# MASA Planet

**Volume 6, Issue 6** **Year End Edition** **November 2003**


*Safety First!*

## Staying on the Field

***Avoid lost rockets and other accidental expenses***

**Ted Cochran**

The rocket flight that ended as shown in the photo to the right unexpectedly cost the rocket owners $400. That was the bill from Xcel Energy for removing the rocket from the 500 kV power lines that run about 3/4 of a mile to the east of the field in North Branch that is used for high power launches. Calling Xcel was obviously the right thing to do, but, ouch! What a hard lesson!

Ted Cochran

This event is a painful reminder of the drifting range of high-performance rockets. Even rockets that use dual deployment can drift a looooong way in a breeze, especially if they start out a high altitude.

For example, a dual deployment rocket with an initial descent rate of 50 feet per second (a typical descent rate under drogue) could take over two minutes to fall to its deployment altitude from 7000 feet. Add to that the time spent on the main chute, and the potential

***Safety, concluded on page 2***

### ALSO IN THIS ISSUE



*Outreach*

## TARC 2004

***The world's largest rocket contest returns!***

NAR and the Aerospace Industry Association are once again sponsoring the Team America Rocketry Challenge. TARC is a contest in which teams of students design and fly two-stage, dual egg-loft model rockets to as close to 1250 feet as possible. The 100 best scoring teams as of April 5, 2004 will be invited to the National Finals on May 15, 2004 in The Plains, VA.

Last year, 873 teams signed up, and 275 completed qualification flights. Of ten teams from Minnesota, three qualified for the finals. All of these teams were mentored by members of either MASA or Tripoli Minnesota.

The rules of this year's contest are almost the same as last year's. The target altitude was lowered to reduce the number of lost rockets flying from small fields available to many schools. Middle school teams are allowed, and each school may enter three teams, instead of last year's two. Also, composite motors in upper stages are prohibited this year (This change was needed as a noise abatement measure: All of the whistling lawn darts made too much racket last year :-).

As of this writing, 251 teams from 43 states have signed up for TARC 2004. Three of these teams are from Minnesota: Apple Valley High School returns with a new team (all of last year's members graduated) and is joined by newcomers Kimball Area High School and Hope Christian

***TARC 2004, continued on page 2***

*Safety, continued from page 1*

exists for a drift of nearly 3000 feet in just 10 mph winds, and more than a mile when the winds are higher.

Obviously, if dual deployment is not used, drift is even more of a problem. An easy rule of thumb to remember is that, when winds are 10 mph, the expected drift equals expected altitude. (This conservatively assumes that the descent rate is 15 feet per second, and that you start walking from a point under the rocket's apogee). So, if you fly to 2600 feet in 10 mph winds, you'll walk half a mile. If you fly twice as high in winds twice as strong, you'll walk four times as far!

## *Rule of Thumb: In 10 mph winds, expected drift equals expected altitude*

Power lines, trees, and other vertical obstructions increase the risks of drifting, because they make for surprisingly large snagging hazards. For example, suppose a rocket with a 40' recovery harness is drifting toward an 80' tall power line on a 15 mph breeze. There is a 100 yard danger zone extending downwind of the power line--if the rocket were destined to land anywhere in that zone, it would be snagged by the power line instead.

The danger zone obviously grows larger as the obstruction height or wind speed increases. It grows as recovery harness length increases, too, because the longer harness means the drifting rocket has to be higher as it passes over the obstacle. The danger zone also grows as descent rate decreases, because the rocket spends more time at a snaggable altitude.

This explains why trees are so good at snagging rockets, especially when there are lots of them: The problem is not so much that trees are eighty feet tall; it's that the trees create a 200- to 500-foot wide landing exclusion zone downwind of them. Even when trees are widely spaced, the odds are against you. It doesn't matter that much of the area is free from trees, because unless the wind is very low, your rocket won't be able to drift over one tree and land before getting caught in the next one.

From now on, I'm going to worry a lot more about wind drift before I launch my favorite rockets!

*TARC 2004, continued from page 1*

Academy.

All of these teams have MASA members who are volunteering as mentors. Mike Erpelding is helping Kimball (his alma mater); Art Gibbens is helping Hope Christian Academy, and Ted Cochran is helping Apple Valley again.

There may be other schools in the process of signing up, and you're also encouraged to recruit some schools on your own. NAR is requesting NAR members to spread the word about TARC and to mentor teams that need help. The registration deadline isn't until November 15, so there is plenty of time to approach schools in your area. Flyers and other information are available on the TARC web site: www.rocketcontest.org.

One of the biggest predictors of success last year was whether a team had an experienced rocketeer to mentor their efforts, and mentors almost universally report that the experience is highly rewarding, so it's a win-win proposition all around.

Another opportunity to pay forward is to volunteer to help out as an observer of qualification flights. Observers must be NAR members, can't be affiliated with the school, and can't be related to any of the team members, so even some schools with mentors will need a volunteer to watch their qualification attempts

Finally, you might want to consider volunteering to help at the Finals in Virginia in May. Despite the worst launch weather they'd ever experienced, Mike Erpelding and Ted Cochran had a terrific time last year. And you'll get an early look at the site of next year's NARAM. Save your frequent flyer miles!

*Shenzhou 5 soars skyward atop a Long March CZ-2F carrying the People's Republic of China's first taikonaut. The spacecraft was launched October 15, and landed safely about 24 hours later.*

## MEETING SCHEDULE

**THURSDAY, NOVEMBER 6 (NOTE CHANGE)**
**2004 MASA OFFICER NOMINATIONS!**
Location: Science Museum of Minnesota, St. Paul
Time: 7 PM to 8:45 PM
Topic: Cloning old rocket kits (David Whitaker)

**ANNUAL HOLIDAY PARTY!**
Watch the MASA web site for
time, place, and other details

## LAUNCH SCHEDULE

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

**SATURDAY, NOVEMBER 22**
Location: Elk River / Otsego VFW
Time: 9 AM - 4 PM
Junk Yard Rocket Launches!

## TV SCHEDULE

**SUNDAY, NOVEMBER 9**
Time: 7 PM - 8 PM
Discovery Channel: Wild and Weird Rockets

**SUNDAY, NOVEMBER 9**
Time: 8 PM - 9 PM
Discovery Channel: How High Can You Fly?

**SUNDAY, NOVEMBER 9**
Time: 9 PM - 10 PM
Discovery Channel: Supersonic Speed Demons

**REPEATED ON NOVEMBER 13, 15, AND 22: SEE TV LISTINGS FOR TIMES.**

***Snapshot***

*India's PSLV lofted an earth observation satellite into orbit on October 17, but it didn't upstage China's first manned flight, which occurred two days earlier.*

***President's Corner***

# Ruminations

**Glen Overby**

On November 9th, the Discovery channel is going to air a 3-hour show called "Rocket Challenge". I expect this show to highlight rocketry's positive aspects, as opposed to so much news we've had this year painting model rockets in the worst ways. Most of the show was filmed at the Tripoli national launch, LDRS, this year. Frank Uroda, the owner of Public Missiles, Ltd., decided this show was an opportunity to try to bring new people to the hobby. In a letter to the NAR and Tripoli boards, he outlined his plan to run a 15-second commercial every hour of the show to try and draw people to a web site, www.flyrockets.com, where they would find more information to hopefully draw them in to the hobby. To run the advertisement during the 6 showings of the program, he needed to raise $70,000. NAR and Tripoli both gave him a donation, and encouraged their members to do so as well. In the end, he raised $83,000! The additional money will go to print advertisements.

Several MASA members proposed that the club send a donation. At first, I was hesitant because few details had been given. However, as more details were given, I changed my mind. I would have preferred to hold a membership vote to decide this, but there wasn't time (at least in part because I had hadn't moved quickly to start it). I polled the other officers, and Mike Erpelding proposed sending them a $100 donation, which Lee and I agreed with.

The other big event in November is the MASA officer nominations. Nominations will open at the November 6th meeting and remain open for a month. I hope everyone will consider serving as a MASA officer. You can find the descriptions of each club officer's duties are on our web site at

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

Mike and Lee have told me that they are willing to continue as officers for 2004. I've decided to step down.

I've enjoyed serving as President, and I thank you all for your help.

Glen Overby, MASA President

# Quad Bertha

***Build this massive cluster boost glider***

**Mark Thell**

## Origins

If there was anyone thing that made the Quad Bertha a reality, it was Hub Hobby. They were selling Berthas at a really good price. At the next MASA launch I presented Russ Durkee with an idea. What if I was to take two berthas, build each one with only one fin, and Russ was to do the same. Then we'd bring our sets together, and with the aid of a little CA assemble them on the field, and launch it the resulting rocket as a four-engine cluster? Of course, Russ looked at me as if I was nuts. Then the idea began to sink in. Maybe this idea was just silly enough to work.

## Assembly instructions

Assemble MMTS and install in each Bertha. Install one fin each, and assemble shock cord mounts as normal. Take two Berthas, set them down on a FLAT surface with the fins at the appropriate angles, run a bead of CA on the seam, and hold till it sets, You can use accelerator if you want; it works a lot faster (Chemicals really are our friend). Next, repeat with the other two Berthas, and let dry. Then glue these parts together, making sure to align the fins correctly. Let the rocket dry as long as you can before launching--could be as long as 5 minutes. While waiting, cut a couple of launch lugs and glue them in the space between the four tubes. Use a launch rod to align them.

When ready, install motors. The original flight was on 2 C6-3s and 2C6-5s. The original intent was to have two of the Berthas deploy streamers and the other two deploy chutes. Alas, it was not to be; it all deployed, but it was a tangled mess on landing. After thinking about it, I decided to only have one of the Berthas deploy a chute, and the rest just blow the cones off. I punched holes in three of the Berthas for venting purposes. This seems to be working.

## Shuttle launch Quad Bertha

Those of you that know me know that every once in a while I do some "unorthodox" things with these rockets. Scale Model Supplies in St. Paul once had a box of foam Space Shuttles, each about the size of the Estes shuttle kit. These were catapult-launched using rubber bands. I bought a couple of them and they sat in my shop for the better part of 2 years while I figured out what to do with them. At the Buffalo launch I figured that the Quad Bertha would make a cool launch vehicle. I CA'd a length of lug in the valley between the Bertha tubes so that the Shuttle wings would sit on the Bertha fins. I then CA'd a toothpick on the catapult lug on the shuttle to fit the retainer lug. I put four C-6-5's in it. It flew really well, lots of drag, however. The shuttle did not eject like it was supposed to (I am inclined to call it a captive flight test). Like Mike E says, "A little glue and we're good to go." I will continue flight testing this combination, and let you know the results.

Flying: DO NOT USE A8-3s; it's way to draggy. I know this from personal experience. You can use B6-4s, C6-3s or C6-5s. All in all it's fun to fly. If you have questions, you can ask me on the field.

Seth Cochran

# 2003 Holiday Gift Guide

***Gifts for rocketeers who don't want kits***

Kits aren't bad as presents, but face it, we all have a lot of unbuilt kits already. And giving kits is tricky, too: Does the recipient prefer scale, or fantasy? Do they already have an OOP Super Vega? What to do?

The MASA Planet conducted a survey, and came up with the following gift ideas for the coming holiday season, none of which involve rocket kits.

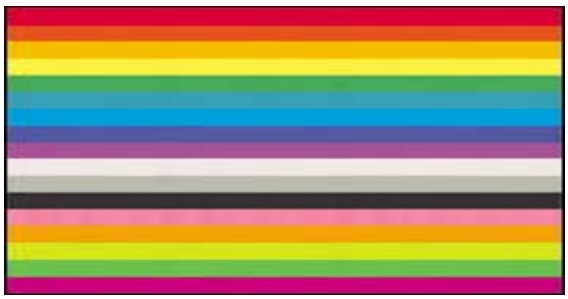

**Rocket Science car emblem.** The perfect fish knockoff for the rocketeer's automobile. $6.00 from Northern Sun, 2916 Lake Street: www.northernsun.com.

Optional reflective flame cut from red, white, and blue reflective tape strip, $1.00 from Axman.

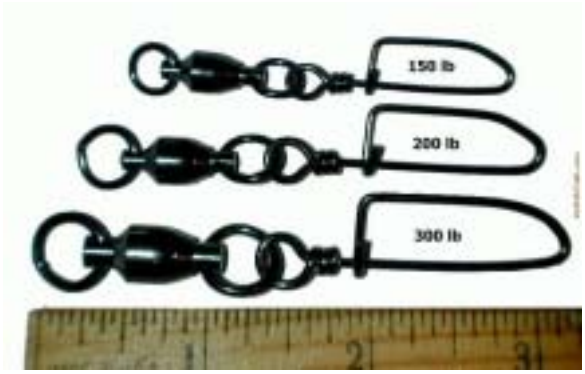
**Apollo Rescue paperweight** with a Navy ship in the background and the Apollo astronauts and the Apollo capsule floating following splash down. They are floating in a blue liquid simulating the ocean. $6.95 from the Space Store, www.thespacestore.com.

**Miniature Squeezie Rocket** (left) on a keychain. Approximately 3 inches high. $3.95, also from the space store.


**Remove Before Flight key chain** (above) made of an extremely strong nylon web fabric. $4.50, from http://www.mypilotstore.com/



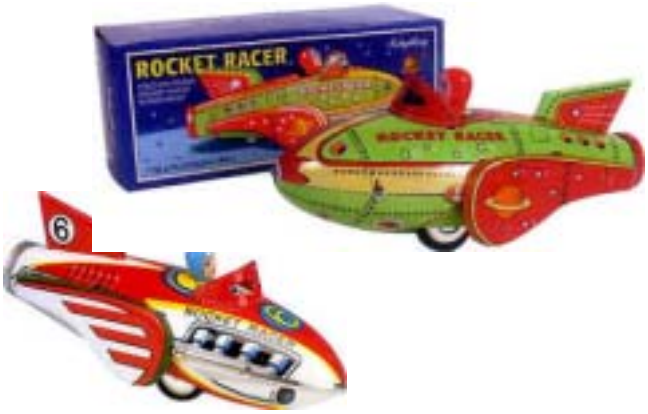
**3/4-oz. ripstop nylon**. An excellent material for parachutes. Zero porosity with little stretch; cuts without fraying, lots of colors! 41" wide. $9.95/yard from Into the Wind: www.intothewind.com.



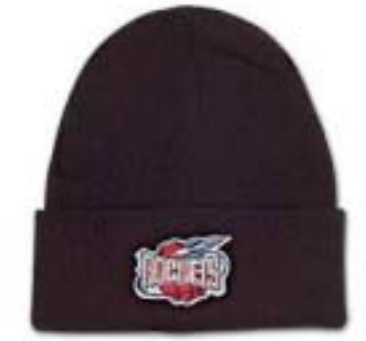

**Heavy-duty ball bearing snap swivels**
3 sizes available and all stainless steel components. 150 lb - $1.80 200 lb - $2.10 300 lb - $2.25 from http://2catchfish.com/

**Pratt Hobbies MicroBeacon**
Loud, pulsating piezo-electric beeper with flashing LED. Uses N-sized 12-volt batteries, available in Radio Shack. You may not be able to keep your rockets out of the corn, but they don't have to stay there!
http://www.pratthobbies.com/

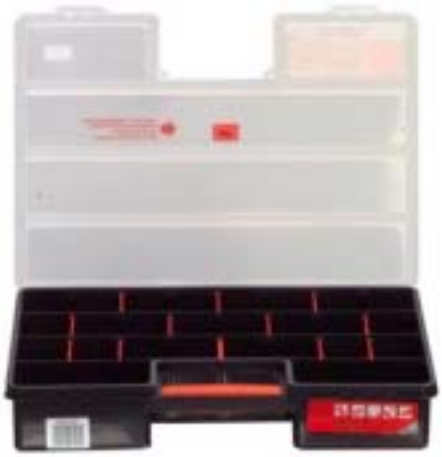
**Toggle Switch Guards.** Just the thing for your new launch console. Available with white or black lettering. Cool standard labels ("Arm", "Boost", "Nitrous"), or order a custom label for $3.95 more. $16.90 each from Performance Unlimited: http://performanceunlimited.com/cobravalley/index.html



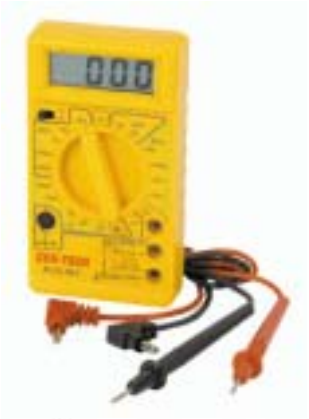

**Old-style metal rocket toys.** Choose either the Rocket Racer (green and red) or Rocket Racer 6 (white and red). $4.49- $6.49 from www.metaltoys.com.



"Rockets" cap. $9.99 from the NBA store: http://store.nba.com/.

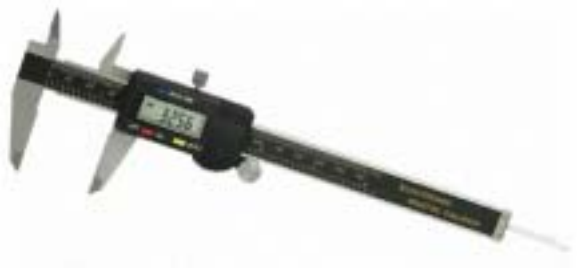


**Zag parts box**, Model 14005. Perfect for storing Estes motors (6 24mm or 12 18 mm per compartment). $9.99 at Home Depot. [Optional FLAMMABLE SOLID sticker, $0.50 from Seth Cochran].



**Digital VOM.** Very handy for testing avionics batteries, igniter continuity. $9.95 when on sale at the Harbor Freight store in Columbia Heights.

http://www.harborfreight.com/



**Digital Calipers.** Remember when decent digital calipers were over $100? Now they're regularly available for around $19.95 at lots of places, including the Harbor Freight store in Columbia Heights. The quality isn't bad either, unless you're working with metal in addition to cardboard, fiberglass, and balsa wood!

## Also recommended

**Tools that may be useful for more than just rockets**

Rotary tools like a dremel

Painting respirator

Tool boxes

**Other stuff that is useful in rocketry**

Good sun hat ($10-20)

Good binoculars (especially good zoom binoculars)

Portable sun shade ($50-200)

Folding chairs ($10-20)

Folding tables ($20-100)

Mini-tool sets

Soldering Iron

Rocket retrieval pole

*Editor's Note*

# Thanks!

**Ted Cochran**

This is the last issue of Volume 6 of the MASA *Planet*. I have really enjoyed editing it! I want to take the opportunity to thank all of this year's contributors: Tim Bush, Ken Corey-Edstrom, Mike Erpelding, Alan Estenson, Art Gibbens, Jon Hayman, Katie Hayman, Stuart Lenz, Ellison Lenz, Glen Overby, Mark Thell, and Rick Vatsaas. That's an author base that is one-third larger than last year's!

Because of your help, the *Planet* has had its best year ever! The index to the right of this column shows how broad and deep your contributions have been.

We've made good progress in meeting the content goals that were set for the *Planet* last year. There was minimal overlap between content in the Newsletter and content on MASA's Most Excellent web site, administered by President Emeritus Estenson. There is also minimal overlap with other sources: As a rule, you won't see many press releases or other material reprinted here.

Apparently, other folks are noticing the Planet, too. As Mike Erpelding mentioned in the last edition, the *Planet* placed third in NAR's annual newsletter competition, which looked at issues published from July 2002 through June 2003. The competition is tough! The judges read all the newsletters they can get their hands on, and if you surf club sites on the web, you can see a lot of great ones. Let's see if we can keep setting the pace next year!

In last year's survey, your top topics for coverage were club business, safety, tech tips, rocketry plans, member stories, interesting pictures, member accomplishments, motor information, and visits to rocket-related sites. We did pretty well in most of those areas this year. I hope that each of you will find time to contribute an article or two, or a picture, in some of those areas next year, too.

The *Planet* is a group effort, and we've done very well. I'll be happy to stay as Editor next year, if the membership so desires, because I enjoy working with the amazingly talented people in this club to spread the word about what makes this such a neat hobby! I look forward to seeing some more great articles from you folks next year!

*For the good of the* **Planet**

# Annual Planet Index

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 asked to alleviate the impact of urban development on rocket flying!)

**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.

## *Milestones*

### New NARTREK Awards

David Whitaker Silver (pending, November 2003)

### New Certifications

Rick Vatsaas Level 2, 10/11/03, Evil Grimace, J350

## *Parting shot*

*By the grace of the camera angle alone, Ted Cochran's strawberry-banana Bomb Pop, a modified Lil Nuke, beats Seth Cochran's black raspberry Bomb Pop, a similarly modified Lil Nuke, in a drag race in North Branch last month. Both rockets flew on G35-4W Econojets, and both were recovered after good flights.*

Ted Cochran

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