MASA Planet

Volume 8, Issue 4 **Team America** **July 2005**

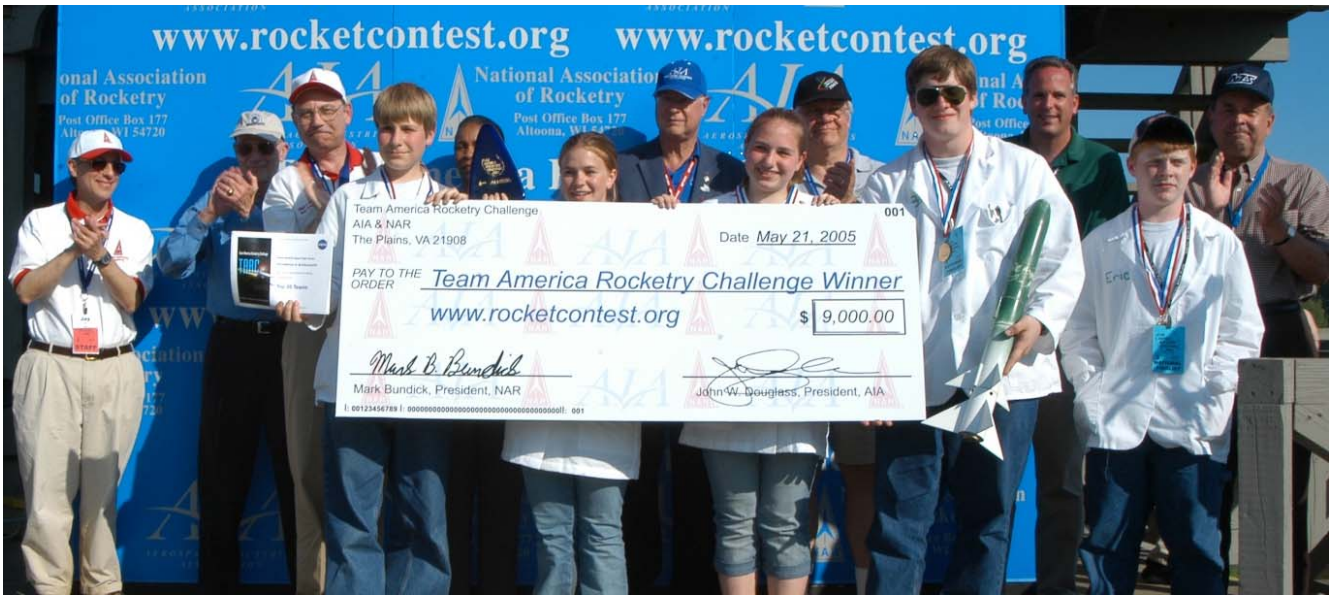
Superstars!

Dakota County 4-H is TARC Champion

Near-perfect score beats 99 other finalists

Mary Duncomb
University of Minnesota Extension Service

On May 21 at Great Meadow in The Plains, Va., the top 100 Team America Rocketry Challenge (TARC) teams competed in a national championship and the world's largest model rocket contest. The team representing the Dakota County 4-H Aerospace project from Farmington, Minnesota attained a nearly perfect score to beat out 99 other squads.



www.rocketcontest.org

Dakota County 4-H Team poses with the winning check at the TARC 2005 finals.

The team members are as follows: Eric Eide, son of Carol and Mark Eide of Farmington, is a homeschooled eighth grader, and is a member of the Bright Stars 4-H Club. Joe Kamen, a seventh grader and T.J. Kamen, a ninth grader, both at Farmington Middle Schools; are the sons of Lisa and Don Kamen of Farmington, and are members of the Empire Rockets 4-H Club. Julia Nelson, a seventh grader at Northfield Middle School, and Nicole Nelson, a ninth grader at Northfield High School; are the daughters of Mark E. and Lyn Nelson of Farmington, and are members of the Bright Stars 4-H Club. Ben Pangerl, son

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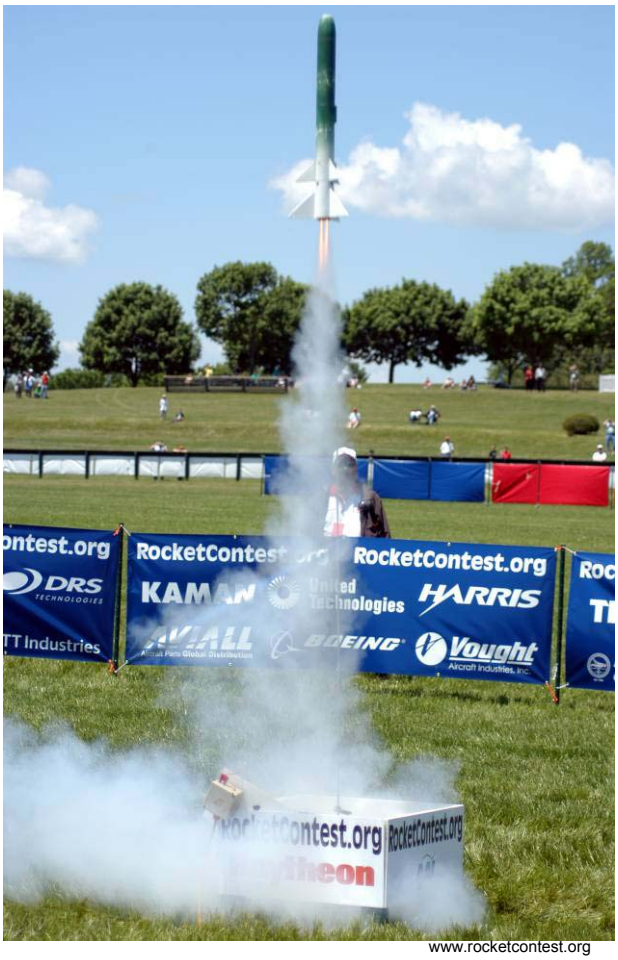
of Russ and Gwen Pangerl of Hastings, is a tenth grader at Trinity at River Ridge, and is a member of the Klover Klub 4-H Club.

Initially almost 10,000 teens from 49 states competed regionally in preliminary rounds. More than 500 middle



www.rocketcontest.org

Lift-off of the winning flight!

and high school students from 27 states qualified for the competition held at Great Meadow, a picturesque steeplechase racecourse outside of Washington DC, to vie for the title. The third annual contest included a total prizes of $60,000 in savings bonds and cash. The Dakota County 4-H team was the only 4-H team to qualify, and won $9,000 for their efforts.

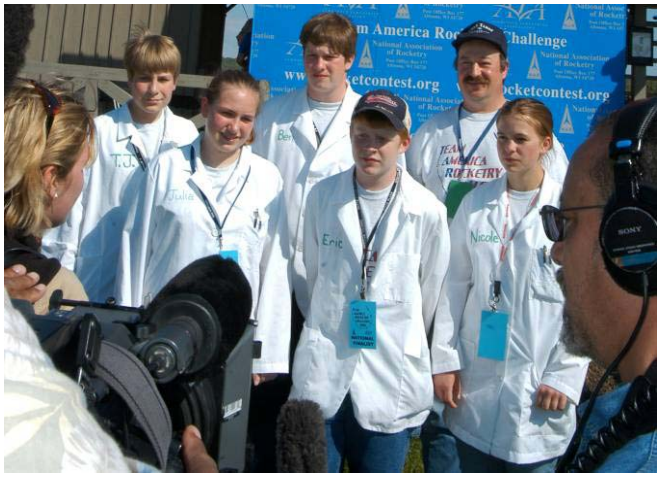
This year's competition tasked students with launching a one- or two-stage rocket and having it fly for exactly 60 seconds. The payload of one or two raw eggs must return safely to the earth without being broken. Each flight received a score according to performance and weighted for the number of stages and eggs. The team

www.rocketcontest.org

The chase is on!

launched its rocket and had it safely return to earth in 59.94 seconds, rounded to just 1/10 of a second from the target time of 60 seconds. It also returned the payload of two raw eggs safely, with no cracks.

What makes this feat even more amazing is that this is the first year of competition for the team, who range in



www.rocketcontest.org

The press crowds around the winning team and Mentor and MASA member Mark Nelson (at rear).

ages from 13 to 16 and attend six different schools. They designed, built, and tested their model rocket without their team advisor, Mark E. Nelson who is an engineer, stepping in. According to Pangerl, the most difficult problem to overcome was organizing and

Dakota County 4-H wins TARC, continued on page 4

MEETING SCHEDULE

SATURDAY, JULY 16
MASA Summer Picnic!
Location: Otsego
Time: 11 AM to 8 PM

THURSDAY, AUGUST 4
Location: Science Museum of Minnesota
Time: 7 PM to 9 PM
Topic: Paper Rocket construction (Stuart Lenz)

THURSDAY, SEPTEMBER 1
Location: Science Museum of Minnesota
Time: 7 PM to 9 PM
Topic: NARAM Highlights (NARAM attendees)

LAUNCH SCHEDULE

NOTE: TIMES AND LOCATIONS SUBJECT TO CHANGE! CHECK THE WEB SITE FOR UPDATES

SATURDAY, JULY 16
MASA Summer Picnic!
Location: Otsego
Time: 11 AM to 5 PM

SATURDAY, JULY 23
Location: Elk River
Time: 9 AM to 4 PM
Theme: MASA's Annual Scale event!

SATURDAY, JULY 30 THROUGH FRIDAY, AUGUST 5
NARAM-47
Location: West Chester, OH
Time: All rockets, all the time!
Info: http://www.naram.org/

SATURDAY, AUGUST 27
Location: Nowthen
Time: 9 AM to 4 PM
Theme: MASA's Annual UFO Drag Race!

SATURDAY, SEPTEMBER 24
Location: Nowthen
Time: 9 AM to 3 PM
Theme: Clusters!

Bill Dauphin

Sunrise on the morning of the TARC Finals.

President's Corner

Summer Fun!

We are now in the busy time of the flying season. The June launch went well.

We had excellent weather and a great turn out. We are starting to take advantage more of our new field. About 16 G motor flights and one H flight were flown that day. That's the most G and H flights since 2003!

So far we haven't had any rockets over 3.3 lbs yet, but I'm sure that there are some under construction. But remember that our waiver is for 4500 feet AGL.

We do have a "special launch window" option in our waiver. If someone has a rocket that is expected to go higher than 4500 feet AGL and yet can be recovered safely on the field (read dual deployment). I'll need about a 70 day notice of when you want to fly it, so I can get the paperwork rolling with the FAA and MSP ATC.

Hopefully our request would be approved for a narrow one hour flight window.

NARAM 47 is coming within just a couple weeks. This year NARAM is hosted by QUARK in Cincinnati, Ohio. Several MASA members are planning on attending.

*[At last report, Alan Estenson, Ted Cochran, Seth Cochran, and fearless leader President Mike Erpelding were on this list --E*d.]

It should be a lot of fun for all. As I'm typing this, I'm surrounded by several projects on the table in various stages of completion for NARAM. It is a good point to make that the most important part about competition rocketry is having fun. If you don't have a model for every event, that's okay. It should be more about the experience of a national event, than having to win. There should be lots of great stories to be told when we return....

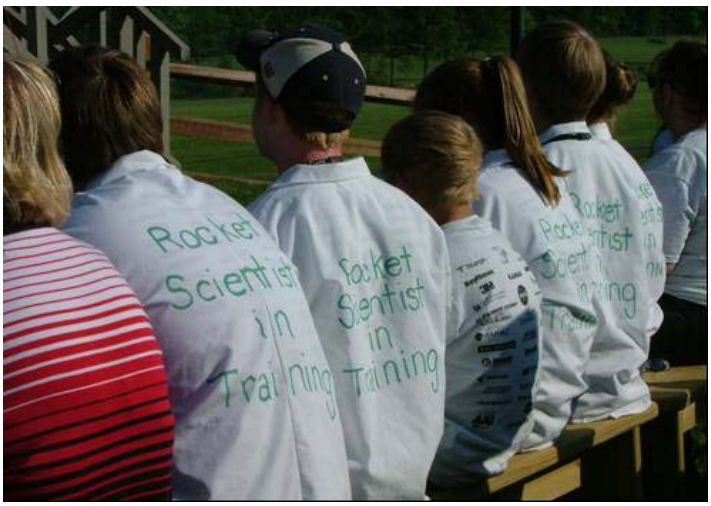
Take care,

Mike Erpelding, NAR # 79922
MASA President

Dakota County 4-H wins TARC, continued from page 2

prioritizing the rocket building and test flights among multiple school district schedules.

According to Mark Nelson, "Participants apply concepts of physics like thrust, drag, and acceleration, then see the results immediately," he said. "There's a deep satisfaction in knowing things you learned are helping launch something into the sky." He noted that prior to the launch, the team had noticed a few hawks circling above the launch area at Great Meadow, and



Dakota County 4-H

Waiting for the trophy.

they watched the birds ride the air currents. Because the 4-H Aerospace youth have the opportunity to glide with trained pilots at the Stanton Airport each summer, they understood that the sun heats the ground and the air causing thermals, rising air currents; the team then made the decision to add extra weight to their rocket prior to the flight to ensure that it came back down when it should. The decision paid off as the first-year team attained a nearly perfect score, and ended up taking home the victory crown.

Aerospace Industries Association (AIA) President and CEO John W. Douglass said that the contest is a golden opportunity for colleges to recruit high school students for aerospace engineering studies. "All 100 teams showed amazing cooperation and knowledge and should be very proud of their accomplishment," he said, "The next generation of aerospace engineers--the ones who will develop spacecraft with advanced chemical propulsion and plasma solar sail technologies--will be cutting their teeth on these model rockets. We expect to see many of these young people in our aerospace companies in the future, perhaps helping launch actual rockets into space."

TARC is sponsored by AIA and the National Association of Rocketry in partnership with NASA, theAmerican Association of Physics Teachers, and the 34 AIA member companies. The goal is to promote aerospace to students to attract more young people to careers in the industry. In addition to the savings bonds and cash provided by the sponsors, NASA also provides top-performing teams with grants for students to build more advanced rockets and for coaches to attend workshops and meet space program engineers.

4-H is the youth education branch of the Cooperative Extension Service, a program of the United States Department of Agriculture (USDA). The cornerstone of this cooperative venture is the relationships between the Federal, State, and County Governments. As a public program, brought to Minnesotans through the University of Minnesota Extension Service, 4-H teaches knowledge and life skills to enhance the quality of life and creates opportunities to promote positive youth development, delivering value for the public investment. This makes 4-H different in many respects from other youth development organizations.

4-H is open to all youth ages 5 to 19 and is the largest out-of-school youth program in the US. Whether you're from the city or the country, 4-H has opportunities in aerospace, technology, and more. Pictured below is a 2004 4-H Aerospace Adventure beginners workshop.

Dakota County 4-H

4-H Adventure Beginners workshop: Future TARC winners?

Road Trip

Hope Christian Academy Wins Fourth Place at TARC 2005

Or, rain, rain, go away, come again another day...

Art Gibbens

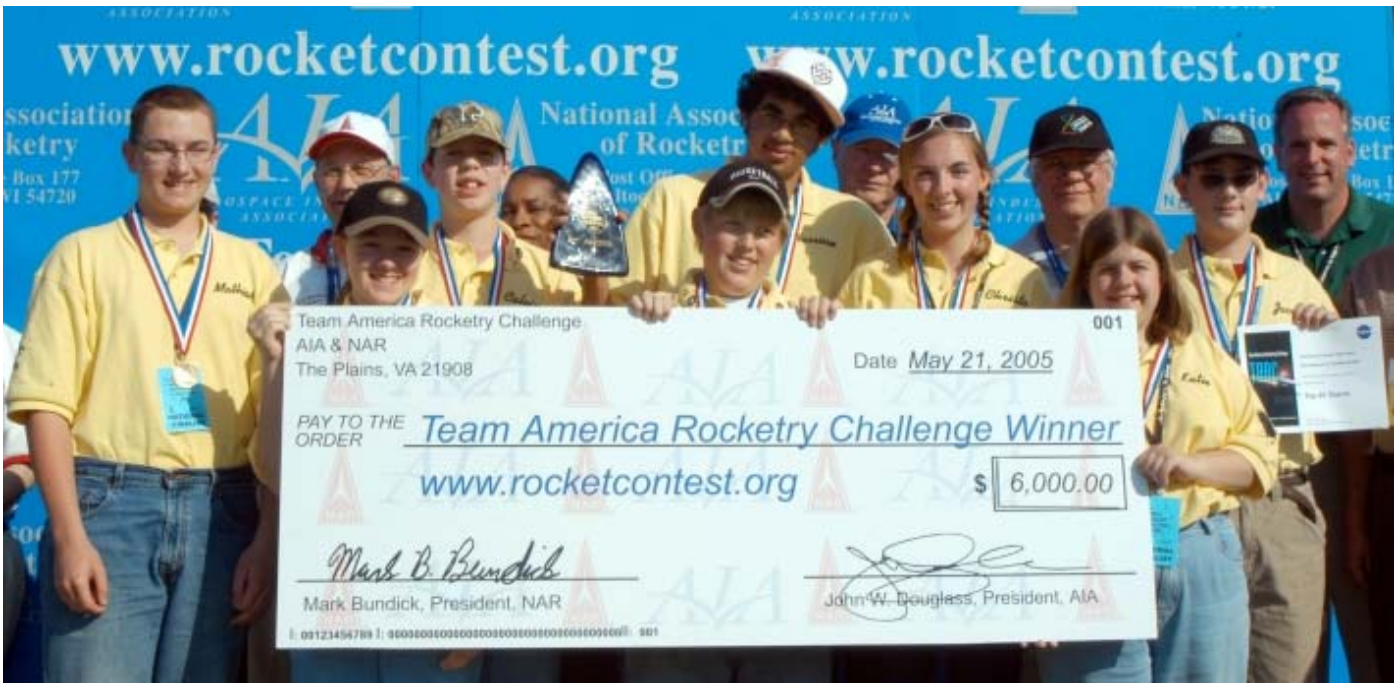
Hope Christian Academy Team #3081 left the front of their school at about 9:15 am on Wednesday, May 18th in a downpour. We started packing the van with the canopy and suitcases around 8:30 am, and within minutes we were all soaked to the skin. After opening exercises in the common room at the academy, we all put back on our wet jackets and headed for the van. With most of the school wishing us well and the parents taking pictures as we left, we hit the road.

Our overnight destination was Bloomington, IL, about 8 hours away. It rained just about the entire time we were headed there. That night after supper the students were able to get out and throw a football (with fins) around the backyard of the home we were staying in. Only their feet were soaked when they came in.

The next morning we load the van in a sprinkling rain and head for Manassas, VA. Rain and more rain; going across eastern Ohio we got deluged. Then into western PA where there was construction and we really lost time. We called the hotel to let them know that we are going to be really late. We didn't get in until just before 10:00 pm eastern daylight time. We unload the van in the rain.

Our itinerary included the Air and Space Museum of the Smithsonian on the National Mall on Friday. We drove to the nearest Metro Rail Station to do the park and ride thing, in the rain. We get our tickets and hop the train, riding into downtown. We strike up a conversation with a lady who is surprised to hear about the competition. She shares that it's supposed to rain all day. Sure enough, we get out of the tunnel on the National Mall and it's raining with about 20 mph winds. The umbrellas are just about useless. By the time we walk the half to three quarters of a mile to the museum we are soaked through - again. We're seriously thinking of making a duck or frog our mascot.

The Air and Space Museum is fantabulous! 29 years ago I went to Washington, DC for my high school senior trip and it wasn't open yet. We could only go into the entry way about 10 feet to see some of the planes hanging from the ceiling, the X-15 and the Spirit of St. Louis being the most famous. However, this time we break up into groups and drink deep the draughts of history left there for us to enjoy. Did you know that

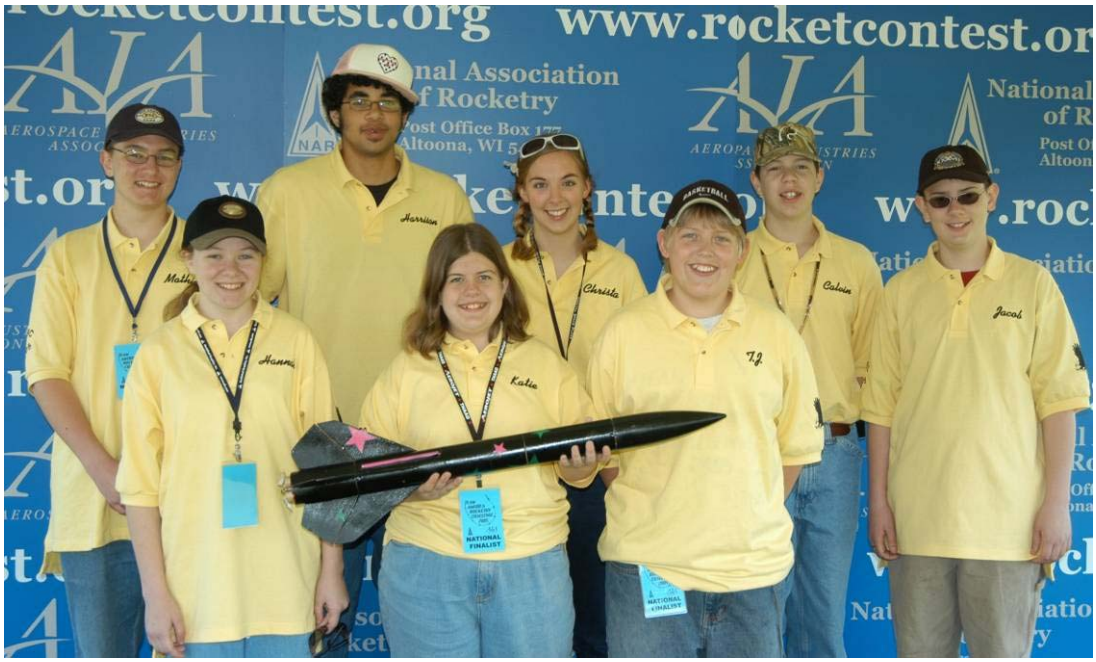


Rocketcontest.org

Mathias Gibbens, Hannah Gibbens, Calvin Schleich, T.J. Smith, Harrison Samuels, Christa Krussow, Katie Ross, and Jacob Miller display their winnings for Fourth Place at TARC 2005.

there were 530,000 people involved in the Apollo program? Or that there is no wire longer than two feet in a Cray Super Computer that has over 66 miles of wire in it? Or that Mylar was invented to stop micro-meteors from penetrating spacesuits while astronauts wore them outside of a space capsule? There is just so much interesting stuff to try to take in on one morning. I barely made it to the airplanes, catching only the Wright Brothers history exhibit.

We leave the museum around 1:15 pm to catch the train back to our van so we can make it to the movie theatre to catch the new Star Wars movie, Revenge of the Sith. It's still raining, but not as hard and the winds have died down a bit. We get in the van, in the rain, and head for the highway. Now we encounter stop and go traffic because of the rain on a Friday afternoon.



Rocketcontest.org

Ready.....

We get to the theatre in time for the 3:15 pm showing, but not with enough time to get any lunch beforehand. We buy some popcorn to tide us over. The movie is done and we head back to the hotel to put on some dry clothes and get freshened up before the meeting at the high school where we get all the last minute instructions.

On the way to the meeting we swing into a McDonald's and get some burgers, in the rain. We get to the high school and I drop them off as close to the door as possible because it is still spritzing. After the meeting, (where we meet the Dakota County 4-H Team for the first time because they sat right behind us), we head to Pizza Hut and eat lunch and supper combined. The rain has finally stopped and the pavement is actually drying out in some places, but the clouds are still overhead looking thick and menacing. Some of the students head over to Wal-Mart to kill some time Friday night and buy some light sabers. They're a hoot.

At the meeting, we're told that the forecast on Saturday is blue skies and winds out of the North up to 15 mph. We're looking forward to the reprieve. Sure enough, we wake up and look out of our windows to an almost perfect day to fly rockets. We get to the field about 8:15 am, allowing enough time for us to stake out a decent sight line for setting up our shade canopy before the team has to go into the preparation area. When we get there, there is almost no wind, but by 9:00 am for first flights the flags are flapping nicely already. The wind would be steady for most of the day.

We flew in the third round of teams at 11:00 am. The time to beat for the day was already posted at .2 and there was a .7 posted as well for second. I was pretty confident in the teams' ability to make calculations to get them as close to 0 as they could. Mentors and chaperones have to stay outside the preparation and flight area just watching and waiting. I could see that they were ready to fly because of their raised paddle. The launch was again picture perfect! I timed them from the observer's area with my stopwatch and got a time of 1.00.38. The NAR guy next to me got 1.01.17. I was extremely happy at this point. Now to make sure we had two intact eggs. Then I saw my team jumping around like beans because

Mathias Gibbens

Set.....

they found out that they did have intact eggs! More extreme happiness! Now we had to wait for the official posting from the official timers. 1.1, good for third, yes!!!

Half the field has flown to this point and now Dave (parent/chaperone) and I time only those teams that fly a two staged rocket, knowing that single staged rockets have a 3 point deficit to start with and they can't knock us out of third. Then the Farmington 4-Hers fly near the end of the first round in the afternoon and I time them with a 59.78. Knowing that the official timers were a tad slower than my time of our team, I suspect that they may get second. And then the .1 gets posted. We're now in fourth and they have first place. It's a great day for Minnesota fliers with much rejoicing in our sector of the spectator area!

Apple Valley had drawn the last contestant round to fly in and they had a motor CATO in their booster. This allows them to refly immediately in the last make up round when any of the teams that earned a reflight could fly. As it was, they are the only team that gets back to the pads in time to try to refly. This time the payload section pops off during staging causing the second stage to fly erratically. However, the eggs remain intact and they post a score of 39.1, tying for 75th, beating out 24 other teams.

And as we wait for the final teams' official scores to be posted on the scoreboard our excitement builds because a red dot gets placed next to our name and score. This means that our team has won an additional trophy, but we won't know until it is announced from

GO! (Mentorand MASA member Art Gibbens is at left).

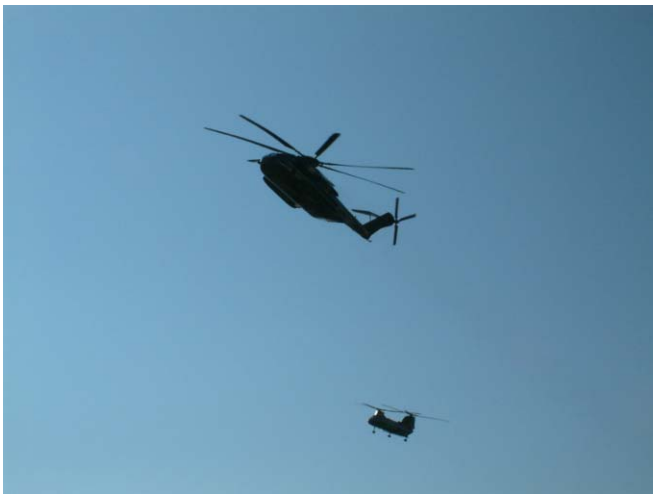
Mathias Gibbens

the podium what it is. So at the beginning of the trophy presentation time our team discovers that it gets an additional plaque for having the best parachute. It really is cool. Each of the students had their hand outlined on it and then there was some silver "waves/droplets" drawn between the hands. This is on an orange parachute. Psalm 115:1 was also put on by calligraphy around the outer edge.

All top ten teams posted scores 2.7 or lower. 43 teams had scores under 10. The lightest two-stage rocket with a qualifying score weighed in at 280 grams, the heaviest was 1498 grams. There were 9 single staged rockets in the mix as well. It really was a potpourri of rockets all trying to complete the same objective.

We get up early on Sunday morning to take advantage of the Continental Breakfast offered at our hotel and then load the van. It's only a few hours along the road before we run into more rain. Thankfully, it's not near as long lasting or as intensive. Our final day of travel we also experienced some more rain, but were able to drive out of it. We arrived back home with clouds in the sky, but no rain. All four travel days and our field trip day had rain in them. The only rain free day was on the day of the contest, for which we were thankful.

All in all, a very memorable and rewarding trip for the students and chaperones. We're looking forward to next year's challenge with enthusiasm.



Bill Dauphin

Marine helicopter flyover at beginning of TARC Finals.

Road Trip

MASA Outreach, 2004-5

Promoting rocketry, one kid at a time

Ted Cochran

Here's a complete-as-we-can-make-it list of outreach activities that MASA members completed in the contest year just ending. Everyone reach around and pat yourselves on the back!

7/16/04	GSA Jamboree Build
7/17/04	GSA Jamboree Launch
8/30-31/04	Minnesota State Fair 4H Aerospace judging
10/7/04	Minnesota Science Museum Exhibit/Launch
10/28/04	Cub Scouts Pack 73 talk & Build
10/2004	Richmond Thundering Herd 4-H briefing
11/13/04	GSA Winter Encampment build and launch
11/15/04	Hope Christian Academy
1/20/05	Lego League Tournament exhibit
1/29/05	Stearns County 4-H Build
2/24/05	Lockheed Martin talk
3/4/05	Marscon exhibit,
3/5/05	Marscon exhibit
3/12/05	NARCON talk: Parachutes
3/12/05	NARCON talk: TARC
3/12/05	NARCON talk: GSE
3/12/05	NARCON talk: GSE II
3/19/05	Hope Christian Academy TARC Qualifying
4/?/05	BSA Troop 294 Build and Launch
4/8/05	U of M CanSat Launch
4/10/05	TARC Qualifying attempt launch--Apple Valley
4/10/05	TARC Qualifying attempt launch--River Falls, WI
4/23/05	Washington County 4H club Build
4/30/05	Stearns County 4H Club build
5/11/05	Kimball High School GSE build
5/13/05	Westwood Elementary School Build
5/17/05	Cub Scout build Kutzke
5/26/05	Bethune Rocket League Launch
5/26/05	Cub Scout Launch
6/1/05	Park Terrace Elementary School Launch
6/3/05	Westwood Elementary School Launch
6/6/05	Anwatin Rocket League Launch
6/7/05	Pillsbury Rocket League Launch
6/9/05	4H Club Launch
6/13/05	BSA Troop 567 Talk

TARC Mentors:
Andover High School, Apple Valley High School, Dakota County 4H, Eagle Ridge Jr High School, Hope Christian Academy, Kimball High School, River Falls High School

TARC Qualification Flight Observation trips/launches:
(not otherwise listed above) Jordan Park School, Kimball HS, Oak View Middle School, Dakota County 4H

News Coverage
HCA TARC Team South Washington Co Bulletin 5/2/2004
HCA TARC Team South Washington Co Bulletin 5/12/2004
KARE-11 TV coverage of Rocket league launch 5/26/2005

Apple Valley: Qualified Flight

...and looking forward to next year!

Ted Cochran

Apple Valley High School qualified for the finals after a last-minute reflight caused by a CATO. Their reflight went exceedingly well, and the team constructed two new rockets for the occasion.

The team members--Tim Noffke, Owen Gaasedelen, Ricky Vanderholst, Josh Lilja, Martin Schroeder, Jessica Jaman, Tim O'Neill, and Ryan Nelson--elected to build a three motor cluster of C6-0s staging to a three motor cluster of B6-4s. During nine months of practice flights, they documented over 25 separate failure modes for this configuration (their favorite: forgetting the parachute), and had reasonable methods to minimize the chances of recurrance. However, CATOs aren't always controllable, and their flight suffered another CATO in the last round of competition.

Fortunately, the judges recognized the CATO (they aren't always easy to detect, and the team received a reflight. However, during the somewhat rushed preparations, they neglected to pay sufficient attention to the friction fit of their balsa transition between the rocket body and the egg capsule. The rocket suffered a drag separation at booster burnout, resulting in a wasted sustainer burn and a time of 20.9 seconds and a tie for 75th place.

The team was disappointed by the result, but vows to return next year to make another go of it.

Ted Cochran

Uh oh. Apple Valley's rocket is not even clear of the rod, and trouble has already begun as smoke and flame issue from vent holes above the booster fins. As usual, this "forward closure failure" in a booster motor resulted in premature staging while the booster motors continued to burn. The reflight was (slightly) more successful.

The *MASA Planet* is the official newsletter of the Minnesota Amateur Spacemodeler Association, Section 576 of the National Association of Rocketry. It is published bimonthly as a service to its members. MASA authors and photographers retain rights to their submissions, which are used by permission. The *Planet* is available in color on MASA's web site:

http://www.mn-rocketry.net/masa/

Submissions may be made to the editor at: masa.planet@mn-rocketry.net. (Volunteer quickly, lest you be assigned to collect data for a safety study.)

If your email address, U.S. Mail address, or phone number changes: Please send notice of your change to masa@mn-rocketry.net. Include your name, old email address, and new address. We depend on email for communicating important information. When an email address starts "bouncing", we lose contact with you.

Web Gem

See: http://www.transformspace.com/

t/Space's 23% Scale CXV capsule and QuickReach II booster are successfully dropped from Scaled Composites' Proteus carrier aircraft in test of innovative Trapeze-Lanyard Air Drop system. Drogue is to slow rotation.

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