ZOG-43

Nov/Dec 2015
Vol 37 Number 6

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And More...

Zog-43
Volume 37 Number 6
November/December 2015
Official NARHAMS Newsletter
Editor: Don Carson

ZOG-43 is dedicated to model rocketeers of all ages, abilities, and interest. We are committed to providing the most current, up-to-date information on model and real world rocketry, and to provide educational material, as well as, entertaining information.

ZOG-43 is published bi-monthly and is available to all paid up members of NARHAMS. Club membership is open to all, dues are 10 cent per week.

If you have any questions about ZOG- 43, NARHAMS, subscriptions, or if you have any comment(s), correspondence, or if you'd like to submit an article, send them to:

ZOG-43
117 Coventry Ct.
Macon, NC 27551
Email us at: zog43editor@yahoo.com

About NARHAMS

The National Association of Rocketry Headquarters Astro Modeling Section, or NARHAMS, serves Baltimore, the state of Maryland., Washington, DC and the surrounding Metropolitan areas. The club is a section (#139) of the National Association of Rocketry (NAR).

We are the oldest continuously active model rocket club in the United States, first established as a high school club in 1963, changing our name to NARHAMS when chartered as a NAR section in 1965. NARHAMS is the only seven time winner of the NAR "Section of the Year" award (1997, 1998, 1999, 2001, 2004, 2006, and 2007).

NARHAMS members regularly fly their model rockets at NASA's Goddard Space Flight Center in Greenbelt Md, at Old National Regional park near Mt. Airy, Md. and at the Carroll County Agriculture Center, near Westminster, Md.

NARHAMS welcomes all to our monthly meetings and launches.

For details, dates and directions to our club, meetings and launches, go to: http://narhams.org

From the Editor - *Ring Out The Old, Ring In The New!*

Don Carson, NAR #11069

Closing up NARHAMS 50th year as an NAR section, Ole Ed finally reveals the story behind the newsletter's name, Zog-43. Tom Ha concludes his series on his and Maria's fabulous trip to Australia to participate in Thunda Down Under 2015. The front and back covers feature great images from that event.

Looking to the future, the details for our annual regional contest, ECRM, have been released with a great slate of events. Chris Flannigan reports on a new way of doing contests - via mail! The World Spacemodeling Championships USA team has been selected and a number of HAMSters are on the team - way to go!

Speaking of congratulations, check out Ellen Fineran's successful Level 1 certification flight on Halloween. Also, Chris Ha stepped up to the vacant club secretary position. Good on both of you.

The 2016 NARHAMS calendar is done and you will find a copy here and on our website.

As always, there is lots of launch, competition and outreach coverage. Thanks to all the volunteers who make it possible.

Fly 'em high, bring 'em back, and be safe.

For questions, answers, opinions, files, photos, and more NARHAMS, join the NARHAMS Yahoo group. You have to get yourself a yahoo e-mail address (but you don't have to use it for anything else), it is free, painless, no ads, and may just be the cure for the common cold. Also: Facebook if you are not parnoid about that sort of thing.

Front Cover: Tom and Mara Ha's trip to Australia for the Thunda Down Under 2015 included this Big Sparky Drag Race. Photo courtesy of the Has.

Back cover: The world record 1:1 scale model of the iconic V-2 flown at Thunda Down Under 2015. Photo courtesy of Rocketry Victoria.

ZOG ROYAL COURT
(NARHAMS OFFICERS)

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F Giant Altitude Postal Contest

By Chris Flanigan (NAR 17540 L1)

Executive Summary

I organized and sponsored a postal contest for F Giant Altitude. There were two primary objectives:
Get some experience with "Giant Altitude," a potential new provisional event for NAR competition.
See if a postal contest – or the Giant Altitude event – can get more people to participate in competition rocketry.

To encourage participation, cash prizes were awarded to the top five places ($100/50/20/10/5). North Coast Rocketry also volunteered to provide prizes to the winners.

The postal contest was modestly successful for an initial attempt. Sixteen flights were submitted by fifteen competitors. Nine of the flights (56%) were submitted by people who are already active in NAR competition. The other flights (44%) were submitted by people who are new (or mostly new) to competition. Flights were submitted nationwide from ten states plus Canada. The top three flights used some very creative models (ultralight construction, boosted darts). This may lead to some tweaking of the Giant Altitude rules.

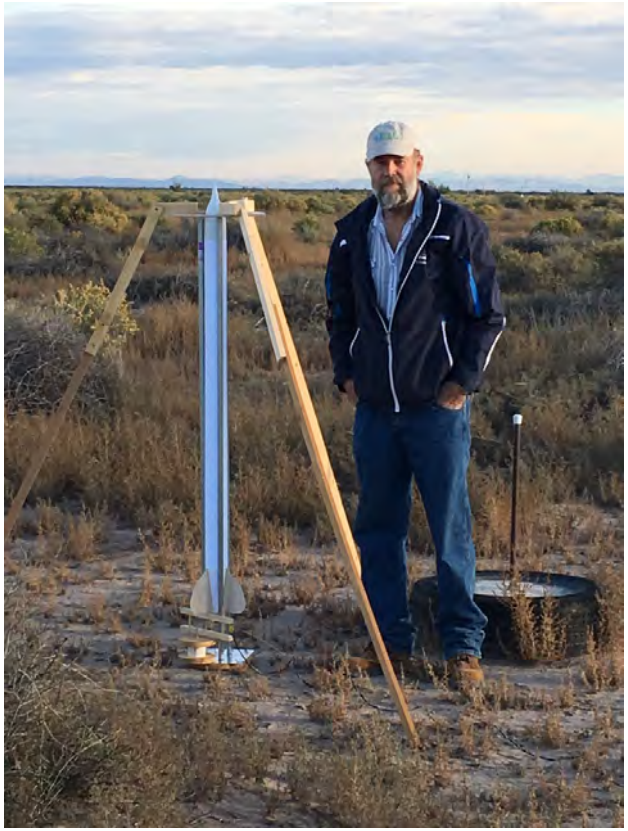
Based on these initial results, I think that Giant Altitude (with some tweaks) would be a good provisional event. In addition, postal contests may provide an opportunity to get more members involved with competition.

Schedule and Announcements

The postal contest was announced on 24-Aug-2015 on the ContestRoc Yahoo Group and the NAR Facebook page. The flight window for the postal contest was Sept 4 through Oct 18. This provided two weeks from initial announcement to opening of the flight window, plus six weeks for flights (eight weeks total from initial announcement to close of window).

Reminders/updates were published on Aug 28, Sept 7, Sept 22, and Oct 6. Announcements were also made in the NAR Electronic Rocketeer (thanks, Ted!) and the NAR web site (thanks, Ryan!). Final announcements were made on Oct 19 (flight window completed) and Oct 21 (winners announced).

I thought this schedule was reasonably generous. However, I received several comments saying "hey, the postal contest is a great idea, but I didn't have time to finish a model. But I'll be there next time!"



Vern Richardson with his first place entry.

Dimension Requirements

For F Giant Altitude, the dimension requirements of the models were diameter = 75 mm and length = 150 mm (or greater). At least 75% of the overall length had to be body tube. The remaining 25% could be nose cone, boattail, etc.

In hindsight, the "% length" requirement is somewhat tricky. It would be easier to just define the required length of the body tube.

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Entry Information

The contestant was required to submit the following information:
Name and NAR number
Flight location (to determine launch altitude)
Motor
Design file (Rocksim, OpenRocket, etc.)
Photo of model
Download file from the altimeter

This went pretty well. It sometimes took an extra email or two to prompt the contestant to provide all of the information. The design file was good for checking that 1) models satisfied the dimension requirements; and 2) running simulations to check/verify the altitudes on some of the exceptional flights.

All of the altimeter files were good. There were no negative anomalies that (as far as I could tell) caused invalid results.

Technical and Related Issues

Altitude Adjustment. For a nationwide postal contest, it seemed prudent to account for air density at different launch sites. However, the compensation factor depends on vehicle mass, drag coefficient, and perhaps motor impulse. I decided to use an adjustment factor based on simulations using a generic F Giant Altitude model. This resulted in an adjustment factor that reduced altitudes by 6-7% for high altitude launch sites (Utah, New Mexico, Colorado, etc.).

The altitude adjustment factor almost switched the 1st and 2nd place flights. The raw altitudes for the top two flights were 673.5 meters and 638.3 meters. However, the 1st flight was in New Mexico (4,208') and Ontario (656'). The adjusted altitudes were 636.2 meters and 632.5 meters – close!
I believe that an adjustment algorithm is important for a postal contest. My initial method may not be the best approach, but at least it helped level the playing field.

New Altimeters. Some competitors wanted to use new altimeters (AltimeterThree, Altus Metrum EasyMini) that are not yet approved by the Contest Board. I decided to allow these altimeters because 1) these altimeters use the latest-generation pressure sensors, so they should be accurate; 2) I wanted to encourage entries in the postal contest; and 3) the postal contest isn't an official NAR-sanctioned event (i.e., no contest points or national standings at stake).
Motors Not On NAR Web Site. Two contestants used Cesaroni F51 motors. These aren't listed as contest approved motors on the NAR web site. However, I believe that these motors are included in the cross-certified motor list and are widely available. Therefore, it seemed reasonable to allow the use of these motors. If postal contests are approved for sanctioned NAR competition in the future, this might be a more critical issue.

Other Observations

Model Similarity. Most of the entered models looked the same (nose cone, long

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Postal Contest - continued

Jim Filler's entry
Photo by J. Filler

body tube, boattail). At first, I thought this wasn't great because the Giant Altitude rules encouraged the models to be identical. However, that's not necessarily bad. If you look at model airplane contests such as F3K (discuss launched gliders), all of their models look pretty much the same. Even if the models look generally the same, there's still room in the GA rules to build superior models – as illustrated by the next paragraph.

Creativity. The top three models were very creative. The 1st and 3rd place models used very lightweight construction and the Apogee F10 motor to achieve really impressive altitudes. The 2nd place model used a boosted dart concept. A boosted dart is (in my opinion) legal under the initial GA rules. However, it goes against the general idea of the Giant Altitude event (big models, easily seen, straightforward recovery). I plan to update the GA rules to require that the model stay in one piece prior to ejection.

Modest Number of Entries. Getting sixteen entries isn't bad for an initial postal contest. However, it would have been nice to have more entries. I plan to do another postal contest next spring. It will be interesting to see if more people participate.

Enthusiasm. I received many comments saying "hey, this was a great idea. Let's do it again!" So there seems to be some support for the Giant Altitude event and the postal contest format.

Concluding Remarks

I think that the initial F Giant Altitude postal contest was a worthwhile exercise. We obtained some flight experience with the Giant Altitude event that will lead to useful improvements to the rules. We also had some participation by people new to competition rocketry.

I plan to run another Giant Altitude postal contest in the spring. That may provide some additional data to determine the popularity of the postal contest approach.

Postal Contest Results

	Name	NAR Number	Motor	Altitude		Launch Site Location & Adjustment			Adjusted Alt (m)
				(ft)	(m)	Location	Alt (ft)	Factor	
1	Richardson, Vern	91272	Apogee F10-4	2,210	673.5	Cotton City, NM	4,208	0.945	636.2
2	G-Force Team (Guzek)	T-981	AeroTech F50-4	2,094	638.3	Chatham, Ontario	656	0.991	632.6
3	Kristal, Steve	82815	Apogee F10-8	1,900	579.1	Brooklyn, MI	991	0.987	571.4
4	Cooper, Bill	97213	AeroTech F50-9	1,394	424.9	Toole, UT	5,050	0.934	396.9
5	Boetto, Steve	98849	CTI F51-12a	1,207	368	TTRA Tampa, FL	80	0.999	367.6
6	Coleman, Ryan	59361	AeroTech F50-9T	1,223	372.8	Espanola, NM	5,820	0.924	344.6
7	Kerbel, Geoffrey	85416	AeroTech F40-7W	1,068	325.5	Salome, AZ	1,346	0.982	319.6
8	Flanigan, Chris	17540	AeroTech F50-6	1,028	313.3	San Diego, CA	12	1.000	313.3
9	De Toro, Lorenzo	95402	AeroTech F50-6T	1,013	308.8	Coral Gables, FL	70	0.999	308.5
10	Barber, Trip	4322	AeroTech F50-9	942	287.1	Great Meadow, VA	610	0.992	284.8
11	Hamlin, Victoria	97170	AeroTech F50-9T	872	265.8	Ridgeland, SC	56	0.999	265.6
12	Crampton, James (#2)	88816	AeroTech F40-7	860	262.0	Cotton City, NM	4,208	0.945	247.5
13	Filler, Jim	27862	AeroTech F25-6	674	205.3	Grove City, PA	1,256	0.983	201.8
14	Kolland, Benno	97954	AeroTech F25-4W	628	191.4	Helm, CA	187	0.997	190.9
15	Woebkenberg, David	52423	Estes F26-6FJ	614	187.1	Holland, IN	528	0.993	185.8
16	Crampton, James (#1)	88816	CTI F51-5	572	174.4	SARA launch site, AZ	2,180	0.971	169.3

Ellen Fineran Certifies for Level 1 at NOVAAR Night Launch

Photos and story by Jim Filler

Ellen with her Level 1 cert model,
the "Goofy Mag"

Take off on an AT single use H135

Jim Filler's 3 "D" cluster model on takeoff

Safe landing in a graveyard on Halloween!

US Spacemodeling Team Selections - NARHAMS Going!

By Don Carson

The members of the US team for the World Spacemodeling Championships have been announced. Congratulations to all who were selected for the team.

One of the six Juniors and seven of the seventeen Seniors are members of NARHAMS! Stoil Avramov, James Duffy, Jim Filler, Steve Humphrey, Kevin Johnson, Chris Kidwell, Jay Marsh, and Dave O'Bryan will all travel to Lviv, Ukraine, to participate in the 2016 FAI World Spacemodeling Championships next summer.

Check out the table to see what events they are flying in. For those who aren't familiar, FAI competition is similar, but not exactly the same as US NAR competition. To decode the names, the first two digits (S1, S3, etc.) is the shorthand for the type of event (Altitude, Parachute Duration, etc.). The third digit is the motor class of the event (A, B, etc.). Notice there is no motor class for Scale (duh). The radio controlled glider event name gets some more descriptors, because, its complicated. The Juniors and Seniors fly slightly different RC glider events and so they are named differently.

In practice, one thing you may notice is that the Parachute Duration, Streamer Duration and Gyrocopter Duration models look very similar to each other. The FAI rules require a minimum length and a certain percentage of the length must be a pretty fat body tube. The designs all look pretty similar. There are differences in the design and construction as modelers strive for light weight and strength. It is not easy to meet both goals.

Another kind of unique aspect of international competition is that it is a truly team sport. Although each individual builds and flies their own model, every US team member will be doing all they can to make sure all their teammates do well.

Expect to see a lot of test and practice flying in the coming year as team members prepare for the toughest and highest level of competition rocketry.

JUNIOR TEAM	S1A Altitude	S3A Parachute Duration	S4A Rocket Glider	S5B Scale Altitude	S6A Streamer Duration	S7 Scale	S8D R/C Rocket Glider	S9A Gyrocopter Duration
Stoil Avramov*		X	X				X	
Rachel Nowak	X	X			X			
Alyssa Stenberg			X				X	X
Zakary Stenberg			X				X	X
Allison VanMilligan	X	X			X			
Ashley VanMilligan	X				X			X

SENIOR TEAM	S1B Altitude	S3A Parachute Duration	S4A Rocket Glider	S5C Scale Altitude	S6A Streamer Duration	S7 Scale	S8E/P R/C Rocket Glider	S9A Gyrocopter Duration
Matthew Berk							X	
James Duffy*		X				X		
James Filler*		X		X				
Chris Flanigan			X			X		
George Gassaway							X	X
Steve Humphrey*		X						X
Kevin Johnson*							X	
Chris Kidwell*								X
Bob Kreutz	X			X				
Steve Kristal	X							
Kevin Kuczek					X			
Jay Marsh*					X			
Mike Nowak						X		
Dave O'Bryan*			X		X			
Randy Ringner			X					
Matt Steele	X			X				

* Members of NARHAMS

Secrets of Competition Flying:
Eggloft Altitude Using An Altimeter

By: Jim Filler NAR #27862

NAR contest flying offers many different events for those looking to fly model rockets with a mission. Egglofting is an event that when looked at on the surface, is quite challenging. The event has been a part of the US Sporting code for many years. The egg is intended to simulate (in miniature) an astronaut, who must be properly cushioned and restrained to withstand the forces of acceleration and the shock of landing. Egglofting can be flown as a duration event or as an altitude event. Rule 26 in the sporting code goes into detail about the rules of the altitude event.

The purpose of this article is to present my option for flying egglofting altitude with an altimeter. The shift moving to flying NAR contest altitude events with altimeters has been increasing over the last several years with the technology of commercially made altimeters improving.

Taking a closer look at the rules for flying altimeters in any altitude event, has presented a different set of challenges to design a model to fly in eggloft altitude. Rule 14.10 that covers the use of altimeters states **"Only commercially available altimeters approved by the NAR Contest Board and publicly announced as approved at least 60 days before any contest where they are used may be used in competition. These altimeters may not be altered or modified in any manner, including use of power sources which are outside the voltage range published by the altimeter manufacturer."**

So after you have decided which altimeter you want to use, then you will need to "design" your model to carry the altimeter per this additional language also from rule 14.10. **"The altimeter must be fully enclosed within the rocket body. The part of the rocket containing the altimeter must be vented to the outside air by at least 3 vent holes evenly spaced around the circumference of the body. There must not be any protrusions or depressions on the body within 1 body diameter of the holes. Any attempt to deliberately produce excessively high altitude readings, such as venturis are specifically prohibited. The ports must be on a section of the model that is an unobstructed cylinder or cone for 1 caliber either side of the ports, and the cone must be no steeper than 1 in 4 taper (.25" change in diameter per inch of length). In this case, a fin counts as an obstruction, as does a launch lug and would not be allowed within 1 caliber of the ports."**

The entire model, at first glacnce, is an "egg on a stick"

I have seen different approaches to designing a model to meet the requirements specified in these rules. The design I came up with is

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shown here if you would like to fly this complex and challenging event. I am not advocating that my design is the best approach, but is one that worked for me at NARAM-57 good enough for 4th place in “E” eggloft altitude.

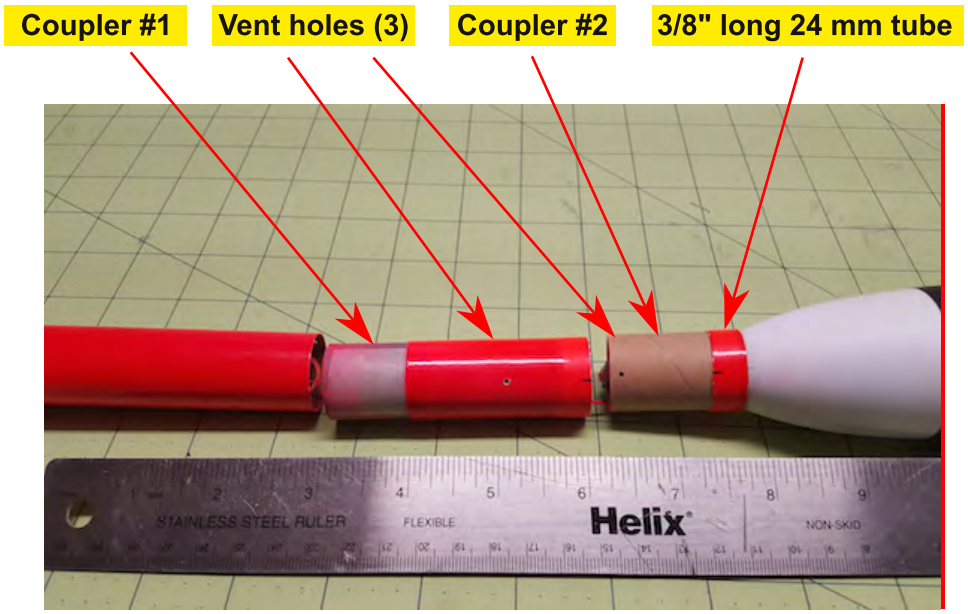
My design starts with a 14.5” piece of 24mm tube for the main body. I used a regular “Pratt Egg Capsule” and then another piece of 24mm tube 2.25” long for the altimeter compartment and one more piece of 3/8” long 24 mm tube that is an adapter between the egg capsule and altimeter compartment.

The photos will hopefully will make it easier to understand the text I have included for this article.

Here you can see the separation points between the model, the altimeter campartment, and the small 3/8" ring that butts up against the egg capsule

A two inch coupler (#1 in the picture) is glued into the altimeter compartment so 1” is protruding out the bottom and 1” is installed into the altimeter compartment. A centering ring fiber disc is installed to hold the altimeter in place just at the forward end of coupler #1. The 3 altimeter holes are spaced 120 degrees around the tube and go through the main tube and the coupler. They are located 1 3/8” from the bottom of the egg capsule. Align the holes after you install the altimeter into the bay.

Use a piece of foam to hold the altimeter in the compartment. I used a piece of 100lb Kevlar anchored in the bottom of the capsule and extends through the altimeter compartment and through the first coupler to tie the model shock cord to. The 3/8” long piece of 24mm tube is glued at the top end of coupler #2 and serves as a way to tape the altimeter compartment closed once the altimeter is installed. Use a piece of electrical tape to secure the altimeter compartment to the egg capsule.



All the pieces unstacked. Coupler #1 is glued into the base of the altimeter campartment. Couple #2 is glued to the bottom of the egg capsule. The 3 altimeter holes are spaced 120 degrees around the tube and go through the exterior tube and the upper coupler.

Load the egg into the capsule and pack your parachute into the main tube as normal and fly from a tower or piston which ever you utilize.

Don’t forget to have fun!

November 2015 Goddard Visitors Center Sport Launch Report

Safety Check-in.
Photo: J. Fuller

Richard did safety checks, Jim narrated and launched, the rest of us helped modelers' prepare, did crowd control, retrieved models and acted as pad pursers.

Photo: E. Pearson




We and the crowd enjoyed watching the flights.
Photo: E. Pearson

Afterwards Julie of the Visitor Center went to the employee's side of the fence and collected models that had flown over. Alex and she sorted through the accumulated goodies.
Photo: E. Pearson

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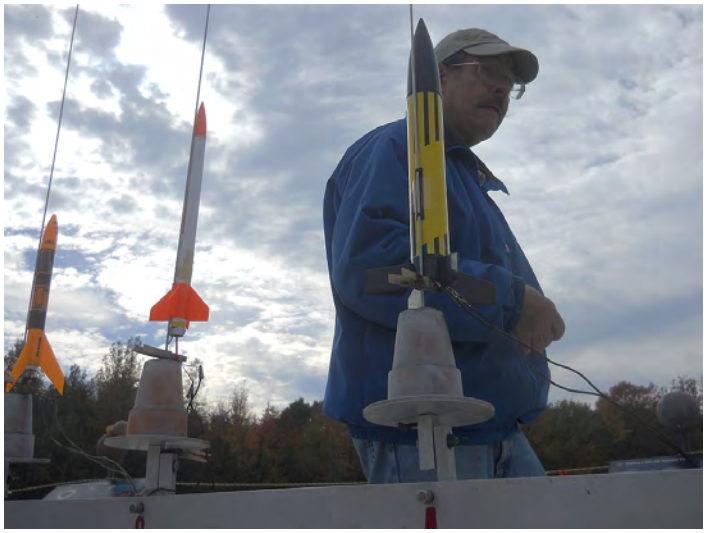
It was a beautiful fall day, temperature close to 70, and wind speeds measured at 4 or less mph. Jim said we put up 90 or so flights.
Photo: E. Pearson

Nov. Goddard Launch, Continued

We had met a fellow during the launch who had a shuttle tattoo on his calf. He and his wife did get to view one of the later shuttle launches in Florida.
Photo: A. Mankevich



Hero Shot
Photo: A. Mankevich

Our range crew consisted of (clockwise in photo) Alex Mankevich, Richard Crisco, Jim Filler, Michael Cochran and self (not shown).
Photo: E. Pearson

Thirty-three of the fliers were first timers. We were pleasantly surprised so many showed up and look forward to December's launch.
Photo: E. Pearson

An American (or two) in Australia

By Tom Ha

Photos by Tom and Maria Ha

I am often reminded of the rarity of women that are into rocketry, so a special shout-out needs to go here to Maria, the love of my life and a fellow lover of rocketry. Our Australia trip was over and Maria asked me about the best part of the trip, and I honestly let her know that it was spending two weeks on vacation with just her. No kids, no-one else to worry about, just her and I, like we were back in the earliest days of our relationship.

Camp and Flight Line

We did log our flights, but I haven't found that information yet. We didn't fly anything motor-wise between our C6's from Southern Cross Rocketry and the CTI G88, because I wanted to go big, and the rockets we took along were either very small or were one of the five H-motor capable rockets that just fit into our bags. Logistically, taking rockets to Australia and back was a total non-event. No questions asked, no bags noted to have been opened, it was as if we had taken along just another bag of clothes, instead of 35 rockets. And note that some of them had been flown before, none were cleaned particularly (though the reload casings were washed with soap and water before we left), and we brought back flown rockets, some with spent motors and reload casings still in the rocket, as they had come off the field after being flown!

I've sent in a variety of photo's that Maria and I took at the launch site, and then another set that has some better angles and closer-up shots that help to set the stage. Anyone who wants to see the rest of the photos that we took (hundreds if not thousands) can ask and we'll gladly show any or all of them.

This time around, we'll focus just on rockets. The highlights for me are:
The V2 Flight, of course (see separate article, May/Jun 2015).

Having everyone make a deliberate effort to stop by our (and everyone else') canopy to say hi. Many times at rocket launches we

World record 1:1 V-2 Scale model

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Thunda 2015, Continued

move among our own circle of friends, and certainly the New Zealand Rocketry Association (NZRA) with about 35 people there had their own huge multi-canopy space. But I stopped there to chat, and they came by to chat with us. With such an international group, and as a first-ever event (that we were all well-aware-of), it was just a great way to enlarge the rocketry family. We had participants from the U.S., the UK, Germany, Namibia, New Zealand, Canada and all across the continent of Australia.

Blake Nikolic and Tom Ha

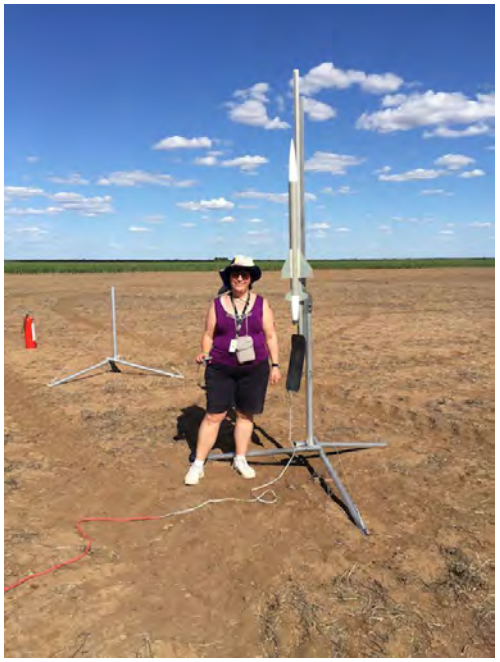
Meeting Linda Hickam, who I had Facebooked with prior to arrival. She is an author in her own right, and it was great to be able to spend quite a while chatting with her and Homer about Australia and rockets and books and cats.

Meeting Nic Lottering, who I had messaged on the Australian Rocketry forum before we left the US. Nic is from Brisbane but is currently working in New South Wales. He was the one who offered to store our rocket-containing checked bags at his place for the second week of our trip, to Cairns, to save us the haulage and cost. Nic set two new records for Australia rocketry with one flight, breaking

Adam Martin

67,000 feet in altitude and reaching Mach 3.2 with his 3.9" diameter, 47lb Mad Max II rocket, flying on a 98mm diameter O3400 CTI motor. The rocket was recovered successfully about 2 miles downrange from its take-off location which was a special launch site approx. 4 miles away from the rangehead.

I will say that I've already gotten to the stage of thinking about what we'd do differently the next time we go Down Under, to attend another fantastic launch with our (now extended) rocketry family! If you haven't heard about our non-rocketry vacation time, you can ask us the next time you see us! Australia Rocketry's Thunda Down Under (ARTDU) is coming back in 2018, bigger and better than ever!



Maria Ha with the Talon 2

Ed. note: For a great report on the event from the organizers' perspectives click here: http://thunda.com.au/faqs/get-your-butt-to-thunda/after-the-storm-artdu-2015-report/

FROM THE ZOG:

Looking forward to chilling in our new crib

By Alex Mankevich, NARHAMS President
Photos: A. Mankevich

Having a comfortable and dependable place (i.e.: 'crib') to host our monthly meetings is essential for NARHAMS. An amenable place is one where we could conduct our typical variety of themed presentations, host open build sessions and project slide shows and movies. Other amenities need to be available such as near-by bathrooms, sufficient space to put out refreshments, running water and ample free parking.

For several years in the past we had used the Operations Annex building at the College Park Airport. This facility was a green-colored portable classroom structure fronted by a wooden walkway. We had used one-half of the building for our meeting purposes. Amenities included a built-in screen and projector for presentations as well as a near-by bathroom. Meetings during the summer months often turned into a tropical survival exercise.

We had to abandon the Operations Annex building during the Fall of 2013. Then Vice-President Frank Panek discovered that the College Park Airport was moving forward with plans to construct a new two-story Operations Building approximately 12,000 square feet in size, which would replace the current Operations Building. We were told at that time that our current meeting space was to be turned over to the construction crew. We hastily scrambled to locate a new meeting place that fit our limited budget.

The new Operations Building!

We were fortunate to have Alec Waterhouse arrange for us to meet at the Wallace Presbyterian Church. This facility was a spacious room with ample restroom facilities. The big drawback was the terrible acoustics which made presentations and discussions of business difficult to understand. Another drawback was the need for Alec to be present at each meeting. This was difficult for the father of young children to do on an on-going monthly basis. Around October 2014 Alan Williams arranged for us to return to the College Park Airport.

NARHAMS currently uses the Airport's Hap Arnold facility. This is a rather small facility that seats about 15 people comfortably. We've managed to project some presentations on the wall when necessary. An on-going bet is whether the overhead lighting will completely go dark on us sometime soon. The frequent passing of the Amtrack trains on the nearby rail road tracks can be annoying.

The second floor of the new Operations Building is designed to include a general purpose room to be used to provide a meeting space for a variety of airport-affiliated aviation groups and organizations. We are hoping to continue our partnership with the College Park Airport by being granted permission to use this general purpose room for our future monthly

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From the Zog, continued

meetings. Vice-President Alan Williams has maintained good contact with the College Park Airport Manager, Lee Sommer. We are hoping that our long-term association with the College Park Airport will result in some agreeable accommodation with our use of the new general purpose room.

Alan and I had been told repeatedly that the projected date for completion of the new building had been pegged for the end of 2015. A current look at the progress of the building shows that much parking lot paving and landscaping needs to be completed. The old Operations Annex building had been completely removed. The parking lot had been extended where the building once stood towards the new building. We can see that the windows, doors and the brick façade had been installed. Of course, we are unable to see how much still needs to be completed internally in terms of HVAC, plumbing and lighting. The new building's plan includes spaces for pilot/passenger waiting area, a pilot flight briefing room, a dedicated space for airport management, a meeting space for transient flight crews and kitchenette facilities. All these rooms need to be furnished and completed. By early November 2015, personnel on duty at the Operations Building conceded that the completion of the new building had been set back into 2016.

The old Operations Annex

It could only help NARHAMS to be able to hold its monthly meetings in a modern, new facility that have been designed for general purpose meetings.

Chris Ha becomes the new NARHAMS Secretary

By Alex Mankevich – NARHAMS President

Chris Ha has gallantly taken over the NARHAMS Secretary post from out-going Secretary Kevin Johnson. Chris joins his mom, Maria, to give NARHAMS a welcomed family affair in its current officer ranks.

Chris had previously served as NARHAMS Vice-President from 2007 to 2009. You could have previously seen Chris assisting Tom and Maria in manning the NARTS booth at prestigious NAR activities such as TARC and NARHAM.

Chris has been flying competitively at contest meets such as ECRM, HQSM, NARAM, RAMTEC, SPAAR, STSC and quite possibly others. Chris had stepped up to serve as our Mt. Airy Sport Launch Manager on occasion, and has assisted his parents at numerous other sport launches.

Chris has been with NARHAMS starting as a youngster. He brings to NARHAMS a long-standing familiarity with our traditions, culture, objectives and goals. The next time you see Chris, please take a moment to thank him for his past and future service on behalf of NARHAMS.

Welcome New/Renewing Members

New Members

William Boublitz, Larry Levine, Joseph Bender, Caleb Hackey, Steven Darnell, Charles Bruno, Tamyra Schafer, Heather Ha, Geoffrey Cosden

Renewals

Alex Waterhouse, Jim Baird, Dave Fuller, Richard Crisco, John Schafer, Natalie Schafer, Rachel Schafer, Michael Warren

Meeting Hightlights

November

John McCoy shared a couple of Micro-Max gliders.

Bat Glider

Flis Kit Slide Wing Glider

NARHAMS Gold

National Association of Rocketry Headquarters Astro-Modeling Society (NARHAMS), NAR Section 139 presents:

Limited Edition
50th Anniversary
Model Rocket Kit

Only 139 numbered kits available!

Unique Ducted Booster
2-stage styling
Quality Kit Production
Decal sheet included

Length: 20"
Diameter: 1.34"

Suggested Motors:
B6-4 (first flight)
C6-3
C6-5

Per kit price: $30; $7.50 shipping up to two kits, or free delivery at NARAM.

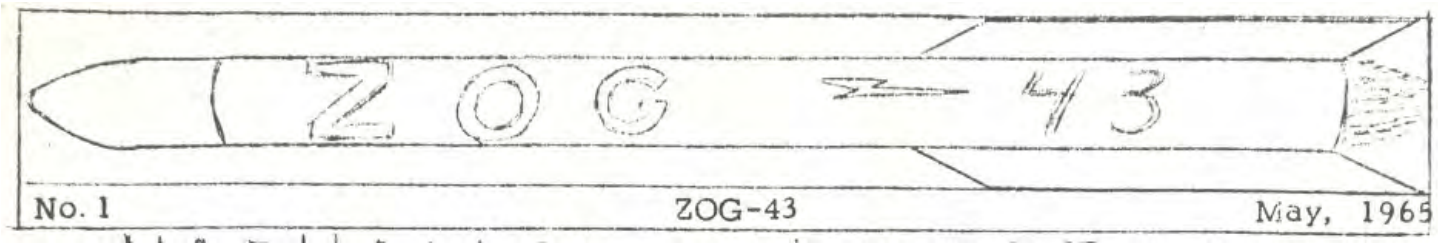
Kits available NOW!

Send checks (payable to NARHAMS) to Maria Ha, NARHAMS Treasurer, 512 Chestnut Street, Mount Holly Springs, PA 17065

or
PayPal to rocketha@gmail.com

Please use the send money to friends or family option when using PayPal!

The History of NARHAMS - Why Zog-43?



Without hype, hyperbole or teasing, except in this first paragraph, this is the true explanation behind the name of the storied NARHAMS ZOG-43 newsletter. And although frequently speculated upon, this really is the first time the account has appeared in print. The appellation's genesis seemed quite natural. Let's go back in time…queue up the way back machine please…

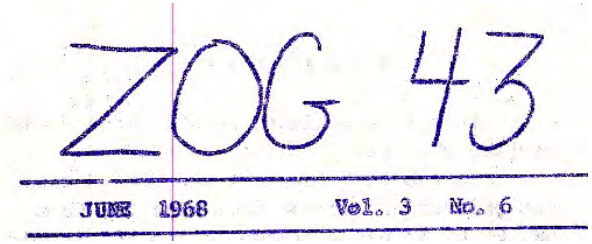
Before the club was chartered, I knew we wanted to have a club newsletter. I "got religion" in 1964 at NARAM-6 meeting one evening with Jay Apt, Jim Kukowski, and Pat Stakem. Jay and Pat were contemporaries, Jim was NAR's Executive Director, and Jim was pushing us to form sections. The exchange of ideas and news through a club newsletter was one of the things a club should do, Jim explained.

After Wallops Island (NARAM), I started getting the club together, with Doug Frost, Paul Connor, Rusty Rice and other great members of the Northwestern Model Rocket Club—the most "membered" progenitor of NARHAMS. I mention those three because all four of us went to NARAM that year, were affected by seeing all those really good rocketeers, and meeting such people as

Harry Stine, Willy Ley, and Bill Andres (whom we didn't know at the time would make history with the first human mission to the Moon and photograph the now iconic Earthscape image).

With the club developing, I started to wrestle with what to call the yet-to-be newsletter, and to this day I remember the deliberation at my Hyattsville childhood home. I was standing at the piano staring at the mail we put on top of the keys' cover. This brought back earlier memories. Queue up the way back machine again, please.

My family had always been interested in Science Fiction. I grew up with two uncles who read books and books on the subject. One uncle, Bob Pavlat, was a founding member of the Washington Science Fiction Association (WSFA) in the late 1940s.



I remember coming home one Sunday in 1963 to see the top of the piano COVERED with chrome Bonstellesque Destination-Moon statuettes. WSFA was holding the 21st World Science Fiction Convention that year and Bob as Treasurer had purchased the awards. (I would go to that 600-people convention and see Willy Ley there before meeting him again at NARAM).

Continued on page 18

Why Zog-43, Continued

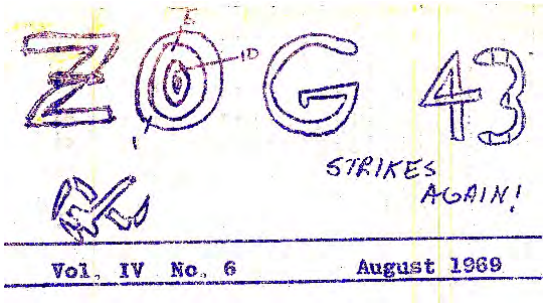
Bob also had a fanzine called Bob 'O Link that he'd mail out periodically. A fanzine was a publication that an amateur science fiction enthusiast sent out to others for comment, exchange, print a story, tell some news, etc. in the same way maybe a blog does today. (We had a mimeograph machine in the basement that helped facilitate that).

Bob probably had the only terrestrial named 'zine of the lot he received. I got to see them (folded and stapled/taped) as mail on the piano in the same manner that some of us receive ZOG-43 today. Some had star or constellation names or with acronyms (e.g., BEM) that only those in fandom would know about (e.g., BEM=bug-eyed monster).

And so as I pondered the name for our club's newsletter, I saw a kinship with the fanzines.

There were other great model rocket section newsletters with clever names like Countdown (North Shore being the first I think), Launch Pad (also a couple of clubs), Polaris (Zenith section), and Star Burst (Steel City), but I wanted our newsletter to be different than play on words with the section name or rocketry.

It would have to be a combo of name and number. ZOG was chosen because it was short, sounded nice, and was alien-friendly (I had never heard it before). Why I chose to start with a Z instead of the oft-used K for alien names, I have no idea; guess the letter Z is less used. I tried out making guttural

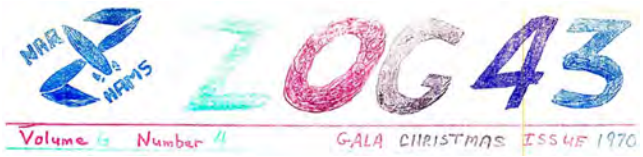


sounding foreign sounds and ZOG came out (am glad that exercise wasn't recorded; it would most likely seem embarrassing now).

The number was a puzzle. This too I wanted to be unique and thus it would have to be a primary number. I didn't think of log, imaginary, or exponential notations otherwise our newsletter might have a superscript in the name (hmmm imagine ZOG^{-43}).

Forty-three was chosen because I encountered it often. I lived on 43rd Avenue, the last two numbers on my telephone were 43, the zinc/steel 1943 penny was unique (and you still got them occasionally in circulation back then), some major coffee brand (Maxwell House or Nescafe) advertised that 43 coffee beans were in every cup, and so on. Forty-three as a primary number seemed a good choice and it wasn't too big either.

When it came to voting on the name, the club seemed to take to it. There were a few suggestions for a more terrestrial play-on-the-rocket theme but alternates didn't muster any support, and people voted for ZOG-43. As they say, the rest was history.



In short the connection was with having a science fiction family and 'zines laying a background for us; the number, then as now, just seemed to pop up with unusual frequency and appeared unusual enough to choose.

That's that, and it is indeed a small world. This paragraph concludes with some connections and has little to do with the newsletter. The Hugos I saw on the piano that day (the name of the SF awards) were designed by Jack McKnight whose daughter, Peggy Rae, would later marry my uncle Bob. Jack took the rocket design from Willy Ley, and Chesley Bonestall immortalized the design in his renderings. Lastly, club member Jim Miers married Jan Derry the daughter of Chick Derry, a family friend, and another of the original seven founders of WSFA.

Written from memory, good or bad, in 2009. (Ed Pearson)

Jim Filler and Bruce Canino 2006

The old haunts

Holiday party 2004

July 2011

Farewell To An Old Friend

By Alex Mankevich

For many years NARHAMS held it is business meetings at the College Park Airport Annex Building. This building was a green-colored portable classroom structure that served our purposes. We used this building at least since the start of this millennium until October 2013.

It may sadden some members to know that our former meeting place was torn down in late September 2015 to make way for a new Operations Building. In place of the building, there is now an extended driveway from the existing parking lot to the new parking lot surrounding the new building.

This old facility was home to many of NARHAMS' great moments. We learned from numerous presentations, been entertained by movies, hosted summer picnics, presented FROG awards, worked hard during several build sessions and engaged in numerous other rocket-related activities through the years.

The photos are a nostalgic reminder of times gone by as NARHAMS conducted many meetings in this old facility. And gee whiz, we looked so young!

Kevin Johnson's WSMC Medal

June 2007

June 2013

January 2011

Group shot 2006

The Real McCoys 2003

July 4th Party 2011

Outreach: Launching Gnomes for Cub Adventure Day at Alpha Ridge Park

Story and Photo by Alex Mankevich

NARHAMS President

NARHAMS assisted the Boy Scouts of America - Baltimore Area Council to launch model rockets as part of their Cub Adventure Day on Saturday November 14, 2015. The launch was held from 12:30 PM to 3:15 PM at Alpha Ridge Park in Howard County. This launch was one of two conducted by NARHAMS on this day.

Richard Crisco conducted the launch at the Broad Creek Memorial Scouting Reservation in Harford County that same day.Joe Azzarello and Lisa Macek were the Boy Scout contacts for the Alpha Ridge Park launch. The launch range was set up on one of the baseball diamonds in the park. The home plate area was fenced in, which made for a good means to keep folks out of the launch range area. The scouts set up 4 individual launch pads on top of a folding table. The launch pads were taped down to withstand the wind. The pads were labeled as pad 1 through pad 4. This arrangement was thoughtful as it kept the tip of the launch rods well above the eye level of the scouts.

The scout leaders wanted the flyers to press the launch control button for their own launches. The firing panel was a two-button contraption in which the safety key needed to be pressed down simultaneously with the firing button. A nine volt battery powered the firing panel. All but two of the rockets flown were Estes Gnomes flying on 1/2 A3-4T motors. Most of the rockets were built on site that day using super glue. The construction was performed under a pavilion nearby the baseball field.

Flight preparation (wadding and engines) were done at the safety check-in station. About 60 flights were launched. The winds were supposed to be gusting to over 20 mph, however my weather station recorded a wind gust going only as high as 18 mph. Most of the wind stayed in the 8 to 11 mph range. The late Fall temperature hovered from the high 40's to the mid-50's.

Most of the Gnomes landed at the deep end of center field inside the fence, but some rockets “hit a home run” and were lost to the trees beyond the fence.

October 2015 Mt. Airy Sport Launch

By Jim Baird, Launch Manager

The October Sport Launch was held at the Old National Pike Park on October 17, 2015. Temperatures were a bit chilly in the low to mid 50s, with somewhat high winds averaging 10 to 15 mph, occasionally gusting to over 20 mph. Skies were mostly cloudy at first, but gave way to partial sunshine later in the day. Launches were limited to D motors or less due to soccer games being held on the nearest game field for most of the launch.

The theme for the launch was “spooky rockets.” A few “Goblins” were seen flying around, as well as saucers, ghosts, pumpkins, and other similarly themed rockets!

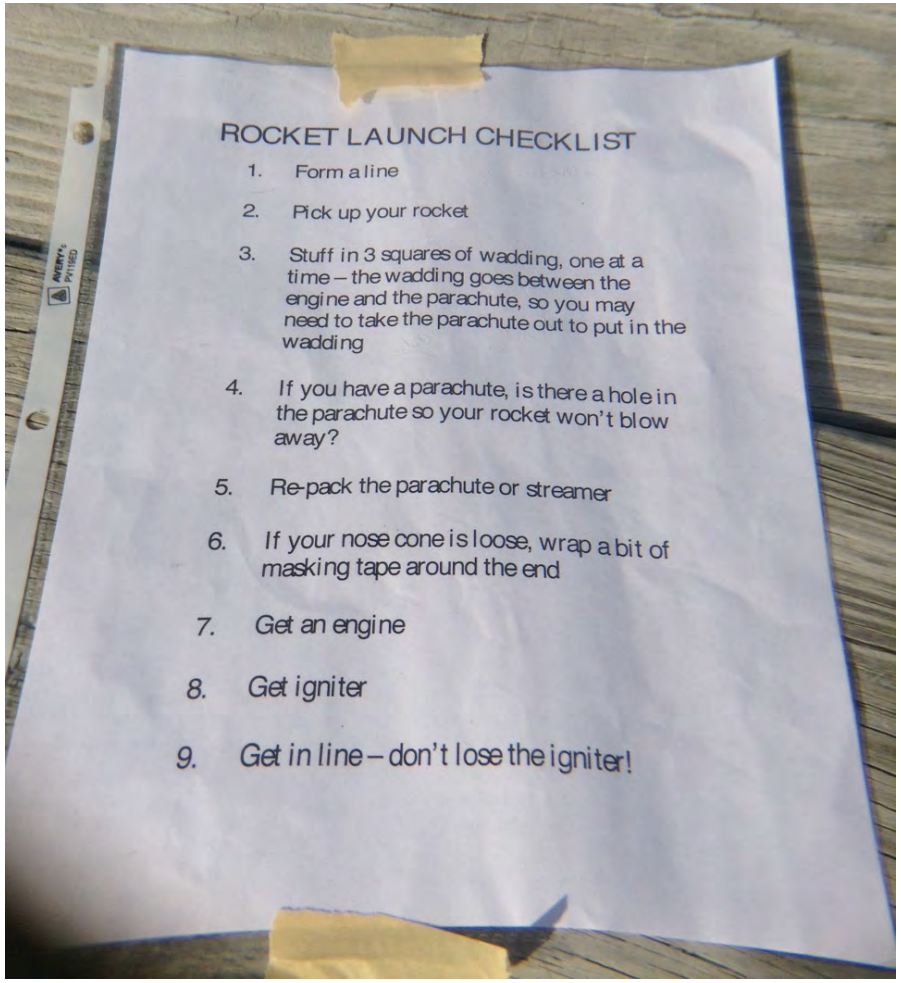
Two cub scout packs attended the launch: Pack 460 from Mt. Airy, MD with 48 scouts, and Pack 178 from Derwood, MD with 10 scouts. The winds proved to be somewhat problematic for the eager scouts, forcing the launches to hold from time to time until the winds died down. Even so, every scout was able to launch his rocket at least once, and all of them had a great time!

A TARC team from Rockville came to the launch, but unfortunately were unable to launch any of their rockets since they needed to be powered by E motors. The relatively high winds would have made these launches less than desirable, in any event, and so they plan to try again next time.

Thanks to Jim Filler, Rich Crisco, and Fabrice Derullieux for helping to set up/break down the equipment and for transport to/from storage; to Mark Wise for helping to keep vehicles off the field; and to John and Mary McCoy for keeping an eye in the winds, and for handling all of the safety checks for the cub scouts’ rockets.

Number of flight by motor class: 1/8A, 7; 1/4A, 1; 1/2A, 37; A, 16; B, 14; C, 9; D, 5.

Good Advice!



This was seen at the November launch at the Goddard Visitor Center where the scouts were prepping their models.

November 2015 Mt. Airy Sport Launch

With a Lot of Help From My Friends

By: Alex Mankevich
NARHAMS President

My best summary of the November 21, 2015 Sport Launch at Old National Pike Park is that the launch did its very best not to happen. Normally, the chief concern of a November launch is the ever-colder weather. This was not the case on November 21st.

Alan Williams at the Launch Panel
Photo: E. Pearson

Fabrice Derullieux watch a cool launch
Photo: A. Mankevich

We knew prior to the weekend that the combination lock on the storage unit had inadvertently re-set itself. Mark Wise was in contact with the storage facility management, and he arranged beforehand to have them loan their bolt cutters so that we could get into our unit. Maria Ha had already purchased a new combination lock to replace the old lock. NARHAMS was all set to go. However, on Saturday morning, no bolt cutters were to be found at the office. Richard Crisco's brothers arranged to rent a pair of bolt cutters. The cutters quickly got the job done and we were soon loading all the range equipment into Maria's truck.

Alex and Frank Panek
Photo: E. Pearson

We had a launch manager in place shortly after our November business meeting. However, family matters forced that person to have to step aside. Normally, I would take up on the vacancy, however recent surgery forced me to "go easy". I was capable of hooking up wires and pushing buttons on the control panel, but I needed mucho help with lifting and loading of equipment.

Thankfully (but not unexpectedly), the depth chart of NARHAMS came to the rescue. Maria Ha provided the all important vehicle for transport, Richard Crisco provided his good-sized brothers Mark and John, Fabrice Derullieux (NARHAMS' official battery-charger) and Mike Kelley provided

Continued on page 23

Ed Pearson running Check-in
Photo: A. Mankevich

Nov. Mt Airy Launch, Continued

Rob Edmonds
Photo: E. Pearson

strong arms and backs for loading and set-up. Mark Wise, Maria Ha and Alan Williams provided experience in Launch Managing and flight narration, Ed Pearson and Maria provided safety check-in, Fabrice and Alex provided some pad assistance for the scouts and novices. Richard and his brothers provided the rocket preparation assistance for scout pack #2005 from Ellicott City. We had set up both launch racks and three away pads.

Richard and Mark Crisco (back) helped scouts all day get ready to fly.
Photo: E. Pearson

New member Charles Bruno
Photo: E. Pearson

It was nice to see our members get in on the launch action. Maria Ha, Mark Wise, Alex Mankevich, Fabrice Derullieux, Richard Crisco, Frank Panek, Bill Boublitz, and Stephen Darnell (along with Craig and Theodore) all launched models. Mike Kelley brought out several of his military models to launch during November's normal "military" theme. Scout pack #2005 launched numerous Gnomes on ½ A3-4T motors. Three 2-stage flights were launched. Joey Heffron launched his Astron Elliptic on 1/2A3-0 to 1/2A3-4T. Geoff Cosden brought out his Hyper Bat on B6-0 to A8-5. Mike Kelley flew his Super Chief on C-11 to B6-4.

A total of 95 flights were launched. The motor break-down is as follows: 26 1/2A3-4T, 2 B4, 20 B6, 16 C6, 11 D12, 8 A8, 5 C11, and one each for A10, E9, E28, F15, F35, F39, F40, G53 and G71.

Maria Ha
Photo: E. Pearson

Mark Wise
Photo: E. Pearson

Carl McLawhorn Memorial Fly-Off-3

Story and photos by Jim Filler

The CMMF-3 Regional Meet was held on Oct 10th & 11th, hosted by Pittsburgh Space Command near Grove City, PA. If you've never been to this field, it is a long trip to get there, but the field is huge. Easily supports up to "K" motors which is great for flying contest flights. There were eleven contestants counting teams and some great flights were logged. Weather was great with cool temps in the morning and thermals in the afternoon. Five sections were represented from the region.

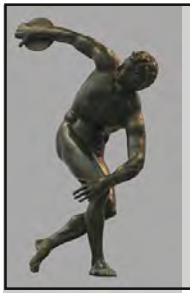
Jim's Predicted Duration flight using a Semroc Max-Micron

The meet is flown in memory of Semroc founder Carl McLawhorn and the request was made to fly the Predicted Duration event with a Semroc Model. Jim Gerhart of NOVAAR had the best flight of the meet with a 2% error for his flight. Optical tracking was used for "A" Altitude and every single flight made was tracked and closed. The G-Force team had an awesome flight blowing everyone away with a 357 meter flight some 65 meters better than anyone else at the meet. "B" Eggloft Duration had several flights at or over a minute. The Flying I-Beam Kids turned in a meet best flight at 76 seconds. "C" Boost Glide also seen many great flights including some RC birds. However Alan Stokker from Jersey had 2 great free flights of 202 and 270 seconds to combine for first place overall.

Traditionally PSC is known for having a "wildcard" event and this meet was no exception with "F" Fexwing Duration rounding out the meet. Several strategies were tried with varied results. Wolf Von-Kiparski had a flight of 631 seconds he was unable to return. Yes, there were several DQ's as well. I decided to try a different approach. I flew an Estes Leviathan with a small internal glider that when boosted on a black powder "F" motor only got to about 300' and the glider was recovered after a 95 second flight. I flew the same setup on a second flight on a full "F" motor which doubled the altitude and I thermaled the glider away for a 240 second flight.

Rod Schafer with his "F" Flex wing

I did some proxy flights for Bradley Grant and together we racked up 1869 points and a second place in sections for NARHAMS. Thanks to PSC for hosting a great meet and for Andy Jackson of ASP sponsoring the meet with door prizes.



Competition Corner:
New Contest Announcements

ECRM-43 Announced!

Yes, that right, the 43rd East Coast Regional Meet has been scheduled for June 18-19, 2016. The meet will be held at the Old National Pike Park, Mt. Airy, MD.

Jim Filler will be the Contest Director for a contest full of exciting events. The weekend will also serve as a practice session for the US World Spacemodeling Championships team. Lots of great stuff to see and do.

Events

Plastic Model Conversion
Open Spot Landing
A Helicopter Duration
1/2A Super-Roc Altitude (*)
Standard Precision Payload (*)

(*) Altitude events will be measured with altimeters

Standard Precision Payload is like a TARC event in that you are given duration and altitude targets to meet and you must carry a “standard” payload (a one oz. cylinder the size of a regular BT-20 body tube) inside the model plus an altimeter. We’ll need some practice flights for that event!

For the full details, including links to guides for each event, click:
http://www.narhams.org/calendar_details.html#ecrm.

Radio-Controlled Rocket Glider Championship

From the NAR NARAM website, this posting:

"R/C rocket glider enthusiasts face off for a friendly show down. Experienced volunteer instructors may also be on hand to teach you how to fly an R/C rocket glider."

No other details are available at this time.

NARAM-58 Competition and Sport Launch

Plastic Model Conversion
E Scale Altitude (altimeter)
G Streamer Duration
D Rocket Glider Multi-Round (no radio control in this event)
C Parachute Duration Multi-Round
A Helicopter Duration
½ A Super-Roc Altitude (altimeter)
Open Spot Landing
Research & Development

July 23 to Friday July 29, 2016 in Location: Walnut Grove, MO

For more info, go to www.naram.org

NARHAMS 2016 EVENT CALENDAR

Date	Time	Event	Location
12/05/15	5:30 - 9 pm	Holiday pot luck dinner and raffle Greenbelt Community Church 1 Hillside Road, Greenbelt	Greenbelt, MD
12/06/15	1 - 2 pm	Goddard Public Launch	Greenbelt, MD
12/12/15	12 - 4 pm	Sport Launch Theme: odd-roc Launch manager: Bradley Grant	Mt. Airy, MD
01/02/15	5:30 - 9 pm	Monthly meeting Topic: Cold Weather Survival (John McCoy/Alex Mankevich) Refreshments: Jef and Ellen Fineran	College Park, MD
01/03/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
02/06/15	5:30 - 9 pm	Monthly meeting Topic: Cold Weather Launch Tactics (John McCoy) Refreshments: Richard Crisco	College Park, MD
02/07/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
02/20/15	12 - 3 pm	Sport Launch Theme: Winter Wonderland Launch Manager: Jim Baird	Mt. Airy, MD
03/05/15	5:30 - 9 pm	Monthly meeting Topic: Plastic Model Conversion - bring models, mentoring (Jim, John, Alex, etc) Refreshments: Jim Baird	College Park, MD
03/06/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
03/18/15	4 - 7 pm	Space Night at Wood Acres Elementary School	Bethesda, MD
03/19/15	12 - 4 pm	Sport Launch Theme: Gliders, free-flight and radio-controlled Launch Manager: Don Carson	Mt. Airy, MD
03/26/15	12 - 4 pm	Ag Center Launch Launch Manager: open	Westminster, MD
04/02/15	5:30 - 9 pm	Monthly meeting Topic: Managing Goddard Launches (Alex Mankevich/Ed Pearson) Refreshments: Alex Mankevich	College Park, MD
04/03/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
04/16/15	12 - 4 pm	Sport Launch Theme: SEMROC models Launch Managers: Tom and Maria Ha	Mt. Airy, MD
04/24/15	12 - 5 pm	Rockville Science Day	Rockville, MD
05/01/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
05/07/15	5:30 - 9 pm	Monthly meeting Topic: Fly It, Take It building session (Tom and Maria Ha) Refreshments: Tom and Maria Ha	College Park, MD
05/14/15	7 am - 5 pm	TARC Finals	The Plains, VA
05/21/15	12 - 4 pm	Sport Launch Fun Event: Ping Pong Ball Spot Landing Launch Manager: Alex Mankevich	Mt. Airy, MD
May 28 - 30	9 am - 5 pm	National Sport Launch	Manchester, TN
06/04/15	5:30 - 9 pm	Monthly meeting Topic: Open building session Refreshments: open	College Park, MD
06/05/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
Jun 18 - 19	9 am - 5 pm	ECRM-43 Regional Meet Events: PMC, OSL, A HD, 1/2A SRA, SPP with altimeters Launch Manager: Jim Filler	Mt. Airy, MD
Jun 25 - 26	9 am - 5 pm	Can Am Cup (FAI international competition)	Muskegon, MI

Date	Time	Event	Location
Jul 1 - 3	9 am - 5 pm	Escape Velocity Conference	National Harbor, MD
07/02/15	5:30 - 9 pm	Monthly meeting Topic: Pot Luck Picnic Refreshments: everyone	College Park, MD
07/03/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
07/13/15	1 - 3 pm	SISTER program launch	Greenbelt, MD
07/16/15	2 - 7 pm	Sport Launch Theme: open Launch Manager: open	Mt. Airy, MD
07/17/15	1 - 4 pm	Apollo Contest (Jim Filler and Jennifer Ash)	Greenbelt, MD
Jul 23 - 29	9 am - 11 pm	NARAM-58	Walnut Grove, MO
08/06/15	5:30 - 9 pm	Monthly meeting Topic: NARAM-58 wrap up (Tom Ha) Refreshments: Tom and Maria Ha	College Park, MD
08/07/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
08/20/15	2 - 7 pm	Sport Launch Theme: Flying Saucers Launch Managers: Tom and Maria Ha	Mt. Airy, MD
Aug 23 - 29	8 am - 8 pm	FAI World Spacemodeling Championships	Lviv, Ukraine
09/03/15	5:30 - 9 pm	Monthly meeting Topic: Elections Refreshments: John and Mary McCoy	College Park, MD
09/04/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
09/17/15	2 - 9 pm	Sport Launch Theme: Night Launch Launch Manager: Jim Filler	Mt. Airy, MD
09/24/15	12 - 4 pm	Ag Center Launch Launch Manager: open	Westminster, MD
10/01/15	5:30 - 9 pm	Monthly meeting Topic: WSMC recap (Jim Filler, Kevin Johnson) Refreshments: Jim Filler	College Park, MD
10/02/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
10/15/15	12 - 4 pm	Sport Launch Theme: Odd Rocs Launch Manager: Don Carson	Mt. Airy, MD
11/05/15	5 - 9 pm	Monthly meeting Topic: Planning for 2017 Refreshments: Alex Mankevich	College Park, MD
11/06/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
11/19/15	12 - 4 pm	Sport Launch Theme: Helicopters Launch Manager: Kevin Johnson	Mt. Airy, MD
11/26/15	12 - 4 pm	Ag Center Launch Launch Manager: open	Westminster, MD
12/03/15	5 - 9 pm	Holiday pot luck dinner and raffle Greenbelt Community Church 1 Hillside Road, Greenbelt	Greenbelt, MD
12/04/15	1 - 2 pm	Goddard public launch	Greenbelt, MD
12/17/15	12 - 4 pm	Sport Launch Theme: open Launch Manager: Alex Mankevich	Mt. Airy, MD