ZOG-43

In this ZOG:
Outreaches
Launch Reports
Build Articles
Rocket Judging
And more...

Zog-43
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Official NARHAMS Newsletter
Editor: Sarah Jackson

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:

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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 and at Old National Pike Regional park near Mt. Airy, 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- March/April 2022
Sarah Jackson, NAR 101372

Hello NARHAMSters!

I bring you the next edition of ZOG-43. It is currently organized by sections. First we have Outreaches, then upcoming events. Launch reports follow right along. After that we have a couple good construction articles, some old memories, and finally some good things to know.

Hopefully this issue is slightly more polished. You may notice that I have found the format called columns. At least, I found it halfway through the editing process. I think I might be getting slightly better at picture placement, but I'll leave that to your judgement.

I would like to reach out to the membership and request folks to send in short biographies of themselves. New members can get overwhelmed by the amount of helpful HAMSters and it would be nice to get names to faces and faces to areas of expertise. I suggest a possible format of:

Name:

How long have you been in rocketry? How did you start?

What's your favorite model? What do you prefer to fly (engines, model types, themes, contest, sport, etc)?

Do you have any particular goals to reach? (ex: appear on the NAR national scoreboard, creating a rocket from scratch? Building a holy grail model? Etc.)

Why do you like rocketry?

Any special tools or techniques you'd like to share?

Any ideas for fun events the club can do?

Keep flying safe, folks!

For questions, answers, opinions, files, photos, and more NARHAMS, join the NARHAMS Groups.io. Also checkout the Facebook group, and of course, the website at narhams.org.

Front: John Larson's Minion Mosquitos on display at the April 2022 launch. *Photo by Alex Mankevich.*

Back: Alan Williams sent in this photo from the last Antares launch. I thought it was awfully cool! *Photo by Alan Williams.*

ZOG ROYAL COURT
(NARHAMS OFFICERS)

ZOG (President) Alex Mankevich

VICE ZOG (Vice-President) Alan Williams

COLLECTOR OF THE ROYAL TAXES (Treasurer) Ed Jackson

KEEPER OF THE HOLY WORDS (Secretary) Open

COURT JESTER (Section Advisor) Jim Miers

Outreach Activities

Wood Acres Elementary School Outreach Report

Reported by Sarah Jackson

NARHAMS was cordially invited to attend the Wood Acres Elementary School's Space Night on 4/22/2022. Wood Acres Elementary is a Montgomery County Public elementary school in Bethesda, Maryland, and recently received the 2022 Best of Bethesda award from Bethesda Magazine. Space Night is an annual event put on by the students' parents to celebrate and learn about all things space. Various parent groups, student groups, and outside presenters (like NARHAMS) set up booths with information and activities for the kids. The NARHAMS booth was manned by Ed and Sarah Jackson and Ole Ed Pearson. Andrew and Adlai Perry stopped by as well. The school was listed as having around 650 students, and it felt like at least half of them attended the event!

NARHAMS arrived early and began setting up. The event organizers assigned us two middle school students to assist us throughout the night. Set up was easy, just putting out tablecloths, rockets, and signs. The Jacksons brought a variety of models, including sport, scale, helicopter, glider, and night rockets. Ole Ed Pearson brought some rockets, too, including one of John Larson's Minion Mosquitos. Andrew and Adlai Perry stopped by and added an egg lofter and scale model to the array. Once set up was complete, Sarah instructed the two volunteers on how to build a John McCoy Puff Rocket, which was our hands on activity for the evening. We quickly decided that the puff rocket might be a bit too challenging for the younger students, so all hands were on deck to quickly build a few decent models that we could offer to any student who managed to mangle theirs.

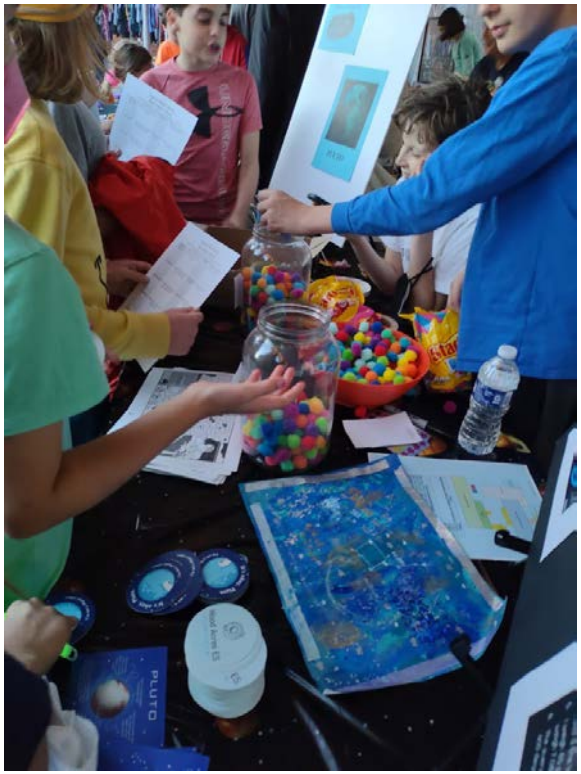
Once the official event was underway, we learned that the Wood Acres students had a scavenger hunt card to fill out, to ensure that they visited all the booths to learn something. NARHAMS' category was aerospace and the

Top: Ed and Sarah Jackson interact with students and parents. Sarah helped build puff rockets, while Ed showed off rockets and explained model rocketry. *Photo credit to Ed Pearson*

Bottom: Sarah Jackson and the two volunteers commandeered a table just for puff rockets and were consistently mobbed. *Photo credit to Ed Jackson*

Left: A young student looks through a telescope provided by the Northern Virginia Astronomy Club (NOVAC). Several telescopes and binoculars were present, as well as computers showing images of planets and the sun's surface. *Photo credit to Sarah Jackson*

Right: Pluto winning the planet status votes. Also note the starburst candies that were in great demand. *Photo credit to Sarah Jackson*



kids had to answer the question, “what did you like best about this booth?” Almost unanimously, the answer was the rockets. We also googled the answer to “How fast is the ISS?” (ans: 4.76 miles/second) and gave stamps and stickers for that box too. Ed Jackson made sure that every student knew what the initials ISS stood for before he gave them credit. There were a surprising number of guesses.

We were given two tables that we arranged in an L shape. The front side was used to make the puff rockets, and the side table displayed our rockets. A half hour after opening time, the booth next to ours remained empty, so we made the executive decision to assimilate it into our booth. We moved the arts and crafts over to that table, so Ole Ed and New Ed could talk to the visitors easier in the original booth. Sarah and the two middle school volunteers operated the puff rocket table and doggedly cut, taped, and rolled paper rockets with the ever increasing crowd of kids. We discovered that puff rockets are very fiddly and take some dexterity and time. According to Sarah, and I have a direct quote, “We are NEVER doing puff rockets again.” That said, we would gladly take any suggestions for easier hands on activities we can use with kids. Moreover, if you really think the puff rocket sounds easy, take a stab at the plans attached to this ZOG and see how you do. Just saying.

Space Night was well attended, but the NARHAMSters had little opportunity to go visit the other booths. Wood Acres Elementary also has a planetarium, with several show times, but alas, none of us were able to make a show. One of the booths gave information on supernovas, and likened a supernova to popcorn. And incidentally, they gave out popcorn too. They also had student quotes about supernovas. My favorites: “Sometimes, after chili, it feels like I ate a supernova.” “I had a t-shirt with a supernova on it. It has a hole in it now.” “I want to see a supernova but I don’t want to sit in the front row.” A second booth was labeled Mad Science, and had a mini James Webb telescope (I thought of you, DJ!).

The gentleman at the booth was happy that I already knew what the JWST was. My favorite booth (besides NARHAMS' of course) was the booth that asked the question: Should Pluto be a planet? My answer is an emphatic YES. Judging by the amount of pompoms the boy dumped into the Yes Jar per answer (versus one pompom per No answer), I'll assume I was with like-minded company. Out in the field, another booth had telescopes and binoculars set up. It wasn't dark enough to see the planets or stars, but the kids still seemed to like looking through them.

Overall, it was a successful night. The children were extremely boisterous. At one point, a posse of grade schoolers marched to the Pluto display chanting "Candy! Candy! Candy!" We assume their demands were met. Very hectic for us NARHAMSters, but overall we had fun. Except for those building the puff rockets!

Photos: Students enjoying Space Night and the activities available. *Photos credited to Principal Marita Sherburne and retrieved from her twitter account @WAESprincipal*

NARHAMS Model Rocket Club:

Section 139 of the NAR National Association of Rocketry
Design & Drawing by: John E. McCoy Sr NAR-15731, 09-18-2002

" Puff Rocket"

NAR Section 139

Apply Magic Tape to the area
inside the dotted line box
Then cutout the launch tube

Fold down on line
Inside

NARHAMS Model Rocket Club

NARHAMS Model Rocket Club

Glue Tab

www.narhams.org

Puff LauncherTube

Glue Tab

www.nar.org

1 inch
square

Fins:

Cut-out Fin Square alone outside black lines.
Fold & crease heavy Diagonal "Blue" lines (first).
Fold & crease Lighter "Green" lines (second).
Fold both Diagonal "Blue" lines to center and cut off
Dark "Red" center point and fin tips.
Fold Lighter "Green" line in to form fin can,
Paste or glue stick Diagonal Fin halves together.

Aero-Body:

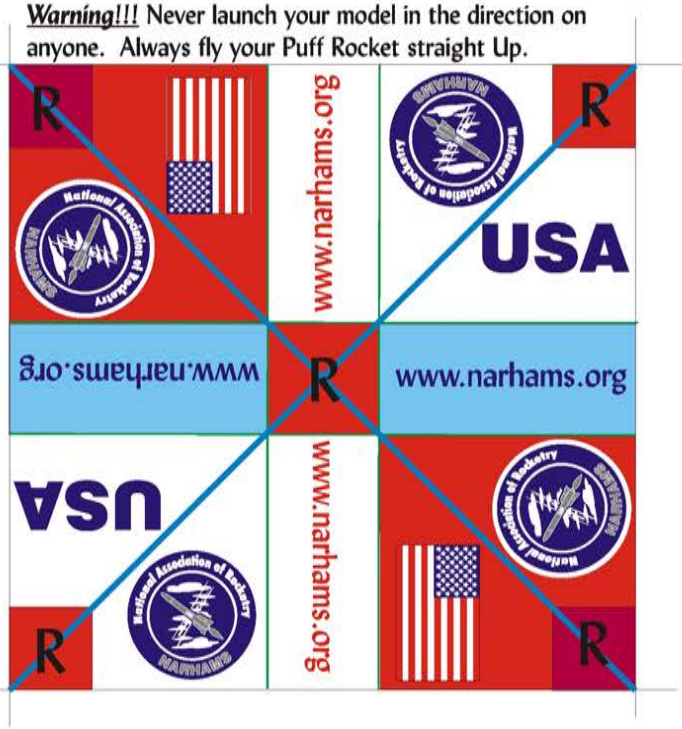
Cut-out Aero body along the outside black lines.
Pre curl body over the edge of a table or around a pencil.
Fold down nose alone the dotted line.
Roll the body taper around a pencil (Flattening is OK),
Use a pencil point from outside to help at nose end of the body.
Tape or Paste along entire body seam length, start
at the wide bottom end and work forward.
Model Body will come to a blunt open nose.
Reshape body if flattened during tape application.
Slide finished fin unit onto the model from the front.
Paste or tape the fin can in place even with the Bottom or
about ½ inch up from the bottom of the body, your choice.

Puff Launcher Tube:

Cut out, apply a strip of magic tape to the large end
and pre curl paper on edge of table
or around a pencil.
Roll tube, tape or paste entire length of tube seam.
Note: Tape gives a smoother launch tube finish, adds a
bit of strength and help slow the wetting of the paper.

To Launch:

Insert "Puff Launch tube" loosely into the model body.
Tilt head back so model is nearly Straight UP.
Give count down, 5 - 4 -- 3 - 2 - 1 Liftoff
Take a deep breath, Blow hard into base of tube.
Warning!!! Never launch your model in the direction on
anyone. Always fly your Puff Rocket straight Up.



Rockville Science Day

Reported by Edward Jackson

April 24th saw the continuation of Rockville Science Day for their 31st year after a two year hiatus due to Covid 19. Like previous years, NARHAMS was asked to conduct a build and launch for the general public to give the participants a fun activity to actively demonstrate STEM principles.

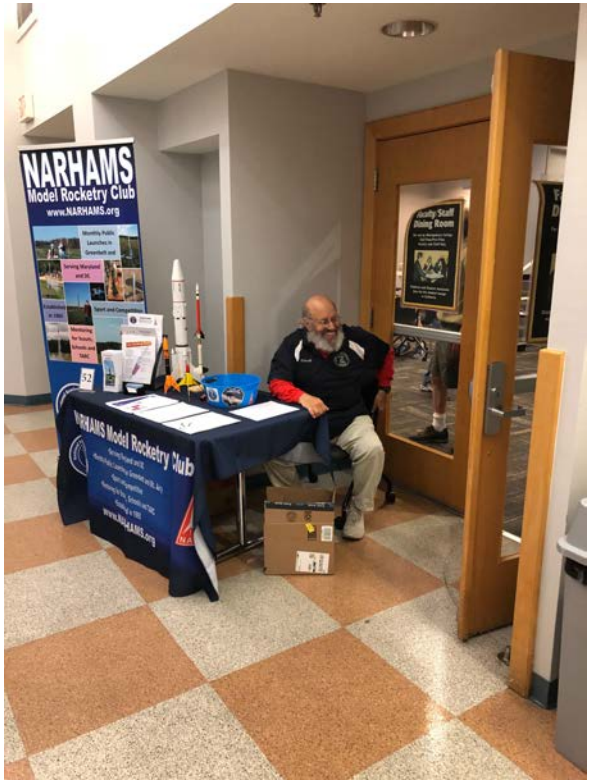
Science Day

NARHAMS has participated in almost every RSD and I was told by Bob Ekman, the event coordinator, that it would not be a science day without NARHAMS. In addition to NARHAMS there was a menagerie of other participants that spread across the Rockville campus of Montgomery College. To quote the event flier, there were Rockets, Reptiles and Robots as well as Music, Math games and Maker projects. 3000 people came to the campus with more than 40 different activities to explore. Life Sciences occupied one gymnasium while Technology occupied the other. NARHAMS was in the Campus Center again occupying the Faculty Lounge for the build session and later the upper Athletics Field for the afternoon launch.

The Setup

NARHAMS members started arriving at the campus around 9:30 for room setup and rocket pre-prep. We set up a table inside with display rockets as well as moved one table outside the room with banners and additional rockets. With only 45 minutes to build the rockets for each session, we elected to do some steps ahead of time as well as alter the design slightly. We pre-cut the engine clip slot. We also glued the launch lug to the fin can with CA because this step is easy to both forget and get wrong. New for this year we also cut kevlar cord for the shock cord mount because in years past the traditional shock cord mount had not had enough time to dry before the launch. The crew then set about preparing

Top left: Rocketry display
Top Right: Ole Ed showing a Reptiles Wonders volunteer how to attach a parachute.
Bottom: The setup from the outside.
All photo credits to Sarah Jackson



Top: Build session 1 preparing to start. Ed Jackson led the build, while the others roamed the tables helping out where needed. *Photo credit to Sarah Jackson*

Bottom: Alan Williams manned the outside table while the build sessions were in progress. At one point, he was hoarding a rather large pile of RSD provided snacks on that table (which he later shared with the other NARHAMSters). *Photo credit to Ed Pearson*

each build station with trays, glue, rags and a rocket kit as they came from pre-prep.

The Build

At 12:00 the event for the day started and our first build session began around 12:45. The first 45 minute session was lightly attended with 12 rockets builts by a handful of families with a few minutes to spare. We cleaned up and re-prepped the room and started the second session promptly at 2:00. The second session really filled the room with a total of 22 rockets built bringing the total to 34 out the 36 possible kits. Even with a loaded room we got through the build with spare time to let the kids decorate their rockets. At this point the race was on, I had moved to the athletic field to set up the launch range while the built rockets were prepped for flight and the Faculty Lounge was put back to the way we found it.

The Launch

The weather for this day was sunny and warm but once again we faced a stiff breeze. At 3:15 the participants of the build and general spectators began to trickle onto the field for the 3:30 launch. After some introduction announcements and safety briefings we started calling names of our builders for the first rack. The first rocket left the pad at a fairly aggressive angle into the wind then gracefully drifted back, over our heads, over the fence and into the maintenance lot. Thankfully a campus employee was able to retrieve the rocket quickly and we adjusted our launch angles even further into the wind to compensate. We were able to retrieve all 34 rockets that were built. We still had two rocket nose cones separate from the rocket body and opt for a longer tour of the college campus. Many thanks to Natalie Shafer for tracking down the noses and reuniting them to the rest of the rockets.

Rockville Science day is one of the more involved events that NARHAMS participates in and it would not be possible without the help we get. Thanks to everyone for helping on set-up and clean-up but I also want to take a minute to specifically acknowledge the following contributions:

Bob Eckman's explorer group was on hand to help with both the build session and launch setup. Ed Peason slaved away at safety checking and prepped rockets throughout the entire afternoon. Alan Williams was on hand to serve as greeter and assist in the launch. Sarah Jackson and Natalie Shafer pre-prepped rockets, aided during the build session and track down errant rocket parts. Mike Cochran helped with rocket pre-prep, builds and pad assistance at launch. A number of members also walked around the campus in the little bit of downtime we had to drum up interest for the build. Thanks to everyone who made NARHAMS' 31st Rockville Science Day a great success.

Above: Michael Cochran outside our build-session building air-guitaring a Patriot model. The Patriot was a popular prop to walk around Rockville Science Day with to drum up additonal business. *Photo credit to Ed Pearson*

Center Top: Ed Jackson prepares to launch the first round of Alpha IIIs. *Photo credit to Sarah Jackson*

Center Bottom: Pauses between flights allowed rocketeers time to retrieve models, and loading of subsequent racks. *Photo credit to Ed Pearson*

Above: Natalie Shafer helped with the build sessions and later retrieved detached nose cones after separation during flight. *Photo credit to Ed Pearson*

Upcoming events

May 7	Monthly meeting	College Park, MD
May 14	TARC Finals	The Plains, VA
May 21	Sport Launch and Rocket Run	Mt. Airy, MD
May 28-30	National Sport Launch	Sumter, SC
June 4	Monthly meeting	College Park, MD
June 18-19	ECRM	Mt. Airy, MD
July 2	Monthly Meeting and Potluck	College Park, MD
July 16	Sport Launch	Mt. Airy, MD
July 16-22	NARAM 63	Springfield, MO

Rocket Run

May 21, 2022

Old National Pike Park

12406 Old National Pike
Mt. Airy, MD. 21771

Free Event

Sponsored by:
The NARHAMS model rocket club
www.narhams.org

How it Works: NARHAMS will launch twelve (12) small, tumble recovery model rockets at five (5) seconds intervals. After the 12th rocket is launched, the participants will then go and try to find them. Those who find a rocket will return it to us – but you get to keep the model rocket.

Time Frame: **The rockets will be launched beginning at 12:30 pm sharp** (weather permitting). You need to return the rocket by 1:00 pm to claim the prize.

Prizes: Participants returning a rocket will also get a "Swag Bag" prize of rocketry and space exploration goodies (a NASA calendar, decals, patches, pins, a model rocket kit, etc.).

Participation: This activity is open to any student. A student is defined here as a full-time pupil of a home school, elementary school, middle school, junior high, high school or college.

Anti-Hogging Rule: Participants must yield to the person closest to a model being recovered, i.e., no fighting over a model.

The Mosquito Rocket

The Mosquito is one of the smallest and lightest of model rockets. It is just over ½ inch in diameter and just short of 4 inches in overall length. It uses featherweight or tumble recovery – meaning that it has no parachute. Yet the rocket tumbles lightly and safely to the ground. Painting the Mosquito in bright colors helps to find it on the ground.

Ole Ed Pearson
Rocket Run Contest Director

Ole Ed is a founding member of the NARHAMS model rocket club. Ed has travelled the world in support of model rocket activities.

This contest is Ed's brainchild and he has brought together the concept, rules and organization of this fun activity. As contest director, Ed's decisions are officially the final say regarding any challenges arising from the Rocket Run.

Rocket Run

Ed Pearson

Above: Top five Mosquitoes (left to right). *Photo credit to Ed Pearson*

Background: Last year, the club built and flew a fleet of Estes Mosquitoes as a public outreach event. Children chased after the landed models akin to an Easter Egg hunt. Successful finds were rewarded with the retrieved models and swag bags of space-related goodies. The event was called a Rocket Run (RR) and was inspired by watching John Bonk launch a different-themed Mosquito monthly for more than a year and then talking with him on how to get others interested.

NARHAMS voted in January to hold a second Rocket Run. At February's meeting, club members were given Estes Mosquitos for the outreach. At the March anniversary-meeting the finished models were collected and judged.

We received 12 models for the RR at the meeting and one was pledged afterwards. These were the builders: Jen Ash, Michael Cochran, Fabrice Derullieux, Ed and Sarah Jackson, John Larson, Alex Mankevich, Jim Miers, Alan Williams, and Mark Wise. Fabrice brought two models, and Ed & Sarah teamed up to build four total. John offered his model after the meeting.

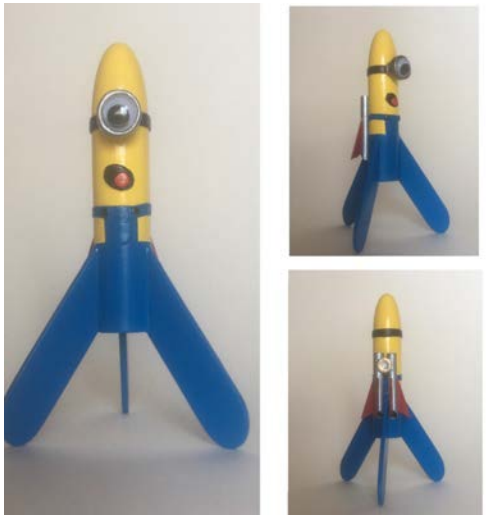
We held a mini contest at the March meeting to statically determine the "best" model. This writer judged the entries. Twenty dollars went to first place, ten to second, five for third, a real two-dollar bill for fourth, and everyone else got a buck.

Ed/Sarah got top honors with a model honoring the Gryffindor House of Hogwarts (they did the other three houses too, but only one entry per person/team was judged). Jim Miers won last year's static event and built an outstanding orange model for this year's second place. Third place went to Alan Williams with arguably the most colorful model and silver pin-striping that hid the nose to body-tube transition. Our Zog produced a fine model favoring a ladybug which edged out a Mosquito depicted as an RAF Avro Vulcan bomber that flew over the head of a young Mike Cochran growing up in Sussex, England.

Thanks to all builders and to Scott Branche of Hobby Works of Laurel, MD, who gave the club purchase discounts.

If you want to see how the models were judged, please read the accompanying article which goes into detail.

The actual RR, where youngsters endeavor to recover a flown Mosquito, is scheduled for May's club launch.



Left: John Larson's model was not judged. He built what he calls the MINION Mosquito. Oh, that's so clever. *Photo/ caption credit to Ed Pearson*

Right: The corralled RR models (John Bonk uses a tomato jar to hold his monthly Mosquito offering; that's where this storage idea originated). *Photo credit to Ed Pearson*

Meeting highlights

January- Virtual meeting due to COVID. MOTION passed to procure another canopy to replace the one damaged in October. New Secretary needed.

February- Equipment cleanup and repair. MOTION passed to award $43 to the winners of the Mosquito build contest for the Rocket Run. The club watched the ISS fly over.

March- MOTION passed that all NARHAMS members are strongly suggested to sign up for duty if present at the launch field, with the exception that the Firing Officer be a NAR member over the age of 18. The sign up sheet will be posted at the check-in station at each launch.

April- The club watched the ISS fly over. Again.

Top Left: Members perform an annual cleaning of launch system #2. *Photo credit to Ed Pearson*

Top Right: Apparent lunar transit of the ISS—February NARHAMS meeting (2/5/22, 6:22.17 pm, College Park, MD). *Photo credit to Ed Pearson*

Bottom left: An Irish leprechaun dressed up as Sarah Jackson monitored the on-line activity during the business meeting. *Photo credit to Alex Mankevich*

Bottom right: Ellen and Jef Fineran paid rapt attention to Mosquito judge Ole Ed Pearson as he detailed the range and value of the points that he awarded during his Mosquito judging. Note the huge pile of cash on the table that was designated as prize money. *Photo credit to Alex Mankevich*

Launch reports

February 2022- Mt. Airy

Top left: A Baby Bertha lifts off! *Photo credit to Sarah Jackson*
Bottom far left: Mike Kelley blessed the old new canopy. *Photo credit to Sarah Jackson*
Bottom left: A little rocketeer watching her newly received club donated silver Baby Bertha fly. *Photo credit to Sarah Jackson*
Bottom right: Josh M. and his homemade Leap Frog. Josh did an admirable job with the fillets and painted the model beautifully. The decal (vinyl lettering actually) was contracted out; he referenced online instruction and built an Arduino platform, programming an altimeter with readout altitude. *Photo credit to Ed Pearson*
Bottom far right: Cleanup on Aisle 43…folks pitched in to put our launch equipment up to take to storage. *Photo credit to Ed Pearson*
Top right: David B. holds his IRIS scale model. His models are beautifully finished; he brought out a Baby Bertha, a Boosted Bertha, a Doorknob and a Dr Zooch Saturn V as well: all well crafted and gorgeous. *Photo credit to Ed Pearson*

March 2022 Sport Launch Report

By: Alex Mankevich – Launch Manager

Folklore says that “if March comes in like a lion, it will go out like a lamb.” The original March sport launch date of March 19th was postponed due to high winds and the threat of rain, which all sounds pretty much like a lion. It was hoped that by postponing until March 26th we would get the lamb. However, NARHAMS is still waiting for the lamb to make an appearance.

The forecast for the postponed launch date called for a threat of wintery mix and high winds. We were willing to set up the launch range and hope for the best. We set up without the EZ Up tents since we didn’t want to risk losing another tent to damage from being blown over. We also set up only one launch rack just in case we needed to make a hasty retreat in case of deteriorating weather. Alex brought out his anemometer so we could get some feedback on the blustery wind speeds.

The intrepid souls that braved the cold and windy day were all bundled up in their best winter weather gear. There was the expected soccer activity on the adjacent field meaning the TARC qualification flights could not launch. The blustery winds were from the west, so that the rockets drifted away from the soccer activity, however the normal windy day weathercocking turned the rockets towards the soccer field during the powered portions of the flights. Happily, no rockets came close to the soccer fields during the day.

March 2022- Mt. Airy

Twenty-three flights were flown. Brain Beard launched the most models at four flights. Brain exhibited his appreciation of current events by launching a “Ukraine-A” model in recognition of the war currently underway in that country. Brian also woke up the launch range with an A10 moto CATO. It is remarkable how loud of a bang that small motor can produce when all its 3.5 grams of propellent goes off instantaneously.

NARHAMS officers Alan Williams and Ed Jackson got in on the launch action. Alan flew an Arcas model which suited the day’s theme of sounding rockets. Ed got creative with his prototype “RocKKKKKet” model.

As the clock turned past noon, we made a cold, objective reassessment of the day’s situation. It became evident that the day was cold and windy and only a few modelers were launching. It was decided that it was best not to tempt fate and to call off the launch at 1:00 p.m. We got the word out on our Facebook page and on the narhams.org website that the launch would end at 1300 hrs. So, we took down the launch range, put up the chain that blocks access to the field, stored the equipment, and dreamily anticipated the bright, sunny and warm Spring launch days that we hope to have in the ensuing months.

Above: Alan William Preps His Arcas Model. The theme for launch day was ‘Sounding Rockets’ and Alan Williams filled the bill quite nicely with his Arcas model rocket. *Photo credit to Alex Mankevich*

Fabrice Derullieux

Brian Beard

Have you seen these men?

Left: Frozen Eskimos. Club members Fabrice Derullieux, Brian Beard, Alex Mankevich and Mike Kelley are seen bundled up well against the blustery and bitter cold winds of launch day. You'll see no T-shirts and short pants worn during the winter by this group of rocket launch veterans. *Photo credit to Alex Mankevich*

Above left: Ed Jackson got creative with his "RocKKKKKet" model by alternately stacking ten (10) cups to make up the body of this prototype rocket. It flew quite well – particularly when you factor in the high winds it encountered during its flight. *Photo credit to Alex Mankevich*

Above right: When the wind is too much for rockets, go fly a kite! *Photo credit to Sarah Jackson*

Mike Kelley

Alex Mankevich

April 2022- Mt. Airy

Top left: Jim Baird (left) checks in the booster stage of a Nike Ajax modeled by Chris Greco (right). Chris flew the Nike booster and the Ajax upper stage separately to great success. *Photo credit to Alex Mankevich*

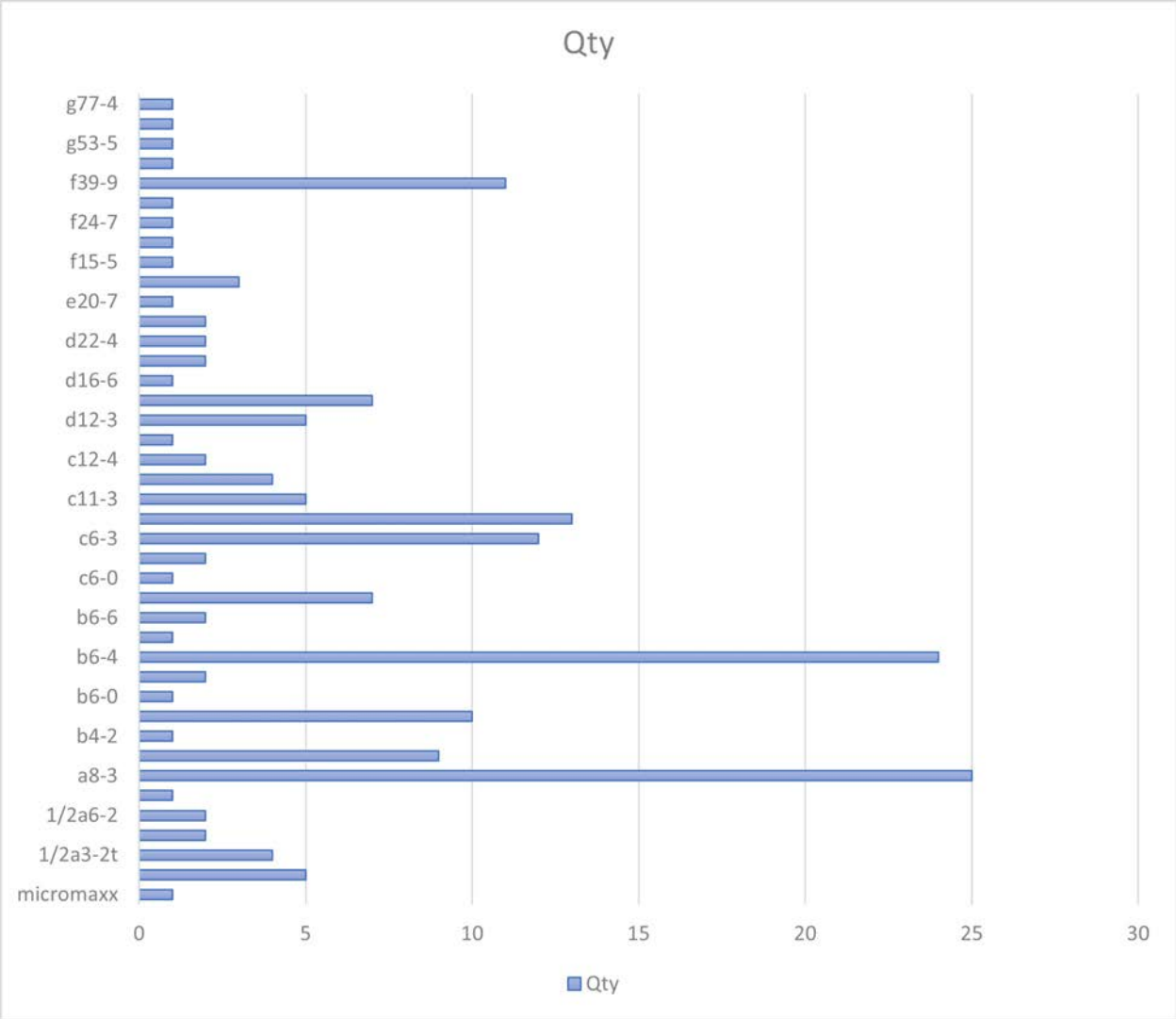
Top right: John has been inspired by Ole Ed's tutelage of the Rocket Run. So, John has created and crafted a troupe of "Minion Mosquitos" that he has donated to Ole Ed. Here John is seen preparing his "Eggscalibur" Mosquito for the April 2022 sport launch. *Photo credit to Alex Mankevich*

Bottom: Steve Lloyd has contributed a number of articles for the ZOG-43. He usually writes about backyard science and nature or just a philosophical slant on science/nature which you can read in the Frederick News-Post. Steve often gets creative with the themes of his model rocket design such as his "Spirit of Candy Corn" rocket. *Photo credit to Alex Mankevich*

Impressions of the day:

Jim Baird- Launch Manager noted:
1) TARC fliers were present at the launch with Trip Barber doing practice? qualifying? launches; 2) there was a small cub scout pack there; 3) there were plenty of NARHAMS sign-ups to help at the launch, that made my job a LOT easier; 4) the weather was pretty nice, although a bit breezy, only remember one rocket in a tree tho; 5) there seemed to be a number of launch system problems, certain pads not reliably firing - perhaps connector problems; 6) setup and break down went smoothly.

Ed Pearson's comments:
Missed you yesterday (your happy-go-lucky ZOG editor had another commitment and could not attend)—well whole club did, and so did the TARC teams, the FAI teams, the Shaffers, the Stec (only Bill showed this time), the park people, the countryside... Ed did bonzo great yesterday!!! Great to see him. I forgot my phone yesterday which merits either a boo or a yay, but hopefully you'll get some submission photos for Zog. Ed has told you we had a mess of people there and daggone people helped out too.



Above: 179 engines were used during the April launch. *Data credit to Jim Baird*

Top right: Model rocketry and photo ops go hand in hand as seen during the April 2022 Sport Launch at Old National Pike Park. *Photo credit to Alex Mankevich*

Middle right: A The American Rocketry Challenge (TARC) team practices to fine tune their entry into the 2022 TARC Finals to be held on May 14, 2022 at Great Meadows, Virginia. *Photo credit to Alex Mankevich*

Bottom right: John Volpe (R) joined NARHAMS and signed up daughters Samantha and Olive at April's launch. He tells ole Ed that 37 years ago he used to launch regularly at Goddard, coming out with his dad who worked there. *Photo credit to Michael Cochran. Caption credit to Ed Pearson.*

The Antares NG-17 launch from Wallops Island

By: Alex Mankevich – Intrepid ZOG-43 photojournalist

Northrop Grumman targeted liftoff of its Antares rocket for 12:40 p.m. on Saturday, February 19th from the Mid-Atlantic Regional Spaceport's Pad 0A at NASA's Wallops Flight Facility on Wallops Island, Virginia. The Mid-Atlantic Regional Spaceport's Pad-0A is the only launch site utilized by the mid-sized Antares rocket.

As the NG-17 mission's title implies, this was the 17th operational cargo re-supply mission to the International Space Station (ISS) by the Cygnus spacecraft. This was the sixth flight under Northrop Grumman's second Commercial Resupply Services (CRS-2) contract with NASA. It also was the sixth flight of the upgraded Antares 230+ launch vehicle. This was only the third time a launch was performed in the month of February for the Antares rocket.

NASA Wallops was still in its COVID-19 pandemic protocols therefore, they were issuing a limited number of media credentials to cover this launch. Your ZOG-43 launch reporters declined to apply due to this restriction. The standard pre-launch press conference was held virtually, and the NASA Wallops Island Visitor Center was closed to the media and to launch spectators for this launch.

Your pandemic minded NARHAMS President decided to perform a photographic "hit-and-run" by waking up early on launch day and driving to the Gargatha Landing boat ramp site that is just under six miles away from the launch pad. This venue offered a site less frequented by launch spectators thus providing an increased measure of social distancing. While this site is further away than other boat launch sites, its location towards the southwest of launch pad 0A assured that the mid-day sunlight would shine on the white Antares' rocket body. Those photographers stationed to the west and north of the launch pad had to contend with the shadowed side of the Antares rocket facing their camera lens. The Gargatha Landing site allows the launch spectator to view a longer flight of the rocket since it is travelling southeast from the launch and into the general direction of this site. And yes, not to worry, the roar of the RD-181 engines can be heard quite loudly and with satisfying duration from this viewing location.

Launch day produced a cloudless blue sky out over the Atlantic Ocean. The surface winds were a bit brisk, but they didn't threaten to postpone the launch. As a photographer I was not pleased that the backdrop for the Antares rocket's flight was a monotonous blue sky. I'd much preferred to have fluffy, billowing white clouds scattered widely across the sky so that they would provide some drama and composition to the launch photographs. The upside was that there was no low cloud cover that would have obscured the rocket as it rose from the launch pad.

This was the first Cygnus mission to feature an enhanced gimbaled engine on Cygnus' service module which was upgraded in order to perform a re-boost to the space station's orbit as a standard service for NASA. Re-boosts of the Station's altitude are routinely required to counter the natural decay of the ISS' orbit as it races around the planet.

Cygnus NG-17 is scheduled to remain at the ISS until late May 2022. After unberthing from the ISS Cygnus will deploy some CubeSats, then dispose of several thousand pounds of trash during its controlled re-entry into Earth's atmosphere over the Pacific Ocean. The February 19th launch coincided with the next-to-last day of the 2022 Winter Olympics. Concern over a Russian military invasion of the Ukraine was gaining traction around that time and a build-up of Russian forces near the Ukraine border was evident. The cause for concern over the potential for military activity was that Russia's NPO Energomash manufactures the Antares' RD-181 engines and the Ukraine's KB Yuzhnoye/Yuzhmash

constructs the Antares' first stage body and propellants tanks. This situation prompted questions to Northrop Grumman regarding their preparedness regarding potential interruptions for the delivery of Antares flight hardware. Northrop Grumman's Kurt Eberly responded the day before the NG-17 Antares launch that they had secured the necessary flight hardware from these countries for the next two Antares launches.

Russia started its military invasion of the Ukraine on February 24, 2022. The United States and other western nations responded by levying sanctions against Russia. In response to the imposed sanctions, Dmitry Rogozin, head of Russia's Roscosmos, announced that Russia would no longer supply its RD-181 engines to the United States. Naturally, the raging war in the Ukraine has disrupted routine business in that country, so that the construction of future Antares core stages by KB Yuzhnoye/Yuzhmash located in Dnipro, Ukraine is facing some uncertainty.

As noted above, we can expect to have two more Antares flights out of the Mid-Atlantic Regional Spaceport on Wallops Island. These flights will be designated NG-18 and NG-19, and their completed missions would close out the Northrop Grumman's current CRS-2 contract with NASA for ISS re-supply missions. The NG-18 mission is currently penciled-in for August 2022 and we can anticipate the NG-19 mission sometime in the timeframe of the first quarter of 2023.

So, let this be your wake-up call. If your bucket list includes witnessing an Antares launch in person from Virginia's shoreline, then you should make plans for heading towards Wallops Island this summer.

Top left: You can count 17 stars on the mission patch which signify that this is the NG-17 mission to re-supply the International Space Station (ISS). Note the thrusting engine on the Cygnus spacecraft to indicate that this mission will feature a re-boost of the ISS by Cygnus. The only other spacecraft capable of re-boosting the ISS to a higher orbit is the Russian Soyuz spacecraft. *Image-Alex Mankevich*

Top right: *Photo- Christina Tyler Wenks*

Middle right: Liftoff ofthe Antares rocket on its NG-17 mission occurred at the beginning of the launch window. This is the view from the Gargatha Landing boat launch which is situated about 5.7 miles southwest from launch pad 0A. *Photo- Alex Mankevich*

Bottom right: The Antares rocket's twin RD-181 engines produced a column of exhaust shortly after launch, which became visible in the cold high-altitude sky. *Photo-Alex Mankevich*

Virginia / CarolinaTryouts

Don Carson has been hosting a series of NARHAMS-sponsored NRC/US Team Tryout events, labeled VACATION. (Editor note: Not sure what it stands for?) at the Old Warren County Airport in North Carolina. He's given some details on how the flying went. VACATION-1 was held in February 2022. VACATION-2 was held in March 2022. So far, 4 VACATION events have been held, with the possibility of more in the future. Here are Don's comments below (make sure to check out #3 for some good vellum advice:

VACATION-2
We had a great day of flying today. Thanks Jay Marsh and Jim Filler for coming out. We were joined by one of the fellows (and his son) that fly RC planes out at our field. They enjoyed the rockets.
We had entries in S2/P (Fragile Payload), S3A (Parachute), S4A (Glider), S6A (Streamer), and S9A (Gyrocopter) - lots of variety.
The field is in great shape. The grass has been mowed recently and the crops are still less than 5 or 6" tall. The soil has mostly dried from all the rain we had, there are a few low spots that are a little wet. The grass is quite wet with dew in the morning, be prepared for that.
The results have been posted on the NAR website in the US Team Tryout Scoreboard. They will be listed as pending until someone on the Contest board reviews and accepts them. Should be soon. We had some good scores. Tomorrow we have VACATION-3 and I expect Jay Marsh and newcomer Will Gilley (who Jay and I are mentoring) to join me for some more flying.

VACATION-3
Sunday started out windy and stayed that way. Jay Marsh, Will Gilley and his mom, Jamie, joined me for the day. We had a lot of time to check out Will's excellent vellum models and provide him with some materials for launching and building more models.

We had entries in S2/P (Fragile Payload) from me, and S6A (Streamer) from Will. Unfortunately, my flight landed in a tree, so DQ. Will had three good flights in S6A. It was too windy to try parachute.

The results have been posted on the NAR website in the US Team Tryout Scoreboard. They will be listed as pending until someone on the Contest board reviews and accepts them. Since they are not using the scoreboard to qualify Juniors for the flyoffs, I'm not sure what will happen to Will's score. I did find out that the two other contestants listed as Juniors, are actually competing for Senior slots. There is a glitch in the system they are working on to fix that.

I mentioned to Steve Kristal the issue we had with the ejection charge roasting the transition section of Will's Vellum rockets. Here is his response:

"As to your mentee's vellum models, vellum is not strong enough for the transition. It will burn or melt from Estes ejection charges. You can extend the motor mount up into the transition but for vellum it is still iffy. My suggestion is to use a heavier cardstock for the transition section.

Also, remember the downside to vellum tubular portion is that it is extremely water sensitive. The flyoffs are going to be in Missouri. If the models are flown in the morning the dew on the ground will probably render them un-reflyable. That's why Emma and I always showed up with multiple models, some vellum, some waterproof paper, some straight cardstock.

For what it is worth, for parachute I just use straight cardstock models. At Arizona Cup I maxed 3 flights all using straight 30# "Presentation Paper" cardstock."

Good advice. Paper rockets are really good, inexpensive ways to practice FAI flying. Get some of that 30# cardstock and try that. Down the road we will work on more water resistant models, like fiberglass. The waterproof paper that Steve references is next to impossible to find (as I understand).

As a bonus attached are pdf of templates for transition and cylindrical body parts. The cylindrical tube may need to be longer if your nose cone is short. Need to make sure the overall model is 500 mm long.

VACATION-4
Jim and I braved the dubious weather forecast and got started a little after 9 am. We had mostly cloudy skies with the Sun peeking through occasionally. It was enough to set up some regular thermals carried across the field by light winds.

Jim was flying S9(gyrocopter) and I was flying S4(glider) and S2P(Egglofting with the target altitude and duration, the kind of model I lost in the trees last time. It is still up there).

Our flights were not very competitive and we ended up just getting some valuable practice flying in. Turns out we were both a little rusty. Jim had some trouble with his fixed head piston staying together, but after his first test flight, he put up 3 qualified S9 flights.

I had rebuilt some old S4 models. Some of these leftovers had some bad habits that I thought I had corrected. One had a nearly burned through body tube that I managed to crush while getting the glide trimmed. I had 3 great boosting flights. The first went into some bad air for a short duration flight. The next one spiraled in. I had not checked the tension on the rubber band that swings the wing. I tightened the rubber band up and flew it again for a nice flight. The sum of the three flights did not improve my past score.

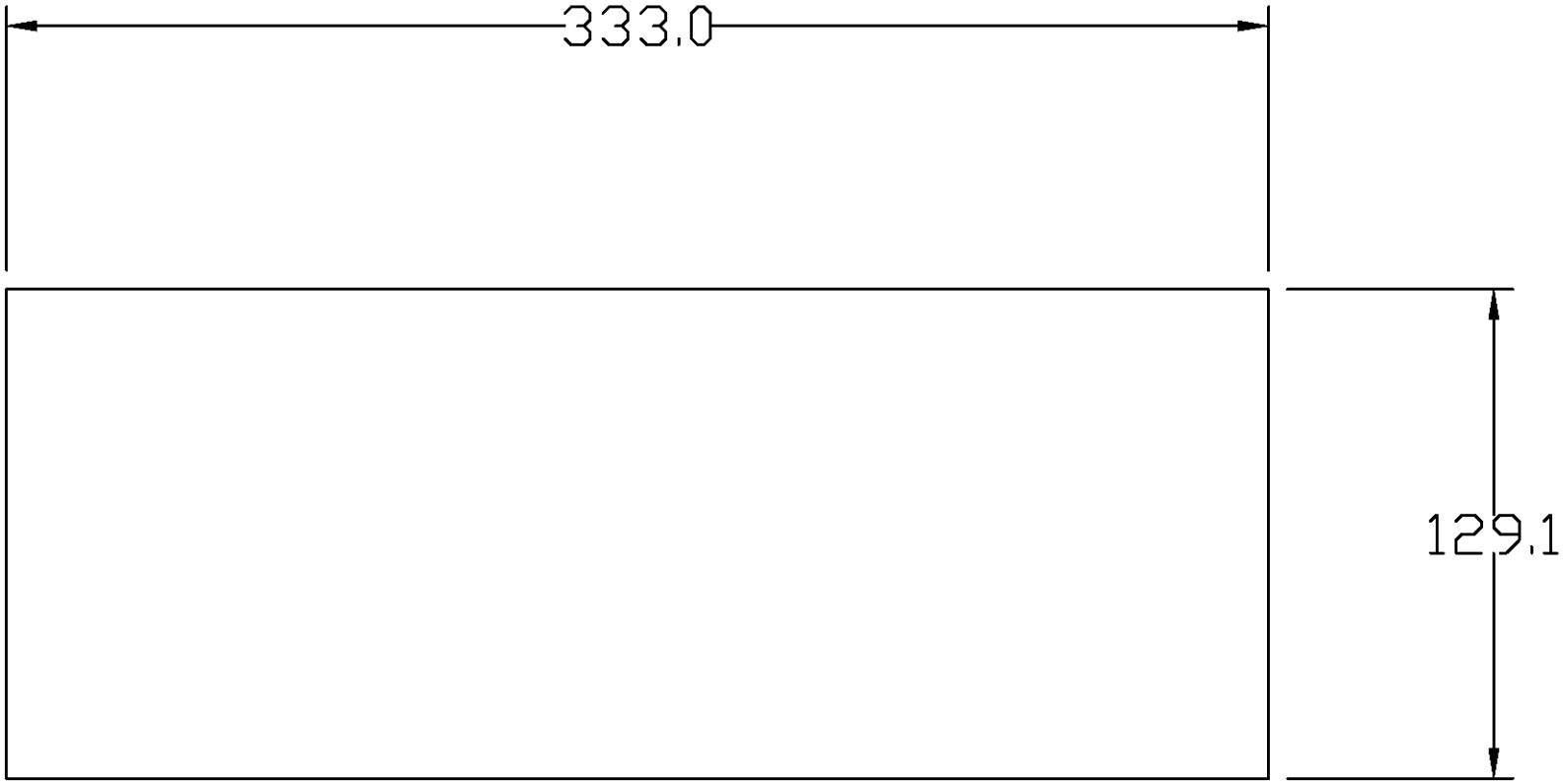
My S2P replacement model was a disappointment. All three flights featured a squirrelly corkscrew boost which cost me altitude. I believe this model is too heavy and may have some poor airfoils on the fins. Time for a rebuild. The original model showed pretty good promise.

We were joined by Allan Foster, one of my RC Plane buddies. He brought his mower and finished the job I started mowing the airstrip earlier in the day. Rain chased us off before Allan could get his plane in the air. All in all, a productive day of rocket flying.

Top: It was a little chilly when the breeze picked up. Jay and Jim discuss the finer points of international Streamer Duration. *Photo credit to Don Carson*

Middle: Pretty busy line up for the Old Warren County Airport field. *Photo credit to Don Carson*

Bottom: Don Carson prepares a model for flight. *Photo credit to Jim Filler*



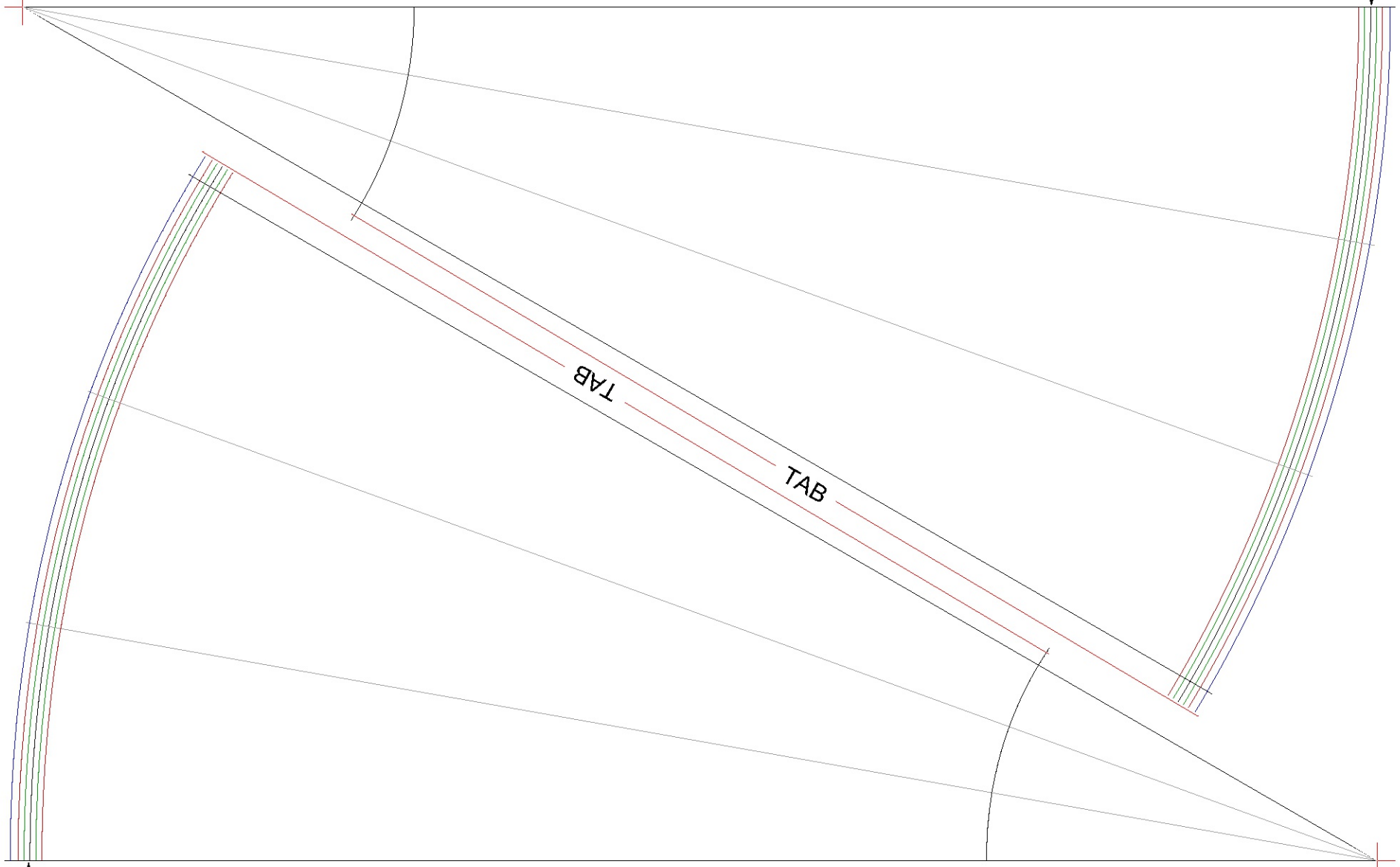
MYLAR PATTERN
FOR ONE WRAP
AROUND MAIN BODY
JUNE 15, 2005
(ALL DIMS IN mm)

40mm Paper body Tailcone Pattern

March 13, 2001

Cylindrical body is 11" long by 4-31/32" wide. Resulting tube a bit over 40mm.

Nominal 40mm line is black



Nominal 40mm line is black

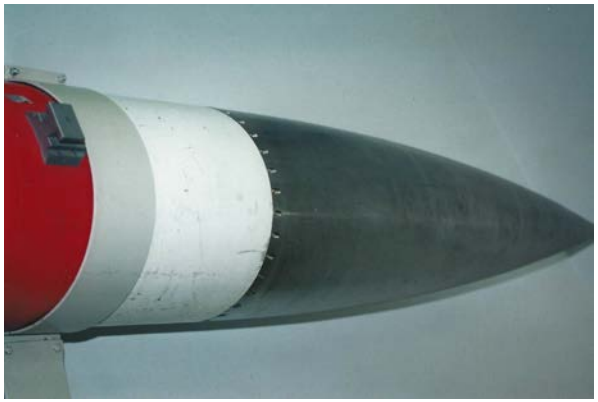
Reference Rectangle should print 7" x 10"

A Bare Metal Nose Cone

By John Brohm, NAR #78048 *(all photos credited to John Brohm unless otherwise noted)*

Above: Black Brant VIII- Photo by Tim Harincar

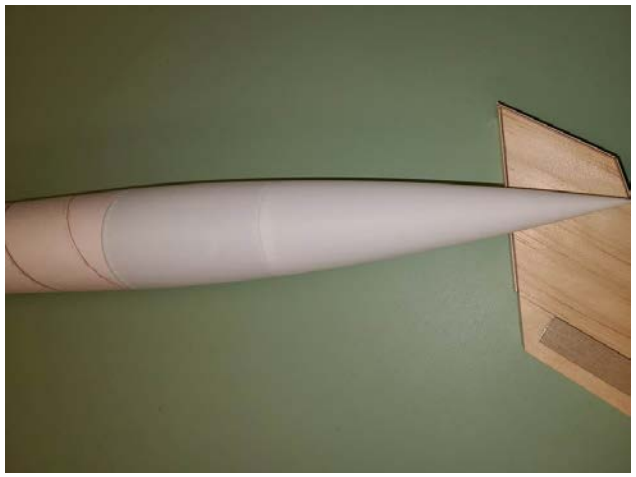
Many of you are no doubt familiar with the Black Brant VIII, a two-stage member of the Black Brant family of sounding rockets. NARAM 62 afforded me the opportunity to scratch-build a scale model of this prototype, and the particular round I modeled was the one formerly on display at the St. Louis Science center. This is the same round Peter Alway documented in his 2002 Rockets of The World supplement. A prominent feature of the round is its bare metal nose cone, and in this article, I'd like to share with you how I tackled that challenge.



Above: Black Brant VIII Nose Cone- Photo by Paul Lubertowicz

A scratch-built scale model often implies special, or non-standard, parts, and the nose cone for my model was no exception. Because of its size at my scale factor, I needed a custom part, and since finding a vendor that can or will CNC-machine a precision balsa nose cone is becoming harder than picking winning lottery ticket numbers, I opted for a 3D printed part. Because of its length, the nose cone was printed as a two-part, 3D resin-printed assembly, produced by Mike Nowak of Galactic Manufacturing. Two parts means a joint, and so a little bit of sanding was needed to arrive at a clean fit. Also, to maintain the nose cone's compound curve, I found that leaving a small gap in the joint helped the fit. With the cleanup finished, the two halves were epoxied together.

Below: Two-Part Nose Cone



Above: Filled Joint

Because the resin material can flex, the joint gap was filled with an epoxy/micro-balloons mix. I chose this particular filler mix because a typical solvent-based filler in this application could lead to a cracked joint, as a consequence of that flexing.

Surface blemishes were filled with Bondo Glazing and Spot Putty. The very tip on this cone sustained a little damage during shipping, so that defect was corrected with

Left: Ready for Primer

Right: Finished Nose Cone

a dab of Apoxie Sculpt, sanded to shape once cured.

The nose was then prepared for primer. I used Rustoleum Automotive Primer for the first two coats, with Tamiya Basic Modeling Putty applied as needed to rectify any remaining surface blemishes. Once satisfied with the base primer finish, the nose was sprayed with a couple of coats of Tamiya Gray Fine Surface Primer, and then finally, with GSI's Mr. Finishing Surfacer 1500 Black Primer. I then spent some time and elbow grease wet-sanding and buffing the black primer completely smooth, as metallic paint will reveal the slightest unattended surface blemish.

Now for the metal paint. For this application I decided to go with AK Interactive's Xtreme Metal Polished Aluminum, airbrushed over the buffed black primer. This stuff is an enamel, and comes airbrush-ready right out of the bottle.

And there you have it, a bare metal Black Brant VIII nose cone, ready for installation. Let's place it on the model's payload section and take a look at the thing.

Overall, I was quite happy with Mike's printed part, and particularly with the metal finish AK's Xtreme Metal paint provided. Both

vendors now occupy a prominent place in my future scratch-building plans.

==

Galactic Manufacturing - Galactic Manufacturing
AK Interactive Xtreme Metal Paint - Xtreme Metal Color Series 30ml AK Interactive (megahobby.com)
(also available at other on-line hobby vendors)

Below: Payload Integration

Making Hollow “Built-Up” Fins

By Alan Williams NAR 14137 *(all images credited to Alan Williams)*

Fin design is driven by a combination of esthetics, plus the atmosphere in which our models fly. And everybody knows how to make rocket fins, right? Grab a sheet of balsa; draw a shape on it, start cutting, then sand and sand to your desired profile. Any fin planform (elliptical, swept-clipped delta, trapezoid, even square) you can dream up will likely perform satisfactorily so it’s often a matter of personal taste. Perhaps more importantly some version of the skinny teardrop cross section will help reduce drag. Ideally, your rocket should commit the least violence to the air that you can get away with. You also want fins that are strong in torsion. If your rocket’s fins hum from flutter, you can bet it’s wasting a bunch of energy.

However, the quiet truth about our “space models” is that most of them fly a ways down in the subsonic end of aerodynamics. The cool swoopy swept fins we love are unneeded at the speeds we normally reach. The popular Cessna 172 light aircraft uses a similar swooshy looking tail for its blistering top speed of 126 knots. Hey, fantasy sells planes too.

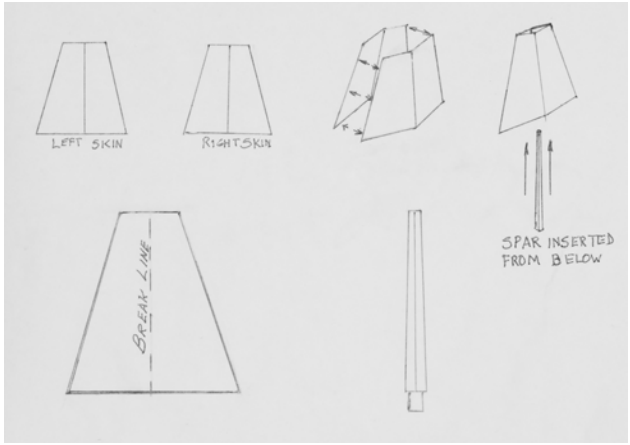
But when a rocket actually gets up near supersonic speeds, design parameters transform fast. Shock wave propagation and drag effects require fins with swept leading edges and specialized thin sections like the sharp diamond cross section Nike and Honest John fins and wedge-slab-wedge panels of the Javelin 2nd and 3rd stage fin units. At peak altitudes, the thick single-wedge shape of the X-15’s large vertical tail maintained control and stability authority.

Replicating these fins and cross sections for scale or sport models demands a different modeling skill set. Imagine recreating the swept wedge fins of the Saturn 1B, Astrobee 1500, and other big lift space vehicles by sanding them out of solid planks of wood. Creating scale solid high speed fins from slab wood requires repeatable control of narrow sanding angles that most modelers struggle with. It can be done, but the results are often disappointing. NASA didn’t do it that way. Rather, these fin systems were assembled with rugged spar structures covered with shaped flush-riveted metal skins.

Of course, the new-ish world of 3-D printing opens up a wealth of possibilities here, but the parts are often heavy, covered in ridged layering artifacts, and require a ton of vector plotting before anything real happens. But there is another way: spar and skin construction also works in the space modeling world.

These techniques were shared decades ago by the pioneering international competitor Col. Howard Kuhn in an old Model Rocketeer article. (Howard is remembered for creating the hobby’s first reliable commercial egglofting capsule and a whole fleet of contest gliders.) They are no secret to experienced scale builders. But I want to encourage neophyte flyers to try them too. With the right materials, adhesives, and care in assembly, this method can match the strength of traditional solid fins, while allowing lighter, more accurate structures. It could also up your game some.

The actual construction begins by tracing out the desired shape (say, a “Nike” style trapezoid) on your fin surface material. Depending on flight forces expected this can range from manila folder paper, quality



playing cards, tagboard, 1/64th inch modeling plywood, or even plastic sheeting. A certain degree of flex is OK, as the structures will stiffen during building. The important thing is to duplicate each fin face exactly. Now cut out the fin surface shape from the material sheet.

Next, draw a line at the exact measured "break" line of intended maximum thickness from base to tip on the inside surface of each fin. Here's the fun part: use a good sharp modeling blade to gently cut halfway through each piece on the break line. Were you successful? It takes some practice. Now, at that cut line, carefully fold the face just a bit in toward the side you just cut. Looking at the outside aspect, you should now see a nice crisp border appearing at the high point of the fin thickness. Now do precisely the same for the other side of the fin. Repeat the process a bunch more times.

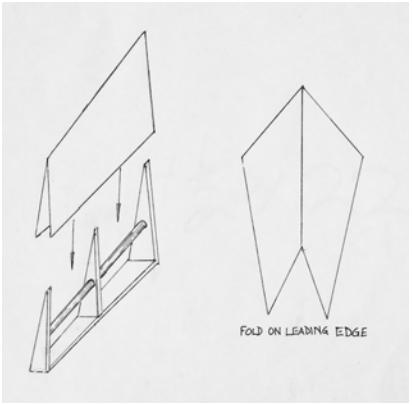
After thusly preparing each fin panel skin, take any two well matched parts and carefully glue just the fore and aft edges together. Use your adhesives sparingly to avoid blobs on the leading and trailing edges. Make sure the edges exactly match on each contact surface. You should now have a hollow fin with a visible diamond cross section. Make many more than you need and toss any where the break lines and joins do not square up. This is usually from unmatched edges inducing an unwanted structural twist.

Now the magic happens. You will also have prepared wooden or plastic spars with a slight taper from one end, a bit longer than the fin height. (Many of these fin shapes naturally induce a slight taper from base to tip.) For smaller fins tapered wooden toothpicks and matchsticks are a great timesaver. Apply adhesive along two opposite surfaces of the spar and insert it up inside the base of your fin halves right on the break line. Ensure alignment and an even glue join, then go wash the dishes, or something. When you come back you should have a strong and attractively symmetrical fin ready for use. (Any extra spar length is for handling; trim off or use for through-the-wall mounting.*) Once each fin is installed and filleted in place you may be surprised at its stiffness. The open fin tip can be filled with any favorite modeling putty before finishing,

Similar "wedge-slab-wedge" fins can be made the same way, with double break lines and a tapered internal wooden slab or multi-spar frame to fill the flat center surface. 3-D printed spars for complex fin shapes can also work.

Single wedge cross section fins, as on the Astrobee 1500, Little Joes, and Saturn class rockets can be served by simple frames, internal wedge brace segments, and symmetrical card paper or modeling-ply skin surfaces. Finally, for models intended for higher velocities, more robust fiberglass and carbon fiber materials can be chosen. With practice, a world of possibilities in scale and other applications can open for you. I think you will be pleased by your results.

*While making my recent little Terrier-Sandhawk, Captain Stoopidpants managed to drive those spars right through the engine holder tube, making it impossible to install a motor. Go ahead kids; trust my advice on any subject!



Public Letter to Mark Wise from Ed Pearson

Dear Mark,

Not long ago NARHAMS awarded you a well-deserved FROG Award. You spear-headed* the FROG delivery to Todd Schweim at NARAM-62. You nominated a successful 2022 FROG candidate. You also suggested that the FROG Award be renamed.

So I thought you might like to know how FROG became the award's appellation. Sometimes origin stories have interest and are lost as times passes.

It all started with a trip to Kentucky's capital circa 2000. I bought a two-foot tall treasure from a Franklin artisan. He had welded together snips of copper and tin to form the likeness of a sitting bloodhound. The creation was clever, clever, clever and I knew my cousin (a dog owner) had to have it for Christmas. Happy at the find, I packed doggie away carefully for the return to Maryland. When my prize was delivered, my cousin was shocked, asking, 'Why did you get this monstrosity?' (or something like that; I don't remember the exact words, just the sentiment).

The following Christmas, my cousin retaliated and got me the most useless, grotesque stone-garden ornaments he could find—three dawdling frogs. Needless to say perhaps, I loved and still have them! (Note: twenty plus years outside has taken the toll, and they are worse the wear…when I tried to discard them last year, my daughter balked in disbelief; their wear hasn't diminished her affection yet for the froggies).

So subsequently when it came to think of a name for the nascent NARHAMS award, why not name it for the frogs and gin up an appropriate acronym meaning? What sealed it for me was thinking of Doug Frost—who eponymously chose Frog Dust as a moniker. The late Doug was persistent for preNARHAMSters to form a section and introduced me to the NAR and Estes model rocketry (for years I had only known about Model Missiles—Harry Stine was prescient about getting model rocketry into hobby shops in a time when Vern and Lee were doing mail order business). Anyway, this narrative covers only the naming of the award and not why it took us 37 years to conceptualizing one.

Mark, thank you again for your many NAR contributions. I have yet to read the online NAR Member Guidebook Todd and you edited/contributed and made possible. This is but one example of your work.

*Spearheaded, yes, but also with noteworthy contributions from Alex Mankevich, Jen Ash, Don Carson, et. al. (in supply-chain order of the at-NARAM presentation/ attendance). I found it both intellectually eerie and naturally comfortable, that at the award, we unconsciously self-separated putting the ten or so southpaws on the left side of the restaurant room and the righties on the right.

Right: The Original FROG Namesake *(author's photo)*

Memory Lane 2017 - James Webb Space Telescope at NASA Goddard

By: Alex Mankevich – Nostalgic President

The James Webb Telescope (JWST) was subjected to vibration and acoustics testing at facilities at the NASA Goddard Space Flight Center, where the core of the observatory was constructed, to assess its ability to survive the rigors it would encounter on its ride into space aboard an Ariane 5 rocket.

NASA Goddard engineers announced that the space telescope had also successfully passed the center of curvature test, an important optical measurement of the JWST's fully assembled primary mirror.

The space telescope was later shipped to the NASA Johnson Space Center in Houston for its next round of testing.

But before that, the JWST got a good look at NARHAMSters Sarah and Ed Jackson. The Jacksons were rewarded for their good work during the public model launch at the NASA Goddard Visitor Center on the First Sunday in April 2017.

Currently, the JWST is at Lagrange point 2 about one million miles from Earth. It has now completed its final stage of telescope alignment and will now undergo a series of science instrument commissioning which should take about two months before scientific observations begin in this summer.

Far left: The JWST's 18 hexagonal shaped mirror segments are seen through a window at ground level. Each mirror segment is covered in a microscopically thin layer of gold. *Photo credit to Alex Mankevich*

Left: The backside of the JWST. *Photo credit to Ed Jackson*

Right: The James Webb Space Telescope (JWST) was thrilled to meet Sarah and Ed Jackson on April 02, 2017. The JWST was happy to take a break from its vibration and acoustic testing and to socialize with its admirers. *Photo credit to Alex Mankevich*

Rocket Run Static Judging

by Ed Pearson

This is based on a presentation made at the March NARHAMS meeting after the Rocket Run's (RR) static judging. It shows participants how their models were judged. It also shows anyone a pathway for comparing similar models.

What follows is the RR static assessment schema. It is made a priori and offers a judge a way to determine outcomes… outcomes that may be seen as consistent, fair and valid (defined as shared acceptance). More on this later.

The schema consists of an eligibility assessment and a dozen+ categories to evaluate. A judge examines a model, assures it is eligible, and assigns a numeric value to each category. A range of category values (i.e., choices) is specified to assist the judge. The chosen values are summed and that total becomes the model's score. Scores are sorted/ranked for all eligible models. The highest compared score reflects the "best" model and the ranking-range determines other places.

It takes time to explain eligibility assessment and this is addressed in footnote-1. Someone who takes time to build and enter an ineligible RR model deserves reasonable rationale why the entry was excluded.

Here are the dozen+ categories chose to evaluate, short narratives of each, the categories ranges of values, and what-to-do guidance for value assignments.

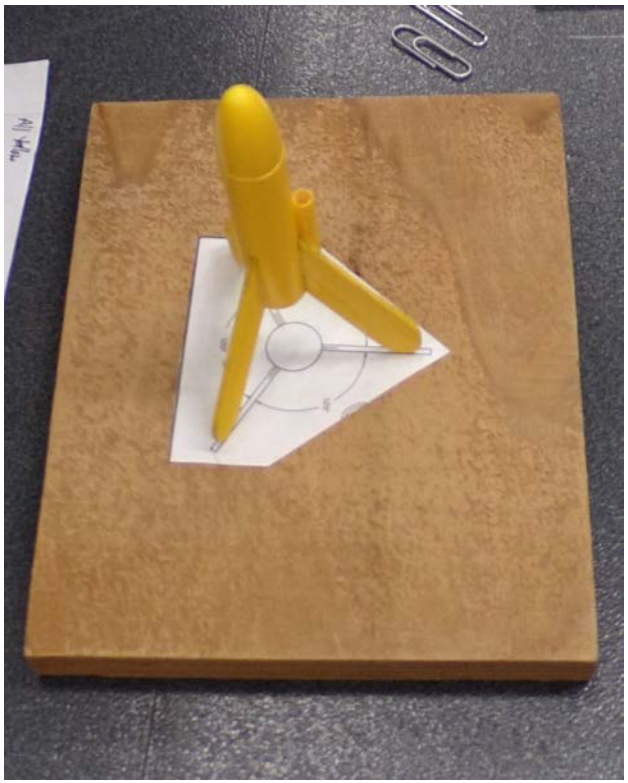
1. Fins Rotational Alignment. The Mosquito is a three-finned model. Thus fins are expected to be spaced equally 120-degrees apart. A scoring range is -1 to +1. A marked template is used to assist judging. Models having fins that are clearly off the template receive the -1 value. Fins may appear to match the template, but when the model is rotated no longer seem to match. For these models a 0 is assigned. A perfect template match, even if the model is rotated, receives a +1. If you have a fin jig, you can use it in lieu of a printed template.

2. Fins Vertical Alignment. Fins should be attached parallel to the model's longitudinal axis. Values for scoring the range are -1 to +1. Use a fin jig or sight along the edges of fins to see that the edges project (extended) lines that bisects equally the nosecone. Assign a -1 to models where fins are clearly misaligned. If there is some deviation but mainly aligned give a 0 value. Give a +1 to models having perfect vertical alignment.

3. Fins Perpendicularly Aligned. Fins should be perpendicular to a plane that is tangent to the body tube. The category value range is -1 to +1. Use a fin jig to check alignment, or look at a fin's attachment line face on. You should see only the fin's edge, not either side or a hint of a fin's side. Check the other fins too. Assign -1 if more than one fin is not perpendicular to the body. Give a 0 if there seems to be some misalignment and a +1 if all three fins are perpendicular to the body.

4. Fins Horizontally Aligned. Models should sit straight—not cant or lean—when placed

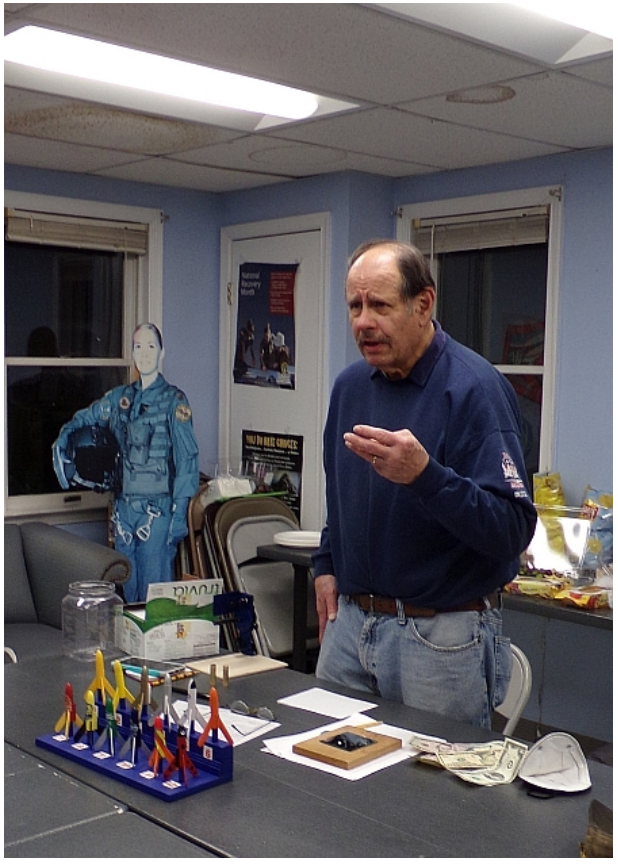
Below: Mosquito judge Ole Ed Pearson utilized a 3-Fin alignment guide to objectively determine the precision of the fin alignments. *Photo credit to Alex Mankevich*



upon a table. Leaning occurs when a fin is attached higher or lower on a body tube in relation to other fins—the fins are on different horizontal planes. If you espy fin-attachment height differences or canting, assign a -1 value. Give a 0–a normal case—to a model which appears to sit level (longitudinal axis is perpendicular to the model's horizontal plane).

5. Fins - Airfoils/Construction. It is unnecessary to sand Mosquito kit fins, or substitute materials. Yet, nicely sanded fins or use of other materials take time and reflect craftsmanship. The judging values are -1 to +2. Give a -1 to unevenly sanded/airfoiled fins. If fin edges are not sanded or merely evenly rounded, assign a 0 value. Give a +1 to fins evenly sanded and airfoiled, or well constructed. In rare cases where the airfoiling or construction is exceptional, assign a +2.

Below: Mosquito judge Ole Ed Pearson explained the twelve factors that he used to score the Mosquito models. *Photo credit to Alex Mankevich*



6. Fillets. Fillets reflect one's workmanship—the time and care one puts in the model. Fillets should be neat and even. The judging values are -1 to +2. Give a -1 to a model where fillets seem to distract from the model's appearance, i.e., sloppy work. If the model has no fillets (on fins and lug) assign a 0. If filleting is only somewhat uneven/untidy but does not detract from the model's appearance (an average job), assign a +1 value. Give a +2 to models with great fillets.

7. Fin Surface. Wood grain should be covered/painted and the surface smooth and even. Category evaluation range is -2 to +2, with -2 going to unfinished fins. Give a -1 for surfaces showing a lot of grain or only fair coverage (smoothness). Assign 0 to models showing some grain or lack of surface smoothness. Give a +1 if grain is filled/covered but improvement can be seen in surface smoothness, or good smoothness but hints of wood grain. Assign +2 for an outstanding fin surface on all three fins.

8. Body Tube Seams. They are unseemly for the "best" model. The category value range is -2 to +2. Assign -2 when seams are left as is (unfilled). Assign -1 to a poor job of filling/covering. Give a 0 to what seems to be average work. A good job at filling/covering seams rates +1. Assign a +2 to what you feel is superior work in filling/covering. Consider the seams on the launch lug too as part of this category.

9. Nosecone Seam. The transition between the body tube and nosecone is a chosen evaluation category, and the assigned values range from 0 to +2. It is normal to see the transition—especially when it is highlighted by different colors—but a really great job (a hidden transition) merits the +2. The +1 goes to models with a faint hint of transition not due to color change. Otherwise assign 0.

10. Blemishes. Flaws, including dings, glue drips, or presentation imperfections, detract from a model's aesthetics. The category value range is -1 to +1. Assess a -1 to notable blemishes. Give the +1 to no imperfections noticed and the 0 if you observe only minor flaws.

11. Colors or Decorations. How one finishes a model reflects the time spent and workmanship. The assessment range is -1

to +2. An unfinished model earns a -1. If the model is a single color, that is a normal occurrence, and earns a 0. Two colors get a +1 value. More than two colors (3 or greater) on the model receive a +2.

12. Paint/Decoration Neatness. A judge looks for bleeding, evenness, runs, covering overlaps/peeling and just how well the model is finished. The evaluation values can be -1 to +1 with poor painting/decorating getting the -1. If there are some issues, chalk that up as being normal and give 0 points. Assess +1 to outstanding painting/decorating.

Other. Realize that issues may arise that are unanticipated and thus otherwise unaddressed. Address issues you feel affects the judging with a value range of -1 to +1. A -1 is assigned to a negative previously unconsidered issue. For an issue not otherwise judged, but which you feels adds to the model's evaluation, assign a +1. If no unanticipated issue applies, give the 0. If there are more separate unanticipated issues, a second Other category may be added/rated; but no more than two…lest these be misused for justifications.

When scores are tied, say in the five highest rankings, a tiebreaker is used. Amongst the contenders (tied scores) the higher ranking goes to the model having a higher Category 10 (Blemishes) value. If a tie remains, the higher individual Category 11 (Colors or Decorations) judged value further winnows the tied field. If there is still a tie, a third tiebreaker is dropped. Instead, the ranking (place) is shared between contenders.

This article shows how the "best" RR model is determined. Despite attempts at objectivity and fairness, the judging is still subjective…subjective in choosing evaluation categories, the weighting (value range), what the judge decides, and arbitrary on how how ties are broken. Your feedback can help improve objectivity…a goal. A methodical schema helps somewhat to reduce subjectivity. For example when I've judged, it is only when values are summed and scores ranked, that I learn which is the "best" model and the other placings. This differs from alternate judging approaches (not gone into here) which may yield quicker rankings and have a greater validity/objectivity issue. Having multiple judges may help make the activity seem less subjective, off-set individual judging errors/omissions, and adds time to the judging. Determining results timely is frequently a judge's bugaboo and only mentioned here; budget 1.5 hours to check 12 models. Before getting afield in considerations, hopefully you have found this insightful.

Footnote-1. Eligible models are ones that are flyable, siblings, and perceived as safe. Flyable means, if prepped, the presented models could be flown. Ineligible examples are models which where engines won't fit, models without a launch lug, or models missing a fin(s)—these aren't made up; I've seen these in this or other static events, or at checkins.

Siblings mean brothers or sisters (i.e., like models)….but not necessarily half-brothers/sisters. Otherwise they are ineligible, such as the absurd case of entering an Alpha into a Mosquito contest. Cousins such as the Gnat, Lunar Bug, Quark or Swift should not be ranked or awarded a place either in a Mosquito static-judging event. Half-brothers/sisters are models that started as Mosquito kits but have been adapted/changed. My rule of thumb for evaluating a half-sibling is to ask oneself if a silhouette of the entry was presented, would I be able to identify the model as a Mosquito that has been adapted or is a new model being presented? An adaptation which makes the model unrecognizable as a Mosquito is ineligible for ranking/placement.

An eligible model satisfies the perception that its flight be will be stable and the recovery will be non-hazardous. If unsure of the model's flight safety, consider the model ineligible for the static assessment or flying in the RR. So, to be eligible for static judging, an entry has to be ready, be similar to the other entries, and seen as safe.

Below: A smorgasbord of Mosquitos were prepared for the upcoming Rocket Run activity. Note the four Houses of Hogwarts Academy (front row at left) and the lady bug design (front row at right). *Photo credit to Sarah Jackson. Caption credit to Alex Mankevich*

What's Out There? (Phobias for the Phlying Phield.)

By Vice Zog Alan Williams *(Editor's note: No photos accompany this article due to the said editor's arachnophobic tendencies)*

Its great to see everyone on the field again. I hope we will have another great flight season. However, as club Killjoy in Chief, I should remind you of certain non-COVID safety stuff to keep in mind.

With the coming of warmer weather the Frederick County area's snakes will leave their winter dens and renew their active place in the local biosphere. Most are both entirely harmless and beneficial to humans. However, two venomous Pit-Viper species do occur in the region around Mt. Airy. The Eastern Copperhead is a moderately sized (full grown at 30-50 inches) snake that can be found all across Maryland. Equally at home in forests, fields, and suburbs, it's looking for small rodents, lizards, birds, and the occasional insect snack for dinner.

Generally camouflaged with orange-brown or brown-tan diamond–like bands, they can be identified as a Viper by the hollow "pits" set between their eyes and nostrils. These are directional heat-sensing organs seen only in Viper species Viper heads are also flatter and more "V" shaped than in many snakes. Their irises have "cat-slits' rather than round pupils. (Obviously, if you're close enough to study the pits, eyes, or head shapes, you've got problems.)

Copperheads are described as really irritable but do not have the rattles common to many of their brethren. They may shake their tails in dried leaves to make noise if threatened. Smaller, chunkier, harmless Hognose snakes mimic the appearance of the copperhead. When startled by you, the Hognose (or "hissing adder") famously gives Oscar-worthy hiss, writhe, and bloat "death-struggle" performances. The Copperhead will just bite ya. Copperheads of any size can deliver effective amounts of powerful hemotoxin venom. A herpetologist I know got nailed on his pinky by a baby he was helping from its egg. Eventually he lost much of the finger. (By the way, the fabled "cottonmouth" water moccasin does not occur north of the Potomac River.)

Our other snake of interest is the Eastern timber rattler, which is found in much of Frederick County. Larger than the copperhead at four to six feet, it is generally marked with blotchy brown diamonds on grey backgrounds. Rocky terrain is its preferred home, but it's happy in and near highland woods as well. The venom is a powerful combination of circulatory system and neurotoxin poisons. Fortunately, they are less easily provoked, unless stepped upon or otherwise directly endangered. Their primary warning against threats is that rattle on their tail. It sounds exactly like what you've heard in every Western film you ever saw. They will happily give you warning to move away if given the chance. Use it! If you anticipate being near the treeline, I suggest looking carefully where you step. Obviously, the field is not paved with snakes. These guys have been near us for as long as we have flown there and I don't remember a single snake incident at either Middleton or Old National Pike Park. Just be aware.

The much more probable thing to worry on is ticks; vectors of dozens of bacterial and viral diseases. Our main concerns are Lonestars, and Black-Legged (also called deer ticks), common throughout Maryland. Lonestars, named for the white dot on their backs, are about the size of dog ticks. Their tiny nymphs often cluster and climb aboard by the dozens. Lonestar saliva is often the source of intense itching which can be enjoyed for days after they are removed. They are a carrier of tick paralysis as well as a syndrome causing a red-meat allergy.

The smaller Black Leg tick is famously the carrier of Lyme disease. This is a serious debilitating chronic ailment if left untreated. Note that the well-known "bullseye" rash often does not develop. Dog ticks, which carry Rocky Mountain Spotted Fever? We got 'em

too!

All can be found in scrub brush, grass, and woods, just waiting for something to brush by. They can't leap or fly and do not drop from overhanging shrubs. They are essentially hitchhikers. They have foreleg-mounted heat and carbon dioxide sensors which alert them to nearby prey. Ticks can be observed "questing" at the ends of grass blades and stems with legs held high, scanning for us. These ticks are active year round, like that skeezy guy that's always outside the corner 7-11, just hoping to hook a ride.

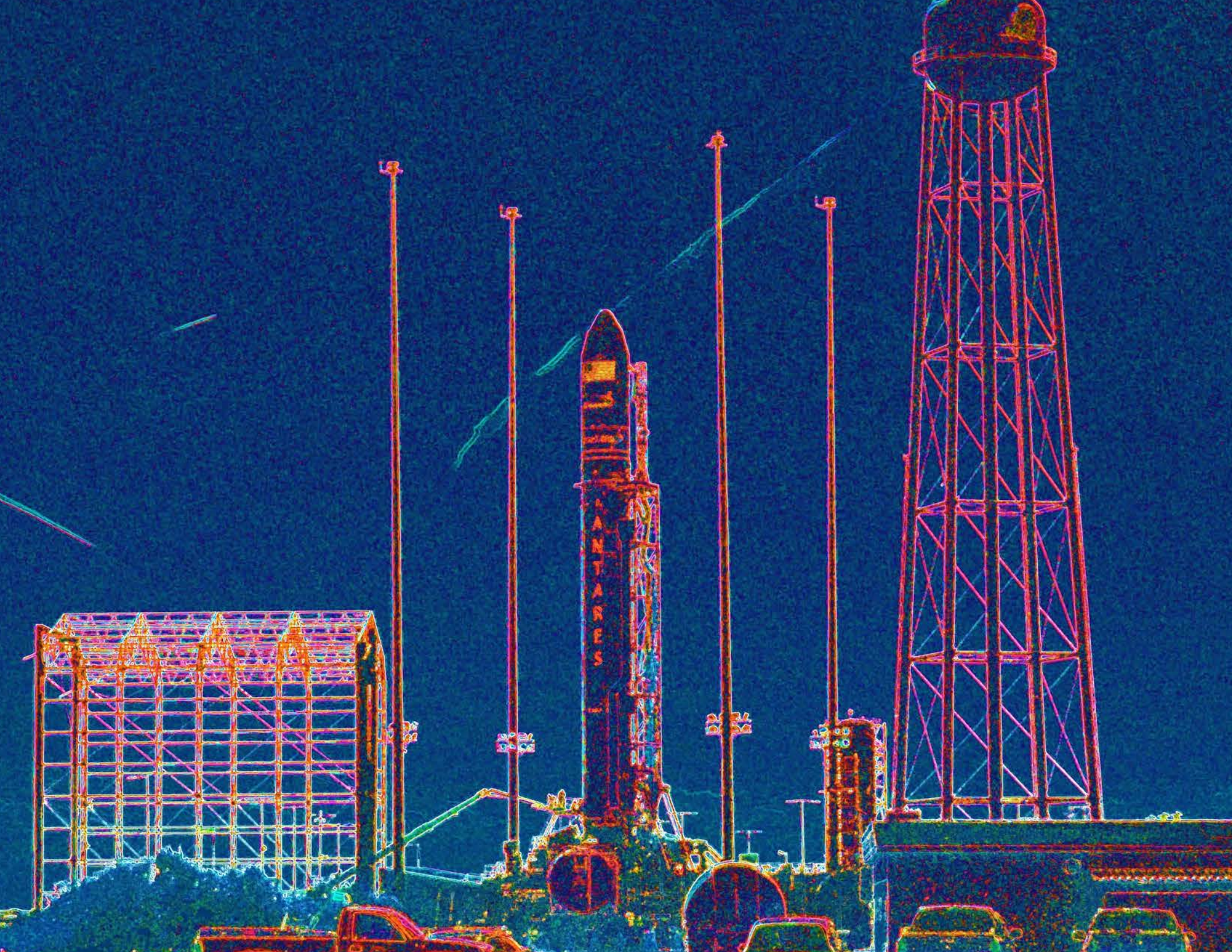
Consult reliable contemporary sources on proper removal technique for attached individuals. Do not try the old Boy Scout tricks with hot matcheads or smooshing them with tweezers. The tick can literally glue its mouthparts into the wound, and the old ways promoted injection of infective stomach contents during the removal attempt. Smothering the tick with grease is nonsense: ticks can live entirely submerged in water for days without trying. And famously, they can endure radiation exposure several hundred times higher than is survivable by humans, so that RONCO TIK-Be Gon Cobalt-60 removal wand is a really bad idea.

Pyrethrum clothing treatments, DEET sprays, light colored slacks and socks over pant cuffs (to help spot your new pets as they gambol across the fields of you), plus careful full body surveys are the suggestions here. Baking clothes in the dryer immediately when returning home is a great idea. Adhesive or masking tape is a much better capture resource than fingers to get one you spot on the run. These suckers can really move when motivated.

Black Widow spiders are common throughout Maryland. They are not aggressive, but will bite if disturbed. The webs have a sort of cobweb-on LSD look. The female has a glossy black ½ inch round abdomen with a red "hourglass" on the underside. Her venom causes intense large-muscle cramping spasms that likely won't kill you. However, you may just wish it would. Like snakes, the proper action path is to not bother them at all.

Finally, the Frederick Parks Department has successfully beaten back last year's ugly field lobster invasion. There may be a few puddles of lemon and butter repellant sauce left around, so do watch your step.

Just some things to keep in mind. See you on the field!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