



EAA Chapter 691 Newsletter
May 2022

On the Web @ www.eaa691.org

EAA 691 is:

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Table Of Contents:

- Upcoming Events **pp. 3**
- Letter from the Editor **pp. 4**
- President's Report **pp. 5**
- Fire season and aircraft **pp. 6**
- Member Updates **pp. 7-8**
- Tech Corner **pp. 9**
- Electrify the Dragonfly Proposal **pp. 11-15**
- EAA Chapter Renewal **pp.16**



We Can Do It!



And So Can You!

Building Skills
Training-
RIVETING!
Saturday,
May 21st

During the war, the poster on the left, painted by J. Howard Miller, was only on display for only two weeks. Norman Rockwell's, on the other hand, was seen by millions. Nick Lehr/The Conversation

Upcoming Events

- **Building Skills training** May 21, 2022 @ KLAM
- **Dragonfly Work Sessions** every Wednesday and Saturday @ 2:00pm @ KLAM. Contact Will Fox for more information
- **KLAM Open House:** Due to the Cerro Pelado Fire has been put on hold.

Letter from the editor

by April Fox



The upcoming chapter meeting will be held at KLAM at the Dragonfly (Dan Holden's) Hangar. It's a building skills class, and a headcount of folks interested would allow the instructors to put together enough kits so that everyone can build something. Please send an email to Will Fox at tailspinfox@gmail.com if you are interested. This way we can get an idea of how many kits are needed for the class.

Marc requests Chapter talk ideas! If any members have ideas for presenters, events, or field trips for next years (2023) chapter meetings, please email Marc at mbonem7@gmail.com



“We don’t grow when things are easy; we grow when we face challenges.” -Anonymous

President’s Report

by Will Fox



It has been a hectic month with a fire threatening Los Alamos and a possible evacuation. As of today, though things are looking much better thanks to the amazing efforts of the fire fighters. The fire is now 71% contained.

The upcoming Building Skills Training on Riveting Aluminum Structures is scheduled for May 21, 2022 at 10:00am in Los Alamos. Skip, Roger, and I are planning to have a class on basic riveting skills where participants will build a simple desktop cell phone holder out of aluminum by bending and riveting it together using various riveting techniques. We plan to conduct the class in Dan’s hangar. We are cutting the necessary parts out of aluminum and putting together kits for the participants.

Dragonfly Project update. The Dragonfly team has been making progress on the fixtures and construction table for the project. We have also been making progress with the STEM program with the possibility of a club sponsored by Don Davis, the science and robotics teacher at LAHS, in the works. Several interested parents have contacted me about how to get their kids involved in the project as well. Temporary hangar space will be needed for Dan’s C-172 in the near future since the unoccupied hangar we have been using is about to become occupied again. Brian Smith has volunteered to let us use his hangar when it becomes available in a month to store the C172 temporarily.

The Los Alamos Airport Open House has been delayed as a result of the fire and has not been rescheduled yet.



Fire Season and Aircraft

Fire season as we all know is upon us, and worse than ever due to a historically warm, dry climate and dense forests (among many other factors). Remember to check TFR's before you fly- "[A] fixed wing incursion over the (Cerro Pelado) fire caused air attack to order a complete shutdown of all air operations, significantly slowing the progress of fire suppression work being performed" – this happened on Monday, May 16th. There have also been drones spotted flying near active fires. Remember; **#IfYouFlyWeCant** and **#NoDronesInFireZones**

That said, every Super Scooper in America is here in NM fighting fires. Check out this [video](#) of the two Super Scoopers landing at Cochiti lake..



Member Updates

From Skip Egdorf:

My engine mount and firewall forward are progressing. The seats are in and the control system is done.

After welding up the mount using the fuselage and a stout jig to hold the Dynafocal ring in alignment, I have bolted the engine mount to the Lycoming as it sits on its stand to ensure that the welding did not move or warp the Dynafocal ring itself. Everything seems to fit and so now it is time to begin the final prep on the engine for installation of the firewall forward.

I have ordered one of Superior's cold-air induction sumps to replace the original Lycoming sump from its days on an Arrow-180. Along with this comes the inverted oil system. After some research I have decided to go with the Raven inverted system rather than the older Christian system. When these arrive I should be able to lay out all the bits and pieces and holes in the firewall.

Then all the formers and outer skins and it will really start looking like an airplane!

Skip





From Jack Ranweiler

I'm going to Chandler, Az the 23rd of this month to take lessons in a Great Lakes biplane. Plan to get my bi-annual done then also. When I get back I'll de-winterize my Hatz then and see about flying it.

Hired someone to put another 3" of crusher fines on my N-S runway. They started but then stopped when we had those high winds and haven't finished yet. I'll have to see if I can get them to finish so I can use it next month.

Jack

Tech Corner

by Will Fox



Electric Dragonfly Project

The National Aeronautical Association (NAA) is planning the first ever cross county electric aircraft race. Named the Pulitzer Electric Aircraft Race, it is a resumption of the Pulitzer air races that began in the 1920s to promote aircraft development. Only zero emission electric aircraft will be allowed to participate in the 1000 nm race from Omaha, Nebraska to Kitty Hawk, North Carolina. The race is scheduled to be held in May 2023 and participants will have 4 days to complete the race. The participant's speed will be based on flying time only. The race will emphasize the combination of speed, range, and reliability of electric aircraft in a realistic environment. The winner of the race will be awarded the Pulitzer trophy that is currently on display in the Smithsonian National Air and Space Museum.

EAA Chapter 691, in Northern New Mexico, with members in Los Alamos, Santa Fe and Taos, plans to build an electric propelled aircraft to compete in the race. The airframe will be based on the Viking Dragonfly that was designed by Bob Walters. The Dragonfly is a very efficient two place tandem wing aircraft that uses the foam core/ fiberglass construction technique popularized by Burt Rutan.

EAA 691 is considering several different concepts for the electric propulsion system but the basic system will be composed of an axial flux electric motor, power controller, monitoring system, power cables, and battery. The design goal is to have sufficient battery storage to allow the Electric Dragonfly to have a one hour endurance while cruising at 150 mph. The original Dragonfly used an internal combustion engine ranging from 60 hp to 100 hp. The Electric Dragonfly will use an electric motor with a peak power of 100 kw. The motor will weigh around 50 pounds including the power controller, monitoring system and power cables. It will be replacing an engine that typically has an installed weight of around 180 pounds. The original Dragonfly carried 15 gallons of fuel that weighed 90 pounds and that gave it a range of 400 miles. By comparison, the Electric Dragonfly will carry a battery that will weigh 300 pounds and provide a range of 150 miles. This means that the Electric Dragonfly will need to fly several legs in the race to cover the 1000 nm distance. Right now the plan is to swap batteries after each leg, with the capability to recharge a battery while it is on a crew vehicle on the way to the next airport. It should be possible to fly at least three legs a day



The Viking Dragonfly designed by Bob Walters

using this approach and complete the race in less than four days. One advantage the electric motor has over the internal combustion engine is that it maintains its power level regardless of altitude. This will allow the Electric Dragonfly to climb to altitude much faster to take advantage of higher ground speeds as well as favorable winds. The Dragonfly has a glide ratio of 14 to 1, and the Electric Dragonfly will have a slightly better glide ratio because there will be less cooling drag with the high efficiency electric motor. Another advantage is that excess altitude can be used to recharge the battery and increase drag for a faster descent when desired.



Building an electric aircraft to race will be fun, challenging, and exciting for EAA 691 members, but I'll let you in on a little secret. That is not the real reason they are doing it. They chose this project with the hopes of attracting and educating the next generation of aviators and building a Science, Technology, Engineering and Math (STEM) program for students in the process. Let me tell you more about how they hope to do that.

Having the opportunity to be part of a project to build a race plane is a rare opportunity. Add to that the fact that it will use an electric propulsion system and you have a once in a lifetime opportunity to be part of a revolution in aviation. This is the opportunity that EAA 691 wants to offer the next generation of pilots and builders in New Mexico. They hope that once folks interested in aviation find out about the project they will want to get involved. In addition the Chapter wants to build a STEM program around the project. To this end they are planning to partner with local schools to get K-12 teachers and students involved in the project. Aviation related STEM materials are abundant and many of them are available for free. The NAA plans to make a STEM program available to 5th and 6th grade teachers and students that will teach them about electrical power systems and aeronautical engineering as it relates to the to the race. Chapter 691 plans to use free online NASA STEM materials to teach students about aviation related subjects. They also plan to offer building skills classes to students so they can learn how various aircraft structures are made. These will include how to make riveted aluminum structures, composite structures, and 3D printed plastic parts. Oh, and they also plan to have the kids work on the race plane, once they have learned the necessary skills.

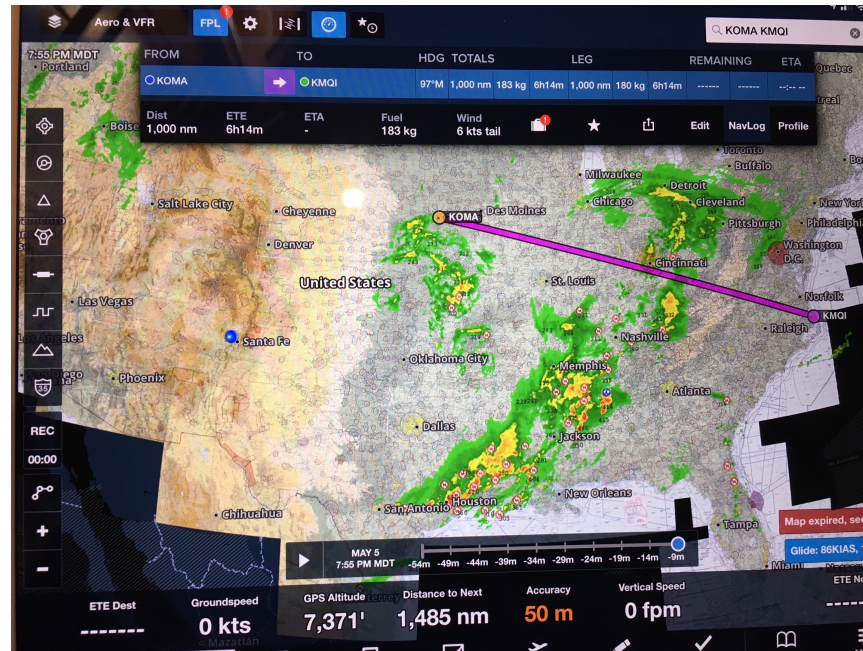


The EAA Chapter 691 Electric Dragonfly project is underway in a hangar at the Los Alamos airport.

How is Chapter 691 going to make this all happen? Well, it turns out they got off to a pretty good start thanks to some real help from a couple of aviation enthusiasts. Wes Baker, former president of Chapter 555 down in Las Cruces, heard about the project and donated two Dragonfly airframes he had planned to rebuild at one time, but never got around to it, to the effort. Dan Holden, an avid pilot and member of Chapter 691 also got behind the effort and donated the use of his hangar to house the project. It seems these acts of generosity are contagious because the number of folks getting involved and contributing their time and effort to the project is growing. Chapter 691 plans to have a prototype Electric Dragonfly flying in less than a year. A challenging goal no doubt, but never underestimate the Spirit of Aviation☺

The Pulitzer Electric Aircraft Race Goal is a Practical Demonstration of the Feasibility of an Electric Aircraft

- It is organized by the National Aeronautical Association and is the first ever Electric Aircraft cross country race.
- A race will be from Omaha, Nebraska to Kittyhawk, North Carolina in May 2023.
- It is a 1000 mile nautical race where the fastest air time wins.



Our Entry is Based on a Modified Dragonfly Aircraft

Our goals are:

- Build an electric experimental aircraft to race in the Pulitzer Electric Aircraft Race.
- Integrate a Science, Technology, Engineering, and Math (STEM) program into the project.



Pilots Experienced in Building Aircraft are Leading this Project

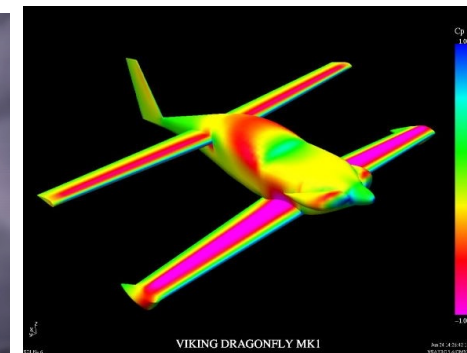
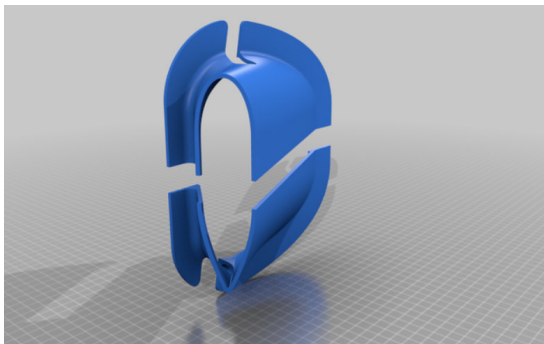
We are off to a great start

- We have hangar space, two super efficient airframes, and some experts on building experimental airplanes to kick this project off.
- We need some some students that want to learn about experimental aircraft and how to construct them



Science, Technology, Engineering, and Math Activities

- Build a wind tunnel to evaluate the Dragonfly aerodynamics.
- Model the aerodynamic performance of the Dragonfly with Computational Fluid Dynamics software.
- Build an RC model of the Dragonfly and measure its performance.
- Build a flight simulator for the Dragonfly.
- Create a spreadsheet for the racing crew to use to build a flight plan for each leg of the race.
- Design some fairings and cooling ducts for the Dragonfly and build them with a 3D printer.



Why You May Want to Participate

- Learn about aeronautical engineering and aircraft performance.
- Learn how to build aircraft structures.
- Learn about electric propelled aircraft.
- Get experience building fixtures and test apparatus.
- Learn about aircraft systems like propulsion, avionics, and controls.
- Work on an experimental aircraft that uses electric propulsion.
- Maybe get some free rides with our pilots!
- For more information contact: Don Davis



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: