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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:

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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 - Hunkered Down and Thinking

Don Carson, NAR #11069

While we still cannot get together to launch and enjoy the fellowship of our monthly meetings, we are making do with virtual teleconference meetings, building more rockets and maybe sneaking in a launch or two.

For those who had planned to go to NARAM or who would have liked to, but couldn't, please check out the Competition Corner for some pretty major (IMO) news. We are putting together a Virtual NARAM!

Lots of other things to think about in this issue from Stuart Lodge's challenge to the international competition community, to the innovative sport builds of Steve Lloyd, and to Sarah Jackson's recollections of where a beginner stumbles and yet continues on.

I hope everyone stays safe and healthy.

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

I hope you enjoy this issue.

As always,

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

For questions, answers, opinions, files, photos, and more NARHAMS, join the NARHAMS Groups.io 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: Rare shot of the Dragon Crew Module DM-2 launch from where the pad evacuation buckets would end up. Up at the capsule access gantry level, there are baskets that personel could hop into and ride, monorail fashion, down to the ground in an evergency. The buckets pick up a drag chain and plow into a net to bring them to a stop. No one will admit whether a live person has ever taken that ride.
Photo: NASA/Bill Ingalls

Back cover: Who hasn't taken a pic of their rocket and just got the smoke? This dramatic photo of the Crew Dragon DM-2 launch was on this NASA HQ page of images, but reminded me of so many pictures we have all taken.
Photo: NASA/Joel Kowsky

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Space Modelling's Participation At An All-time High

…but are we flying the right stuff?!?

1997 Saw me pen *"No Contest…has FAI Space Modelling run out of SPACE!?!"* This was a document written for FAI-CIAM's Sapphire Programme, highlighting the strengths and weaknesses of contemporary Space Modelling, across the spectrum of classes listed in the FAI Sporting Code; resume includes:

Juniors:	Too few being brought into FAI Space Modelling
Models too small:	Need to be bigger to be spectacular and attractive
Not selling well enough:	To general public and fly-for-fun model rocket flyers
Resume of classes:	Where they are now and how they could be improved
Provisional classes:	Which seem attractive but are hardly ever flown
Not enough classes:	More should be flown at a typical World Cup weekend

Juniors ~ Some good news associated with Juniors' development. The United States' National Association of Rocketry (NAR) introduced the *Team America Rocketry Challenge* (TARC) – a fragile Payload and Parachute duration event – for schools across the continent, in recent times. This has been mimicked in the United Kingdom, with the *United Kingdom Aerospace Youth Rocketry Challenge* (UKAYRoC). Combined, these have resulted in 1000s more young people getting 'hands on' experience with model rockets. Canada, France and Japan run similar events. This contest resembles FAI-CIAM provisional class *S2/P-Payload Duration.* However, there remains a dichotomy between "hobby model rocketry" in Western countries and FAI Space Modelling… which few in fly-for-fun rocketry have even heard of!

A Paper By Stuart Lodge

Models Progression ~ Models for classes *S1-Altitude; S3-Parachute Duration; S4-Boost Glider; S6-Streamer Duration; S9-Gyrocopter Duration*, increased in size from 30mm diameter & 350mm length, to 40mm diameter & 500mm length, in 2001. Impulse went up from 2.5 Newton seconds (Ns) 'A' power, to 5 Ns 'B' power…although in 2002, the latter was subsequently rescinded to limit excessive performance. *Class S5-Scale Altitude* models increased in size too; *S5C-Scale Altitude* 50mm diameter & 650mm length : Seniors & *S5B-Scale Altitude* 40mm diameter & 500mm length : Juniors. The simple World Cup class of *S8E-RC Rocket Glider Duration,* gave way to *S8E/P-RC Rocket Glider Spot Landing* – incorporating a tasking discipline - at a similar time. These examples exhibit the 'good and progressive' side of Space Modelling. For the record **/P** still means Provisional and not Precision landing!?!

Poor Selling ~ As stated above, in Western countries, there is no trend to progress from building/boosting simple kits from the hobby shop, to FAI Space Modelling. Layer in the thrill of representing one's country and travelling to

Continued next page

S7-Scale isn't just about complex prototypes. This is your scribe's Bristol Aerojet Skua 2, in recovery mode at a SERFs' event at Yatesbury, UK, in the early 2000s. Super, realistic boost and a good ride back under a parachute. That Skua first boosted in 1986!.
Photo: S. Lodge

This is a typical S6A-Streamer Duration composite model. 1000s seen all over the world. Super performance, but still a bit small and boring to watch.
Photo: S. Lodge

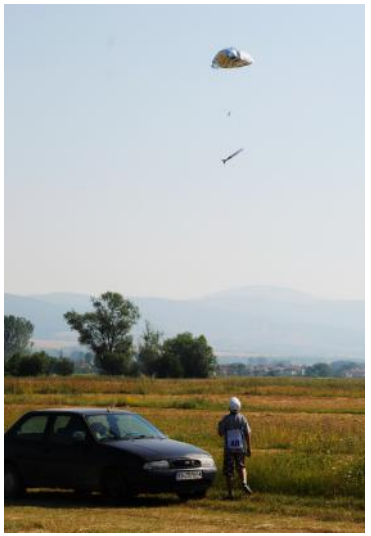
foreign lands and there should be a torrent. The fact of the matter is, Western fly-for-fun model rocketeers do not read the traditional Hobby Press, containing features by ibid and others throughout the world. These go largely unseen by those who should be forming the next generation. Plotting the performance of Space Models may be effected by computer software, skills young people are very familiar with. The exchange of ideas between enthusiasts has never been easier, interfacing via email and social media sites. But it's not really happening, we're just unable to 'shop window' our product effectively.

S-Classes resume ~ Simplistically, what do we fly? Answer…pretty much what we flew 50 years ago! Some of this is for good reason, *S1-Altitude; S3-Parachute; S4-Boost Glider; S5-Scale Altitude; S6-Streamer; S7-Scale; S8E/P-RC Rocket Glider Spot Landing* and more latterly, *S9-Gyrocopter* (a real youngster..) are popular and stood the test of time. Let's look harder:

World Cup…*S4A-Boost Glider; S6A-Streamer Duration; S7-Scale; S8E/P-RC Rocket Glider Spot & S9A-Gyrocopter Duration* are the official events inked in first, for obvious reasons. These are 'Open' events with Seniors and Juniors flying together, although organisers may have dedicated Juniors' awards laid on. Often too, a World Cup event forms the National Championships for the host country.

World & Continental Championships…*S1B-Altitude; S3A-Parachute Duration; S4A-Boost Glider; S5C-Scale Altitude; S6A-Streamer Duration; S7-Scale; S8E/P-RC Rocket Glider Spot & S9A-Gyrocopter Duration*, the full eight classes. Seniors and Juniors fly separately, with the latter flying smaller models in the 'performance classes', in *S5B-Scale Altitude*, using half the Seniors' motor specific impulse in 'performance classes'; *S8D-RC Rocket Glider* flown as a purely duration contest on 20Ns impulse; *S7-Scale*, just like Seniors.

Looking at the whole, things seem fairly healthy now, models are bigger, more spectacular, plenty of participation and competitive standards have never been higher. But…and here it all gets a bit 'inward looking', we are not experimenting with 21st Century progressive novel concepts. It's not as though there aren't a number we could consider, what about our…



S3A-Parachute Duration has stood the test of time since 1966. Performances just amazing, but too many are lost… high end littering?
Photo: S. Lodge

S8E/P-RC Rocket Glider has shown the benefits of EVOLUTION, it started out as a three round duration event, b[illegible] a high

Would it be better if we flew our performance classes with rockets like this? Much more spectacular for spectators!

Provisional Classes ~ er, what are these then?!? Fair question, let's open Volume SM Space Models 2020 Edition. We have: *S6A/P-Streamer Target Time Duration; S11/P-Rocket Powered Aircraft and Spaceships; S12/P-Time Duration Triathlon;* and *S2/P-Fragile Payload Duration*. Not many have a clue about these events; fewer still even flown them. The focal player in this list is *S2/P-Fragile Payload Duration*, a very similar class is already being flown across the World, at TARC, UKAYRoC and similar events.

Why does a typical World Cup normally only feature the 5 classes of *S4A-Boost Glider; S6A-Streamer Duration, S7-Scale; S8E/P-RC Rocket Glider Spot & S9A-Gyrocopter Duration*? We need to look at a typical World Cup contest timescale:

UKAY RoC 2013, Young People are the future of EVERYTHING! Three Young Ladies show off their Altitude/Flight Duration tasking rocket…super.
Photo: S. Lodge

Continued next page

***The Right Stuff?*, Continued**

Friday ~ participants arrive in the afternoon and evening. Deliver *S7-Scale* models to judging hall.

Saturday ~ typically Opening Ceremony, *S4A-Boost Glider; S6A-Streamer & S9A-Gyrocopter* : typically 10.5 hours duration.

Sunday ~ *S8E/P-RC Rocket Glider Spot & S7-Scale flights*: typically 5 hours duration. Competitors depart, late afternoon..

Total for whole contest, not including Medal Ceremonies, weather breaks and the like, comes to **~15 hours 30 minutes**; lots of work for all concerned, not counting the run-up and clear-up. This normally slims down somewhat, by reducing the flying times for Rounds 2 & 3 in Saturday's classes and maybe 30 minutes for Lunch, but an early start still needed to squeeze everything in.

Not enough classes ~ But no time and space for any more either? …and no time for *Progress*. FAI-CIAM is critical of several aspects of Space Modelling, not enough *Technology*, not enough *Complexity*, not enough *Progress*. Ibid reckons they should look in the mirror from time to time, not to mention the birth certificate dates, but…FAI-CIAM does have a point, Space Modelling often flies airframes that make a typical Estes' kit seem complex by comparison! What are these /P, Provisional classes, all about?

Provisional Classes Listed out, we have: *S6A/P-Streamer Target Time Duration; S11/P-Rocket Powered Aircraft and Spaceships and S12/P-Time Duration Triathlon*. It would be nice to describe the strengths and weaknesses of all these classes, but…they're Virtual, 'paper aeroplane' events that once existed in somebody's mind. Almost none of these have been flown at national, still less, international, level and no information exists as to whether any of these are worthy of consideration. Now, *S2/P-Payload Duration*…

Yet another truly spectacular boost. This UKAYRoC schools' event resembles FAI class S2/P-Payload Duration… which should be flown at every World Cup event. *Photo: S. Lodge*

S2/P-Payload Duration ~ Should be flown – not trialled – at most World Cups. It's been "trialled" for years, with 1000's of boosts at TARC and UKAYRoC, plus internationally, at the *International Rocketry Challenge* (IRC), where the winners of each of the nations which fly it, come together for the unofficial *"World Schools' Championships."* It's a major success, flying a fragile payload – chickens' egg(s) – to a target Altitude and landing safely, after a predetermined Parachute Duration. Altitude and duration accuracy are crunched in an algorithm, with the lowest score winning. Oh yes, TARC and UKAYRoC have reached such a standard that the Payload and Altitude requirements are CHANGED each year, alternating between carrying 1 or 2 eggs, shifting the Altitude target by up to 20m up or down and lengthening/shortening the flight duration by +/- 10s. This prevents a 'winning formula' developing; fresh start needed every year. No restrictions on propellant, Specific

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Chelmsford County High School ladies at 2014's UKAYRoC, exhibiting their show table…did really well. *Photo: S. Lodge*

S7-Scale is all about DIVERSITY…much better for spectators. Just a small array of scale birds at 2018's Letovice Cup. *Photo: S. Lodge*

7-Scale is awesome and needs little improvement, going forward. Check out these two Bulgarian entries at the '17 Kaspichan Cup…fabulous. *Photo: S. Lodge*

***The Right Stuff?*, Continued**

Impulse – 60 Ns is typical, often using a cluster of three 20 Ns 'D' motors, or a single composite. Trust me, these kids are good!

Would this event 'fit into' the World Cup format dissected above? Personal experience of UKAYRoC – and also the IRC – has illustrated that 10 or more of the entry may set up together on the launch area and launched one after another. Flight duration times of typically 45 seconds…yes, less than 1 minute, meaning a 12 rocket entry could be flown and recovered in less than 15 minutes per round. Post-flight, the rockets are recovered and brought to Control, where the Electronic Altimeter (eAltimeter) readings are recorded and layered into the flight duration score. If the egg(s) are damaged the score is ZERO! Fly it over 1, 2 & 3 rounds…it's a super event.

Alternative payload A golf ball might be an obvious choice. Why?!? Remove the 'fragile payload' element of the event – makes scrutineering easier for organisers – and golf balls are available globally, with a consistent specification. According to the *Royal & Ancient*…

Golf ball diameter	42.67mm (1.68")
Golf ball mass	45.93g (1.62 oz)

Another plus with Payload Altitude models is that there's no need for 'super lightness', just no need to boost them as high as possible on a minimal motor impulse, contrasting with most existing Space Modelling classes. Models are easy to make from basic materials – or even contemporary composites, take your pick – and painted in eye-catching colours. eAltimeters are readily available; parachutes small, durations < 1 minute and drift – even in windy conditions – quite small.

Come on people, we can do it!!

Space Modelling's *Progress* and *Survival* is in our hearts and minds. We must prove ourselves capable of *evolving* Space Models' contest classes, to keep up with the times and competing similar activities. Remember, we've done the 'hard part', Space Modelling is now over FIFTY YEARS OLD, having embraced global changes in nations and ideology, coming through stronger. The recent global recession should have greatly reduced World Cup and Major Championships' participation. The damage has been relatively small. In fact, 2015's World Cup series showed a 20% increase in participation – we're getting something right. We've embraced *Diversity* of classes, *male & female* competitors, Juniors – *young people*…the Future. We need to work harder on the latter and *Evolution* of the classes we fly.

S7-Scale boosts can be spectacular! This is a Soyuz TMA at 36th Ljubljana Cup in 2015.
Photo: S. Lodge

Lots of kids having lots of FUN, at UKAYRoC 2014. As always, it's Young People who show us the best way forward…they are TOMORROW!
Photo: S. Lodge

One traditional class that continues to amaze is S7-Scale. Scale rockets – especially the flying – are what the public comes to see.
Photo: S. Lodge

Not Your Father's Bottle Rockets

Two-Liter OddRocs

Guidance For Building Your Own

By Steve Lloyd

This past autumn I began to switch from building the regular model rocket kits, and bought the Estes Designer Special, basically a large box of assorted standard model rocket parts. Once I began creating my own designs, I left behind doing kits. I might do the occasional kit *bashing*: where you take parts from certain kits and adapt them to another. The point is, once I started designing my own rockets, I started having much more fun with our wonderful hobby.

Image: Wikipedia

Background

I grew up in the 1950s and from the first time I saw George Pal's 1953 production of *War of the Worlds*, I became a fan of science fiction movies. I loved the V2-based rocket ships and the flying saucers of that movie era. A favorite has always been the 1956 movie, *Forbidden Planet*. Inspired by the futuristic technology in that film and others, I thought it might be fun to create a model rocket that captured some of the excitement and, from our 2020 perspective, the naiveté of those movies. This inspiration occurred while I was enjoying lunch and drinking a Diet Sunkist soda. The two-liter bottle of the soft drink was smooth, clear plastic. Then it hit me: this bottle could be made into the main body of my "1950s" rocket. I imagined at BT-60 tube running through the middle of the rocket vertically, so it could easily accommodate a 24mm (D-motor size) mount. Note: I like the 24mm size because one can always use 18mm (A through C) motors with an Estes Adapter (see Figure No. 1).

Figure 1

When I was building the first model, an idea hit me. Why not leave the body of the rocket unpainted (clear), and use the first bulkhead as the "floor" of the spacecraft? I had 1/48th scale support personnel left over from several plastic models and each seemed to wear the same kind of cap featured on the crew in *Forbidden Planet*! And so it began...

Prepping the Bottle

Remove the label and wash the bottle. Near the base of the bottle use a fine Sharpie to mark a line around the circumference for cutting (the bottles I used had a clear mold line which I followed). Using an X-acto knife with a number 11 blade, slowly score that line until the bottom of the bottle is removed. Take this process slowly and carefully, simply drag the knife along the line several times until it fully penetrates the plastic. I tried cutting a similar bottle with a circular saw blade attachment to my Dremel tool but found cutting the thin


The Author with three of his creations.

All Photos, unless attributed otherwise: S. Lloyd.

Continued next page

Bottle Rockets, Continued

bottom of the bottle is easier with the knife. Smooth the edges where the bottle was cut.

Figure 2

Unlike at the bottom of the bottle, there is no obvious area where you cut the neck. I used an old circle template I had lying around (See Figure No. 2), matched the BT-60 picking a slightly smaller hole template and used it to draw a line on the neck of the bottle. The Dremel with a circular saw blade makes it easier to cut the line on the neck. Take this slowly and at a low speed on your Dremel tool. Too fast, and all you do is melt the plastic, not cut it. Alternately, you could use a razorsaw or a hacksaw better for this job. Once the cut was complete, check the tube against the opening and grind it down to fit. I switched to a grinding attachment on the Dremel tool, followed by careful sanding for a smoother edge. Again, do a little at a time. Once the tube fits without forcing it, clean the bottle again and you're good to go. (See Figure No. 3).

Figure 3

Making the Bulkheads

Measure the diameter of the bottle at its widest part. My particular bottles were 4 ¼". Make two bulkheads, each 4 ¼" in diameter to support the flexible sides as well as center the tube. A hole needs to be cut into the bulkhead dead center and with the exact outer diameter of the BT-60 tube. (See Figure No. 4). I used ¼" balsa for the two bulkheads, although you may wish to try Foamcore© or 1/8" basswood. Check the bulkhead fit and sand them until the fit is snug, but removable.

Figure 4

Build Out the Interior

In my plastic model kit parts drawer were many left over doo-dads, a ladder from a jet plane kit, color photo-etch parts I'd never used, motor display stands from a couple car models I'd built, and lots of other goodies. I envision the unpainted portion of the bottle being populated with the "crew," busy making adjustments to various controls, improvised from all the spare parts. I even added a few electrical wiring nuts as my homage to the "Clystron Modulator" of the movie's spacecraft.

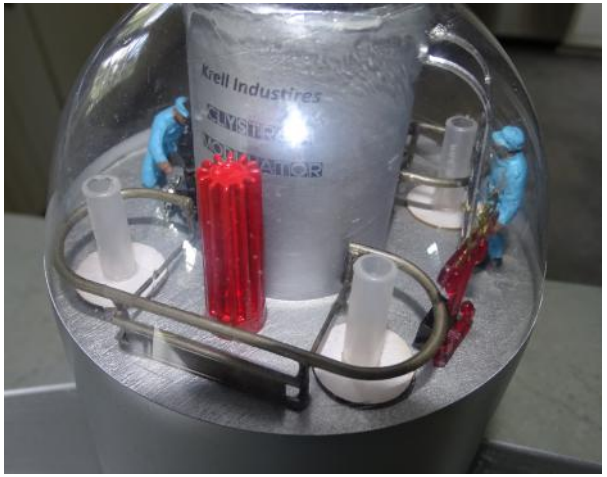

Figure 5

It was necessary to paint those internal parts, position the crew and controls, BEFORE assembling the bulkhead. (See Figure No. 5). I glued the crew, the controls and other equipment with epoxy which is just a tiny bit flexible, something the Cyanoacrylates are not. I wanted my figures to stay put despite the high G forces all model rockets experience.

Figure 6

I used epoxy to glue the uppermost bulkhead into place. (See Figure No. 6). I placed, but did not glue, the lower bulkhead next, to keep everything aligned.

Epoxy-based putty is excellent to address and gaps there may be between the bulkhead and the bottle. When mixed together, it becomes like modeling clay. You shape it to the form you need and in about 15 minutes or more, it will begin to harden with that shape. You will see in my photos that this became necessary in my build. (See Figure No. 7). Be sparing with it. You don't want to add needless weight.

Figure 7

Variations on a Theme

What you do next can add a very dynamic level of excitement to his project. You *could* simply epoxy the second or lower bulkhead in place now, allowing enough room at the bottom of your rocket to clear the motor screw retainer if you use one. Instead of using the regular metal clip that retains the motor during parachute ejection, I like the screw-on retainers Estes makes. They aren't better than the clip, they're just neater looking. Just leave room for that with your lower bulkhead. That said, on to an interesting deviation from the two bulkheads.

From the photos with this article, you may have already noticed that there can be quite a bit of space between the lower bulkhead and the bottom of the rocket.

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Bottle Rockets, Continued

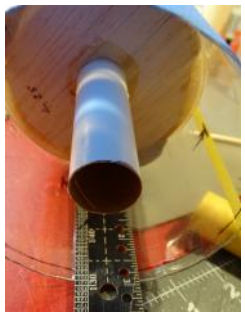
Figure 8

(See Figure No. 8). Potentially, there is adequate space or payload area for small cameras. I did this with my second 2-liter bottle rocket, and it carried aloft two cameras, aimed downward, but far enough away from the exhaust of the rocket motor. It worked. Well… full disclosure: it worked with one of the cameras, and the resulting video can be seen at https://1drv.ms/v/s!ApNK_pg7LsD3qxFQKHeokAs8of3D?e=Js0GoM. (The second camera didn't work because I did not start it properly.) If you choose not to have a payload area, epoxy the lower bulkhead in place as described above, and you're finished with that portion of the build.

Payload Compartment

Assuming you do want that payload area, here is one way to make that possible. First, measure the space needed for the camera. My second attempt was designed for two "cube" cameras, these one-inch square cameras often advertised as "spy" cameras. Once you have the measurements for the camera(s), you can fabricate a third bulkhead. Its purpose is to secure the camera(s) in place during flight. I used balsa scraps to make "holders" for the cameras on the retainer bulkhead. Once again, the bulkhead must be the correct diameter, but this time you need to allow a larger center opening so the retaining bulkhead (hereinafter referred to as the "retainer") can be removed, even with a screw motor retainer at the bottom of the rocket. (See Figures No. 9 and 10). A good, logical question might be, "OK, but what retains the retainer?"


Figure 9

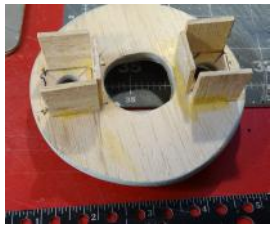
Figure 10

I wanted something very light, but something very secure for this purpose. I decided upon round brass, paper fasteners (See Figure No. 11). I used the end of a knife, heated over a candle flame, to melt a slit in four places around the circumference of the bottle rocket body, just under the retainer. (See Figures No. 12 and 13). Each slit was perhaps ¼" in length. Once the rocket was loaded with the cameras (don't forget to start them before you launch), I slid in the retainer, and put the brass fasteners into the slits on the rocket body, and gently spread each brass fastener's legs enough to hold the retainer in place. (See Figure No. 14). After the flight, it's quite easy to pull out the brass fasteners and remove the retainer to get access to your cameras.

Figure 11


Figures 12 and 13


Figure 14

Fins

The next step is to design and attach fins. I knew this rocket would be somewhat tail-heavy, so I elected to make large fins. I used 1/8" basswood. I opted for epoxy again, as the rocket's body is still somewhat flexible. Additionally, I slightly roughed-up the attachment areas with 200 grit sandpaper to give the epoxy something to "bite." I added solid fillets, or gussets, in the form of shaped 1/8" balsa strips (See Figure No. 15) to reduce the risk of losing fins. Flight testing indicates this works.


Figure 15

The fin design is also dependent on the Center of Pressure (CP) and Center of Gravity (CG). In my "1950s" rocket I opted for a BT-60 tube from Aerospace Specialty Products, and then used a standard Estes plastic nose cone. A full discussion of the CP and CG are well beyond the scope of this article, but suffice it so say that your CP ought to be forward of the CG. NARHAMS' online resources and elsewhere have excellent discussions of CP/CG.

Don't Forget the Lugs


Figure 16

Once you've decided on your rocket length and fin design, launch lugs may be the next consideration. In my first rocket, I just epoxied two 3/16" lugs to the widest part of the rocket body, following my caveats about roughing the surface. On my second bottle rocket (the two-camera version), I again epoxied a launch lug to the widest portion of the rocket, but I opted to move the foreword of two lugs slightly closer to the nose. This required fabricating from balsa, a curved standoff (See Figure No. 16). I was not happy with my final result, but it has worked well enough. With more patience, I'm sure it could be shaped better.

Center Tube

Not everyone wants a bulky BT-60 tube for the length of their two-liter bottle rocket. In my two-camera version, I used a BT-50 tube with a 24mm motor mount in the bottle

Continued next page

Bottle Rockets, Continued

body. The BT-50 extended through the neck of the bottle, but I wanted a larger diameter tube above that to house a larger parachute. This necessitated a BT-50 to BT-60 transition piece. I ordered mine from Aerospace Specialty Products. (See Figures No. 17 and 18). It was necessary, however, to drill a hole through the middle of that transition to allow the chute ejection gases to open into the larger BT-60 tube. This hole should be large enough that the gases pass easily from one tube through the other. A ½" hole should do the trick.

Figures 17 and 18

Flight Tests

Both of these two-liter bottle rockets have flown straight and true. The two-camera version worked, despite my brainfade failure with the second camera. Both had their successful launches at our NARHAMS October 2019 and February, 2020 Mt. Airy get-togethers.

Video Cameras

Like the discussion of CP and CG, this isn't the spot to discuss all the options for video cameras. I have an illustration here of several commonly available small video cameras from eBay.com. (See Figure No. 19). The Firefly Q6 runs about $70; a new GoPro about $400, but the other cameras can be purchased on eBay for about $20 to $30 each. Be aware, they are not the equal to the GoPro or Firefly in quality and durability, but given their use here, $20 to $30 isn't too terrible a loss if things go wrong.

Figure 19

Figure 21

Figure 20

What's Next?

My latest iteration of this design is being built to house either a GoPro Hero 2 or a Firefly Q6 video camera. The same rocket can house either, but not both at the same time. Different retainer bulkheads are required for the measurements of each camera. The GoPro, because of space limitations, will be aimed outwards, perpendicular to the motion of the rocket. The Firefly Q6 will require another, different retainer bulkhead from that of the GoPro. It will be aimed downwards towards the launch pad, and I will devise, from clear plastic sheet, a protective "window" so the camera lens is not burned by a wayward spark from the motor.

A few additional notes are in order here. The 1950s bottle rocket was painted silver with a red nosecone. (See Figure No. 20). Here are a few close-up views of the diorama (See Figure No. 21). Be sure to smooth and fill the transition area (if used) for a finished

Continued next page

Bottle Rockets, Continued

Figure 22

appearance from the bottle to the tube. (See Figure No. 22). You may discover that, even with a permanent bottom retaining bulkhead, you may still have room on the inside of the bottle portion of your rocket. If you are preparing for the September NARHAMS night-time launch in Mt. Airy, there is probably going to be room to attach small LED lights. This past year I used zipper LEDs I bought from American Science and Surplus. (See Figure No. 23). Five of them were less than $5.00. I cut off the zipper attachment portion and just glued them in place. They are quite bright! If you use hot glue, you could remove them later. The LEDs stay on for hours, so you can turn them on before you even put the rocket on the launch pad.

Finally, I am quite aware that a two-liter plastic bottle may not be the best technical solution for launching a diorama, camera, or even lights. But the price and availability were right, and the idea of making a working camera rocket from commonly available materials was too much fun to resist. I look forward to seeing your designs! Happy flying!

Figure 23

The Spirit of Candy Corn liftoff!
Photo: S. Jackson

NASA Goddard Visitor Center Model Rocket Contest

CANCELLED

WHEN: **Sunday July 19, 2020 12 noon – 4pm**
(no rain date)

FOR: All Area Model Rocketeers

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

EVENTS: "Lunar" Spot Landing

COST: Free

REGISTRATION: Register at the launch site on the day of the launch

SPONSORS: This contest 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 M[illegible] Spa[illegible]siness Roundtable and model rocket companies.

AWARDS: First through fifth place trophies and model rocket kits for [illegible]ch event [illegible]ve been donated.

WHY: This event is to commemorate the 51st Anniversary of the Apo[illegible] Moon Landing. This STEM event also promotes Space Sciences among area students.

Contest Rules

1. The contest is open to all model [illegible]eers.
2. Contestants must follow the Nat[illegible]ciation 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 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" 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 Sundays 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.
Opening Ceremony/Demo	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.

Updating the Estes #1358 F-61 Starfighter - Part 2

Article and Photos By
John Brohm, NAR #78048

This is where we left off in Part 1, it's a good start.

In Part I of this series, we covered the construction of the Starfighter's airframe. In this article, Part II, we'll cover the modifications made to the nose cone.

The Cockpit

Photo 23: Cockpit Tub and Seat.

Some searching in the plastic aircraft model aftermarket turned up a broad selection of cockpit detailing sets in a variety of scales, both single and two-seat versions. The Starfighter's nose and canopy arrangement can only accommodate a single seat tub, and I found that 1/72nd scale is about the right size.

Many of these aftermarket cockpit sets are provided with all sorts of detailing parts, both resin and photo-etch. Given the size we're working with here, I chose to use just those additional parts that might be seen through the canopy.

To begin, we use the tub and the F-61's canopy to lay out the area that will become the cockpit well. In Photo 24, one can see I've also begun the opening of the well.

Photo 24: Cockpit Tub and Seat.

The tub has to be placed far enough forward, and at an appropriate depth, so that the top of the seat clears the inside of the highest point of the canopy. For this particular cockpit tub, I found I had to prepare a base for it so that the tub would sit at the correct depth. I also had to fit it with a fore and aft bulkhead to situate the tub correctly within the well. These Styrene parts were glued to the resin tub with Loctite Super Glue UltraGel. The Gel formulation provides a few extra needed seconds for positional adjustment before the CA freezes.

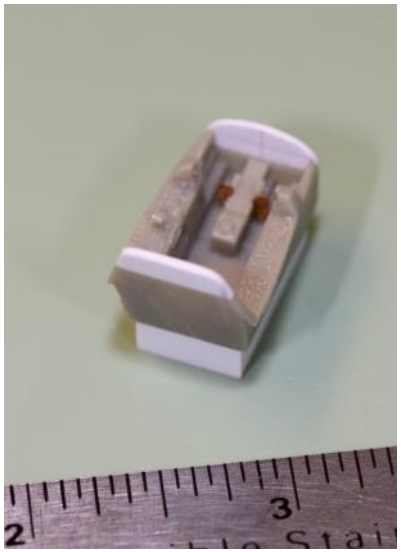

Photo 25: Adapting the Tub.

Continued next page

F-61 Update, Continued

Photo 26: Trial Fit.

The trial fit in Photo 26 shows we have just enough internal clearance. It also validates that the 1:72 cockpit is a good, proportional size for the nose.

With the basic fit confirmed, we'll trim and paint the cockpit set, and then glue the tub in place. The following photo also provides a glimpse of what the ejection seat will look like once installed, but that's only a dry fit; the seat needs to be out of the way while the final fitting, filling, filing and painting surrounding the cockpit well is being done. The seat will be permanently glued in place before we mount the canopy.

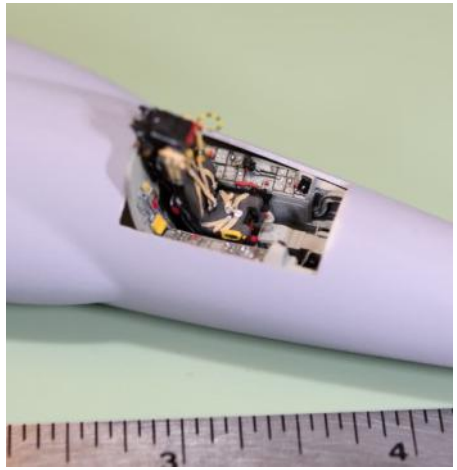

Photo 27: Cockpit Tub Installed.

One may have noticed the pilot's instrument panel is missing; we'll rectify that shortcoming by making use of the brass photo-etched panel provided in the detailing set. Photo 28 shows the native brass panel ready to be removed from its PE fret.

Photo 28: PE Brass Instrument Panel.

After some careful filing, painting, highlighting and assembly, we arrive at a finished panel ready for mounting.

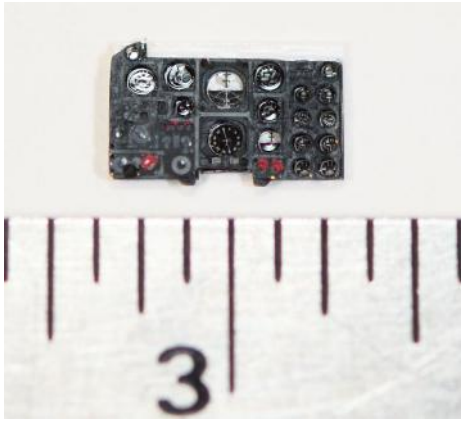

Photo 29: Finished Panel, Ready for Mounting.

As there's not enough space within the well to use the mounting part provided with the cockpit detailing set, we'll use some Styrene to scratch a custom mounting base for the instrument panel. A trial fit gives us the view to the right:

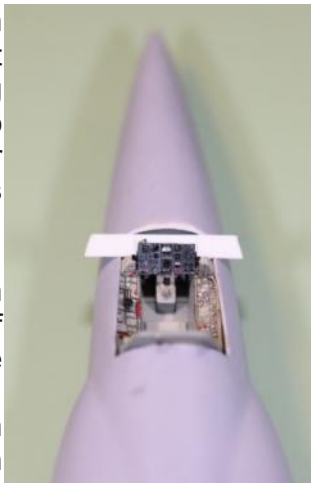

Photo 30: Setting the Instrument Panel.

One can readily see the gap between the panel and the curved contour of the nosecone; we'll fill that space with several layers of Styrene, building up the formation till flush with the crest of the curve. Then, with some careful trimming and filing, and a bit of filler, we arrive at a smoothly filled and fitted contour.

Close examination reveals several remaining open spaces that should also be filled. There's the gap between the cockpit side consoles and the upper edge of the cockpit well, and then the spaces between the seat back and the cockpit well. We'll use some small pieces of Styrene to fill in these areas.

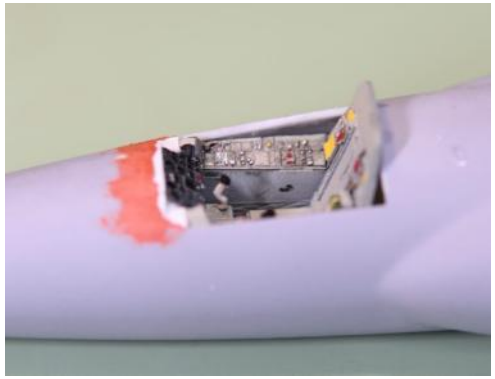

Photo 31: Minding the Gaps.

The sideboard pieces need to be painted before installation, as there really is no way to get at them once they're installed (at least not without messing up the paint on the cockpit tub). Once set, we can fill in the top cockpit edges with Squadron White Putty.

One might also be tempted to fill in the seat back gaps just with putty, but the spaces there are too large to do this

Continued next page

effectively. With no support, there are too many opportunities for the filler to crack and come loose with vibration. So, some small pieces of Styrene are first glued in place to provide the main space filling, with any remaining divots and defects finished with some careful surface putty work.

Once the filler has cured and is sanded, the cockpit is carefully masked, and the nose re-primed. The nose is then sprayed with Testors White Primer, and once this has cured, the area surrounding the cockpit is sprayed with Testors Model Master Camouflage Gray. The cockpit is checked for any areas in need of touch up, and once satisfied, the ejection seat is permanently placed with a dot of Loctite Super Glue UltraGel. We're ready now to set the canopy.

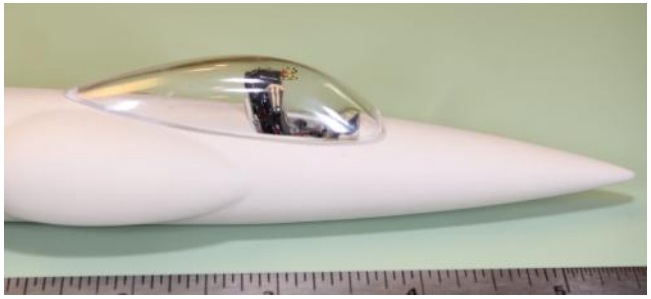

Photo 32: Setting the Canopy.

The canopy is set in place with Formula 560 Canopy Glue. Having done all this work, we'll not take the risk of potentially fogging the clear plastic canopy with the curing vapors arising from either a solvent-based or CA adhesive. Once the canopy glue has set, the canopy is carefully masked with Tamiya masking tape, and then the joint seam is filled and sanded till it's smoothly blended into a nice, tight fillet.

The fillet is sealed with a coat of Testors White Primer, and once cured, the entire nose is sprayed with Camouflage Gray. Once dry, the flat black anti-glare panel is masked and sprayed. A gloss coat, and we're ready to place the nose cone decals. Once those are dry, the nose is overcoated with Testors Lusterless Flat. Carefully removing the canopy masking reveals a finished nose; facelift complete!

Photo 33: Finished F-61 Nose.

We can now mate the nose to the airframe and take a final assembly photo to complete the project.

Photo 34: F-61 Starfighter, Complete.

And there you have it, an updated F-61 Starfighter. Still an awkward and angular bird, but one presenting a fresh new look, with the aid of some modern makeup.

The Failures of a Newbie Rocketeer

By Sarah Jackson

It all started with ECRM-44, or more specifically, the announcement that ECRM-44 will include a classic model competition. The Jackson family read the rules and noted that increased difficulty in flight could up the points of the contest. The spousal unit was building an Orbital Transport, the spousal unit's brother was building a clustered rocket, so I figured I could do a staged rocket. I'd never built one, but it couldn't be that hard, could it? In a stroke of good fortune, the spousal unit just happened to have perfectly stored old decals to a Comanche 3 with the balsa fin sheet still intact. Score! We had the right size body tubes and the correct nose cone, so I was set to start building. I cut the body tubes to size, and joined the two long tubes together to make the fuselage. So far, so good.

I prefer my rockets to be pretty, so I always fill in the spirals on the body tubes as a matter of course. In this case, since this rocket was also for a craftsmanship contest, I definitely wanted to be sure that nary a line could be seen. At the time we were using watered down Elmer's pink wood filler (affectionately known as Pepto in the Jackson household), which had done us well for several rockets. I mixed my Pepto as usual and filled in the spirals, letting it dry as normal. Coming back the next day, I noticed that the body tube was falling apart at the seams. Lovely. New body tubes cut and spirals filled, this time with no problems. No problems, that is, until I tripped and smashed the body tube. The two lower stages are ready for painting, but the upper stage has been the bane of my existence and remains unfinished. At this point, I handed the whole kit over to the spousal unit and begged him to do something about it. To this day, the Comanche 3 still has not been built.

Mini-Commanche 3 first stage burning nominally.
Photo: S. Jackson

The ill-fated Mini-Commanche 3 poised optimistically on the pad.
Photo: S. Jackson

Continued next page

It All Started, Continued

I did build a mini Comanche 3 however. Unfortunately, I used the wrong decals on it (using the full size Comanche 3 decals instead of the mini ones) so it looks a trifle off. One set of fins is wonky, but I flew it nicely on a two stage set up. Just recently, at the February Mt. Airy launch, I wanted to try it with the full three stage configuration. The flight was not optimal. The first stage flew fine, if somewhat slowly, on an A10-0, to my eyes, at least. It promptly took a nosedive. Apparently, my stages were not loose enough, and the first stage engine ejected without detaching the stage, causing the second stage engine to burn through the first stage, and then the third stage never lit. I haven't decided if I want to repair it yet, or give up the whole Comanche 3 line as a lost cause.

I once tried to build a Fliskits Tumbleweed. I managed to sand half the nose cone away, so it was decidedly lopsided. Then I had the brilliant idea of painting it with pink glitter paint to make it sparkly. It never did fly quite right. I attempted to scrape the glitter paint off, in hopes that maybe it was just too heavy to fly, but ended up ripping the body tube. I have since built another Tumbleweed, but I have yet to paint it. This time, I decided not to seal the nose cone because I didn't want a repeat of the first lopsided affair. Time will tell if it flies correctly or not.

Mini Fat Boy after a shovel recovery flight, since repaired. Runs good, needs paint.

Other than these, I've had fairly successful rockets. Okay, I did have a mini Fat Boy flight that resulted in a shovel recovery and a loss of four inches or so of body tube, but I cut the tube, put in a coupler, and added a new body tube. It just needs to be painted. I have a Fliskits Tiberius that needs to be fixed too, after its first launch knocked a fin loose. It's a through the wall fin type, so I haven't figured out just how to fix it yet, but I have hopes for the future. I'm only about four years into this model rocketry business, so that's not too bad, surely. Thankfully, my first two rockets, a Baby Bertha and a Big Daddy, fly wonderfully well, so I can be proud of them. In the meantime, the Jackson household has a build pile approaching sixty kits, so I should have plenty of other chances to goof things up. And I'll take any tips for not smearing glue all over the place when attaching fins. What's your biggest building failure?

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.

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

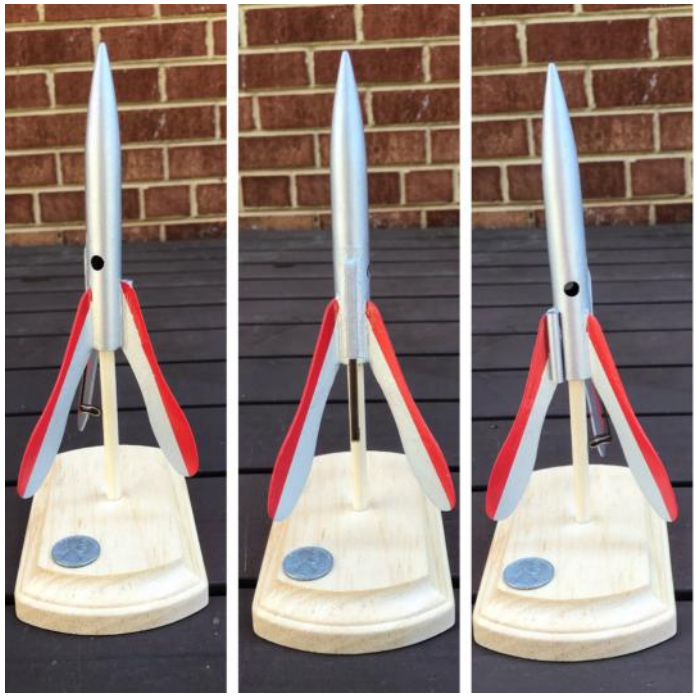
Contact your editor before buying. He gets regular discounts or free shipping codes from Cafepress. Save your dollars for rocket motors.

Shut In Builder

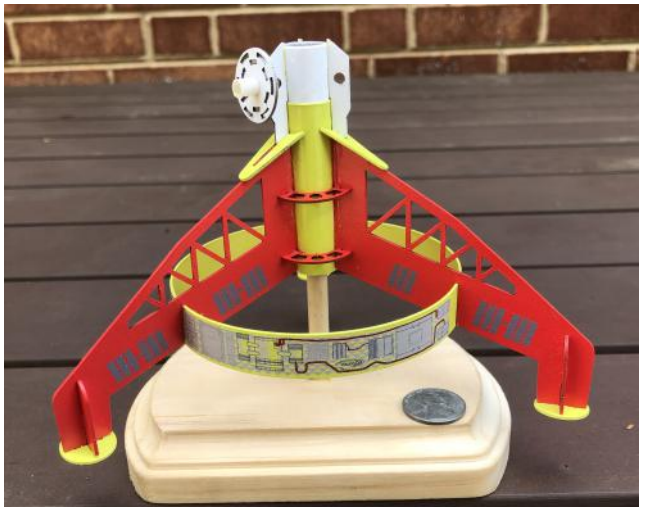
By Ed Pearson

The pandemic slowdown/shutdown gave me a good chance to finish up on my FlisKits Tumble Weed—circa 2000; I got one (his last) from Ken Allen's Performance Hobbies. The model joined my small fleet of 13mm featherweight tumble recoveries. It seemed awfully long to build/paint the mini-motor version of the Estes Sprite, but eating out was out, so I ate up the opportunity (apologies; got carried away). Here is my small motored fleet (I'm not ready for MicroMaxxes yet). If you can think of other models of the Mosquito ilk please let me know.

Front Row L-R: Estes Swift, (Home-brew) Stir Stick, ersatz Rogue Gnat, Estes Quark (four-finned).
Second Row: Estes Mosquito, FlisKits Tumble Weed, Estes/Hobby Lobby Luna Bug (card-stock fins).
Row Three: Estes Twin Factor (five card-stock fins ea. stage).
Photo: E. Pearson



Spoony - home design. (Fins come from wooden spoons used for ice cream cups).
Photo: E. Pearson



Estes Lunar Scout. This is one of the new offerings that Bill Stine showed at NARCON.
Photo: E. Pearson

Antares NG 13: A Little Bad luck On Our Side...

By Alan Williams

A passel of black cats boiling out of an alley, squalling. Nancy helping with Charley Brown's football. A crate of mirrors tumbling down a stairway. Northrop Grumman's Frank DeMauro at the press conference proclaiming, "Thirteen is just the number after Twelve". Coincidence, or portent of doom? You be the judge.

King Zog Alex and I made our ways to Chincoteague the first Friday in February. The severe weather in route was almost identical to the ugly November storms we encountered for the NG-12 flight. Go figure. Drenching rain and gusts dogged me almost to Easton, with spotty downpours from scary clouds. Coming up the sidewalk at the Wallops Visitor Center I was batted around like a hated cat toy. With Alex's arrival after 1PM the winds began to relax. The Chincoteague Inn was our base again. Bill Boublitz arrived later that night.

At 9 Saturday we were badged and boarded the media flight hardware viewing bus. We were enthusiastically mauled by "Harley", a super friendly new girl bomb dog. I got an almost artsy shot as we crested the Wallops causeway bridge. We turned south to the Vehicle Assembly Shop area to capture the launcher scene. With the advent of the "Late-Load" payload system we would have few chances to see the Antares vehicle standing upright but it was still interesting to do. Yesterday's winds had mostly died and what we could view was brilliantly lit by the morning winter sun. After a generous twenty minutes shooting time we rode up to see Antares 14 being assembled in the Horizontal Integration Facility. We followed standard radio field safety practice, disabling all camera Bluetooth features and leaving any emitters on the bus again.

Since we were seeing Vehicle 14 much sooner in the preparation cycle there were open vent and adjustment hatches and the engines were missing. We also saw the peculiar little crane used to install cargo in the Cygnus payload carrier. We got a look at the second stage solid motor with none of the secondary hardware mounted. The exposed Castor motor gave us a great view of its electromechanical flexible nozzle steering system. (An odd fact: though it looks small, the Castor 30 motor weighs about 1/3 the empty mass of the Space Shuttle Orbiters.)

The aft end of stage one was empty, without mounts for the Energomash RD 181 main engines. We noted the four small hold down flanges that secure the rocket to the pad before launch release. Assembly jigs and such stymied any attractive angles of the overall vehicle. However, we got plenty of time to ask questions and document hardware before returning to the Visitor Center.

Last shot before the scrub.
Photo: A. Williams

Later that day we had briefings on launch readiness and the overall Cygnus load out. We learned that NG-13 was the 32nd Station resupply mission over the 8 years of the Commercial Resupply system. This is also the 20th year of ISS operations. All factors for launch looked good, with firing scheduled for 5:38 PM Sunday evening, just five minutes after local sunset. Clear skies and light winds would prevail. This promised a great launch photo experience.

A view from the bridge (through an odd anti glare coating).
Photo: A. Williams

Later we got the details on Cygnus USS Laurence. First Northrop Grumman's DeMauro explained that its name honors the memory of pioneering black astronaut Major Robert Laurence. (While in training for the Air Forces' Manned Orbiting Laboratory Program his F-104 fighter's engine failed. He was too low to eject successfully and died in the crash.)

Continued next page

Antares NG 13, Continued

Space Station docking would occur about two days into the flight. Along with the usual replacement living supplies and support materials, Cygnus would bring some notable experiments aboard. Bone cell loss study and biological specimen growth measurements would continue from previous investigations.

Station crew would grow new varieties of highly nutritious and enjoyable plants to increase food choices available to them. The Washington Post remarked on a selection of gourmet cheeses, spices, candy, and garlic sauces sent as Valentine treats for the crew.

The (Bacterio) Phage study will track mutations in beneficial viruses that attack pathogens while ignoring normal human bacteria species.

A remarkable miniaturized Scanning Electron Microscope, the "Mochii" system will allow in-space study of biological samples and trace contaminant sources (such as 2018's dirty water that plugged spacesuit filters and almost drowned a crew member during a spacewalk!). The normally closet-sized instrument has literally been shrunk down smaller than many toasters, uses less than ½ watt power, looks stylish, and costs only about $5,000 apiece!

As supplies are removed an estimated 8,100 lbs. of compacted trash will gradually fill the cargo module. Finally, after Cygnus leaves the Station in mid-May, the SAFIRE IV combustion-in-microgravity experiment will commence. This time oxygen and pressure levels will be increased on the materials test samples. The aim is to fight and prevent fires in manned flight environments.

Christopher Own of Voxa poses with a model of a miniature scanning electron microscope (SEM) following the What's on Board presentation inside the NASA Wallops Island Visitor Center. The actual SEM is to be flown on the NG-13 mission to the ISS.
Photo: A. Mankevich

Shortly after, the USS Laurence will be flown to a controlled destructive reentry east of New Zealand.

All was ready for the next day's flight.

Alex would try some photo magic to get a sunset long exposure streak shot from Stockton, Maryland again. Bill and I were bussed down to the Press Site by 3:45. Everything was going perfectly! The sky did pretty things as sundown commenced. This was going to be great!

The Godz began giggling and pointing.

About five minutes before T-0 Mechanical Systems officers called a hold for unspecified issues with valves in the launch pad. After a few opaque calls about manual valve settings, the count rolled again. Then, seconds after I started my video, "Abort" calls rang out over the PA loop. The valve issues had scuttled the flight. We scuttled back on the bus. We hung around the Media Center till almost 9PM, then were told the new launch day was Thursday, the 13th. I sped home, arriving around midnight. Bill and Alex did likewise. Then the Thursday flight target became 3:31 Friday, the 14th.

Alex and I left our homes early that morning in another remarkably violent weather system (five confirmed tornados this time) and met at Wallops

Bill Boublitz strikes a heroic pose nearby Launch Pad 0A at the Mid-Atlantic Regional Spaceport. Note the Antares rocket is in a horizontal mode for its final load of cargo.
Photo: A. Mankevich

A wide view inside the Horizontal Integration Facility looking down the 90.9 feet length of the Antares first stage.
Photo: A. Mankevich

about 12 noon. Unfortunately a cold that was dogging Bill fired up during the week and he was staying home. We returned to the Press Bus loading area again. After greeting bomb dog "Bruno" who really liked the signs of my Coonhound "Penny", 1:30 had us moving south to the Island again. We arrived to the sound of Weather officers briefing the Launch Test Conductor about dangerously intense jetstream winds right overhead, throwing in

Continued next page

Antares NG 13, Continued

that tomorrow would be considerably better. Then just as I reached to mount my still camera on its tripod, they came back on the PA with a firm "Abort" call.

The Godz roared with merriment. Some Valentine's Day gift.

We packed up again, and eventually got to the Media room at the Visitor Center. I waved bye-bye to Alex, who had to drive to Connecticut for a family celebration. I couldn't stay either. I got home again about 7PM. The next day the bird flew like clockwork with Space Station docking early the following Tuesday morning. My attempt to get any long distance shots from Bowie was blocked by local overcast. Fortunately our very motivated member Christina Tyler Wenks was still down there. She said it was really crowded at the old ferry site, but good and loud!

Apparently, a little known fact is that the Ukranian technicians who work on the Antares rocket inside the Horizontal Integration Facility are enclosed inside a wire cage to undergo calibration prior to being escorted to their workstations.
Photo: A. Mankevich

Apparently the Godz didn't realize she was one of us. Hah!! Good for her.

NG-13 did finally get to lift off, club member Christina Wenks was there to record it.
Photo: Christina Tyler Wenks

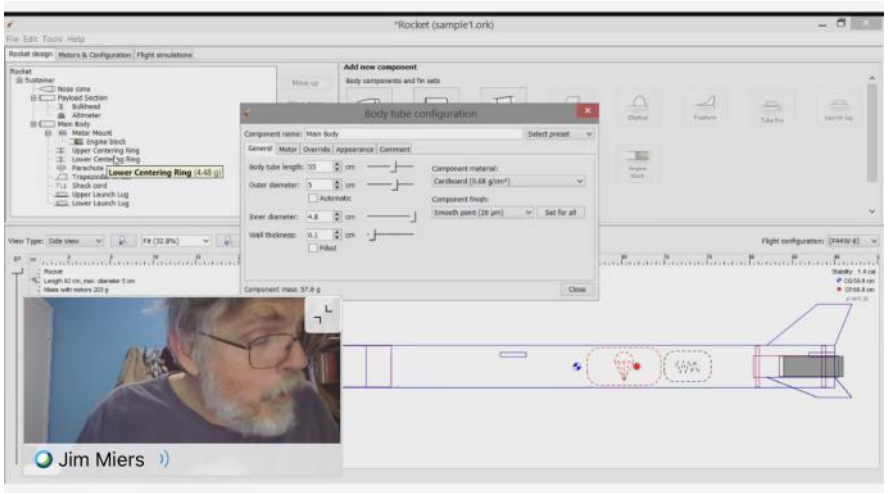
May Meeting Highlights By Ed Pearson

May marked the second month of remote-conferencing only meetings.

The club rescheduled ECRM to coincide with September's Night Launch and made it a one day event minus the cookout. We also canceled this year's Apollo Rocket Contest at Goddard.

The club discussed the need to change range SOPs when launches resume. Although we were short on specifics, agreement was that different protocols should apply to club and GSFC public launches.

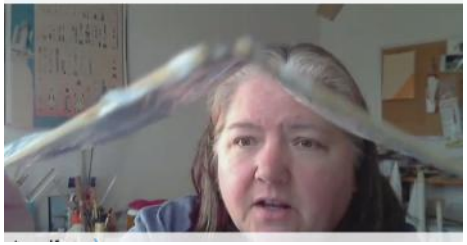
The benefit of remote teleconferencing was shown when Bruce Camino (NJ) and Tom Ha (NY) (and others) joined us for the first time.



Jim Miers treated everyone with a discussion on rocket construction/performance simulations citing Open Rocket, RockSim and SpaceCad software applications. He demonstrated Open Rocket to everyone.
Photo: E. Pearson

April Meeting Highlights
By Ed Pearson

No fooling! The April meeting was held decentralized—via Cisco Webex software for video and phone for audio only participation. Ed Jackson set up and hosted the session. Sixteen members popped in; we discussed activity/event postponements. Jen Ash led a session on how to make flexwing gliders and led a virtual work area tour.



Some of the folks who joined the video and Jen divulging the secrets of making Flexwing "Gliders".
Screen Captures: Tech Whiz E. Pearson

Bits and Pieces

The Next 3 Months

Date	Time	Event	Location
06/06/20	06/07/20	06/08/20	06/09/20
06/07/20	1 - 2 pm	**Goddard public launch** - CANCELLED	Greenbelt, MD
06/20/20	12 - 4 pm	**Sport Launch** - CANCELLED	Mt. Airy, MD
07/04/20	5:30 - 9 pm	**Monthly meeting** Topic: Summer Pot Luck Picnic - Webinar Only	Online
07/05/20	1 - 2 pm	**Goddard public launch** - CANCELLED	Greenbelt, MD
07/15/20	11 am - 12:30	**SISTER launch support**, GSFC - CANCELLED	Greenbelt, MD
07/18/20	12 - 4 pm	**Sport Launch** Theme: Sounding Rockets Launch Manager: Alex Mankevich	Mt. Airy, MD
07/19/20	12 - 4 pm	**Apollo Contest**, GSFC - CANCELLED	Greenbelt, MD
Jul 25 - 31	9 am - 10 pm	**NARAM-62** - CANCELLED	Geneseo, NY
08/01/20	5:30 - 9 pm	**Monthly meeting** Topic: Unicopters - Webinar Only	Online
08/02/20	1 - 2 pm	**Goddard public launch** - CANCELLED	Greenbelt, MD
08/15/20	12 - 4 pm	**Sport Launch** Theme: open Launch Manager: Bill Boublitz	Mt. Airy, MD
Aug 22 - 23	9 am - 5 pm	**CanAm Cup**	Muskegon, MI

Shop Tip

How many times to you reach for paper towel to get that glob of glue off your finger, or to soak up that excess bit of CA on a fin joint? What a waste of paper.

Last cut is the deepest.

Create a stack of little paper towels - simple process; fold in half, cut the stack, fold in half, cut, repeat.

Ready in the bench caddy.

A whole sheet makes 32 small paper towels (~ 1”x3”). You'll probably have to separate the last batch in two to cut. It takes 30 seconds to make a stack.

Put a stack in the range box.

You won't believe how handy these are!

Welcome New/ Renewing Members

New

David Brown, Marc Held, Kevin Knebel

Renewals

Matthew Filler, Christopher Ha, Maria Ha, Tom Ha, Twain Shroyer

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.

From the Zog: *Does it matter who pushes the cart or who pulls the cart?*

By Alex Mankevich, NARHAMS President

I'm sure that many a NARHAMSter has lost hours of sleep pondering (as I do) over the eternal question of whether model rocketry feeds off of NASA's (and other countries') space launch program.

It can be argued that we are noticing that model rocketry's profile has been raised in mainstream media because of the build-up leading to the return of launching American astronauts from American soil and an eventual return to the Moon. Here are a couple of examples:

Prior to his scrubbed SpaceX/DM-2 attempt, NASA astronaut Bob Behnken posted a selfie of himself launching a model rocket from Florida's Atlantic coast on May 26, 2020. Viewable at: https://www.space.com/astronaut-bob-behnken-model-rocket-spacex-demo-2.html

SpaceX Demo-2 mission astronaut Bob Behnken launches an Amazon in preparation for his historic spaceflight that delivered commercial crew to the International Space Station.
Photo: R. Behnken/NASA/ Twitter

Now that America's space flight program is roaring back in a big way, will we benefit from increased public and mainstream media interest?

A new Jardiance TV commercial entitled 'Rocket Fair' fairly captures the look and feel of a model rocket launch range as it makes nice use of pop-up tents, a roped-off perimeter and some six-position launch racks. No PPE and face mask wearing in the crowd, though. Viewable at: https://www.ispot.tv/ad/nbzc/jardiance-rocket-fair

A model rocket launch range is the backdrop of a Jardiance commercial. Perimeter ropes, pop-up tents, safety checks and launch racks are all seen in this video.
Photo: OMD Worldwide /Jardiance

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From The Zog, Continued

The popular TV series "The Big Bang Theory" snuck in model rockets and rocketry into a couple of their episodes. Seen in the background of Howard Wolowitz's home (bedroom) are models of the Saturn V rocket, Space Launch System and the Orion crew capsule. An attempted Saturn V model rocket launch was featured with Sheldon Cooper and Howard during a season 11 episode. Viewable at: https://www.youtube.com/watch?v=j9JWpAh9Xcc

A little further back in time we were treated to the opening credits of the Disney program "Stuck in the Middle" which featured the show's star walking through her house and past all her family members before launching her model rocket from her backyard. Viewable at: https://www.youtube.com/watch?v=eHvONRaiY6k

I've been known to bemoan the fact that NARHAMS and the NAR have had to shoulder the burden of keeping the public interested in model rocketry without the benefit of routine crewed flights to regularly provide exciting news coverage. We've endured a long nine-year hiatus in launching crew aboard American rockets since the end of the Space Shuttle program in 2011. The NAR's work with TARC and our work with the Rockville Science Days, ECRM, the Goddard Launches and the Apollo Contest have done what they could to keep the flame burning for spaceflight enthusiasts who need their rocket launch "fix".

Now that America's space flight program is roaring back in a big way, will we benefit from increased public and mainstream media interest? If you believe that we will, then there is plenty to be excited about. America will soon see two private companies providing commercial crewed flights to low earth orbit. Two other private companies could eventually be offering suborbital "tourist" flights to paying customers. A handful of other companies could be offering small satellite launch services at "affordable" prices.

It is a crying, low-down shame that we find ourselves isolating in the midst of a pandemic just when we could be feeding the fires of the public's renewed interest in all things spaceflight. Due to the stand-down in large-scale public model rocket launches, we may have lost our opportunity to directly gauge how much America's return to crewed space missions can contribute towards a renewal in the public's interest in our model rocketry programs.

Stars of the popular TV series "The Big Bang Theory" attempted to launch a Saturn V model rocket during a Season 11 episode.
Photo: Chuck Lorre Productions/Warner Bros. Television

The opening credits of the Disney TV series "Stuck in the Middle" features a model rocket tortuously making its way past several family members on its way to the launch pad.
Photo: Disney Channel/Horizon Productions

Annie Glenn, Spouse of John Glenn, Dies at 100

By Alan Williams

It is inevitable that time must eventually swallow us all. Even heroes will ultimately fall away, and the courage of some is revealed only in hindsight. Thus it was for a woman born as Anne Margaret Castor in Columbus, Ohio on Feb. 17, 1920. Her family later moved sixty miles east to New Concord, Ohio, where she soon shared a playpen with a slightly younger neighborhood baby with a big, round head and a bigger smile. This meeting as toddlers was how she found the man for her life, John Herschel Glenn.

It sounds too cute and perfect to be true, but it happened just that way. At some point they just knew. Throughout their schooling they were each other's constant companions. After Annie graduated from New Concord (now Muskingom) College with a Degree in Music, he withdrew from school, joined the U.S. Navy/Marine aviation program, and they soon wed.

This was in the first years of America's part of World War II. By 1944 he was in the Pacific, flying the F4-U Corsair against Japanese ground forces. Following VJ Day he had both front line and test flight assignments. In the Korean War he flew a pilot exchange with the Air Force, scoring three victories aboard an F-86 Saberjet with big red lettering proclaiming him the "MiG-Mad Marine." With his 149 mission combat record and later exploits as a Marine test pilot and establishing a new cross-country jet speed record in the F8-U Crusader, he was selected as one of NASA's original "Mercury 7" astronauts. Through all this he and Annie worked hard to build a stable life for their two children.

A survey of astronaut biographies shows how little help the wives received from NASA in their sudden roles as perfect mates of perfect American heroes. All had come up through the fairly brutal world of military aviation, dreading the unexpected visit of a commanding officer and consoling chaplain. Each had been among the sisterhood of flyer's wives who helped the sudden widow and family through it all, while silently thinking "Not him, not mine next!"

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Annie and John in their teens.
Photo: Glenn Family Collection

Annie and John had known each other since tey were 2 years old!
Photo: Glenn Family Collection

Wedding Photo.
Photo: Glenn Family Collection

The Glenn family at home in pre-NASA days..
Photo: USMC

Annie's post-flight inspection of her husband's capsule after his successful return to earth.
Photo: Associated Press

Anne Glenn, Continued

With scant guidance these women were now expected to be polished spokeswomen and icons for the voyage into a new frontier. They knew that a single mis-considered honest phrase could destroy their husband's dreams of becoming legends, as they quietly faced the very real possibility that it *could* be their husband incinerating live on national television.

But Ann Glenn also had a special burden which was kept secret. This intelligent, lovely, and musically gifted woman couldn't do any of the thousand things we take for granted without enormous difficulty. Much of her life was burdened by the curse of severe stuttering. Many people assumed her silence on meeting meant she was stuck-up and walked away angry. In fact she often met with pity or derision when she tried to speak. So she deflected whenever she could.

This was the heart of an awesome scene in the film "The Right Stuff". Vice President Lyndon Johnson tried to bully his way into the Glenn's Arlington, Virginia household after one of many scrubs of John's orbital Mercury flight. NASA PR staff demanded that she let him "comfort" her before the press. She refused. Eventually Lt. Col. Glenn was called to order her to do it. Instead, he backed her against all the arm-twisting of the government; LBJ stayed in his limo. It really happened just as portrayed in the film. This scene was the first time most of us knew the depth of the bond between them.

John's daunting but successful "Friendship 7" Mercury flight changed their lives forever. After leaving NASA he joined the business world for a time, then entered politics. During the early 1970's Annie conquered her stuttering via an intensive residential speech therapy program. It revealed a lovely speaking voice that had John in tears as she first spoke to him by phone unhindered. In 1974 she campaigned by his side; they would win him a twenty four year run in the U.S. Senate representing central Ohio. Not surprisingly, a big area of interest was the American space program, and the state of our military forces. She also took part in his unsuccessful 1984 presidential campaign.

The Glenns on stage during John's short-lived presidential campaign in 1983.
Photo: Associated Press

Annie reunited with John following the shuttle mission in 1998.
Photo: NASA

Near the end of his Senate career, he got the opportunity to return to space. Then in his late 70's, he would serve as a guinea pig on Shuttle Discovery's flight STS-95 to study spaceflight effects on older crew members. *(See Don Carson's story about Glenn's pre-flight visit to NASA Goddard in the archived Jan-Feb 2017 issue of Zog-43.)* Soon after the flight he retired from politics. For years afterwards, Col. Glenn's annual lectures at the two National Air and Space museum facilities were standing room only affairs. He died late in 2016 at 95.

In her own right, Annie became a strong advocate for the communications-impaired. She later was named an adjunct professor in speech pathology at Ohio State University. The American Speech-Language-Hearing Association's annual achievement award is named the "Annie" in her honor. She also was involved in meeting the needs of America's Autism community. Annie Glenn passed on May 19 in St. Paul, Minnesota.

I would argue that the marriage of Annie and John Glenn was likely the strongest of any American spacefaring family. She leaves to mourn her passing son J. David Glenn, daughter Carolyn, and two grandsons.

She died as revered a hero as her husband.

Sources

John Glenn: A Memoir Glenn and Taylor/Bantam Books 1999
Annie Glenn obituary: Matt Schudel, Washington Post, May 21, 2020
Microsoft Encarta Encyclopedia various articles

Shop Spotlight: Musings from the Rocket Room During the Pandemic

With Jennifer Ash

Some of you got to see the mess that was my rocket room on the April Webex. As Don Carson kept encouraging me to ”Get rid of it! Throw it out!”, I have started to clean it up. This meant all the small parts, tubes, things I kept around but know I have plenty more.

I started with my small drawers of fins, engine blocks, and other stuff and started putting things away. I found flex wing springs! They look like a bag I had received from John McCoy a while ago. Still no sign of the fin jig. (Maybe Jim Filler has it?) However, I found swivels, more engine blocks and piston parts than I thought I had, emptied out a few small containers to put everything in one place. One shelf cleaned off. One trash bag to the curb.

Next up was looking at the finished models but not painted pile. Here is a picture of my table (standing height) where I pulled all the models I was to the point of painting. I tried to match up the model with the kit cover (and decals or parachutes, if I had not put them in) and as you can see, I have 2 unknown models. (The one at the end is an Alpha.) In the forefront of #4, I have a booster stage to something, but it doesn't fit ANY of the models I have up there. Hmmmm. If you have a clue on what the rocket is at number 4 and 7 (left to right), drop me an email. I think #4 was a kit Scott Branche made for Quest.

All I had to do was put the decals on the Galaxy Taxi (Custom Rockets) and call it good. However, I realized I do not have any black spray paint. 2 of the known models, the Marauder and the Phoenix Bird, show black. Guess it is time to think custom, or as Ed Pearson would say at Goddard – “That child's model is blue and white. Why? Because that is what color spray paint they had.”

I have also found several kits in various building stages, so I guess after painting the next part is the finish of the started kits. I *think* I have all directions.

Have you started cleaning up? Found old kits, parts you had been looking for? Share what you have built on the Facebook page, or send pictures to the Zog Editor. Heck, make me feel better by showing your rocket room.

Competition Corner: Cancellations and Postponements Virtual NARAM!!!

A Virtual NARAM is in the works!

By Don Carson

Are you going to miss going to NARAM this year? Well, Chris Flanigan and I are working to set up a Virtual NARAM. Plans are for it to feature a postal contest and we are expecting to host a virtual Manufacturer's Forum. We have found out that the NAR was already planning an online Town Hall meeting, voila! A Virtual NARAM.

The postal contest will be an easy going, completely unofficial activity featuring all 6 NRC events plus 1/2A Flexwing Duration and C SuperRoc Altitude (downgraded from NARAM's D SRA to accommodate smaller fields). We are also seeing if we can do Sport Scale virtually (still tentative). We plan to give you about a month to fly your events, starting in July. Fly as often as you like.

If you can find a place to fly, you can participate. You can do this by yourself, or with a small group (like household members). You can time your own models and process your own altimeter readings. No need to register the launch as an NRC launch. Although if you fly at an NRC event, the flights can count for both.

The only other quirks are that, unlike NARAM, we are waiving the return rule on duration events, and unlike NRC, you'll time the whole flight (so no max's, this eliminates the multiple ties for 1st we could get with the NRC process).

This unofficial event will provide a fun opportunity to practice our competition skills on the events that will be held at NARAM next year. Here is the wwebsite with all the details: https://www.nar.org/site/virtual-naram/ Now get back into the shop and build some more rockets!

Upcoming FAI-style Contests - *Check with Organizers for Updates*

FIRE - Open International Meet - see https://www.nar.org/site/f-i-r-e-cup-2020/
Postponed to the October time frame
CanAm Cup - August 21-23, 2020, Muskegon, MI. Contact Mike Nowak (mikemnowak@gmail.com) *Under Review!*
North Coast Cup - Cancelled for this year

East Coast Regional Meet-47

Events(Under Review):

All NRC Events can be flown
Plus
1/2A Parachute Duration*
1/2A Helicopter Duration*
1/2A Altitude w. altimeter*
1/4A Flexwing Duration**
Open Spot - Free Event

*National Rocketry Competition event
**Similar to a NARAM event

September 19, 2020
Old National Pike Park
Mount Airy, MD

Rocketry Festival 2020

NARAM-62 Events:

1/2A Parachute Duration*
1/2A Streamer Duration*
1/2A Helicopter Duration*
1/2A Altitude w. altimeter*
1/2A Boost Glider*
B Payload Altitude w. altimeter*
1/2A Flexwing
D SuperRoc Altitude w. altimeter
Sport Scale
Research & Development

Postponed to July 2021
National Warplane Museum
Geneseo, NY

For current info, go to
www.nar.org