Zog-43

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Zog-43
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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 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 - Contest Season Is Upon Us

Don Carson, NAR #11069

The Team America Rocketry Challenge in May seems to kick off the frenetic Contest Season in this area (Details can be found in the Competition Corner, page 27). The first three weekends in June feature contests that club members will be attending, including:

Steel City Smoke Trails - 19, Grove City, PA - 6/1-2
Can Am Cup FAI Contest, Muskegon, MI - 6/7-9
Our own ECRM-46, Mt Airy, MD - 6/15-16

In July, we have:

Apollo 11 50th Anniversary Moon Landing Contest, Goddard Visitor Center - 7/20
Rocketry Festival 2019 (NARAM, FAI Team Flyoffs, Sport Launch), Muncie, IN - 7/27-8/3

I want to give a special shout out to Ole Ed, Glenn Feveryear, Jim Wilkerson, and Chris Kidwell for providing the great coverage of the final Team America Rocketry Challenge. "FINAL, you say?" Read the article for the details.

Also, deserving of recognition is Alex Mankevich, and the Williams brothers for their continued coverage of the orbital rocket launches out of the Mid Atlanitic Regional Spaceport, located at the Wallops Flight Facility. If you have never seen one of these launches, you should plan to go. It is so much closer than Cape Canaveral - just a little over a 3 hour drive from Washington, DC. There is nothing like the sound of a rocket ship bound for space.

As always, my thanks go out to everyone who contributes to make this a such an outstanding newsletter - the credit goes to you.

As always,

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

For questions, answers, opinions, files, photos, and more NARHAMS, join the NARHAMS Yahoo group. 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: On time performance by Northrop Grumman Innovation Systems (NGIS) as it Antares rocket lifts off at the beginning of the launch window on the original launch date.
Photo: A. Mankevich

Back cover: A 4.5 minute long exposure photo of the Crew Dragon launch seen from atop the Vehicle Assembly Building. To the right, an offshore lightning storm is occurring.
Photo: Jared Haworth/We Report Space

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COURT JESTER (Section Advisor) Jim Miers

The Last Team America Rocketry Challenge

By Ed Pearson

The 17th Team America Rocketry Challenge (TARC) finals was held May 18, 2019, in The Plains, Virginia. Team 2 of Madison High, Madison, Wisconsin climbed to the top of the podium—for Madison's third win and the sixteenth consecutive time Madison has placed in TARC's annual top ten scorers.

Approximately 4,700 students competed this year leading up to the finals. They represented over 800 teams from 47 states, Washington D.C., and the Virgin Islands. This was the largest student count since TARC's first year in 2003.

NARHAMSters were instrumental in running TARC and included Jennifer Ash, Jim Filler, Kevin Johnson, Chris Kidwell, Alex Mankevich, Jim Miers and as many former members/alumni.

Photo: C. Kidwell

Continued next page

TARC, Continued

The Competition

The initial objective (first flight) was to launch three egg-a-nauts to an 856' altitude (the first Moon walk occurred at 8:56 pm CDT) and have a flight duration between 43-46 seconds. One hundred one teams participated in the finals. After the initial flight, 40 teams were invited to fly a second time with the target altitude changed to 831' (no historic rationale—just a coin flip to make the objective 25' lower).

After two flights, Madison's combined score was 10 where 0 is a perfect score...the second place team (Alabama's Russellville H.S. score was 12.5 and the third place team (Missouri's Festus H.S.) received a 22.

These three teams alone shared more than $50k in prize money given by the Aerospace Industries Association (AIA).

First Place Madison High School TARC Team 2.
Photo: G. Feveryear

After the contest, AIA rebranded TARC. The acronym remains and the new name is:

The American Rocketry Challenge

THE AMERICAN ROCKETRY CHALLENGE

An impressive array of demo rockets ready to go.
Photos: Jim Wilkerson/Tahoma Photography

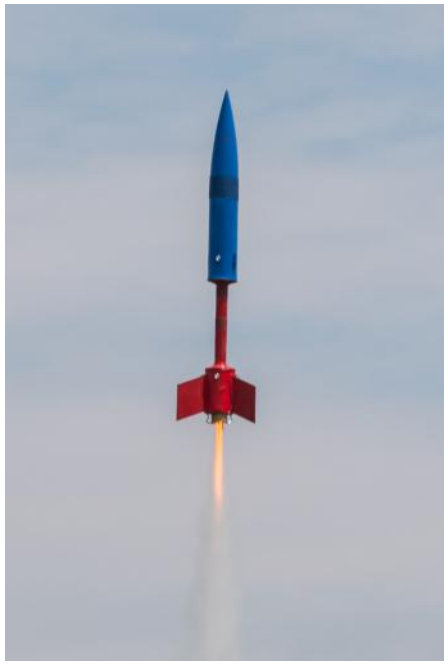
Continued next page

TARC, Continued

Apollo Anniversary Angle

This year's TARC coincided with the 50th anniversary of the Apollo 11 Moon landing (hence the 3 egg-a-nauts) and there was an optional Saturn V look-alike competition. Alan Willams and I were tapped to judge the 16 entries.

Of the 16, 13 entries were clearly not top tier. Of the remaining three, one made a strong case for third place. (In my opinion) the winning entry, from Richards R-V Schools of West Plains, MO, did not exhibit the best craftsmanship seen, but had features (wrap-around stringers, fin shrouds, etc.) that were absent on competition and best resembled an Apollo Saturn V.

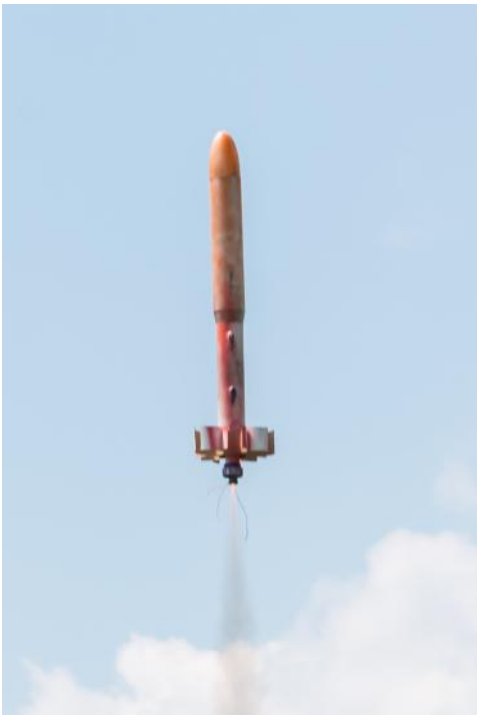


This team was not trying for the Saturn V look-alike award.
Photos: Jim Wilkerson/Tahoma Photography

(Clockwise from top left): Entries from Rogers H.S., Florence, AL; Green Vale School, Old Brookville, NY; Webster City H.S., Webster IA; Richards R-V Schools, West Plains, MO; First Baptist Church, Manchester, CT; Community Home Education, Cypress, CA.
Photo: E. Pearson

Eenie, meenie, minie, moe, pick your three best eggs.
Photo: G. Feveryear

A couple of Saturn V look-alike models in flight.
Photos: Jim Wilkerson/Tahoma Photography



A tube-fin stabilized entry.
Photos: Jim Wilkerson/Tahoma Photography

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There are times of celebration.
Photos: Jim Wilkerson/Tahoma Photography

Did any break?
Photo: G. Feveryear

Teams often pick a uniform or theme.
Photo: G. Feveryear

And times of consternation.
Photos: Jim Wilkerson/Tahoma Photography

Costumes of all kinds, this one, um...
Photo: G. Feveryear

Continued next page

Steve Kristal's awesome scale Apollo pad abort test model was one of many spectacular demo flights.
Photos: Jim Wilkerson/Tahoma Photography

This year, TARC featured a Jumbotron. Big time, now!
Photo: G. Feveryear

Steve Humphrey checks a model.
Photo: G. Feveryear

There were lots of demo tables. Here, Keith Vinyard shows off some rocket gliders.
Photo: G. Feveryear

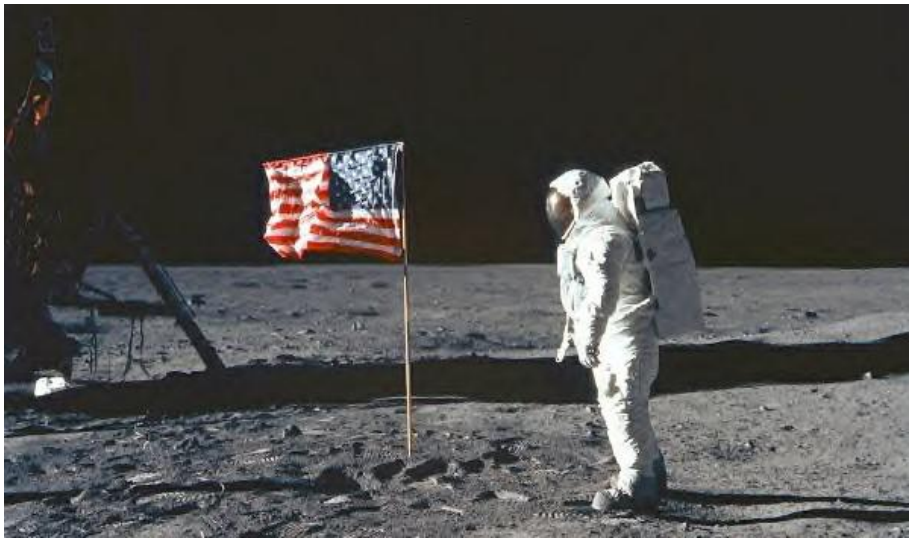
Alan Williams (seated) and NARHAMS alum Jim Wilkerson at the Apollo judging area.
Photo: E. Pearson

Kevin Johnson helps at check-in.
Photo: G. Feveryear

Apollo 11 50th Anniversary Moon Landing Contest – NASA Goddard Visitor Center Greenbelt, MD. Saturday July 20, 2019 12:00 p.m. to 4:00 p.m.

Celebrate the 50th anniversary of the historic Apollo 11 moon landing. Attempt to land your model rocket nearest the center of a “moon” drawn on the ground. We will distribute free commemorative “moon landing” items to the first 200 contest registrants. Trophies and model rocket kit prizes will be awarded to the top youth and adult finishers. A narrated demonstration launch of models of historic NASA space vehicles will take place before the contest.

The contest is free. On-site registration is required on contest day. You must bring your own rocket and motors, or purchase them at the nearby Goddard Gift Shop. An awards ceremony follows the contest. For more contest details see the contest flyer.



NASA Goddard Visitor Center - Model Rocket Contest
50th Anniversary of the Apollo 11 Moon Landing

WHEN: Saturday July 20, 2019 12 noon – 4 p.m. (no rain date)

WHERE: NASA/Goddard Visitor Center, Greenbelt, Maryland
(I-95 Exit 22A, Baltimore-Washington Parkway Exit for Rt. 193 East; then follow signs to the Visitor Center on ICE Sat Road)

EVENT: `Lunar_ Spot Landing – land your model rocket nearest the center of a `moon_ on the ground.

COST: FREE

AWARDS: First through fifth place trophies and model rocket kits will be awarded.

REGISTRATION: Register at the launch site on the day of the launch. The first 200 registrants will receive free `moon landing_ commemorative items.

SPONSORS: This contest is hosted by the NASA Goddard Visitor Center and conducted by the National Association of Rocketry Headquarters Astro Modeling Section (NARHAMS). Assistance has been received from the Maryland Space Business Roundtable and model rocket companies.

WHY: This event is to commemorate the 50th Anniversary of the Apollo 11 Moon Landing, which happened on this date (July 20th). This STEM event also promotes interest in Space Sciences among area students.

Contest Rules

1. The contest is open to all model rocketeers.
2. Contestants must follow the National Association of Rocketry (NAR) Safety Code
3. Modelers must provide their own model rockets, wadding, engines, igniters, and prepping tools. The Space Center will provide the launch equipment suitable for 1/8_ and 3/16_ diameter straws (launch lugs).
4. In each event, contestants may fly either as an individual or as part of one team. Entry into both team and individual competition is not permitted.
5. Model rockets must use a single (NAR classification and safety certified) engine for each flight. `D_ class engines or greater are prohibited.
6. Total weight of the model rocket with engine must be less than four ounces.
7. Model rockets must pass a preflight safety, engine and weight inspection at the launch site prior to launch.
8. Model rockets must land safely and must use either streamers or parachutes or gyrocopter-type devices for their recovery.
9. Model rockets must not separate into two or more unattached parts during flight.

Contest Judging and Other Important Information

1. Modelers may launch their models one time.
2. A launch is a successful ignition of the engine. A flight is when the model rocket starts to move upward on the launch pad and until the model rocket finally stops its descent.
3. The object of the event is to determine whose flight comes closest to reaching the center of a circular 125'-diameter `Moon_ marked on the ground.
4. If a model rocket lands on the `Moon_, contestants must leave the model rocket undisturbed until the model rocket is measured.
5. Officials will only measure all model rockets that land within the `Moon's_ boundaries.
6. Measurement will be from the `Moon's_ center to the tip of the model rocket's nosecone. The measurement becomes the contestant's score.
7. The person with the smallest measurement (i.e., closest to the `Moon's_ center) will be declared the winner. The next smallest score will be second place and so on.
8. The contest will be flown in two age divisions: one is for those 15 years and younger; the other is for those 16 years and older. Teams will be classified by the age of the oldest team members.
9. Decisions of the judges are final.
10. These contest days have traditionally been some of the hottest days of the year, so be prepared. Also, please be prepared to have FUN!

Time Schedule

Visitor Center Hours for This Event	12 Noon to 4:00 p.m.
Contest Registration	12:00 p.m. to 2:30 p.m.
Demo Launch of Historic NASA Rockets	12:30 p.m. to 12:45 p.m.
Contest (Flying Period)	12:45 p.m. to 2:45 p.m.
Awards Ceremonies	3:30 p.m. to 4:00 p.m.

For further information, call the Goddard Visitor Center at (301) 286-8981, Tuesday through Friday, 10:00 a.m. to 4:00 p.m.

The Tape

By Ed Pearson

So I am clearing away layers of antiquity, when I encounter the basement piano. “Ha,” my grandchildren cry, “There is no piano in the basement.” This really happened, and my doubting grandchildren live with me (In fairness, the oldest confided to my wife the other day, “I have never even seen the basement floor before.”).

Antiquities covered an old piano in the basement.
Photo: E. Pearson

Anyway the piano exists and has been there since 1973. A layer of antiquity atop the piano contains a rock on a plaque [Ed. - a piece of the Berlin Wall!], some music CDs, 1988-1992 era bill-receipts, and a nondescript thin white box crayoned, ***2 Days Before Doom***.

It is the latter item ***(...Doom.)*** that is the subject of this writing.

Inside the box was a reel of recording tape. Now, I don't have a tape recorder anymore, but I quickly remembered how ***2 Days Before Doom*** came about. Here is the story.

After Sputnik, I started writing short, short science fiction. The stories were trite and unsupported by science. Hey, I was in fifth, maybe sixth grade (aged 10-11). My uncle would type the stories up on a stencil and we run them (produce copies) on a mimeograph. I would fold the copies in two and a couple of sheets would make a 8.5 x 5.5” booklet. I entitled issues ***Science Fiction Newslet***. Then I would go door-to-door around the neighborhood trying to sell copies for two cents each. Don't think I made more than 30 cents in sales or that I produced more than two issues.

As for the tape recording, my mom later found an issue, gave it to a professional radio broadcaster, and for my 16th, 17th, or 18th birthday had my handiwork preserved in sonorous tenor and first bass with dramatic pauses of course.

That is the story of this sixty-plus year-old title ***2 Days before Doom***, I have the tape to prove it, and am really content not to have a tape recorder to hear my old childhood fantasy. Just remembering was the treat of that box's discovery.

The Launch of the Antares/Cygnus NG11 Mission

By Alex Mankevich

The Northrop Grumman's Antares rocket lofting the Cygnus spacecraft filled with over 7,600 pounds of science and cargo launched on April 17, 2019 at 4:46 pm from the Mid Atlantic Regional Spaceport (MARS). The NG-11 mission was the final flight of the first phase of the Commercial Resupply Services program (CRS-1) to deliver cargo and research science to the International Space Station (ISS). The Cygnus spacecraft had flown eleven missions on both the Antares rocket out of MARS and on the Atlas V rocket out of Cape Canaveral.

This daylight launch followed two successive Antares launches during which lift-off was timed for the pre-dawn darkness. The NG-11 mission consequently drew record crowds of space flight enthusiasts owing to the friendlier launch hour and to its coincidence with the local schools' spring break. Authorities numbered the crowd as over 10,000 with an estimated 4,500 having gathered at the NASA Wallops Island Visitor Center. Keith Koehler of the Wallops Flight Facility Public Affairs Office reported that the Visitor Center's parking filled up in just 35 minutes. Consequently, thousands of spectators lined the streets and watched from local parking lots, private properties and local parks.

The NG-11 mission was the final flight of the Antares 230 rocket. Northrop Grumman will now fly the updated Antares 230+ rocket which features improved mass fraction – meaning that more payload mass can be lofted due to savings from vehicle mass. Heat exchangers will be removed from the aft bay of the Antares vehicle, two less helium bottles will be installed, and insulation will be reduced in the second stage Castor 30XL motor. These weight savings will be parlayed into structural reinforcements at the intertank and forward bay of the Antares core segment. The reinforcements will in turn allow the rocket to fly at full throttle

Above: A wisp of condensate is seen flailing off the Antares rocket as it begins to clear the 307 foot tall water tower.
Photo: A. Mankevich

Assembly and integration work had already begun in the Horizontal Integration Facility (HIF) in preparation for the Antares NG-12 mission tentatively scheduled for October 2019.
Photo: A. Mankevich

Arcing over.
Image © C J Williams

Continued next page

Antares/Cygnus NG-11, Continued

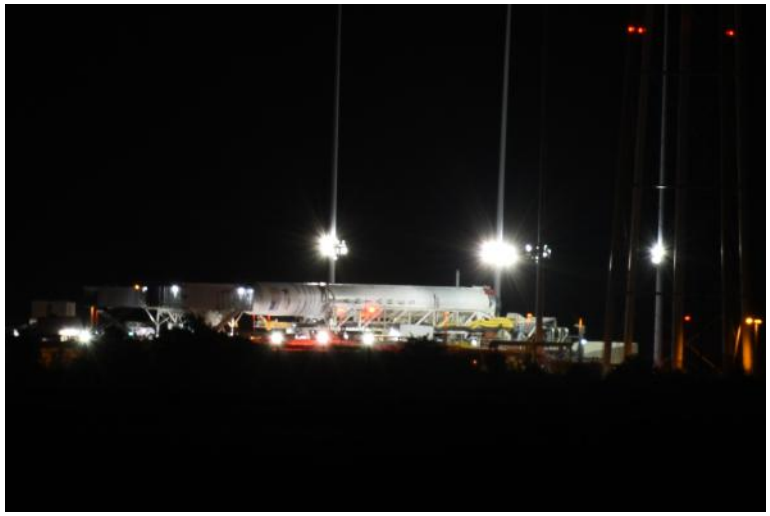
during the Max Q segment of its flight.

A new operation for this launch was a final cargo load performed on the launch pad with the use of a new mobile clean room. The rocket was lowered from vertical to horizontal, then the mobile clean room was brought forward to encapsulate the new pop-top nose cone fairing, about 40 rodents (or "moustronauts") were added to the Cygnus' pressurized payload segment and lastly the rocket was raised back to vertical.

The forecast for this launch was projected as having only a 5% probability of violating any weather constraint. All the countdown milestones basically went smoothly. No last-minute excursions into the restricted zone were attempted by boaters or pilots. Consequently, the launch took place at the beginning of its five-minute window.

Craig Williams joined Alex Mankevich as photojournalists for this flight. Craig brought along a "mule" named Kirk to assist with photo equipment transport and set-up. All three were transported by a NASA bus to the radar site which is used as the media photography station.

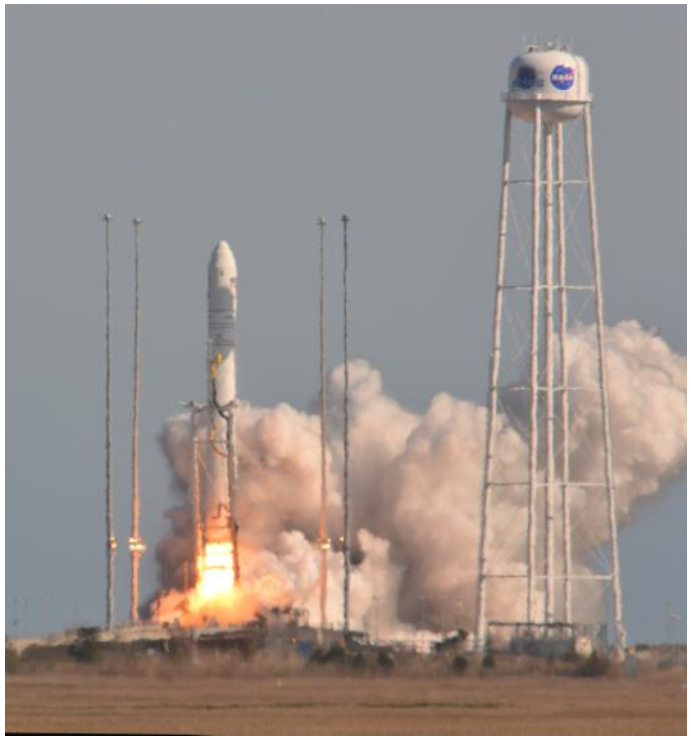
The skies were basically cloud-free and just slightly hazy. The flight was visible up to the first stage engines cut-off. The main photography issue was the atmospheric heat distortion created by the heat rising off the tidal marsh which extends from the photography site to the launch pad. The heat waves bended the light which entered the camera lens and caused a dithering of the images. This effect is exaggerated at rocket launches because you need to shoot with telephoto lenses since you are stationed miles away from the launch pad. Nevertheless, Craig and Alex managed to record several useful images of the gleaming white Antares rocket streaking through the blue sky. This launch



A first for Northrop Grumman Innovation Systems (NGIS) was to accomplish a late load on the night of April 16th during which over 40 rodents were added to the Cygnus spacecraft.
Photo: A. Mankevich

Climbout.
Image © C J Williams

About 15 miles downrange.
We lost sight of the rocket shortly after this shot.
Image © C J Williams



NG-11 Pad Liftoff.
Image © C J Williams

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Antares/Cygnus NG-11, Continued

in particular produced interesting filaments of condensation which wisped off the first stage as the rocket climbed past the water tower. A billowing, twisting, bright-white contrail was produced at about 1.5 minutes into the flight as the rocket began to arc over.

Our roving ZOG-43 reporters Sally Cook and DJ Emmanuel mingled with the record-breaking crowds at a launch viewing site about two miles out from pad 0A. They also took notice of the increased crowds and estimated that at least 300 spectators enjoyed the launch from their location. Sally and DJ noted the absence of the “black ops” helicopter that had previously performed fly-overs during past Antares launches. Instead, a small police boat was seen motoring around the marshes performing safety and perimeter checks.

Sally and DJ both agree that the weather, the launch and the engines’ sound were awesome. They would advise the local authorities to explore developing and/or designating additional rocket launch viewing sites since the known sites are at risk of severe overcrowding stemming from their parking situations and their limited opportunities for prime viewing angles. Sally urges Northrop Grumman to win more International Space Station resupply missions for the Antares rocket.

Often there will be someone of notoriety present for the Antares launch. Past launches had current and former NASA Administrators and astronauts in attendance, as well as Nobel Prize laureates. Otherwise, the role of notorious personage in and around the various launch events and venues falls our own Alan Williams. Alan was absent for the NG-11 launch due to schedule conflicts. Fortunately, Alan’s place was capably filled by actor and producer Gerard Butler, who starred in the movies "300" and "Olympus Has Fallen". Mr. Butler graciously posed for numerous pics with the launch spectators. He attended some of the press conferences at the Visitor Center and watched the launch with the NASA Social members. Photos of Mr. Butler attending the Antares NG-11 launch can be viewed on Facebook, Twitter and Instagram.

Cygnus is scheduled to depart the ISS in late July to begin several months of free-flight while testing its guidance and control systems for long-duration performance. Should the NG-12 mission keep to its planned October launch, that could see two Cygnus spacecraft in orbit together for the first time.

The Mid-Atlantic Regional Spaceport (MARS) medium class launch pad 0A is seen in a magnificent silhouette early on the morning of its launch on April 17, 2019.
Photo: A. Mankevich

"Okay, so no one is going to believe this but I have to post it anyway. We went on a tour of Wallops Island today and Gerard Butler was in our tour group!" Katie Hamilton. It's the tall guy in the middle.
Photo: Facebook/K. Hamilton

More 43 Sightings

Ole Ed's number at Five Guys.

Photo: E. Pearson

Meanwhile Kevin Johnson's got a lucky number at the Shake Shack.

Photo: K. Johnson

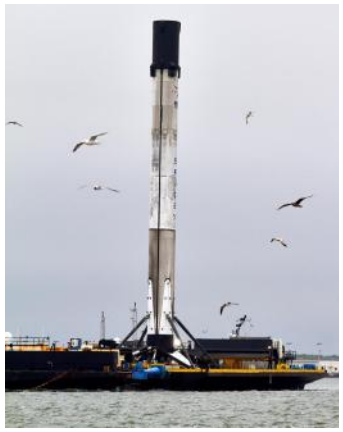
Seeing double? This was spotted outside an eye clinic.

Photo: E. Pearson

SpaceX Recovers Another Falcon 9 Booster

Elon Musk takes questions from the media at the post-launch conference, following the successful liftoff of the Crew Dragon spacecraft and Falcon 9 booster recovery.

Photo: Jared Haworth/We Report Space



Eight minutes after liftoff, the Falcon 9 first stage booster landed aboard the Autonomous Spaceport Drone Ship "Of Course I Still Love You," and was returned to Cape Canaveral for reuse.

Photo: Jared Haworth/We Report Space

NASA Studied Recovering Jupiter C Boosters in 1959

Mercury Booster Recovery Studied

El Segundo, Calif.—Recovery system for Jupiter-C boosters to be used late this year in Project Mercury tests is being designed by Space Recovery Systems, Inc., a new company organized here for work in the field of high-altitude recovery systems.

The unit for the Jupiter-C, a modified Redstone missile, will utilize a system of parachutes and electronic equipment to save the boosters. Recovery system cost approximates 1% of booster value, the company says.

In addition, while working to design and produce hardware to meet the Jupiter-C flight test deadline, the company also is conducting feasibility studies for recovery of larger boosters such as the Jupiter and Atlas which will be used later in the Mercury program and other space systems, and will use flight test data derived from the Jupiter-C.

Theodore Knacke, vice president-engineering of the firm, said the company is looking toward something other than parachutes for the best recovery systems which would work at high altitudes, in the order of 250,000 ft. and above, where there is not enough air to deploy a parachute. Something akin to inflatable spheres and paraflaps are envisioned for this, Knacke said.

The system would employ lift to keep the vehicle at a high enough altitude during deceleration to minimize aerodynamic heating, while using a maximum drag device to accomplish the desired deceleration itself. A re-entry slope of two to four degrees would be desirable to reduce the heat transfer during re-entry, Knacke said.

Three cardinal problems of recovery are heating, deceleration and accuracy, and to solve the accuracy problem, it is not impossible that a guidance system of some sort would be used in the final parachute stage of the recovery system.

Space Recovery Systems, Inc., is a combined operation of Columbia Broadcasting System's CBS Laboratories Division and the M. Steinthal and Co. subsidiary, Aeronautical Equipment Research Corp. The new company took over the complete operation of Aeronautical Equipment Research here, and through the combination makes available the facilities of the CBS electronics unit and the parachute facilities of M. Steinthal of New York.

AVIATION WEEK · JUNE 22, 1959

Photo: AW&ST Archives

Photo: NASA/MSFC

Photo: AW&ST Archives

Launches At Goddard - Do We Have It Right?

By James Miers - Section Adviser

Introduction

RSO Ed Jackson tracks a model's flight.
Photo: E. Pearson

Over the many years NARHAMS has been flying a public launch at the Goddard Space Flight Center's Visitors Center, the club has established a number of protocols and limitations specific to the venue, more restrictive than what is permitted under the NAR Safety Code. In addition, Goddard itself has been required to implement limitations due to federal regulations regarding the DC no-fly zone.

It was observed at the March meeting that while some site limitations are published on our web page, NARHAMS does not actually maintain a comprehensive list of all the restrictions it places upon the Goddard launch. Some of our members are familiar with all of our self-imposed limits (Ed Pearson and Alan Williams certainly, having themselves established the list through experience), however many of our members, and all of the general public, are not.

The list that follows is believed to be a complete list of NARHAMS' Goddard protocols. The club asked me to have them published in ZOG-43 and request comments from the whole of the membership about anything that might still be missed, or that should or should not be included. Hopefully, we will be able to establish a comprehensive listing, and can have it published to alert guests (and a few of our members, too) what we will and will not permit to fly at the Goddard Visitor's Center.

Lift off of Bill Boublitz's Saturn V demo model on a D12 motor.
Photo: M. Anderson

Protocols (as they stand currently)

- Prior to launch, all rockets must be approved by a designated Range Safety Officer (RSO) or deputy. The RSO has the absolute and final authority on what may fly on the range. While the rules and limits that follow are intended as a guide to club members and guests, they do not supersede the authority of the RSO.

- All rockets and flight activity must conform to the NAR safety code.

- Single motor flights only (no staging or clusters) to a maximum of 20NS motor impulse (D power or smaller)

- Flight ceiling 2,000 feet.

- Rockets must be commercially available (kit or ready to fly), and constructed substantially to the manufacturer's specifications. We allow exceptions to this rule only for a rocket which has previously flown and proved flight worthy with the same designated motor that is being used at the Goddard launch.

- In addition, the following are not permitted in any circumstances.
  - Rocket gliders
  - Boost gliders
  - Converted plastic models

Possible Additions to the List of Protocols

There are a few other limitations I'd considered adding, but lack the authority for doing so, and in any event I'm not sure which represent sufficient problem to make them worth including:

- Maximum lift off weight 1 pound (450 grams)

Continued next page

Goddard Protocol, Continued

Comment: From a practical standpoint, stating a maximum allowed lift-off mass implies the need of a scale on site, which complicates things. The maximum recommended lift off mass of the largest motor we would allow on the field in any circumstances (the Aerotech D21) is about 450 grams.

- Positive motor retention must be used. Motor hooks (and the hook must be properly engaged), retainer rings, clips or other positive methods are required.

Comment: This one gets overly complicated when applying it real-time. There are still a few popular kits that use friction fitting, then there's the matter of featherweight and tumble recovery. I don't think this really has been an issue in the past

At these launches, the public may not be as safety concious.
Photo: E. Pearson

- Rockets carrying parasite gliders are permitted only with commercially available kits and provided all gliders are properly affixed to the model at launch.

Comment: I don't know whether this rule is included with our present list of limitations. If it is not, it should be. My preference would be to ban them altogether at GSFS, but that's difficult to explain to guests who just spent money buying one at the Visitor's Center Gift Shop.

I expect club members may have their own ideas as well. Please let me know. Comments and suggestions can be emailed to me: jim662517@yahoo.com.

<u>Commentary and Opinion</u>

NAR Safety Code – the RSO must be familiar with the NAR safety code, and ensure the code is followed. This point is redundant, but it's worth making.

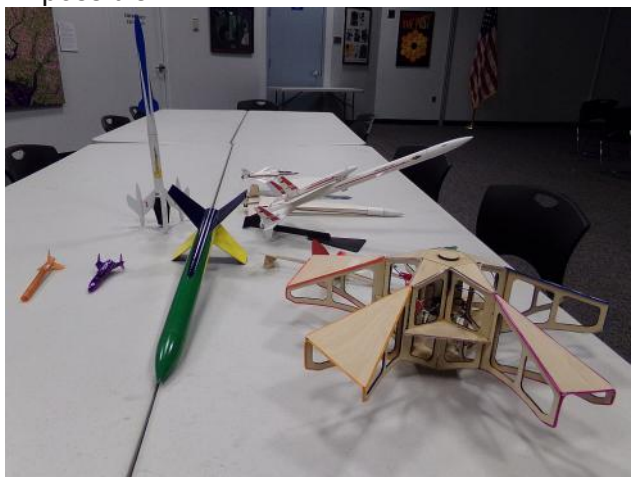
Flight ceiling – this ceiling is ridiculous given the field, but as it is part of the limits imposed by GSFS, it should be included here as well. We may want to suggest that, depending on conditions, risk of loss increases greatly for flights over 500 feet.

Commercially available kits only – This includes kits which have to be assembled, and Roc-in-the-Box models you just take out and fly, and either will be allowed to the extent they have not been substantially altered. The exceptions to this rule, that is rockets that must have previously flown and proved safe, include:

- Custom design / scratch built
- Kit-bash and other non-standard modifications to kits
- Plans from of a magazine or book
- Ideas, designs, or plans from the internet

This rule applies mostly to club members and other hobbiests, who presumably understand the problem. Guests from the general public rarely bring their own designs to fly.

Not permitted types – I put this list in for club members and other serious hobbiests as most of the general public won't have any idea about any of them. Boost-gliders particularly are asymmetric and prone to unpredictable flight paths. Plastic model conversion should be banned everywhere on general principles (author's opinion, I accept that most people don't agree with me on this one). We might also argue for excluding specific models or designs, such as the SR-71 Blackbird and some of the Star Wars series of models that are notoriously prone to squirrelly flights, however I have not included any of those. Maintaining an up-to-date list of specific disallowed models will likely prove impossible.



Ed and Sarah Jackson bring models for show that probably should not be launched at the Visitor's Center.
Photo: A. Mankevich

Outreach: 30th Rockville Science Day

By Ed Jackson

Photos, Captions: Ed Pearson

The Montgomery College marked their 30th anniversary of the Rockville Science Day. NARHAMS was honored during the opening ceremony for participating in all of the Science Days since the start. Bob Ekman presided over the ceremony and presented Ed Pearson with a thank you gift. Besides NARHAMS, there were 97 other organizations spread out across 4 buildings on the Montgomery College campus. Other NARHAMSters could be also be found at the Hobby Works display and some former members stopped by as well. Representing the BSA, Matt Beyers stopped by to talk to Ed and Alan about his younger model rocket days.

NARHAMS was one of the 97 exhibitors this year at Montgomery College's Rockville Science Day (April 28).

As per the last few years, NARHAMS part in the science day was to conduct two build sessions and a launch shortly afterwards. The build session was held in the same place as the last few years, the faculty dining room in the Campus Center Building. We kept the same format as last year for distribution of kits. The first build session would be for a maximum of 18 kits that was a first come first serve. The second session would be by raffle if we exceeded the total amount of kits. We ended up with 17 people in each session so we were easily able to accomodate all interested participants. After the build session, each of the Alpha III rockets was inspected and prepped for launch.

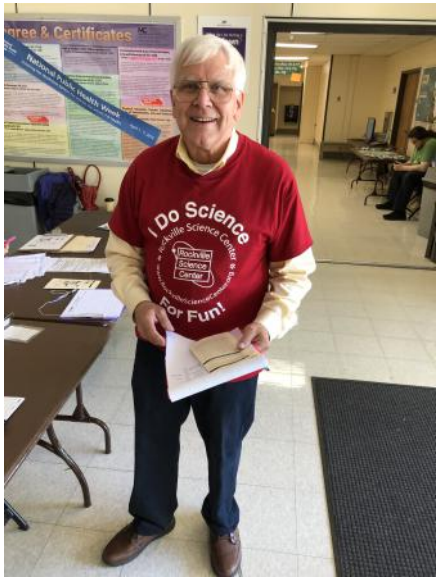
The club, with help from Explorer Post 1010, ran two model rocket build-it workshops.

The launch started at 4:00 PM on the upper athletic field. After a few words from Bob Ekman we started the launch with a modest crowd filling the bleachers. The weather was clear of rain but we were presented with a wind that made recovery a bit challenging. The 10-15 mph wind was blowing lengthwise down the athletic field so we aimed the rockets fairly aggressively into the wind and recovered 33 of the 34 rockets we launched. While normally with an A8 we recover every rocket for this event, for this particular launch, the rockets were traveling more horizontally due to the wind than they were vertically.

This was the 30th year for Rockville's Science Day at Montgomery College. Organizer Bob Ekman (right) was recognized via proclamation from the Maryland General Assembly. Science Day in turn recognized NARHAMS for helping all 30 years.

Continued next page

This build and launch would not have happened if it were not for the volunteers who help out. Myself, Sarah Jackson, Ed and Diane Pearson and Alan William were on hand from NARHAMS. In addition, Bob Ekman's TARC team members, Stephen Jin, Mayilan Thanigai, Aneesh Bellan and Cole Shering from Explorer post 1010 helped with both the build session and launch. Thanks to everyone who helped with this event and those who played a part in NARHAMS' 30 years of participation in the Rockville Science Day.



Explorer Post 1010 Leader and Science Day Organizer Bob Ekman.

Rocketeers set up a rack of Alpha III's completed just minutes before.

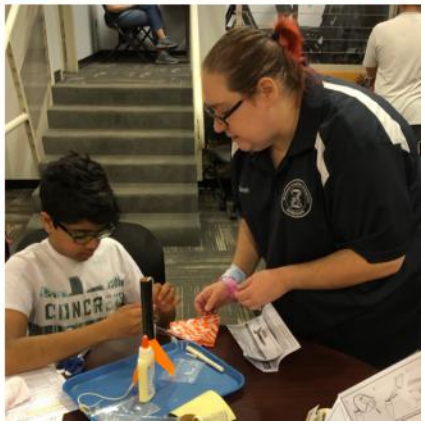
After classes we moved outside and Alan assumed duty as announcer/firing-officer/RSO; Ed did set up and helped rocketeers load up.

We recovered all models but one —alas lost to trees.

We launched three dozen models to the delight of the rocketeers and crowd watching from the college's athletic-field bleachers.

Continued next page

A 43 sighting. Each exhibitor was assigned an identification number. Curiously Explorer Post 1010 was assigned 43.



From NARHAMS we had (top L-R) Old Ed (Diane Pearson photo), workshop leader Ed Jackson, (bottom L-R), Alan Williams, and Sarah Jackson.

From Explorer Post 1010 we had helping, (and these were super duper helpers) (top L-R) Stephen Jin, a Junior at Walter Johnson; Mayilan Thanigai, a Wooten High senior; (bottom L-R) Aneesh Bellam, a junior at the Bullis School; and Cole Sherling a sophomore at Whitman.

Blast From The Past—Scout Master Matt Beyers. He used to fly for Annapolis Association of Rocketry—40 plus years ago!

May 2019 Mt Airy Sport Launch

By Ed Jackson

The Mt. Airy Launches for this year so far have been either soggy or windy affairs when we have been able to have them at all. It was a pleasant surprise that the weather for May 18th was partly sunny, in the 80s and almost no wind. In fact, it was the first time that I have run a launch at Mt. Airy (or Goddard) where no rockets ended up treed. In addition to the very favorable weather, to our even greater surprise, was the lack of soccer games on the fields adjacent to the launch area. The only thing our rocketeers had to contend with was the long grass that likes to eat rockets during the months of May, June and July.

The theme for this launch was military missiles and a number of members participated in the theme. Bradley Lowekamp launched his NORAD twice on F's but the true arms races was between the Jacksons and Mike Kelly. Sarah and I launched our AIM, Patriot (Estes), mini Honest John, and Bull Pup. Mike took the theme even more to heart and attacked with a V2, Tomahawk, Honest John, Corporal and finally his G-powered Harpoon.

We had two cub scout packs show up, one with a few Alpha IIIs and the other one, who was led by Bradley Lowekamp, flew a Balsa Machining School Rocket Kit that flew well and looked great on the pad and sounded even cooler coming down on their mylar streamers.

Bradley's Quinta-Super-Star in action.
Photo: B. Lowekamp

A rack ready to go.
Photo: B. Lowekamp

The Shafers and Roger set up, Boy Scout Alpha III's ready to go!
Photo: S. Jackson

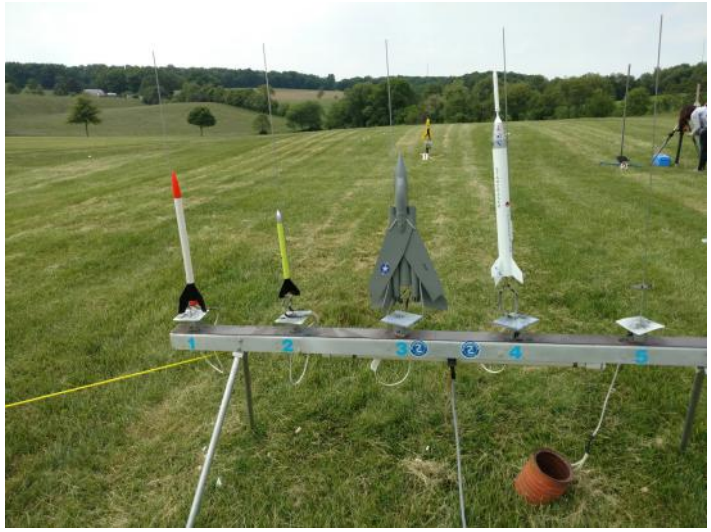
Continued next page

March Sport Launch, Continued

The nice day also brought a variety of other interesting and notable rockets. In commemoration to John McCoy, I launched two of my Micro Max rockets including a newly finished Tiddlywinks helicopter model. Bradley Lowekamp flew his Quinta Super Star UFO saucer as well as his Mega Mosquito. Buff, a new comer to the launches but not to model rockets, flew his collection of 90s era Estes rockets including a Death Star and a F-14 Tomcat that flew better than I have ever seen one fly. Buff also attempted to launch a Saturn V with a E30, on the anniversary of Apollo 10 launch, but his motor had a failure so we will have to wait for July for the next anniversary. Excited to see no soccer games, Mike Kelly went to get some larger rockets that included his new Mega Magician as well as the closing rocket, the big Red Crayon.

This launch was run by myself and Sarah Jackson but we would not been able to do it with the help of Mike Kelly, Bill Boublitz, Bradley Lowekamp and Paul Lilley.

By the Numbers:
1/8A: 2, 1/4A: 1, 1/2A: 1, A: 15, B: 39 C: 29, D: 10, E: 9, F: 6, G: 3
Staged: 2 Cluster: 1



Buff's F-14 Tomcat as well as the StarChaser bequeathed to me from Jim Filler.
Photo: S. Jackson

Mike Kelly's V2 in flight.
Photo: S. Jackson

The F-14 takes off!
Photo: S. Jackson

Mike Kelly's Big Red Crayon on Pad 3.
Photo: S. Jackson

Buff's Saturn V.
Photo: S. Jackson

May Meeting Highlights

The meeting included a discussion of the NAR Trustee elections, the Goddard Apollo contest, and John McCoy's service. The club voted to name our night launches after John.

Kevin, Pau, and Esther Johnson at NARHAMS May meeting.
Photo: E.Pearson

NARHAMS Club Merchandise

New Online Store for NARHAMS Merchandise:

https://www.cafepress.com/narhams

NARHAMS now has an online store for club mechandise. No more waiting for a group buy. Lots more choices of colors and styles. Plus, a huge variety of items, much more than we have ever had in the past.

Shirts, Hoodies, Hats, Mugs and more!

End your loved ones' gift shopping dilemma - leave this page open and circle this announcement.

Contact your editor before buying. He gets regular discount or free shipping codes from Cafepress. Save your dollars for rocket motors.

May 2019 Goddard Launch Cancelled Again

By: Alex Mankevich – NARHAMS President

Once again, fate and poor weather combined to produce yet another cancellation of a Goddard launch. This time Mother Nature made sure that we weren't tempted to conduct a launch as she threw a near certainty of rain into the Greenbelt region. There was plenty of advance warning inasmuch as the forecast for precipitation hovered between 80% to 100% for that fateful day. As you can view in the table accompanying this article, NARHAMS had not been able to conduct back-to-back Goddard launches yet in 2019.

Status of 2019 Goddard Launches

Month	*Launch Status*	*Cancellation Reason*
January	*Cancelled*	*Government shutdown*
February	*Conducted*	*n/a*
March	*Cancelled*	*Rain/Sleet/Snow*
April	*Conducted*	*n/a*
May	*Cancelled*	*Rain*

The Goddard Range Crew was accorded a well-deserved reprieve from launch duties. As is our custom, NARHAMS offered a PowerPoint presentation on space exploration and model rocketry to those Visitor Center guests that showed up hoping that a launch would still happen.

Alex upgraded his presentation to specifically mention the upcoming 50th anniversary of the Apollo 11 mission and included details of NARHAMS' and the NAR's plans to celebrate this historic and cultural milestone.

Ole Ed Pearson and Michael Cochran both put in an appearance at the Visitor Center to be available should they be needed in any manner. The Visitor Center's Operations Manager DJ Emmanuel came by specifically to make sure that Alex could take some of the newly-printed Apollo Contest fliers for distribution. Sally Cook joined the gang to make sure that things were properly progressing as they should.

We had prepared many *First Time Flyer* certificates that were given to Shirley Ramos and Julie Saba. The renovations to the (former) Science on a Sphere room had not been completed by the first Sunday of May, so we could not yet take the opportunity to move our launch equipment into our new storage closet.

We remain optimistic that the current history of wet and unwelcomed weather on Goddard Launch Day will soon become just an unpleasant memory, and the we can get back to routine and predictable launching of model rockets from the NASA Goddard rocket garden.

Alex Mankevich talked up the upcoming Apollo 11 50th anniversary and the NARHAMS plans to celebrate its milestone.
Photo: E. Pearson

Friendly and eager-to-assist persons standing by to help. Left to right – DJ Emmanuel, Sally Cook, Michael Cochran and Shirley Ramos.
Photo: E. Pearson

April Meeting Highlights

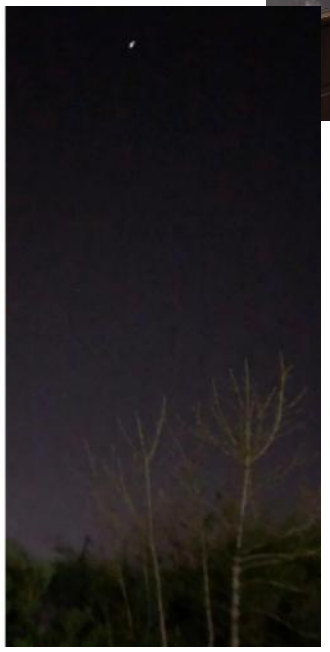
By Ed Pearson

April meeting discussions centered on upcoming launches, e.g., Mt. Airy, Rockville Science Day, Goddard Apollo Contest, ECRM, etc. We commemorated Alan Williams birthday and later went outside to see the International Space Station pass overhead.

Dapper Ole Ed.
Photo: J. Ash

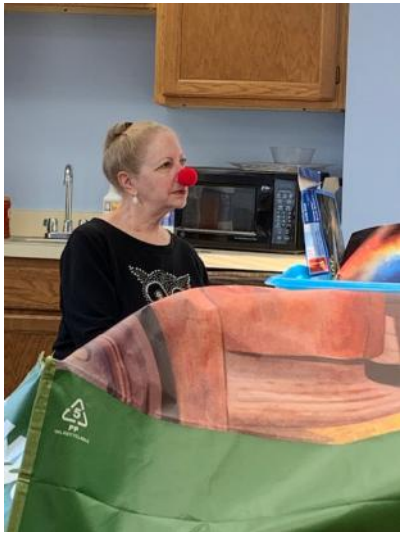
Don't point a camera at Jef.
Photo: E. Fineran

Serious deliberations.
Photo: E. Fineran



Alan's birthday and ISS flying overhead.
Photo: E. Pearson

A delighted Jim.
Photo: E. Fineran



A pensive Diane.
Photo: E. Fineran

April 2019 Goddard Launch Report:

By Alex Mankevich

Over 260 plus NASA Goddard Visitor Center guests enjoyed the warm temperatures and sunshine at the April 2019 First Sunday launch. The parking lot went into overflow mode as families and scout groups brought out a smorgasbord of models for launching. Perhaps the crowd's size represented some pent-up launch demand as the March Goddard launch was cancelled due to a rain/snow/sleet mix.

The range was set up in its usual Goddard launch configuration. Sarah Jackson and Alex Mankevich did the safety checks and pad assignments. Firing Officer Ed Jackson was ably assisted at the launch rack by Michael Cochran. Michael was helping a scout group prepare their Alpha III models. Ole Ed Pearson did the event photography. Alex took the recovery pole to fish out a few rockets from the trees. The recovery pole actually could have seen more action. Normally, the winds blow the rockets towards the Visitor Center building. The winds for this launch were determined to blow the rockets the opposite direction towards the parking lot at the bottom of the Visitor Center grounds.

Michael Cochran and Ed Jackson prepare yet another launch rack for flight.
Photo: A. Mankevich

Those awaiting check-in. Cars were parked along the road in the exit lane.
Photo: E. Pearson

A sampling of flights.
Photo: E. Pearson

Dan White of the 1970's Harford Area Space Modelers strikes a pose with Ole Ed.
Photo: A. Mankevich

Continued next page

April Goddard Launch, Continued

Launch guests who are Goddard employees were marshaled into retrieving the wayward rockets and to repatriate the birds with their owners.

Three cub scout packs added to the total number of flyers. Pack #90 out of Chevy Chase, Pack #1559 out of Bowie and Pack #874 out of Ellicott City all got to burn black powder and to create some smoke and noise.

Poor Sarah was tasked with performing numerous minor repairs to render several models safe and stable for flight. Superglue was needed to securely adhere numerous fins that were "'barely" affixed to the body tubes. A gentle tug on quite a few elastic cords resulted in separations or disclosed that the end was not actually tied to the nose cone. A few rocketeers either didn't know about recovery wadding or had not been able to secure some. We had to send away one five-finned rocket that had one of its fins broken on the ride to the Visitor Center. A two-stage model was also disallowed; however, the rocket was able to fly on a single motor.

Ole Ed Pearson went into full schmooze mode as long-vanished model rocketeer Dan White resurfaced. Dan White of the 1970's Harford Area Space Modelers came out to say hello. Dan recently started working at Goddard doing system administration for NASA Communications. His internet browsing resulted in him realizing that NARHAMS was still active and that the Goddard launches were still on-going. Maybe some not-so-gentle arm twisting will encourage Dan to join our Goddard crew?

The launch day concluded right at 3:00 pm. We anticipate that the renovations to the Science-On-A-Sphere room will be completed by May's launch, so that we can get the closet back for the storage of our range equipment.

A colorful collection of eclectic V2 models await their turn for safety check and launch rail assignments.
Photo: A. Mankevich

Big and Small- Silver Spring Visitor with a D-powered Space X Falcon 9 and John Bonk carrying a Mosquito in a jar.
Photo: E. Pearson

The illustrated preparation and flight display gets some attention prior to the April launch.
Photo: A. Mankevich

Shirley Ramos (l) generates new flyer certificates while Julie Saba (r) answers questions and hands out NASA lithographs.
Photo: E. Pearson

Purser—Rack Assistance - Michael Cochran.
Photo: E. Pearson

Bits and Pieces

Upcoming Meeting Presentation Topics:

June 1	Contest Model Design and Building
July 6	Summer Picnic
August 3	Open Build Session

Upcoming Launches/Themes:

June 2	NASA Goddard Public Launch
June 7-9	National Sport Launch
June 15-16	Mt Airy/ECRM-46/NRC/Sport Launch
July 7	NASA Goddard Public Launch
July 20	Mt Airy/Open Theme
July 20	Apollo Contest - Goddard Visitor Center
July 27-August 4	Rocketry Festival 2019/NARAM
August 4	NASA Goddard Public Launch

Welcome New/Renewing Members

New Members

John Brohm, Susan Picinich, Kirk Wagner

Renewals

Dimitre Avramov, Stoil Avramov, Jim Baird, Michael Cochran, Sarah Jackson, Stanley Max, Thomas Noyes

Congratulations!

(L) David and Donna O'Bryan celebrated their 25th wedding anniversary!

(R) Charis Houston is now a high school grad!

(L) Sarah Jackson received a master's degree in library science!

Not Reading Your Own Copy of the Zog-43? Join NARHAMS and have your own copy emailed to you hot off the press. Only $5/ year! Click here.

Competition Corner:
Scale Data: MMR-06M

MMR-06M Soviet Small Meteorological Rocket

At the FIRE 2019 contest, Ole Ed noticed this interesting model flown by the Ukrainian team. He sent a note to the Ukrainian Spacemodeling General Secretary about the model and got this reply:

> MMR-06 this is a Soviet single-stage uncontrollable solid-fuel small meteorological rocket. The maximum climb height is 60 kilometers.
>
> Some information can be found on Wikipedia - https://en.wikipedia.org/wiki/MMR06
> Now, this model we used for class S-5-B at the Europe or World Championships.
>
> Attached a drawing, it may be useful :)
> [Ed.: see next page]
>
> Best Regards,
> Denis Khmil

Peter Alway's excellent Rockets of the World (4th ed., p. 38) has a B&W photo of the of this configuration.

Searching the net did not reveal much in the way of photos. Chasing down some internet rabbit holes turned up this picture. Probably not much good for substantiation, but gives you a sense of the actual size. There must be some around as the Ukrainians have a substantiation package.

Not the same round modeled.
Photo: Encyclopedia Astronautica

Above: Ukraine MMR-06M scale model at FIRE 2019.
Photo: E. Pearson

<u>More Contests</u>:

Steel City Smoke Trail-19, June 1-2, Weber Farm, Grove City, PA. More info: http://www.psc473.org
Can Am Cup FAI Contest, June 7-9, Muskegon, MI. More info: mikemnowak@gmail.com
Apollo 11 50th Anniversary Moon Landing Contest, July 20, Goddard Space Flight Center, see article on page 13.

ECRM-46 Events:

1/4A HD
A BG
B Payload (w altimeter)
PMC
Open Spot
*** Any NRC event can be flown, no eggs provided**

Julne 15-16, 2019
Old National Pike Park
Mt Airy, MD

Rocketry Festival 2019

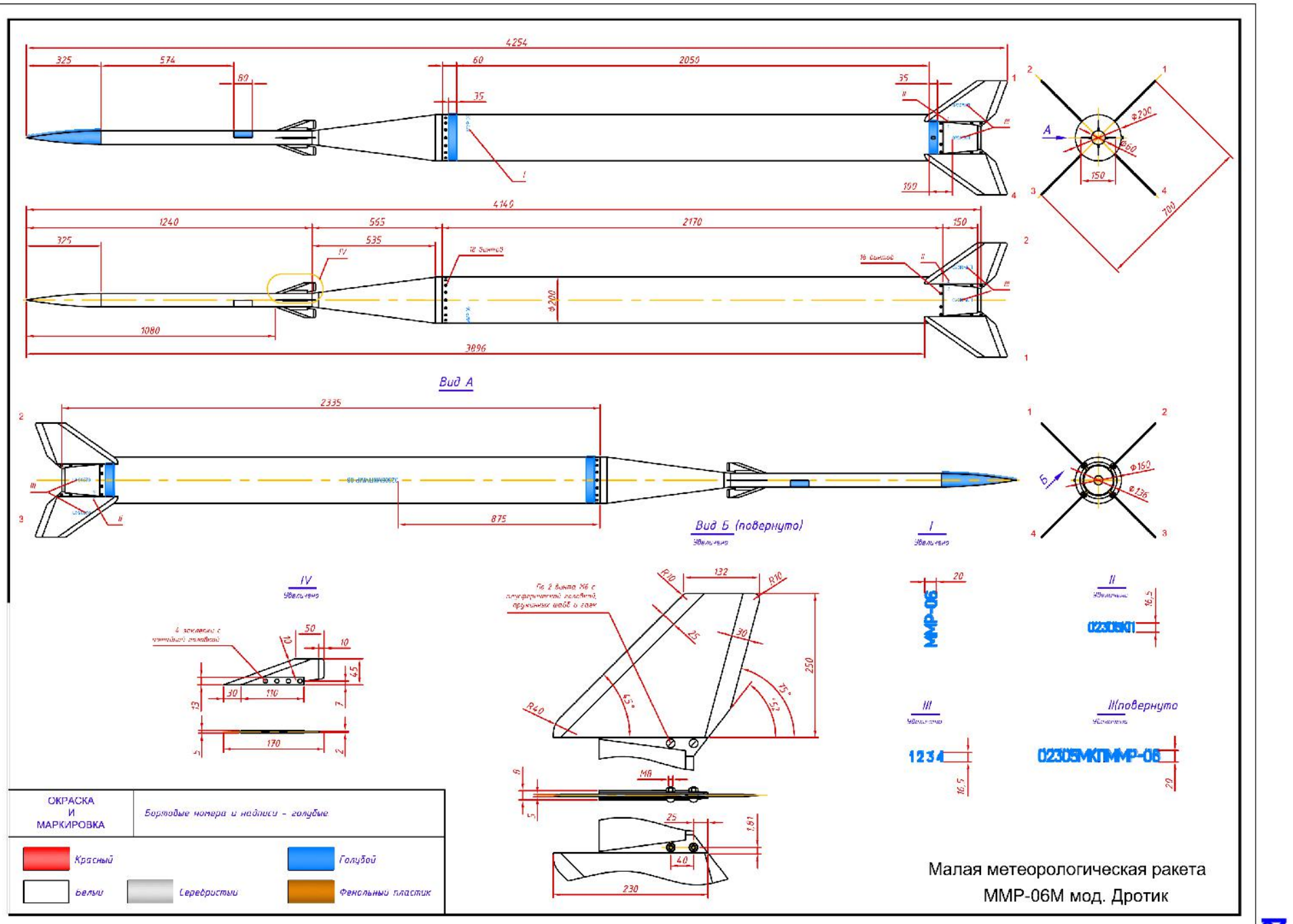
NARAM-61 Events:

1/4A Parachute Duration*
1/4A Helicopter Duration*
A Boost Glide Duration*
B Eggloft Duration*
B Payload Altitude*
C Eggloft Altitude*
C Rocket Glider - Multi-round
E Altitude
Classic Model
Scale
Research & Development

July 27-August 3, 2019
International Aeromodeling Center
Muncie IN

FAI USA Team Flyoffs - July 28-30
Sport Flying July 27 - August 3
NARAM July 31 - August 3

For current info, go to
www.nar.org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Ф200
Ф60
150
700
Вид А
2335
875
Вид Б (повернуто)
Увеличено
I
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Ф160
Ф136
IV
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R40
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ОКРАСКА И МАРКИРОВКА
Бортовые номера и надписи - голубые
Красный
Голубой
Белый
Серебристый
Фенольный пластик
Малая метеорологическая ракета
ММР-06М мод. Дротик