyperspectral imager. How good is it? If Landsat were "chopsticks," EO-1 would be Gershwin's "Rhapsody in Blue."

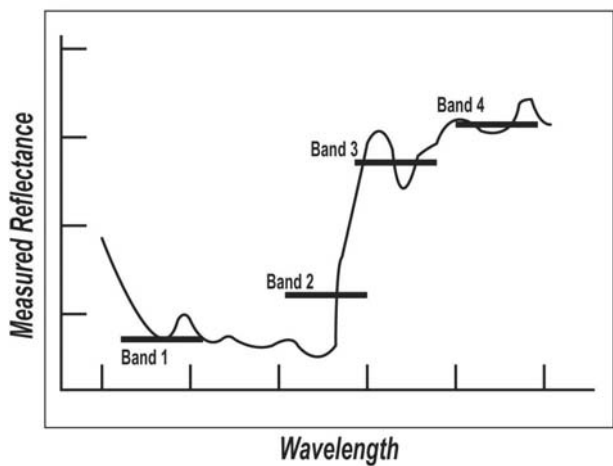
The Hyperion sensor looks at 220 frequencies in the spectrum of visible and infrared light (0.4 to 2.5 microns) reflecting off Earth's surface. Landsat, in contrast, measures only 10. Bryant Cramer, who manages the EO-1 project at the Goddard Space Flight Center, puts these numbers in perspective. "If we flew Landsat over the northeastern United States, it could readily identify a hardwood forest. But using hyperspectral techniques, you probably can . . . tell the oak trees from the maple trees."

Future earth-watching satellites may use Hyperion-like instruments to vastly improve the environmental data they provide. EO-1 is paving the way for these future missions by taking on the risk of flight-testing the sensor for the first time.

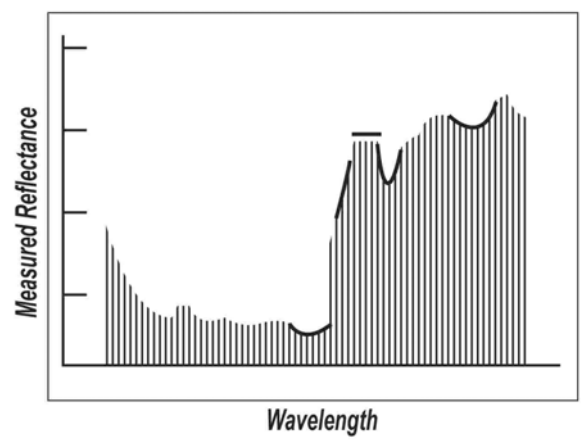
For farmers, foresters, and many others, this new remote sensing technology will surely be music to the ears.

Read about EO1 at <http://eo1.gsfc.nasa.gov>. Budding young astronomers can learn more at [http://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. ✦*



### Multispectral Imaging (few bands)



### Hyperspectral Imaging (hundreds of bands)

**Hyperion instrument distinguishes hundreds of wavelength bands, while current Landsat instrument images only a few.**

## THOR Meeting Minutes

Compiled by Richard Burney, Secretary

### THOR Meeting Minutes 11/4/03

**Attendance:** *Richard Burney, Arley Davis, Jeff Moon, Kathy McGinnis, Barry Connor, Denis Gilbert, Bill Richardson, Andrew Wimmer, George Wimmer, Jon Damme, Kevin Trojanowski, Rick Bosworth, Greg Rothman, Doug Buhrman, Bruce Lee, Doug Holverson, Larry Drake.*

#### **Meeting starts at 19:05.**

Bruce Lee shows a tape he recorded of a tour of Ky Michaelson's house back in 1998.

The subject is brought up of the **ATF** attempting to prove that high power model rockets can be used for attacking an aircraft that is taking off or landing. An ATF agent has been going around the country, under assumed names, buying high power model rocket motors and parts. The current word is that the ATF will be using these rockets and motors in the attempt to hit an unmanned drone at Hill AFB in Utah.

Several "Save Rocketry" commercials will be aired during the showings of **Rocket Challenge**. Money that was left over from this effort will be used to pay for running advertisements in Popular Mechanics/Science in order to help promote model/high power rocketry.

Deb Trojanowski gave birth to a son, Daniel, last Wednesday. Congratulations go to Deb and Kevin!

Greg Rothman passes around his pictures of his Level 3 rocket taken by Nadine Kinney at LDRS XXII.

Andrew Wimmer shows his spool rocket he built for his 4H project. Andrew talks about the progress that he and his team are making on their entry into NAR's **Team America** contest.

Bill Richardson shows a Cesaroni/Hypertek motor he recently got. Bill, along with Rich Baker, are experimenting with some PVC type material by making their own centering rings and bulk plates. Bill passes around a 4" type aluminum motor retainer that Rich Baker machined.

Barry Connor recently finished the large Estes V-2 kit and modified it for a 38mm motor mount.

Doug Holverson is looking for another job; Compaq is closing their local shop. Doug is considering the possibility of moving to Florida.

Kathy McGinnis is back for her first meeting in a long time.

Arley passes around several FlisKits rockets along with the FlisKits catalog. Arley recently got on an eBay auction a Hobby Labs SR-71 remote

controlled kit (flies on one E15). Hobby Labs is no longer in business so this kit is becoming a collector's item.

Jon Damme has some old 1960's vintage c-rails that Estes made at one time. Jon shows his Ringy Dingies rocket and the repairs job he did to it. Jon's main show-and-tell item for the evening is the ancient Estes Camroc. Besides the camera, Jon has an unopen bag of film for it and the instructions for both the camera and the two-stage Astron Delta booster for it.

The last high power launch of the year will be on November 15<sup>th</sup> with the 22<sup>nd</sup> as a backup. A low power launch is scheduled for December 7<sup>th</sup>.

Christmas party will be at Denis Gilbert's house on Friday December 5<sup>th</sup>.

The calendar is laid out for 2004.

Rich Burney is nominated and voted in to continue on as newsletter editor.

With no one else putting their bids in, all the current officer positions remain uncontested for the December election.

#### **Meeting adjourned at 21:37.**

### THOR Meeting Minutes 12/2/03

**Attendance:** *Richard Burney, Jeff Moon, Arley Davis, Kathy McGinnis, Eric Kopiasz, Larry Kopiasz, Denis Gilbert, Greg Rothman, Nathan Warner, Rick Bosworth, Kevin Trojanowski, Kevin Rich.*

#### **Meeting starts at 19:10.**

Denis Gilbert passes out maps to get to his house for the Christmas Party on Friday.

Larry Kopiasz shows some Estes and AeroTech rockets that he built recently. Nice rockets!

Kathy talks about her I211-powered AMRAAM 4 which core sampled at the last launch... forgot the ejection charge!

Arley shows some of the new designs that FlisKits has released. Arley has a number of new kits in his collection including a few paper flying saucers. Arley shows that the cone and boat tail of Estes big V-2 will fit into PML's 4"/98mm type Quantum Tubing.

Jeff Moon is thinking of building a high power scale model of the Bachem Ba 349 "Natter" German rocket interceptor. Has the Schiffer Military book on this aircraft for reference.

Rich Burney talks about his winter projects. New newsletter layout in the works!

Treasurer's Report – our account is close to broke, but incoming membership dues this month and next month will help.

With no one contesting, motion is made and passed to reelect all current officers.

#### **Meeting adjourned at 20:15. ✦**



**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), and **Ripley's Believe It Or Not** (TNT).

**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**  
**6211 South 141<sup>st</sup> St.**  
**Omaha, NE 68137**

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