



# EAA Chapter 691 Newsletter

## June 2023

Paul Price's RV9A

On the Web @ [eachapter691.org](http://eachapter691.org)

EAA 691 is:

President: Will Fox

Vice President: John George

Secretary: Pierre Levy

Treasurer: David Young

Web Editor: Marilyn Phillips

Newsletter Editor: April Fox

Young Eagle Coordinator: April Fox

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# Chapter Flyout to Navajo Lake/Marina Visit

Come with us to Navajo Lake Airport!

Saturday, July 15, 2023.

Plan to arrive 9-9:30 am.

Bring chairs and supplies for a brunch at the airfield.

We are still working on arrangements for transport to the Navajo Lake Marina, and lunch at the Marina restaurant.

Stay tuned for further information, closer to the date!

Plan to return homeward by 2 pm.

Airport is unattended, with no services.

Runway 6/24 is 5022x 60 ft, asphalt, in good condition.

CTAF is 122.9

Nearest Airports are

Durango, CO            KDRO, ASOS 120.625

Farmington, NM      KFMN ATIS 127.15

1V0 is 90 nm (direct) from KLAM, E14, 105 NM from KSAF

**Saturday  
July 15**



# Upcoming Events

**July** - Chapter Flyout to Navajo Lake/Marina Visit – July 15, 2023, Navajo Lake Airport (1V0), 9:00AM-2:00PM. Coordinator- John George.

**August** - Electronic Control Ignition and Fuel Injection System, August 19, 2023, Los Alamos Airport. 10:00-12:00 AM. Coordinator- David Roe.

**September** - Espanola Young Eagles/Cookout, September 16, 2023, (E14), 8:00-12:00. Coordinator- April Fox/Sonyamaria Martinez

**October**- Los Alamos Young Eagles/Cookout, October 21, 2023, (LAM), 8:00-12:00. Coordinator- April Fox

**October**- Chapter Fly-out to Conchas Lake – September 2023, date to be announced, Coordinator- John George

Check out our Chapter Website at <https://www.eaachapter691.org> for more information about upcoming activities.

## Upcoming Events

→ Meetings Schedule (unless otherwise noted) ←

9:30am - social time

10:00am - business meeting

10:30am -  
speaker/workshop/training



# Letter from the editor(s)

by April Fox



## Gearing up for Young Eagles



Saturday September 16<sup>th</sup> is our first Young Eagles Rally in Española (E14) this year. I've submitted the insurance request and am looking for volunteers (both ground and pilot). Last year 's rally at E14 was a huge success thanks to all those who volunteered. Please let me know if you can fly or work groundcrew this year so that I can start the planning process.

A reminder that the Young Eagle Rally @ LAM is October 21<sup>st</sup>, if you can volunteer for this also/alternatively, please let me know. Thanks!



# President's Report

by Will Fox



## Try Try Again

Hi Folks, hope you have been getting a little flying in. It has been pretty nice early in the morning. If you want to see what your takeoff roll would be at 11,000 feet density altitude, come on up to Los Alamos and give it a try around 3:00 PM☺ Our Brunch Flyout this month is to Navajo Lake Airport this coming Saturday. The plan is to meet there around 9:00 am. Bring something to eat and drink and a lawn chair and we can gather on the ramp to visit and enjoy the scenery. Right now the weather looks like it will be more of the same so it ought to be nice in the morning.

One of the summer camps here in Los Alamos, sent about a dozen middle school kids over to the airport to do community service and pull some weeds. Their reward was a short talk about aviation and what makes planes fly. Then they got to sit in a plane, move the controls, and take some selfies. It was a good time for all. We have another batch coming later in July.

We are meeting again on Saturdays at 2:00 pm to work on the Electric Dragonfly. Skip has been making great progress on the canopy. It is back on the hinges and he is doing the final fitting. We have also been reattaching the elevator and aileron controls after overhauling them and then setting their travel to specifications. We recently found that the control stops for the ailerons weren't doing their job so we are building new and improved ones. There is lots to do, so come on by and see what's going on and give a hand if you're interested.

On a side note, I took a trip over to Cuba, NM a couple of weeks back to check out the airstrip. It is not in very good shape. The Northeast end of the runway is covered with weeds which in turn are covering some pretty good ruts that the early rains cut down and across the runway. You'd get a nasty surprise if you rolled over that area. After a couple of low passes to see what I was getting into, I was able to land on the southwest end of the runway which was clear of weeds but had a few ruts made by vehicles driving down a wet runway. Caution is advised.



Middle schoolers learning about aviation at the Los Alamos airport courtesy of Chapter 691.



The rebuilt canopy is back on it's hinges on the Dragonfly. Skip is in the process of doing the final fitting work.



# Member Happenings

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Pegazair at the Cuba Airstrip







## Vinyl Flag Project by Paul Price

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My brother and I had a great time at Oshkosh 2022. I'm sure most of you know the endless variety and vast expanse of each across the 1,500 acres. It was our first time. My brother is not a pilot but loves to fly with me and was turning into an aviation 'nut' like myself. I was a bit surprised and relieved to see him drinking it all in as eagerly and delightedly as myself. By the middle of the week were commenting to each other how openly patriotic the crowd seemed to be. We noted the US and State flags being flown along many of the airplanes. It made quite the impression when looking out across the acres of home-built and certificated planes.

I've been reminiscing of Osh'22 and daydreaming about Osh'23 from the first day back home. Amongst all of that, was the puzzle of how could I get a decently tall flagpole in my airplane, how to anchor it, and how to prevent it from damaging my airplane or a passer-by in the likely Midwest winds and thunderstorms.

Finally, while pondering the height of the tail rudder, it came to me; VINYL! I don't mean a groovy old 33, 45, or 78. I mean vinyl, like a car wrap vinyl 'paint' job. Of course, I have no experience in vinyl other than a few decals on the pick-up truck. I investigated pre-made US vinyl flag decals, but I wanted a flag to cover most of the tail that could be seen like the flying versions when you looked across 1,000 planes at a time. I found a few of those 'biggies' but they cost hundreds of dollars each and I needed one on each side. Well, that was too much when weighed in terms of AVGAS and flying time.

As you can guess, I had to try to make it myself. Everything about my experience is from first-timer, full of mistakes and restarts but turns out very likable, at least, by me. So, there's no expertise to be learned here just a story of how it turned out.





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Following the motto of “Build what you can, where you are, with what you have” I borrowed a Cricut Maker vinyl cutter from a friend and bought some red and blue vinyl. The white stripes were to be supplied by the airplane itself. First, I just cut some random stripes, stars, and small lettering then applied them at various places around the plane. After each flight for a few weeks, I would check to see what condition they were in, how well were they sticking, and could I still remove them without visible impact to the paint. The results were all positive and encouraging.

Now, how to layout the correct dimensions? Well, you can find anything on the internet including a Flag Dimension Calculator. You just put in any one desired dimension such as overall length, stripe height, star diameter etc. and the calculator instantly tells you the corresponding dimensions. Thus, designing a large flag was relatively easy. The most difficult part was laying out the field of fifty stars on the blue union. The easiest part was once you got it the cutter would cut it out perfectly!

I headed to the hangar in late June. I knew this might take a while and I didn’t want it done too far in advance of Oshkosh, thinking this was a temporary change. I borrowed a laser level from another friend. I set up the level on a camera trip pod as well as a dowel on the back wall of the hangar with marks every  $1 \frac{13}{16}$  inches (height of the stripes) bottom to top. I could shoot the same marks from either side of the plane so that aligned the stripes with each other as they came together on the leading and trailing edge. Looking closely in the first picture, you can see the laser lines that kept the stripes level and parallel. The marked dowel kept them consistent in height and made it so that measuring wasn’t needed while applying the vinyl.





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The stripes went on quickly. Each one was made of two parts due to the break at the rudder hinge. The union of stars was very difficult. More than once, I had to walk away to resist tearing the whole thing off, stomping on it repeatedly and chucking it as far down the taxiway as possible. The blue union was floppy and fragile. The 50 stars had cut it into a deranged architect's version of Swiss cheese. I learned a lot from the first side and the second union went on with much lower blood pressure.

The challenges in application were wrinkles and bubbles. I got pretty good at avoiding the wrinkles, but the bubbles looked like pock-marks from the plague. Yes, I exaggerate but they were everywhere and seemed to pop up randomly so I couldn't figure out how to avoid them or to rid them once the vinyl was down. The final product looked pretty good from about 10 feet away but up close it was a very amateur looking. I walked away with some feeling of accomplishment but wondered if it had been worth the struggle and how much I would be able to enjoy it.

Surprise! I came back to the hangar a few days later and found the bubbles were gone! Gone! All of them gone. The vinyl, that seemed completely impervious to air, was apparently porous enough to give up the trapped air and let the vinyl lay down. There are still lots of small wrinkles in the that first blue union but the overall look is so much better than previously thought.

Take a look at the pics and let me know what you think. If any of you are vinyl experts, I'm sure you're just shaking your head at my foibles. But if so, let me know who you are, and I'll call you before my next foray into vinyl. And, if any of you are at Oshkosh this year, look for the white RV9A with US flag on the tail and let's get together for some aviation fun!

# Tech Corner

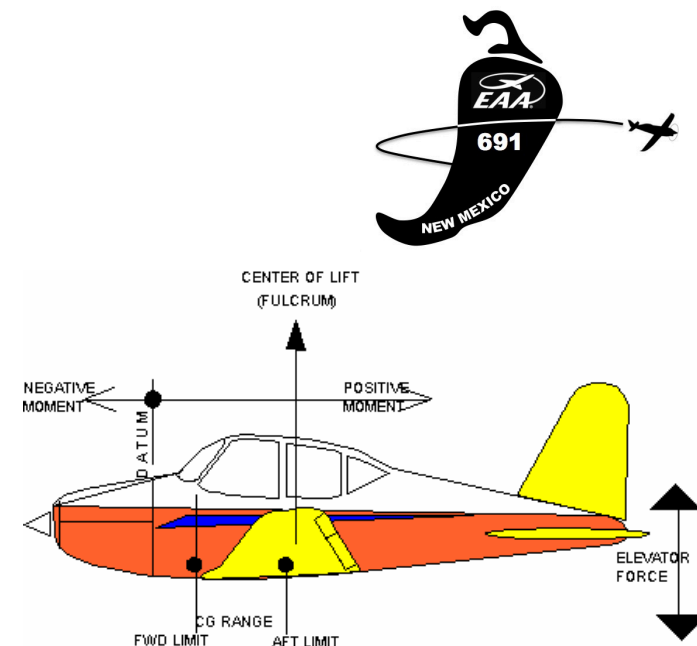
by Will Fox



## Center of Gravity

You just finished your experimental Goes Like a Bat Out of Hell (GLBOH) aircraft, had it inspected, and are ready to fly it. The inspection went really well but the inspector had some confusing question about how you calculated the empty Center of Gravity (CG) for your aircraft. You didn't want to tell him that you never did understand that whole C.G. thing very well and that you found a spreadsheet on the internet and plugged in what you thought were the right numbers. Instead, you told him that you had worked with your EAA Technical Councilor (TC), and he helped you figure it out. The inspector didn't need to know that you wouldn't ask that know-it-all TC for the time of day, let alone help figuring out your CG. Well anyways, the CG must be about in the right place because you followed the plans, pretty much. In fact, you made a few improvements, like putting the battery on the firewall instead of in the baggage compartment so you would have shorter battery cables and save some weight. You also put in a larger engine with a constant speed propeller for better performance. Your GLBOH ought to really go.

So, the time has finally come to fly, and you begin your takeoff roll. The GLBOH really has some acceleration and a lot of P-factor from that big engine. You are halfway down the runway and drifting well left of the centerline when you haul back on the stick expecting the aircraft to leap into the air. It doesn't want to fly though. You look at your airspeed indicator and it shows that you have more than enough airspeed, but the GLBOH just won't part the surly bonds of earth. You look back up and realize that you are almost out of runway and going way too fast to stop. You must get this bird flying, so you really haul back on the stick hard and the GLBOH staggers into the air just as you pass the departure end of the runway. That big engine keeps accelerating the aircraft and pretty soon you can relax your death grip on the stick and trim out all that back-pressure you were holding. You fly around for a while to get the feel of the airplane, but don't do any slow flight or stalls because you never liked doing that stuff and besides the GLBOH is supposed to go fast not slow. Your airspeed indicator must be a little out of calibration, because the airplane isn't flying nearly as fast as you expected. You decide to come back in for a landing and on final approach realize that you are going way too fast. You pull the power completely off and as the GLBOH starts to slow down, you start trimming like crazy to keep the nose up.



The Center of Gravity of an aircraft has a certain range defined by the Forward and Aft Limits. Violating those limits can lead to an uncontrollable aircraft.

You run out of trim, so you must hold the nose up with the yoke and you are still going pretty fast, but you figure too fast is better than too slow. As you fly over the numbers on the approach end of the runway, you start your flare, but the nose just won't come up. You now have the stick all the way back and the nose is still going down and the ground is coming up way too fast. This landing is going to be a really hard one....



What just happened? You probably guessed it, The CG was too far forward as a result of the "improvements" the builder made. Also, the builder did not really understand how to figure out where the CG was for the aircraft and as a result took off with it well forward of the forward limit. The forward CG limit of an aircraft is typically determined by making sure that, at the forward limit, the elevator has sufficient authority to allow the aircraft to achieve its design stall speed. As the aircraft is loaded forward of this point, it becomes increasingly difficult to hold the nose of the aircraft up as it slows down, and it may pitch nose down in an uncontrollable manner at an airspeed significantly above normal stall speed. The aircraft will also require considerable nose up trim at normal cruise speed resulting in greater trim drag and a lower cruise speed. Let's see what happens when the CG is behind the rear CG limit.

It is a beautiful day, and you decide to fly a few of your friends up to Denver for a weekend trip in your V-tail Bonanza. You were planning on your wife and another couple going along, only to find out that they want to bring their kids along as well. You wonder a bit about the CG but then figure that those Beech engineers wouldn't have put six seats in the plane if it couldn't carry six people. As you taxi out for takeoff, you notice that the nose wheel steering is a bit sensitive but attribute it to the fact that the front nose wheel strut is fully extended. You begin your takeoff roll, and as you approach rotation speed the aircraft suddenly leaps of the ground into the air at a much lower speed than normal. The stall horn blares at you and you push the nose over and notice that the controls seem lighter than normal and a bit sensitive. As soon as you can get some altitude, you turn the plane over to the autopilot because it seems to fly the plane much better than you can. A couple of hours later you begin a descent into Denver and turn off the autopilot since it has developed a gentle oscillation in pitch. The aircraft begins to pitch up and as you push forward on the yoke, the aircraft pitches down so aggressively that your wife's purse floats towards the ceiling. You pull back on the yoke and the controls are so sensitive that the aircraft pitches nose up and you feel yourself sinking into the seat from the g forces. This is getting out of hand way too quickly. You fight for control of the aircraft, but you are not sure who is going to win. Every movement you make on the yoke seems to be an overcorrection and you are chasing the airplane instead of flying it. As you start to panic, you try pulling the power and dropping the gear in the hopes that that will help. This seems to improve things a bit, at least enough that you can get control of the aircraft back. You call Denver

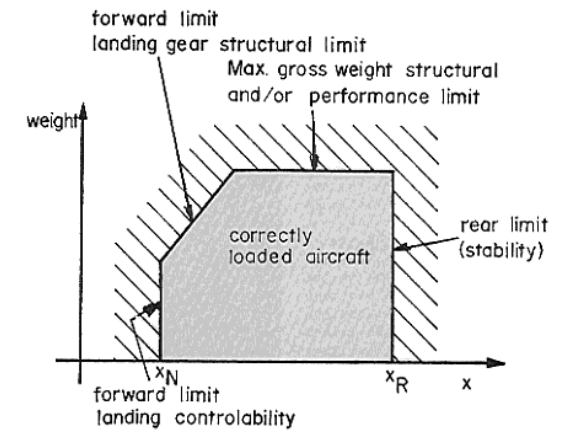
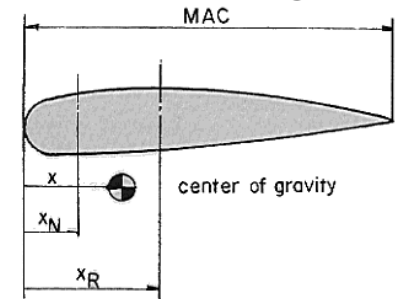


Figure 13



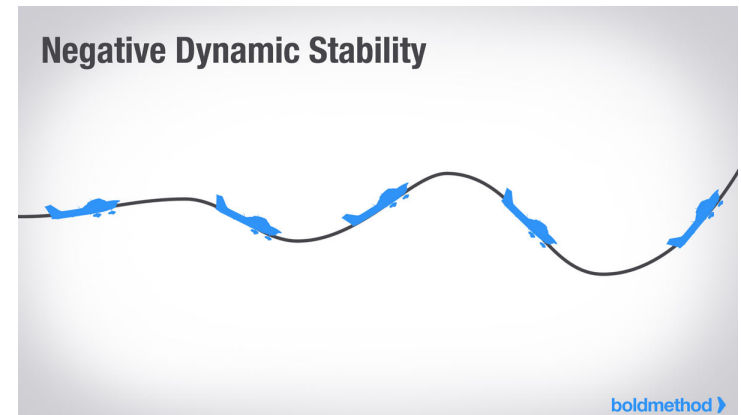
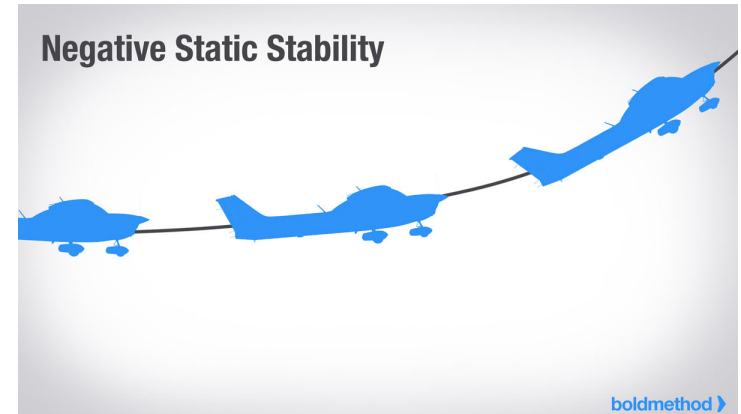
This picture shows an example of the allowable center of gravity envelope and how it is defined by control and structural factors.



and tell them that something is wrong with your plane and that you need to land immediately. They clear you to land on any runway and somehow you manage to get the aircraft on the ground in one piece. As you exit the plane and look at your wife and friends, you realize just how close you came to not finishing this flight in one piece. What the heck happened?

The Bonanza was loaded outside the rear CG limit. This is easy to do on many Bonanzas. The six seats in later model V-tail Bonanzas were more of a marketing ploy than a real capability. Because of the passengers in the rear seats, the aircraft was very close to its neutral pitch stability point during the takeoff, and that made it sensitive in pitch. During the flight to Denver, as the fuel was consumed the CG moved even farther back. In the Bonanza the fuel is carried in front of the spar, resulting in a rearward shift in CG as the fuel is consumed. This caused the aircraft to develop a slightly negative pitch stability. This did not become apparent to the pilot until he turned off the autopilot. Negative pitch stability resulted in the aircraft wanting to diverge from the trimmed condition, rather than to return to it when flown hands off. Reducing power and dropping the gear helped to slow the aircraft and decrease the sensitivity of the controls in this case, allowing the pilot to regain sufficient control of the aircraft that he could land it. The rear CG limit is often set based on where the neutral stability point is for the aircraft. Aircraft designers want to make sure that the aircraft maintains positive static and dynamic stability with the rear most CG so the rear CG limit is set so that it is well forward of the neutral stability point. This is one of the criteria used to set the rear CG limit, another one is the ability to recover from a spin which I will cover in a future article.

These stories are based on actual experiences that pilots have had. I hope they are helpful in letting you understand the implications of flying your aircraft outside of the recommended CG limits and encourage you to develop a better understanding of why it is important to know where the center of gravity is for your aircraft.



An aircraft that is not within the CG limits may exhibit negative static stability or negative dynamic stability or both. Courtesy of the [Bold Method](#).

# Click Bait

[Nasa cancelled the X-57](#) electric aircraft project citing safety concerns. I think the reality is that the \$40M program was overrun by \$59M and they were having problems with their motors. NASA was also so far behind industry in electric aircraft development that there was little to learn from the X-57. They did produce over 90 technical papers that contributed to the development of electric aircraft by others.

<https://spectrum.ieee.org/electric-aviation-nasa-maxwell-x57>

<https://www.popsci.com/technology/nasa-cancels-x-57-flight>

[Paul Bertorelli discusses changes](#) to [AC-90-66](#) which discusses how pilots should enter the pattern at uncontrolled airports. One bit of news is that the Advisory Circular discourages straight in approaches to the pattern. You Think! I don't know a single pilot that hasn't been pissed off by some numbskull sailing in on a long final who is basically ignoring all the other traffic in the pattern.

<https://www.avweb.com/insider/pattern-wars-part-deux/?MailingID=1417>

[Normalization of Deviance](#) is a metaphor for the Boiling Frog urban myth. While the myth is not really true, Normalization of Deviance is a real thing that kills pilots.

<https://www.avweb.com/flight-safety/risk-management/normalizing-deviance/?MailingID=1416>



# EAA Chapter 691 Membership Application/Renewal Form



*Please mail this form along with \$25 to our Chapter Treasurer, Checks can be made out to EAA Chapter 691:*

David Young  
819 Gonzales Rd  
Santa Fe, NM 87501

Name: \_\_\_\_\_

Spouse/partner's Name: \_\_\_\_\_

EAA #: \_\_\_\_\_ Expiration Date (MM/YY) \_\_\_\_ / \_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

E-mail: \_\_\_\_\_

Home phone: \_\_\_\_\_

Work phone: \_\_\_\_\_

Cell phone: \_\_\_\_\_

Please list your currently flying A/C and any finished or in-progress projects: