



MASA Planet

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NARAM-46

September 2004

Safety First!

Here's A Sign I Can Use

But who are you calling stupid?

Ted Cochran, NAR 69921

The sign below was posted on Slashdot recently, and became an instant favorite of mine. Think about it....of all the Band-Aids, stitches, elastic bandages, and the like you have had to apply over the years, how many of them have you needed because you did something "stupid?" For me, it's way too high a percentage of the total. "Stupid" has a lot of synonyms, too: "In a hurry," "wasn't thinking," "not paying attention," "forgot," and so on. But hey, "stupid" is as good a label as any.

I'm thinking about going into the sign business....



ALSO IN THIS ISSUE

- 3** Event Schedule; Editor's Notes
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- 16** Milestones; Parting Shots

Road Trip

NARAM-46

A week of contest flying

Mike Erpelding

(additional comments by the Cochrans)

NARAM was a lot of fun this year! Since I've had some tight scheduling at work lately, so I decided to fly to NARAM, rather than take off four extra days to drive there and back. I arrived at the Holiday Inn-Manassas Battlefield hotel (NARAM HQ) a little after 7 pm. My team partner, Glen Scherer Jr., made excellent time driving from Illinois. He arrived around 3:30 pm.

I didn't have a chance to finish my Gemini-Titan II sport scale and F-102 Delta Dagger plastic model before I

left for NARAM, so I spent most of Saturday and Sunday finishing them, although I did drive out to the field each morning to help Glen set up his shade tent and prep gear. I managed to get both models finished with time for the paint to dry before it was time to turn them in Sunday night after the contestants' briefing.

[Seth and I opted to do some sport flying instead of building over the weekend. I flew Quantum Leap on a low, safe, but impressive two-stage flight, and also flew a bunch of smaller rockets, including a RingHawk to make up for the prototype that I crashed at NARAM-42, and my MIRV Gryphon, which in one flight managed to demonstrate nearly every possible two-stage rocket failure mode. The MIRV booster later became part of Kaplow's prang



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award trophy, but I eventually recovered all four sustainers. I also got a great flight in on my Shuttle Columbia and another on my Broadsword, which I had Vern Estes re-autograph later in the week. Sport flying continued all week long; one of the more memorable flights was a two stage, upscaled Fliskits *Tres*. --tc]

Monday dawned overcast, but calm. Eventually the sun began to peek through, resulting in modest thermal activity. Two of Monday's events were my responsibility: 1/2A Helicopter Duration and B Eggloft Duration. Glen took care of our team's A Boost Glide models. Glen made two flights with two different models. His first flight lasted 23 seconds until it landed in a tree. I searched for an hour and a half before I found it. When we were done flying for the day I went back to the range tent to borrow a pole to retrieve the glider, to get a return on one of our models. Glen's second flight lasted 73 seconds, but the model drifted across the highway behind the parking lot and was lost.

[Seth and I persisted in flying SlingWing derivatives,

but didn't fly late enough in the day to get good air. Neither of us came close to equaling Seth's two-



Thomas Beach

Ted's Quantum Leap, staging an I211 to an H165, shatters the stillness of the Virginia countryside. Well, what else is all that countryside good for?



Ted Cochran

Seth loads his A Boost Glider on the pad.

minute-plus test flight at the MASA picnic, but Seth did score a fourth place trophy. We didn't fly the other two Monday events. --tc]

I repaired my Apogee Components Heli-roc model that I accidentally stepped on at a WOOSH regional and used it for our entry in 1/2A HD. The added couplers made the rocket heavier, thus costing me more flight time. My first flight lasted for 11 seconds. My second flight lasted 9 seconds. These flights put team Challenger in 17th place out of 18 places. I need to develop a better design for future competitions. My second event was B ELD. I didn't have enough time to make any ASP " Hang Time" egg lofting parachutes, because I had spent so much time working on my Sport Scale and Plastic Model Conversion entries. I used a shroud egg lofter that I made completely out of paper without body tubes. The main drawback was that I used some of my pre-made Mills Fleet Farm

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MEETING SCHEDULE

THURSDAY, SEPTEMBER 2

Location: [Science Museum of Minnesota, St. Paul](#)

Time: 7 PM to 8:45 PM

Topic: Clustering!

THURSDAY, OCTOBER 7

Location: [Science Museum of Minnesota, St. Paul](#)

Time: 7 PM to 8:45 PM

Topic: Rocket Recovery Devices

THURSDAY, NOVEMBER 4

Location: [Science Museum of Minnesota, St. Paul](#)

Time: 7 PM to 8:45 PM

Topic: Attic Treasures (by Russ Durkee)

LAUNCH SCHEDULE

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

SATURDAY, SEPTEMBER 25

Location: Elk River VFW

Time: 9 AM - 3 PM

MASA Launch

SATURDAY, OCTOBER 23

Location: TBD

Time: 9 AM - 3 PM

MASA Launch

SATURDAY, NOVEMBER 20 (ONE WEEK EARLY!)

Location: TBD

Time: 10 AM - 4 PM

MASA Launch

OUTREACH OPPORTUNITY

SATURDAY, NOVEMBER 13

Location: Camp Lakamaga

Time: 9 AM - 4 PM

Girl Scouts' Fall Encampment: 125 scouts will build rockets in the morning and fly them in the afternoon!

Editor's Notes

I have several notes to share in this issue as Editor, Vice President, and (believe it or not) NAR Trustee.

- As Mike notes in his NARAM coverage, the MASA Planet was once again a finalist in this year's NAR newsletter competition. Thanks to everyone who contributed articles to make that recognition possible!
- Also as Mike notes, we came in Third in the Section of the Year competition. Given our relatively small size and relatively short history, this is a tremendous accomplishment! We may not ever be able to do all the things that Sections with scores of members do, but on a per capita basis, we rock!
- The third TARC season is about to get underway. If you haven't gotten involved yet, you'll soon get the chance! Last year we were stretched thin trying to help all of the local schools that wanted advice. If you can find an hour or two every week or two, you can really make a difference to a team, and you'll be helping the NAR by paying forward to the next generation of rocketeers.
- We have a fairly significant outreach opportunity coming up in November. Check the announcement to the left, and let me know if you're able to help out!
- I'm beginning to understand the amount of work that has been done on our behalf over the years by the NAR Board of Trustees. I spent about 15 hours at NARAM attending meetings and trying to get up to speed. In the short term, I could use your help: If you have any ideas, suggestions, complaints, or other feedback of any kind, please let me know. The Trustees' actions are supposed to serve the needs of the membership. One of my biggest concerns is that we all help the trustees understand what those needs are!
--tc



Mike Erpelding

A view of the contest range on a hazy Thursday.

NARAM-46, from page 2

orange bag parachutes that were left over from an outreach project last year. They were way heavier than a 1/4 mil Mylar " Hang Time" chute. I made one flight that lasted 19 seconds. The weather started to look like it was going to storm, so gave up on making a chute at the field to try for a better time. (Egg lofting events take your best score of two attempts; they are not added together.) My one flight was good enough for a two-way tie for 14th place out of 17 entries. Glen and I managed to get all of Glen's gear packed up before it started to rain. We stopped at a Subway for supper, on our way back to the hotel.

Monday night was the NAR Town Hall meeting. Mark Bundick was unable to attend NARAM this year, because his company was being merged with another corporation at the time. NAR Vice President Trip Barber filled in for Mark. I think Trip said that this was the first NARAM that Mark missed in 22 years.

Topics covered were things like the 2004 Team America Rocketry Challenge (TARC) review and a little preview of the upcoming 2005 TARC contest, the NAR's upcoming junior HPR certification program, NAR membership trends, and the ongoing legal battle with the BATFE about regulation of our rocket motors. Trip did his best to answer all questions of the members in attendance.

Tuesday was sightseeing day. Our first event was an organized tour of the Smithsonian's new Steven F. Udvar-Hazy Air and Space Museum Next to Dulles Airport. Approximately 125 NAR members and their families attended. We had to have four separate tour

guides for our group. Some highlights of the tour were being able to see the Space Shuttle Enterprise under restoration, a Mercury test capsule, one of the Gemini capsules, the astronaut quarantine trailer used after Apollo 11 in case they came back with any " moon germs", several different rocket engines, a couple of space lab modules, and several different missiles. The



A Vietnam-era SA-2 on display.

Ted Cochran

museum's exhibits are currently focused on aircraft more than on space or rocketry items, but the space hanger will officially open in a few months.

Some aircraft highlights included a SR 71 Blackbird that you can walk right up to, the Enola Gay B-29 Superfortress that dropped the atomic bomb on Hiroshima, an Air France Concorde that was parked across the hanger and almost went from one wall to the other, and some new experimental aircraft. There were several WW I, WW II, Korea, and Vietnam War era aircraft as well. The Subway located inside the museum on the hanger floor was convenient for lunch. I stopped at the museum gift shop for a few goodies before we had to leave for our next tour.

Our next tour was at Aurora Flight Sciences Corporation. This was a very special treat for everyone that attended. Two members of NOVAAR who work at Aurora were kind enough to do a presentation about the work that they do and showed us some of their prototype designs.

The highlight of this tour had to be the Mars Glider that they are developing for NASA. It was so awesome to see the animated dramatization of the Mars Glider on the evening news awhile ago, then being able to see the real thing up close! [And, speaking of



Enterprise undergoing restoration.

Ted Cochran

Mars Gliders, guess what next year's Rocket League contest is going to involve as the primary flight activity? Hint, hint! --tc]

Tuesday night's event was the NAR auction to benefit the Robert L. Cannon Education Program. Robert L. Cannon was the original education director at Estes. Contest Director Jonathon Rains was our comical



Chris Taylor

Vern Estes with Mike's Columbia kit

auctioneer. I was successful in bidding on three items. The best item was an unopened Estes Columbia kit #1385. This was my very first rocket that I ever built!! The sky was the limit on this one! I was successful bidding at \$60. Then I publicly made an offer to pay \$100, if Vern Estes would be kind enough to

autograph the kit for me. (It was for a good cause.) He agreed! Some day I'll have to make a display case with my first Estes Columbia rocket, or what's left of it, and this autographed kit. If I ever have kids, this will be part of their inheritance!

Wednesday's events were B Payload Altitude and D Eggloft Altitude. Glen Scherer Jr. built our eggloft model. Glen chose to use the newly re-certified 18 mm



Mike Erpelding

Challenger's B Payload rocket

Aerotech D13 reload to power his model. On Glen's first flight he cracked an egg. His second attempt was more successful, with an altitude of 297 meters. This flight put us in 14th place out of 19 entries.

I built two models for B Payload. My first flight was with my 19 mm minimum diameter model. Unfortunately my



Ted Cochran

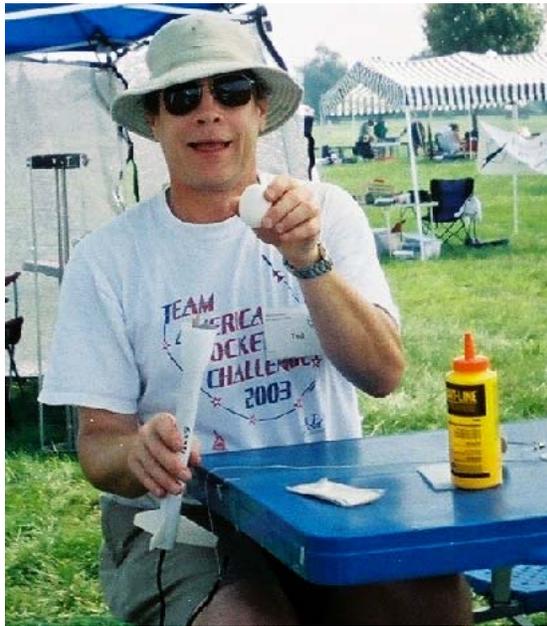
Seth loads B Eggloft Altitude model

rocket suffered a payload section shock cord mount failure, resulting in a separation DQ. My second model had a payload section built out of 24 mm tubing. This flight was successful to an altitude of 116 meters for 15th place out of 19 entries.

[Seth and I built QCR Eggloft Altitude models at the morning Build it, Fly it session. Seth actually ended up building two kits, due to a slight misunderstanding about the correct impulse for B division. We used 24 mm kits, and flew them on D12s, which weren't nearly as competitive as the composite-motor powered or two stage rockets being piston-launched out of towers, but Seth's flight was good enough for another Fourth Place trophy, which pleased him immensely. Just for fun, we also flew B PD--I used a really heavy payload rocket that I'd made to fly altimeters for NARTREK, and Seth used the 18mm Egglofter he had built by mistake. We got flight points, but that's all. --tc]

During NARAM my range duty was reassigned to Tracker/ Timer. So on Wednesday I was part of

tracking station East. I had the opportunity to practice tracking at a regional meet in Wisconsin. This was my third tracking experience, and only my second-ever tracking shift at a sanctioned contest. Each tracking station had two people: one person operated the theodolite, while the other person assisted as a spotter. The Virginia sky was very difficult to see these small rockets in.



Ham with egg...

Mike Erpelding

There was a haze that got worse as the day went on. The wind was also picking up by the last shift, causing the rockets to occasionally weathercock in odd directions. Many of the flights were veering near the sun. Also, fliers were not using enough tracking powder. One problem that I noticed with my payload models was that they were coming back with lots of chalk yet in them. I think the high humidity was causing the caulk to "clump" in the rocket. This made the shift difficult for us. I had one model almost fly over my head. Several of the flights were flying over the West tracking station. All of this led to lots of flights not having a closed track.

The picnic followed the end of flying on Wednesday. The meal was catered by Red Hot and Blue, one of the area's premier BBQ restaurants. The food was delicious and the portions were sizeable.

The finals for the Imagination Celebration Spectacular were held after the picnic. Several presenters braved a light rain shower while they prepped their rockets. There were several glider flights, including George Gassaway's Orbital Transport-style piggyback, powered gliders. Both gliders were R/C controlled; piggy back glider was air-started. Some of the other gliders ejected long colorful Mylar streamers that trailed behind the models as they cruised in front of the crowd. The Alway brothers launched an Estes launch

pad (with spin tabs) on a cluster of four D motors for an impressive flight. Another highlight of the Imagination Celebration Spectacular was a large rocket about 4 inches in diameter and about 4 feet tall, which was covered in dozens of little parasite gliders. This rocket provided a lot of suspense with a (deliberately?) long delay. The rocket arced over into the spectator area and deployed at low altitude, releasing all of the gliders. These gliders then circled all around the crowd, creating an effect like falling snow.

Next was an awards ceremony on the field for the Monday and Wednesday events, where Seth received his two trophies. The ceremony was cut short by another shower.

Wednesday night was the manufacturers forum. Balsa Machining Service, Fliskits, Saturn Press, Quest Aerospace, Edmonds Aerospace, Aerospace Specialty Products, ARA Press, Semroc Astronautics, and Pratt Hobbies were represented.

Rob Edmonds talked about two of his new products, the *Ivee RGB* and the Edmonds *Arcie II*. Both of these rockets are available through BMS. The *Ivee RGB* is a B rocket glider kit. The *Arcie II* is the first R/C rocket glider kit made by Edmonds Aerospace. His goal is to do for RC RG what the *Deltie* did for boost gliders. The glider itself sells for \$34.99. The 3-channel radio system comes with one microservo and all the components for the glider plus the battery charger for only \$149.00. The individual components are also available through BMS.

(I took advantage of BMS's free shipping on orders placed at NARAM. Look to see an *Arcie II* [two!] at a future MASA launch.) This glider only uses one radio channel, but this system allows for future rocket gliders that are more complex. [See <http://members.aol.com/RobEdmonds/RC.html> for more info.]

Bill Stine from Quest Aerospace talked about future kits. He also said that there will be no more "flying brick" solid plastic models. He also said that there is a huge supply of Micro Maxx motors, so there will be no

shortage of them in the near future. He has an immense inventory of them to use before more are made. There are plans for future Micro Maxx kits as well.

Peter Alway from Saturn Press presented his 2004 Supplement to *Rockets of the World*.

Peter also released a new Saturn V kit that he unveiled at NARAM this year. (You'll see this rocket at a future MASA launch as well.)

Jim Flis of Fliskits showed off a few new kits including the *Freedom Forge Missile* and the *Farscape*. The *Freedom Forge Missile* was a Design of the Month winner. The *Farscape* is a futuristic starship troop carrier design which is such a new kit, it didn't make it into the summer catalog. (Look for this kit at a future MASA launch.)

Andy Jackson from **Aerospace Specialty Products** presented a couple new kits as well. Andy has a new tube fin rocket plus a new two stage rocket called *Way Two High*. Both of these kits made their debut at NARAM. The *Way Two High* is a unique three fin rocket that when it is flown with both stages, it looks like it has only one set of fins.

Pratt Hobbies had a new multi-pad launch control system available that is expandable as your needs grow, including away cell capability and hybrid equipment. All you have to do is buy more modules. Another cool item this year is the cansats that they are offering. Basically they are electronic sensor packages that fit inside a beverage can. Different sensor boards can be added or interchanged. (Reminds me a little of the sensors in the movie "Twister".) They are approximately \$200 each. They also offer a curriculum for schools for use with these cansats. I think that this could be a great "What's next?" project for students after they participate in TARC.

The NAR Section Officers Meeting was after the Manufacturers Forum. Basically this was a chance for section officers to voice any concerns that they have about the NAR. Plus it was a chance to ask other sections questions about various topics such as techniques for finding launch sites, membership trends and how to attract new members, how to get more youth into the NAR, support for the TARC program, how to get more active volunteers in your section, and

so on. This meeting lasted a little past 11:30 pm. Its nice to know that MASA is not alone with the challenges that we face as a club.

Thursday's events were B Streamer Duration (Multiround) and B Rocket Glider. Both of these events were originally Glen Scherer's events to fly. On Wednesday Glen and I decided that I should fly the event. I used one of Glen's models, as well as one of my backup models that I brought with me. Glen's model was a lot heavier than my model. I launched this rocket with a 6 by 60 inch Mylar streamer on a B6-6 for a duration of 35 seconds. Next I launched my model, also with a 6 by 60 inch Mylar streamer and a B6-6. Unfortunately my rocket suffered a separation for a DQ. Strangely enough my model without a recovery system managed a time of 34 seconds before the body landed. I quickly made a field repair and switched the streamer from Glen's rocket to mine (My streamer with my nosecone drifted away never to be seen again.). My third and final attempt on a B6-6 was successful with a time of 44 seconds. These flights put us in last place (20th). I need to learn how to find thermals.

[I decided to forgo flying my unperfected *Streaming Broadband* design in favor of a conventional 18mm competition model. I'm still a rookie at this--the model separated on two out of three flights, and the best flight, on a backup non-competition streamer, was for just 43 seconds. I only got flight points. Next year, for sure! --tc]

Next was B RG. Glen spent a lot of time trimming his glider. When he felt that it was ready he went to check in. Glen's motor selection was a B4-2. B4 motors I learned are better for gliders because they have a lower thrust- longer burn than a B6, making a power prang due to the lift of the wings less likely. Unfortunately something went wrong at lift off. Glen's glider went squirrely and power pranged, barely missing Tom Beach! The motor pod on Glen's glider was smashed and would require a complete replacement before it could be flown again. Fortunately I brought along with the B- RG that I rebuilt for the regional in WI. This glider was a sliding wing design vs. a fixed wing design like Glen's. I also launched this rocket on a B4-2. I had a great boost. Unfortunately after about a second or two, the spruce boom snapped. The rubber bands pulled the wings forward

and "tied" the model together. The result was a nice gentle "helicopter recovery". RSO Trip Barber was kind enough to rule my flight "DQ - No Glide" with a big smile. I guess I should have entered that model a few days earlier. :->)

Upon inspection I noticed that the boom had broken in a fresh spot. It suffered a broken boom in WI, when I accidentally glued the sliding wing to the boom while attaching my rubber band hooks. Perhaps the boom suffered a small crack from the plane ride? I plan on building a new glider for future B RG events. This was the only event where we DQ'ed both of our flights.

[This was not MASA's event! Having no suitable RG model, I tried flying a backslider, but it failed to glide (in a rather spectacular way) and was summarily disqualified. --tc]

Thursday night was the Research and Development presentations for C and Team division. I did not have time to properly prepare an R& D project for NARAM this year, so Team Challenger didn't enter. The top four, plus honorable mentions, C division and Team division entries got to present their projects before the judges and the audience. [I wrote up a report on the efforts that we've made to improve formal rocketry outreach programs over last three years of Rocket League. The report was pretty thorough and received informal praise, but it wasn't so much a rocketry R&D project as an Education R&D project. It didn't make the finals, but did earn a whopping 170 flight points. --tc]

C Division

Mark Fisher's presentation, *An Extension of Super-Roc Rocket Glider Theory*, was very interesting. Mark was using a back sliding super-roc for B RG. His hypothesis was that the rocket was stabilized by body pitch due to the angle of attack. The glide is established because it is a damped system which functions by the shifting of the CG- CP. The rocket is stabilized by lift created by the fins on the roll axis, and is stalled based on the angle of the fins. He first started out by using a Peter Alway's backslider design. He varied weights on the end of the fins to change the CG in part of the experiment. He found that a 10-degree angle of attack acting on the fins was ideal. He found a spreadsheet program on the internet to calculate the angle of attack for a given center of mass. He

discovered that moving the fins forward lowered the angle of attack.

Bruce Markielewski's project was called *Development of a Beginner Level Rocket Glider Design*. Bruce set out to find or make a glider that would:

- Be a simple design
- Provide a straight boost
- Operate on 1/4 A through A motors, being able to be tested to over 45 seconds duration on a Ω A motor
- Work with a 3 second delay

He said that a Deltie would meet all of these criteria, but it is a boost glider. He created a new version based on the deltie design and named it the "Deltoid". The glider transitions from boost to glide via a wing flap. He created a dihedral to the wings to compensate for the motor pod and to make the glider turn easier. This design has the added benefit of self righting itself. He had other club member try building this glider from his plans to test his design. The two main difficulties were assembly of the flap actuation mechanism and tension on the burn string. The only failures he witnessed were models built without enough glue.

Ed Pearson's presentation was *How Your Club Can Do Better at Contests?* Ed's project was based on over 40 years of observations of contests and contestants.

David Schultz project was *Application of the Kalman Filter to Rocket Apogee Detection*. The Kalman Filter takes several measurements and then tries to predict what the next measurements should be. If the following measurements are different from the anticipated ones, the Kalman Filter recalculates what the next results should be. These predictions are then compared to the next data and so on, adjusting the formula as needed. The goal is to produce an altimeter that can fire an ejection charge for a drogue chute exactly at apogee.

Keith Vinyard gave a presentation entitled *My 15 Year Old Son is Flying 2-channel Rocket Gliders*. Keith did an observation study of his son learning to fly R/C gliders. He let his son learn the same way that he did, on his own with lots of practice. Keith recommended starting with an R/C hand tossed glider first. He recommended going the Wal Mart and buying a large Styrofoam glider and converting it to R/C. After a flyer

gets " the feel for it like you're in the glider," then try a powered flight.

Team Division

Raging Rocketeers presented *A Summer Saucer Study*. This R&D was conducted by Paul Miller at rocketry demonstrations at two local elementary schools, with the help of his young grandson who loves saucer rockets. The study was basically a duration study of the saucer kits on the market. The saucers used included the Quest Area 51, Estes Snitch, and two of Art Applewhite's paper saucers. They tried things like seeing if removing landing gear legs affected duration times. Overall the Quest Area 51 had the shortest duration times, while the Art Applewhite saucers had the longest times. Overall weight seemed to be the biggest factor.

Pod Bay Doors did a project called *Igniter Placement and the Effect on Delay Times*. The observed Aerotech " bonus delay" is most likely the result of off center ignition of the igniter. To test this idea they took two delay grains and covered them with masking tape to control the burn location. When ignition happened in the center, it took 18 seconds to burn through the grain, while it took 24 seconds to burn through when ignition was offset. Burn time also varies about 5% at best with any propellant mixes. Their suggestion is to insert the igniter all the way up inside the motor, and then pull back ever so slightly. This should position the igniter as close to center as possible.

Mostly Harmless did a project called *A Comparison of Altimeters and Optical Tracking*. They flew 11 different brands of altimeters in a 2.6-inch diameter rocket on G40's and G80's and used tracking stations to determine the rocket's altitude as well. Altimeter processors with 8 bit analog to digital converters had the poorest accuracy and precision. Altimeters with 12 bit ADCs were more precise. Calibration differences affect the accuracy of the data. Optical tracking had consistently more variation than any of the altimeters.

Flying I- Beam Kids project was called *Radio Boost Glider Designs*. Their goal was to design a R/C boost glider for A BG. The R/C components weighted 10 grams, which made a 40% increase in the glider's weight. The advantage to having an R/C BG would be:

- Being able to find thermals for more lift.

- Trimming the glider when needed, especially during boost.
- The ability to keep the glider in sight of the timers.
- Almost no DQ's.
- Get a return.

The goal was to get a glide time of about 2 minutes, based on glider records. Unfortunately the added weight was too much for this engine class glider. A two

Official Results: MASA's NARAM points

Div Place Contestant Flt 1 Flt 2 (Flt3) Total NAR Pts

A Boost Glider Duration

B	4	Cochran, Seth	47	36	83	170
C	14	Cochran, Ted	47	71	118	85
T	12	Challenger	23	73	96	85

1/2A Helicopter Duration

T	12	Challenger	11	9	20	89
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B Egg Loft Duration

T	14	Challenger	19		19	80
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B Payload Altitude

B	8	Cochran, Seth	TL			71
C	32	Cochran, Ted	65		65	71
T	15	Challenger	SEP	116	116	71

D Egg Loft Altitude

B	T4	Cochran, Seth	EGG	285	285	179
C	23	Cochran, Ted	287		287	89
T	14	Challenger	EGG	297	297	89

B Streamer Duration MR

C	37	Cochran, Ted	SEP	43	SEP	43	61
T	20	Challenger	35	SEP	44	79	61

B Rocket Glider Duration

C	--	Cochran, Ted	NG				0
T	--	Challenger	NG	NG			0

Research and Development

C	T5	Cochran, Ted					170
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Div PI Contestant Model Static Flt Tot Pts

Sport Scale

T	11	Challenger	Gemini-Titan II	265	78	343	94
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Plastic Model Conversion

C	5	Cochran, Ted	TF-104G	435	50	485	122
T	--	Challenger	F-102	625	UNS	0	0

Meet Total

B	9/9	Cochran, Seth					420
C	32 /50	Cochran, Ted					598
T	19/21	Challenger					569
S	14/29	MASA					1587

minute glide time was never attained.

After R&D presentations I went to get my PMC and Sport Scale rockets. The viewing room was pretty well picked over by then, so I didn't have a chance to see all the models.

Friday at NARAM is always the highlight of the week with the sport scale and PMC flights. Trip Barber was acting as the chief RSO at check in for all of the questionable models. My Gemini Titan II with the motors way back there made him a little nervous went I brought it to check my motors in, especially since I was going to use two C6-5's. He wanted to see it after prepping before I could fly. This was a great way to increase the safety of the spectators there and I was glad to see him doing this.

At NARAM 45, my first PMC was underpowered. I vowed after that crash to never push the " Maximum lift-off weight" of my motors again. I did an approximate Rocksim simulation of my Gemini Titan II long before I started construction. I played with all the variables, even 15+ mph winds. I planned to have a nosecone weighing 2 Ω ounces to counteract the motors hanging out that far back. I managed to build a boilerplate

model to test the slightly canted motor design. I selected the two C6-5's because it gave me a higher altitude than two B6-4's in the event of a problem with deployment. Both sets of motors had a combined max lift-off weight of 8 ounces. The boiler plate model flew fine at home with a little weathercocking. I had no way of entering all of the dowels for the motor supports. I designed my simulation for about 2.6 calibers of stability margin to allow a little wiggle room. I planned to cut out the holes between the stages of the rocket,



Glen Scherer Jr.

Mike's Gemini-Titan before (above) and during (right) a great flight.



Chris Taylor



Challenger's F-102 Delta Dagger PMC.

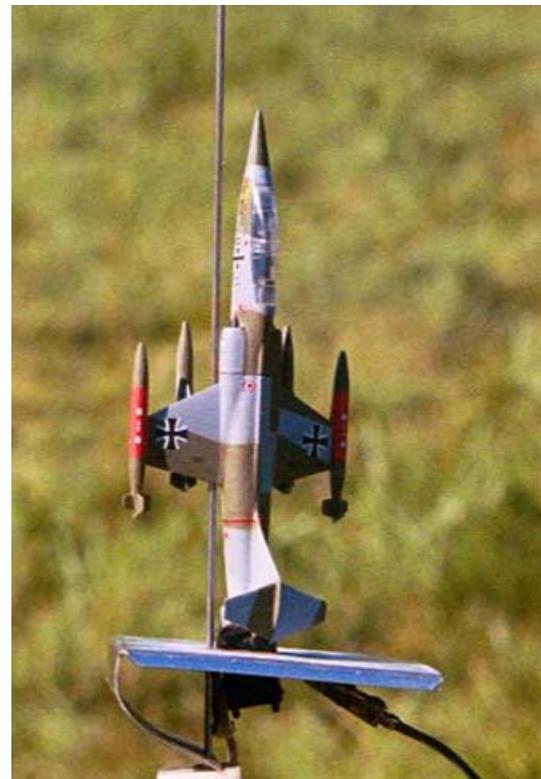
Chris Taylor

so I would have to add a stuffer tube and two cardboard centering rings in addition to the paper top off the fuel tank. I was planning on some of this added weight counteracting the weight of the dowels on my motor mounts.

Trip didn't believe me at first when I told him that the balance point was at the "E" in United, of United States. Upon checking it himself he was a little surprised and asked, "What did you put in the nose? Uranium?!" After explaining the whole process that I have already listed, Trip felt that my rocket should be safe and I went to pad assignment. It was kind of windy on Friday. This made everyone a little nervous. I loaded my rocket and hooked up my pair of 14 AWG clip whips. Then I had Glen Scherer take a couple of pictures of me with my rocket. I had a few butterflies in my stomach about the affects of the wind on my pretty rocket. I raised my paddle, said a little prayer, and they let her buck! A gust of wind caught my rocket up about 60 feet and turned it over 60 degrees as my heart dropped. Much to my astonishment, my rocket self corrected almost immediately, for a nice near vertical flight with a beautiful deployment of her 24 inch Estes chute!! I had a grin from ear to ear as I chased my rocket down wind. The 24 inch parachute gently set my rocket down on the grass about 1000 feet from the pads with no damage! I quickly grabbed the parachute before the wind could drag my rocket on the ground, possibly breaking off a plexiglass fin. The felling of elation was immense! This flight put us in 11th place in Sport Scale.

Next up was the only flight that I was a little nervous about all week, my Plastic Model Conversion F102 Delta Dagger. This event is nicknamed "Plastic Death" for a reason. Due to my time crunch, there was no time to built a boiler plate model first. I couldn't use Rocksim either. My plan was to use an Aerotech E30-4W, the shortest delay I could get. The E30 had a max lift-off weight of 454 grams (1 pound). An Estes D 12 was good for about 14 ounces. My rocket was about 9 ounces before the "dodads" were added. I packed as much shot into that cockpit as I could making this nosecone about 4 ounces of the total model's weight. I wanted a fast take-off for hopefully more stability. I picked the Delta Dagger because its wings were the closest looking to fins, being a flying wing type design. I left the engine out the back a ways for three reasons:

1. The 24mm motor mount tube would hit some internal plastic in the kit.
2. I wanted to allow about a 3/4 inch spacing of the centering rings for the stuffer tube for added strength.
3. I didn't want the composite motor exhaust to melt the rocket.



Ted Cochran

Ted's tiny PMC--a 1:144 scale TF-104G prepares to fly in breezy weather. Note relative size of microclips!

My E30 motor made a lot of people nervous at motor check in. I was told that there was a "Speed of Styrene" just like the "Speed of Balsa". After prepping I brought my model to Trip for flight approval. He didn't like the motor that far out the back. I was expecting that. Once again he was surprised that the balance point was about one-half inch back from the leading edge of the wings (as far forward as I could get it!) With that much noseweight the rocket should be stable. The problem was the wind gusts. My flight card was marked with " Launch only when there is no wind!" Trip advised me to align the model with the wings narrowest profile facing the wind and never to launch this model on a windy day again. I was allowed to proceed to pad assignment. For some reason they picked lucky pad 13. This added to the conversation at the range tent. I figured that if it worked that it would just add to the story.

I loaded my rocket on the pad. I took LOTS of pictures.



Chris Taylor

F-104 captured in a rare MicroMaxx liftoff shot

I wasn't sure if this one would come back in one piece. I waited until the wind died down a little and raised my paddle. RSO Tom Lyon was holding for the wind for several minutes. Finally it was declared that it was as good as it was going to get. The count down started. I prayed that if something goes wrong please don't hit anything!

2..1..START! Nice boost to about 30 feet. Then another gust of wind caught it. The rocket did a Blue Angel's nose down 90 degrees barrel roll, another barrel roll, followed by a perfectly horizontal warp speed flight out over the parking lot. The high thrust kept the rocket from losing any altitude until burn out,



Glen Scherer Jr.

The F-102 undergoes post-flight inspection

clearing almost the entire parking area. The rocket disappeared from sight about 2 seconds after burn out at the pads. There was a really loud metallic "BANG!" That scared me more than just a little bit. Once I walked out to the crash site, thinking about my insurance, I was relieved to see it with its nose buried in the sod, 5 feet from the Class 5 driveway, about 30 feet from the highway. The rear section was facing a large "Great Meadow" semi-trailer about 30 feet or less away. The motor casing had ejected out of the rocket, with the parachute still neatly folded inside the stuffer tube. I think that the casing ejected hitting the trailer, the only metallic object within over 500'. I never really liked PMC. I was able to pull out the nose out of

Official Results: MASA's 2004 points

Division	Place/Total	Name	points
B	18/28	Cochran, Seth	450
C	66 /204	Cochran, Ted	838
C	136	Whitaker, David	224
C	147	Lenz, Stuart	188
C	170	Jarosch, Ken	88
C	181	Estenson, Alan	58
C	182	Grimm, Lee	56
C	198	Nelson, Mark	20
C	200	Schwartz, Larry	12

T 13/40 Challenger 4094

Section Competition

S 16/48 MASA 5112*

*The section total is not the sum of all of our individual points because pre-NARAM points are limited to those acquired in events totalling 12 Contest Factors. Challenger had these completed before our Section meet, where the rest of us picked up some individual points. This did not affect our place in the Section standings; the team ahead of us had over 7000 points.

the sod and red clay. The landing gear broke off, the section between the cockpit and the fuselage was cracked up. I wasn't planning on ever flying this model again, even if it survived. I found all of the pieces. Trip was a little worried that I would attempt a repair for a second attempt, but I reassured him that it wasn't going to happen.

I could now relax and watch everyone else's flights. There were a lot of prangs that day, as well as some good flights.

[My MicroMaxx-powered TF104-G was in fourth place after static judging, and any kind of decent flight would have been good enough for a trophy. Alas, it was not to be. On the first was blown around badly and was very squirrely, resulting in a flight that was generously qualified but which was awarded only 50 flight points. The second flight was nice and straight, but the model failed to separate at ejection and lawn dartsed for a DQ. I ended up in fifth place. Next time I'll supplement the motor's ejection charge. --tc]

Later at the banquet that night the NARAM 47 events were announced. PMC is an event again! Somebody must have some kind of death wish! <grin>

[The sport range was still open--over 1000 flights were flown there during the week. Seth and I drag-raced our Lil Nukes, first on F20s and then on G35s. Both launches were pretty spectacular, with the breeze sending the rockets screaming side by side across the length of the range. It was a great way to end our launching for the week! The only glitch was that Seth lost a nose cone on the last flight due to a separation.]

The banquet was fun. We had a nice dinner, and then the trophies for NARAM 46 and the NAR competition year were handed out. Although none of us did particularly well for the meet as a whole, our combined efforts put MASA in the top half of sections. For the competition year as a whole, we all did better, scoring mostly in the top third of our divisions. MASA was 16 out of 48 sectionsó the best we've ever done. MASA also came in third place for Section of the Year, which is an award that recognizes more general section activities such as membership growth, flying, meetings, and outreach. The MASA Planet was also a finalist in the newsletter competition! Good job Ted!

Section officers and TARC mentors were also recognized. Ted also received a President's award for moderating the NARTARC Yahoo Group.

Congratulations Ted! Next year NARAM 47 will be in West Chester, Ohio, near Cincinnati, and well within reach of the Air Force Museum in Dayton. I think that one will be well within driving distance.

The flight home went well with partly cloudy skies. I was able to see Lake Erie and the Michigan shore of Lake Michigan for the first time. I purchased my first airplane meal for lunch. It was very good.

I hope more MASA members will be able to attend next year's NARAM.



Chris Taylor



The Cochrans send up the first of two Lil Nuke drag races on the last day of NARAM.

Ted Cochran

For more on NARAM:

NARAM:
<http://www.naram.org/> (This will also be the site for NARAM-47).

NaramLive:
<http://www.nerys.com/naramlive/>

Outreach

Minnesota Dreams

Fun at the International Girl Scout Jamboree

Ted Cochran

The International Girl Scout Jamboree was held at St. Olaf college in Northfield last July. About 2000 girls, mostly high school-aged, attended from all over the world. The theme, *Minnesota Dreams: Summer Days, Starry Nights*, somehow seemed apt for the 40 or so girls who decided to build and fly rockets.

Friday, Mark Thell, Mike Erpelding, and I helped the scouts build Generic E2X rockets in two separate two-hour sessions. These kids had the rockets pretty much ready to fly in about 40 minutes, but then spent up to an hour decorating the rockets, creating some of the prettiest E2Xs I've ever seen!

Saturday, Mike, Seth Cochran, and I set up 12 pads on a dike at one end of a complex of several soccer, softball, and baseball fields). Once the kids arrived, we showed them how to prep their rockets, and each girl started off with an A8-3 motor. After everyone had done that, we let them launch as much as they wanted to on A, B, or C motors. We did launch an E2X on a C6 to show them what kind of drift to expect if they picked the biggest motor, but we left it up to them.

Many girls decided to just launch once, but several went crazy, and some of them launched on C6 motors repeatedly. The record was set by one girl who

launched 8(!) times. Overall, the girls launched about 70 rockets in the two hour session, and we added about 14 more as demos, including boost gliders, helicopters, scale models, UFOs, Odd Rocs, and drag races. Very few rockets were lost--one landed on a field house roof but was recovered by college staff, and Mike rescued one from a tree with a pole.

The kids and adults left with a lot of great memories.



The first rocket in a rack of second flights heads skyward on a C6-7Ö

Ted Cochran

There aren't many outreach opportunities where you get the chance to work with kids who all want to be there (remember, they chose rocketry over dozens of alternatives), and have enough time to make sure they get all the flying in that they want to do. It wouldn't surprise me if we saw some of the local kids again at a MASA launch.

Huge thanks to Glen Overby for setting this up for us (starting over a year ago!!), and to Mike, Mark, and Seth for helping to make it a success.



Ted Cochran

Ö and Girl Scouts and leaders try to keep it in sight.

MASA Hosts Tour de Deuce

Fliskits Phenomenon Flies Fantastically Fine

Jim Myers

The Minnesota leg of the Tour de Deuce was completed at the July 24th picnic launch. Minnesota was the 18th state in which these rockets have flown.

In the Tour de Deuce, two Fliskits *Deuces Wild!* rockets are to be launched by volunteers in each of the 50 states, ending in New Hampshire, home of Fliskits. Similar to the Alpha 40 program, the Tour de Deuce was the brainchild of Jason Toft and Eugenio Cebollero, of Florida, who built the two beefed up traveling rockets. Much of the initial planning, discussion and launch volunteering was via [The Rocketry Forum](http://www.rocketryforum.com) (<http://www.rocketryforum.com>).

The Minnesota leg of the Tour de Deuce got off at about 2:20 PM at the July 24th launch. The first Deuces Wild, painted blue on top, took off on 2 C6-5 engines. Ejection happened close to apogee and the rocket drifted into the gravel parking area, a little too close to the power lines for my taste.



Jim Myers

Well-packed Deuces, and this is before the peanuts are poured in!

The second Deuce, yellow on top, has had a bit of a rough life on the tour. It has had two single engine flights, crashed and been repaired twice. It weighs nearly twice as much as the first Deuce. Yellow Top had some hard luck in Minnesota, too. In the first launch

attempt, only one C6-5 lit, but the clip whip and cables held the overweight rocket down to a 3 foot flight, and it was undamaged. Undaunted, we loaded it up again and hit the button to a perfect flight, albeit somewhat lower than DW#1.



Jim Myers

Dad, Heather, Eric, and Deuces ready to fly!

More information on the Tour de Deuce can be found at the [Fliskits website](http://www.fliskits.com/tour_de_deuce/index.htm) (www.fliskits.com/tour_de_deuce/index.htm). I believe they are still looking for a North Dakota volunteer.



Jim Myers

"Yellow Top" flies well on its second launch.

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/>

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Ted Cochran	Vice President & MASA Planet Editor
Lee Frisvold	Secretary/Treasurer
Alan Estenson	Webmaster & President Emeritus
Russ Durkee	Founding President

Submissions may be made to the editor at: masa.planet@mn-rocketry.net. (Volunteer quickly, lest you be asked to host the the next MASA Holiday Party!)

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.

Welcome New MASA members!

Gib Curry & Family
Richard Haller & Family
Michael Kibat & Family
Loren Kjersten & Family
Glen Scherer Jr.
Jeff Stanton



Parting shots



spaceflightnow.com

New prototype for scale buffs: Delta 4-Heavy, at the pad.



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