THOR
The Heartland Organization of Rocketry
T.H.O.R.

May/June 2000 **VOLUME 7 NUMBER 3**

T.H.O.R. - THE HEARTLAND ORGANIZATION OF ROCKETRY 2000 Events Calendar

Monthly Meeting Schedule for late spring and early summer: Tuesday May 2nd, Tuesday June 6th, and Tuesday July 11th. As usual, each meeting will start at 7:00 PM at the La Vista Community Center.

May 6 – Pickrell High Power/Low Power and Streamer Duration Contest
Launch Coordinator ---------- Bruce Lee (402) 691-8420
Contest Coordinator ---------- Rich Burney (402) 734-2749
Description of event – High power rocket launch and streamer duration contest.

May 30 - Parachute Duration
Launch Coordinator ---------- Bruce Lee (402) 691-8420
Description of event -- This contest consist of flying modified Big Bertha rocket with a parachute on a "B" standard engine, the longest time in the air wins.

June 2,3,4 - Nebraska Heat III - Regional Launch
Launch Coordinator ---------- Bruce Lee (402) 691-8420
Description of event -- Nebraska Heat is our third yearly high powered rocket event **dedicated to the memory of Bruce Furan** to take place at Pickrell, Nebraska. Low and high powered flights welcome. June 2nd is a Experimental launch & night launch only.

June 25 - Sport Launch
Launch Coordinator ---------- Rich Burney (402) 734-2749
Description of event -- A low powered day of fun and flying. All rocketeers welcome to come and join in on the fun.

July 1,2,3,4 - LDRS XIX
Tripoli Nat'l Launch – South Carolina
Description of event -- LDRS XIX yearly national high-powered event. Tripoli annual general membership meeting and board meetings will take place during the launch. For details call (402) 691-8420.

* For Launch and activities information call T.H.O.R info line **(402) 896-2069**

* 1st prize for events is valued at no less than $10.00.
* Cost to enter contest is $1 for members $2 for non-members.

TRIPOLI NEBRASKA WEB PAGE
www.tripoli.org/tra_ne/nebraska.htm

THOR WEB PAGE
www.tripoli.org/tra_ne/THOR/thor.html

It is tra_ne, underscore

Rocketman Central

By Richard Burney, Secretary and Newsletter Editor
THOR#8, NAR# 69543, TRA# 6140

Rich Burney bids… One MILLION Dollars!…

After months of deliberation, I have decided to change the name of my column… again! For some reason, "Rocketman Files" has never sounded quite right to me. "Rocketman Central" sounds so much better and I plan on keeping this title, for now anyway!

As the intro indicates, another one of our infamous auctions has come and gone. Another Fire on the Farm has also come and gone. Unfortunately, the weather conditions were not too favorable for us. Saturday was the only day that any flying was accomplished and the two biggest flights of the day were two J flights… in comparison, the two biggest flights last year were two M flights! Though things did not go the way we wanted, it was a good time to get together with old and new friends. Some of these people we only see once a year!

Fire on the Farm III…

Because of time constraints, the detailed FOTF III article is not ready for print this issue (I haven't even started!). I do, however, have some of the major

"Mmmmf mmmm mmmmfmfm mfmm." Translated: The editor with his LOC Minie Magg *I Killed Kenny.*

factoids and a few pictures to share at this time. The article and a few more pictures will appear next month. Right now I have my doubts of this article appearing in *HPR* since the event was small and nothing really exciting happened, but we will see what happens.

Ken Uhlenkamp and members of his high school physics class aim for the Iowa skies.

There were approximately 33 people who flew a total of 69 flights. About 74 motors were burned: 2 unknowns, 2 A's, 6 B's, 8 C's, 9 D's, 2 E's, 6 F's, 12 G's, 18 H's (most motor class used), 7 I's, and 2 J's (both by Jeff Barnes). Doug Breyfogle generated the most flight (6) followed closely by Richard Burney and Ken Nafito (5 each). Jeff Barnes burned more Newton/Seconds than anyone else (@ 2,000 N/S). There were 7 Level 1 attempts; 6 of those were successful. Level 1 Certifiers were: Tom Boston, Doug Breyfogle, Ken Nafito, Jeff Shearer, Jeannie Sullivan, and Kevin Trojanowski.

Though it did not go as planned, I would like to thank all of those who participated this year. We can only hope the Nebraska Heat III launch turns out better.

Look what the Cat Dragged in…

I was one of the chosen few in the group to get the premier issue of *Extreme Rocketry* on its first mailing. After looking it over a few times, I can definitely say that the premier issue was soundly put together. Whether it be advice (suggestions for Level 1 attempts, altitude record breaking design suggestions, etc.), interviews (namely the Gary Rosenfield interview), or individual projects (the big Mars Lander upscale was the main feature), there was a pretty healthy mix of articles. The magazine is entirely glossy and in color. The magazine, for now, will be bimonthy. Brent McNeely, the magazine's editor, has indicated that if enough material becomes available for printing, *Extreme Rocketry* will become a monthly publication.

On Friday, April 28th, I received the May/June issue. The main feature is an interview with Rikki Rockett who is the drummer of the rock group *Poison* (their heyday was during the late 1980's; they finally just came out with a new album after nearly a decade of inactivity) along with the story of the rocket, *Jurassic Kick*, that he and Steve Cello built. Once again, there is a mix of articles such as the very recent Springfest 2000 launch, rocket news, and rocket advice. After these first 2 issues, I would say that future looks good for this magazine… and I'm not saying this because Mr. McNeely printed an e-mail I sent him. Yes, I have already left my own small mark on this publication! I already have plans for doing an article for *Extreme Rocketry*, but it probably will be a year or so from now before it is finished. To subscribe to the magazine or get its e-mail news service, check out www.extremerocketry.com.

The Richard Burney Chronology 1990 – 1999…

Here is the along awaited Part 2 to the Rich Burney Chronology. I know you all were sitting on the edge of your seats for the conclusion to my story (yeah, right…), so here it is.

1992

Late August – After my rockets and stuff had sat around for the last four plus years, I finally took my stuff out to do some flying one sunny afternoon. I bought the 1992 Estes catalog a few weeks later.

1993

Late May – I bought and built my first kit in five years – the Estes Sentinel. A few weeks later I took it and some of my other rockets out to do some flying. It would be two more years before I would fly again. Again, I was at

a point where I didn't know were to go with the hobby and I had nobody to share it with.

1994

July – The HobbyTown in La Vista opens with John Carroll in charge (still is today). A few months later I find out from him that he along with a few others had started a model rocket club – the Omaha Rocket Club. They were conducting group launches on Saturday mornings. Because my job at that time required me to work all Saturdays, I was unable to participate with the club at that time.

1995

April 30th – A week or so earlier, John told me about the "Aerial Days" event that ORC was participating in. I decided to check out it. The most memorable part of the day was when the four-D-motor-clustered Estes Patriot suffered a cato and careened off the hood of the Channel 6 vehicle and bounced into a few other cars (I was parked next to the Channel 6 vehicle!). I turned in my membership form to Jon Damme and the rest was history!

May – I attended my first ORC meeting. Within a few weeks, I came out to fly with the others in the group.

June – Started work on my first D powered kit – the Estes Phoenix. Jon Damme sold it to me for a good price.

July 16th – The day before I started working at Radio Engineering Industries, I did my first D powered flight!

July 29th – I attended my first Tripoli high power launch at Mt. Saint Michael near Elkhorn. This also marked the closest I've ever had to travel for a high power launch! Ever since then, it's been nothing but 200 mile plus round trips!

1996

March – I decided to throw my hat in for the then vacant vice presidency. I was voted in and retained the position until December 1997.

Mid April – At Mark Uhlenkamp's place, I flew my first E motor on my Phoenix. This was also my first composite motor.

May – This month marked the return of the bimonthly newsletter after a nearly 8 month hiatus. Ever since then, I have been a frequent contributor to the newsletter whether it be in the form of "A Word from the V.P.", "The Rocketman Files" (now retitled "Rocketman Central"), meeting minutes, "Rich Burney's Top Ten", model rocket plans, contest rules, and many other articles.

September 28th – This was the first high power launch at the Pickrell site. Nice day, but hardly anything went right for me that day!

October 19th – My first successful cluster flight – Estes Impulse powered by two D12-5's.

December 7th – I flew my first F motor in my Aerotech Arreaux at Mark Uhlenkamp's place. It was windy, but the flight was good!

1997

March 22nd – Two big events this day at Mark's place again: I flew my first G motor (Arreaux again!) and I did my first two reload flights using the 24mm F24 reload (the rocket was the Estes Shadow).

April 19th – My first 29mm reload flight – the F40 reload in my Arreaux.

May 24th – The day I became a (rocket) man! I certified Level 1 by flying my AMRAAM III on an H123. Perfect flight!

August 7th through August 10th – LDRS XVI! My first LDRS and the first time I got to see Colorado and the Rocky Mountains! Of course the big deal was the Nebraska Heat project that Tripoli Nebraska and ORC members had worked for nearly a year on. Since this was the first project of its kind of scale that I was involved with and since it was successful, too, I will always remember this project with much fondness. The last day of LDRS was the day I flew my first I motor (an I211 in my AMRAAM III).

November/December – In the January/February 1998 issue of *Sport Rocketry* magazine, an excerpt from my vice president column was printed in the NAR Section Highlights. In at least two more future issues, parts of my newsletter articles would appear in this part of the magazine.

1998

April 4th – At Fire on the Farm I, I flew my AMRAAM III on a J350 to successfully earn my Level 2 (I've said it before and I'll say it again, but that rocket sure took off like a bullet!).

July – In the July/August issue of *Sport Rocketry* and the May issue *High Power Rocketry* magazines, I had two articles in which pictures of mine appeared. *Sport Rocketry* had quickly published John Phillips' Fire on the Farm I article, and John had included a picture that I had sent him. To top it off the entire Nebraska Heat team, including myself, made the cover of *HPR*. Bruce also used quite a few of my pictures in his article about the project.

December – I was elected to the office of secretary. Going into 2000, I still hold this office.

1999

July – Both of my articles covering Fire on the Farm I and II appeared in the April issue (yep, Mr. Kelly was behind:-) of *High Power Rocketry*. Boy, was my head swelling! I also got my first successful Astrocam pictures taken and developed this month!

July 29th through August 2nd – My second LDRS! Of course the big main event was the flight of the group's 1/3rd scale Mercury Redstone on the 2nd. Though it ended in disaster, it sure was a fun project. I bought my first K motor (a K550) which should get used in 2000 sometime.

August 22nd – The first time I ever flew an altimeter in one of my rockets! I flew my new Transolve P5 in my Arreaux (I sure did a lot of firsts with that rocket!) to an altitude of 1,350 feet.

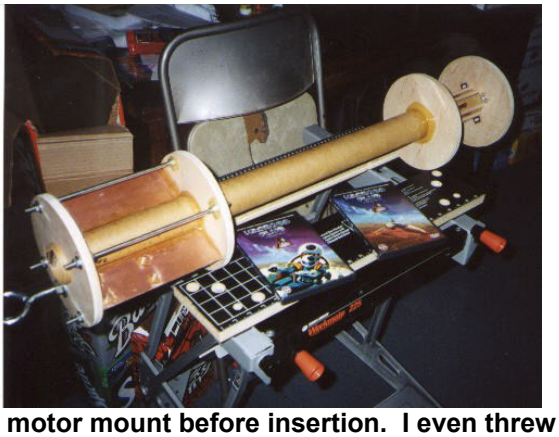
September 25th – The first time I used an altimeter for dual stage deployment. An I161 took my Final Fantasy VII to an altitude of 1,440 feet. At apogee, the drogue chutes deployed. At about 400 feet, the main chute deployed. It took about 30 minutes to unravel and repack all of the parachutes, shock cords, and pistons!

November 6th – This particular flight with my Final Fantasy VII is what I consider to be the total accumulation of all that I have learned and experienced in this hobby up to this date. Final Fantasy VII was the first rocket that I built using fiberglass in the construction and the first to be intentionally designed for altimeter-based recovery. The motor that I used was the J350, which is currently the most powerful motor that I have been using. Final Fantasy VII reached an altitude of 4,440 feet, which is the highest altitude I have recorded. Both apogee and the main charge worked perfectly and the rocket landed just a few hundred feet away. For me, this flight is the current crowning accomplishment of my last 15 years in this hobby.

Going into 2000, the main goal for me is to accomplish two successful K550 flights with my just finished *Macross Plus* rocket. I also intend on starting construction of my Level 3 rocket. I am aiming for either Fire on the Farm IV or possibly A.I.R.Fest in September 2001, but I will build this rocket at my own leisure and everything will be done perfectly. The first 15 years was just the beginning.

***Macross Plus*, The Rocket…**

As I promised, *Macross Plus* was finished (the final decals still have to be made, though) in time for it's maiden flight at FOTF III. Unfortunately, it wasn't meant to be. My next opportunity to fly this rocket and enter the realm of K power will be at the next high power launch on May 6th or at Nebraska Heat III in June. Otherwise, I may end up waiting until A.I.R.Fest 6 down at Argonia, KS in early September for a nice big field to fly it from. The desire to fly this rocket is building! After I have flown this rocket, I will be able to pursue my Level 3 Certification. There were a number of design and construction techniques I tried out on this rocket which will be applied to my Level 3 rocket.



The motor mount before insertion. I even threw in the *Macross Plus* DVD set in for scale!

I have included some pictures of *Macross Plus* from the time it was being built to the (mostly) finished product. The black fin canister and nose cone, a silver body, blue sticker material, and the four straight-edged

The virtually finished *Macross Plus* rocket.

fins give this rocket an appearance very similar to my very first model rocket kit, *The Guild Highliner*, which I bought exactly 15 years ago in May 1985. That rocket had a black plastic fin section and nose cone, a silver body tube, the stickers main font was in blue, and the fins were also straight. I just only have now realized the coincidence of all this. The finish was to pay homage to one of my favorite Japanese anime titles, but it looks like it will also be paying its respects to that very first model rocket I built and flew all those years ago.

The *Macross Plus* rocket in disassembled form.

Rich Burney bids… One Hundred BILLION Dollars!…

I can't help it, but I got Austin Powers on the brain. On a closing note, I would like to announce that by the time the next newsletter is published, I might be a resident of Syracuse which is down in Otoe county. Until I get a new e-mail address set up (Alltel appears to be the only internet provider down there), please send all e-mails and comments to my current e-mail address. I will keep everyone posted as things develop.

THOR Meeting Minutes: March/April

Compiled by Richard Burney, Secretary

THOR Meeting Minutes 3/21/00

Attendance: Bruce Lee, Rob Skiba, Matt Jones, Ann Dush, Candy Davis, Arley Davis, Dan Cramer, Wendy Weng, Richard Burney, Kathy McGinnis, Tobe Wood, Jon Damme, Dave Pares, Alex Pares, Allyson Pares, and Larry Drake.

Meeting starts at 19:15.

Saturday May 6th – a high power launch has now been scheduled for May 6th because of the February and March launches being scrubbed.

Dale Miller auction is back on the THOR web page again.

Arley demonstrates how to secure phenolic fins to PML Quantum tubing (CA is the key).

Treasurer Report – after the rent for the rest of the year was paid, the club's remaining balance is $808.74.

No NAR members allowed to fly (high power) at FOTF III since the NAR's insurance situation is up in the air (*Secretary's note: NAR's insurance situation had solidified before FOTF III so this didn't end up being an issue*).

April 12 – Our Redstone project would finally air on The Learning Channel on the April 12th showing of *Extreme Machines*.

Auction begins at 19:45. Fun by all!

Auction concludes at 20:45. Larry and Jon Damme begin figuring out who owes who what.

With no other business or subjects to discuss, meeting was adjourned at 21:30.

THOR Meeting Minutes 4/11/00

Attendance: Bruce Lee, Richard Burney, Kathy McGinnis, Jon Damme, Ken Nafito, Eric Nafito, Candy Davis, Arley Davis, Kevin Trojanowski, Larry Drake, Dave Pares, Alex Pares, and Allyson Pares.

Meeting starts at 19:20.

FOTF III – looks like the weather should hold for the weekend (*Secretary's note: well, at least it did somewhat for Saturday!*). 5 M class flights possible. 5,500 foot altitude limit for Friday and Saturday, 10,000 plus possible for Sunday. Experimental flying on Friday would run from 12:00 to 4:00.

April 12th – *Extreme Machines* would air at 7:00 and 10:00 in the evening. It would be reaired on Saturday and Sunday.

NAR has insurance again. With the new policy, all members get coverage.

Treasurer Report – THOR currently has over $963.00 in the bank.
Auction results (from March 21st)
-$82.47 (went to THOR)
-$559.25 (total amount from auction)

Arley suggests that everyone interested in going to LDRS could rent a van or bus.

Fire on the Farm Contests (sponsored by I-SOAR) – 5,000 foot, closest to the pad, nicest looking, and most energetic disassembly (*Secretary's note: to my memory, only one or two awards were handed out Saturday night due to the less than perfect conditions*).

Larry plans on going to Huntsville, Alabama. This was home to the Redstone Arsenal (where von Braun and the other German scientists worked their magic) and there is a real nice rocketry museum there (they have a Saturn V… yeah, baby!).

Bruce shows the 3"/75mm adapter he made so that he could fly Super Mario on an M1315. Shows the ALTAC altimeter bay he made for a "quickie" rocket that he made from a number of his damaged rockets (such as his NCR Patriot).

Kevin Trojanowski shows his 1.6x scale up of the classic Estes Mars Lander. It is designed to fly on 29mm motors.

Arley shows his repaired Binder Design Thug. Also shows his Rocketman Thunderchicken and his Estes Galactic Pirate Ship 7 which he spent many months working on (excellent job!).

Rich's *Macross Plus* rocket should fly on a K550 this weekend.

Meeting adjourned at 21:10.

Contest Rules for 2000

by Richard Burney

These are the general rules for the six planned contests this year. Any other specifications or rules will be left for that contest's judge to decide.

WHERE: LaVista Sports Complex south of 66th and Harrison (Egg Lofter, Big Bertha, Drag Race, Spot Landing, and Helicopter Duration). Streamer Duration is now planned to be held in conjunction with the Pickrell high power launch on May 6th.

WHEN: Egg Lofter – To be rescheduled, Streamer Duration – May 6th, Big Bertha Parachute Duration - May 30th, Drag Race – July 16th, Spot Landing – September 10th, Helicopter Duration – October 29th. Sign up between 12:00 noon and 1:00. Rain date(s) will be set if required.

ENTRY FEE: $1.00 per contest. $2.00 for nonmembers.

Construction

Streamer: Contestants may use any scratch built design or kit of their choice as long as it is a BT-50 diameter rocket (ie. the Estes Alpha). All components (ie. airframe, nose, motor, etc.) will remain together for the entire duration of flight. Streamer recovery will be utilized.

Egg Lofter: Contestants may use any scratch built design or kit of their choice. I believe in the past we have used either Grade A or Grade B hens eggs. All components will remain together for the entire duration of flight. Parachute rcovery will be used (unless you want a mess...).

Parachute: The kit that will be used will be the Estes Big Bertha. Externally, the contestants' Big Berthas must maintain its original dimensions and shape. A boat tail and/or adding an airfoil is permitted. All components will remain together for the entire duration of flight. One or more parachutes may be used.

Drag Race: Contestants may use any rocket and recovery system of their choice. All components will remain together for the entire duration of flight.

Spot Landing: Contestants may use any rocket and recovery system of their choice. All components will remain together for the entire duration of flight.

Helicopter: Contestants may use any scratch built design or kit of their choice. All components will remain together for the entire duration of flight. The rocket must be designed to recover like a helicopter.

Motor Requirements

Streamer: A class impulse (2.5 Newtons) or less.

Egg Lofter: C class impulse (10 Newtons) or less.

Parachute: B class impulse (5 Newtons).

Drag Race: D class impulse (20 Newtons) or less.

Spot Landing: D class impulse (20 Newtons) or less.

Helicopter: C class impulse (10 Newtons) or less.

Flight Requirements (Streamer, Egg Lofter, Parachute, and Helicopter)

1. Three flights will be required. Each contestant may have a backup rocket in case their original entry is too damaged or lost.

2. Each flight will be timed from moment of takeoff to touchdown. Timing will stop if the rocket lands in a tree, lands on a building, or simply disappears from sight.

3. At least one timer will be used.

4. All three flights will be averaged. For each flight that is disqualified or not flown, a "0" time will be averaged in. Grounds for a disqualified flight would include a cato or if a part of the rocket (such as the motor or nose cone) comes down separately.

5. Contestant with the highest average will be declared the winner.

Flight Requirements (Drag Race)

1. Contest will run in a tournament style. The winner of each heat will go to the next round until there is a final winner.

2. Points will be given on three grounds: 1 point for first off the pad, 1 point for lowest apogee, and 1 point for

longest duration. The contestant with 2 or more points is the winner.

3. Grounds for a disqualified flight would include a cato or if a part of the rocket (such as the motor or nose cone) comes down seperately.

Flight Requirements (Spot Landing)

1. Contestants will attempt to land 1 rocket as near to a premarked spot as possible. Contestant's rocket who is closest to the spot wins.

2. If part of the rocket separates or a cato happens, a retry will be allowed if contestant so desires.

Prizes

1. Prizes will be determined at a meeting before each contest.

2. If enough prizes are available, a prize will be given to the runner-up(s).

Redstone Analysis

Editor's note: This e-mail was originally sent to Bruce Kelly. Bruce Lee has subsequently contacted Mr. Grant and thanked him for his analysis.

Bruce,

Sorry, I note a number of spelling(typos) in my original mail to you. Comes from typing on a bumpy aircraft. So here is a less embarrassing version.

Perhaps you can get my mail to one of the members of the recent Redstone rocket project. I am an engineer(PhD) that has been engaged in explosives, including bomb analysis, and rocketry for 34 years. I have designed some of the rockets used routinely at Cape Canaveral etc.

There are some great pictures in the recent publication about this huge Redstone scale project. It was(is) an immense undertaking. In fact it has similarities to how many large scale engineering projects are done. That is with many small groups working independently.

There are a couple of opportunities to learn from their experience. I'd like to offer my comments. Bear in mind I'm relying heavily on experience since my only exposure to this project comes from the pages of HPR.

1) The failure. I have looked at hundreds of canister explosions. While the detonations seem wild and out of control there are a surprisingly small number of "types" of progression. The offered explanation of metal failure in the Redstone rocket is not consistent with the pictures shown. I think you should consider an alternative.

As mentioned in the article, the motor was designed to fail with aft separation and directed gases. In the case of container failure(as with a flaw in the casing) there is uniform pressure in the vessel and a weak spot yields. This causes a pattern of gas escape and tearing of the canister along a weak line originating at a weak spot. Thus while things seem to happen very fast, in actuality there is escape of high pressure gas; but NOT a detonation.

One thing about fast burning materials and explosives is that you can form a shock wave in or out of a chamber. A small amount of plastic explosive, for example, can be shaped into a triangle with an air gap and the pressure in gap will be 600 times the usual (this is called ashaped charge). This effect is used to allow "cutting" of supports during a building demolition.

If the fuel in the rocket motor were to crack and then settle it would form just such a shaped charge. The fuel would in fact detonate in that small region. You can also think of this as a binder failure. The resulting explosion would originate at the site and progress outward at supersonic velocity. With this speed and direction only a small tear is required and the edges are bent away. The metal crystals shear off regardless of "weak" spots. It is most common for the canister tear to be triangular in a flat surface or S shaped in a cylinder. The smoke and debris are dispersed laterally and the cloud(smoke and debris) is fairly symmetrical.

This is what is shown in the pictures in HPR. I really think the team should consider that the rocket motor got bumped or went through a thermal cycle and there was damage to the fuel. By the way this has been on off the most common motor failures, especially during the time period when the real Redstone was developed. (Watch "October Sky" where the FX guys deliberately put a styrofoam peanut in the powder fuel, to make it "pop") This failure looks like a detonation to me, not a pressure rupture.

2) When using task teams -- test everything independently. This is hard and can be expensive; but the team that builds the recovery system needs to drop it from an airplane to confirm their part works. The engine should be reloadable and should be fired on a rigid test stand. Not easy with the forces of this big motor; but confirms the welds and gas flow ….

Electronics should be tested while the receiver is at long range and moving. RC -type control has a problem with rockets. The probes I designed to be launched towards thunderstorms refused to respond to radio signals. This was because of the paint. It was an insulator and as the rocket moved at high speed in electrified air it developed an electrostatic shield to the radio signals. Launches in a desert might also have problems. SO, test test test. Send the electronics ONLY up in a smaller rocket and test their actions.

Compared with one-team-does-all, the multi-team approach requires 5x the amount of testing.

I hope the team(s) are not too discouraged. They need to try again.

M Grant

CLUB OFFICERS

PRESIDENT
Bruce Lee
(402) 691-8420
Email: bruce.lee@tripoli.org

VICE PRESIDENT
Lyle Woodrum
(402) 334-8040
Email: lylejwoodrum@prodigy.net

TREASURER
Larry Drake
(402) 895-1583
Email: LarryDrake@tconl.com

SECRETARY
Richard Burney
(402) 734-2749
Email: rcburney@juno.com

NEWSLETTER EDITOR
Richard Burney

TRIPOLI NEBRASKA PREFECT
Mark Uhlenkamp (Iowa)
712-663-4521
Email: marku@netins.net

NAR SECTION 562 Leader
Arley Davis
(402) 346-7566
Email: arleydavis@uswest.net

The Heartland Organization of Rocketry ("THOR") is an officially sanctioned section, #562, of the National Association of Rocketry (NAR).

Tripoli Nebraska #46 is an official Prefecture of the Tripoli Rocketry Association, Inc.

If you are interested in joining The Heartland Organization of Rocketry (T.H.O.R.) simply fill out an application and mail it to:

T.H.O.R.
6211 South 141 St.
Omaha, NE 68137

Meetings are held the first Tuesday of each month, 7:00PM at the LaVista Community Center at 8116 Parkview St, La Vista NE (turn east at the Sinclair Gas Station on 84th St.). Visitors are welcome to attend. For club launch time, launch location or general information call The Heartland Organization of Rocketry at 402-896-2069. THOR strictly follows the safety guidelines set for by the National Association of Rocketry and Tripoli Rocketry Association, Inc.

For more information call The Heartland Organization of Rocketry at **402-896-2069** and leave a voice mail that will be returned in a few days.

T.H.O.R Membership Application

Personal information

Name:_____

Address:_____

City:_____

State:_____ Zip Code:_____

Phone Number:_____

Email Address:_____

Hobby information

How long have you been involved in Rocketry?_____

Are you a member of a national Rocketry Organization:
NAR#_____ TRA#_____ NERO#_____

Rates (1/2 year memberships divide by 2 and add $1)
Family membership - $36
Senior (18 and up) - $24
Junior (under 18) - $12
Correspondence - $10
(people over 50 miles from Omaha)
Newsletter only - $6
(6 issues per year)

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

I agree to comply with the THOR policies as pertains to the safety guidelines set forth by the NAR and Tripoli. Failure to do so is grounds for expulsion.

Signature_____

Dated:_____