



# EAA Chapter 691 Newsletter

## September 2024

Scooting along in a Bonanza

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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## Upcoming Events

→ Meetings Schedule (unless otherwise noted) ←

**9:30am - social time**

**10:00am - business meeting**

**10:30am - speaker/workshop/  
training**

# Upcoming Events

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

**Saturday September 7<sup>th</sup>** @ Los Alamos Terminal Building - Build and Fly, 1:00 pm to 5:00 pm.

**Saturday September 14<sup>th</sup>** @ Los Alamos Terminal Building - Build and Fly, 1:00 pm to 5:00 pm.

**Saturday September 21<sup>th</sup>** @ Los Alamos Terminal Building - Young Eagles Rally.



Saturday,  
September  
21st

# Join EAA 691 for a Young Eagles Rally in Los Alamos

A reminder that the EAA Chapter 691  
Young Eagle Rally will be held Saturday,  
September 21<sup>st</sup> at the Los Alamos  
Airport.





# Letter from the editor

by April and Will



Hello Chapter 691 members, our next two meetings will be Young Eagle Rallies. One is in September in Los Alamos, and the the other in October in Espanola and we need pilots and ground crew. Please let April Fox ([forkfox@gmail.com](mailto:forkfox@gmail.com)) know if you would like to participate. Please join us even if you just want to be a spectator. There will be lots of airplanes to watch and hangar flying to do☺ Don't forget that we will have a cookout/potluck afterwards. We will have brats, hamburgers, and the fixings, but bring a dish if you want a little more variety:-)

# President's Report

by Will Fox



## Time To Fly The Kids

*Don't judge each day by the harvest you reap, but by the seeds you plant. - R.L. Stevenson.*

Hi folks, our first Young Eagle Rally, is coming up. It is time to give some kids some rides☺ The rally is scheduled for September 21<sup>st</sup>, 2024 and will be at the Los Alamos Airport. April Fox our Young Eagle Coordinator is looking for pilots and ground crew. If you are interested in helping just respond to this newsletter and let her know. We will burn some burgers and brats and serve them up with chips and cookies afterwards. The cookout will be in Roger's hangar on the west end of the airport and everyone is invited.

We are knee deep in the Young Eagles Build and Fly program and it won't be long before our young builders will be flying the eKadet RC model they are building. Working with the kids is a lot of fun and I think we are learning just as much as they are:-).

We have some really good news to share. The IRS approved our application to become a 501c3 organization☺ We can now offer folks who would like to make a donation to the Chapter a tax exemption. Donations help to support our Young Eagle and STEM activities, including the Electric Dragonfly project. If you want to invest in the future generation of aviators, consider making a donation. David Young our treasurer will be sending out some more information in the near future.

Get out there, go flying, and take someone along with you for a ride. We have a big job to do to build the next generation of aviators☺

Check out our Chapter YouTube channel at <https://www.youtube.com/@eaachapter691> and for upcoming events, check out the 2024 Schedule that is posted on the Chapter website at <https://www.eaachapter691.org/upcoming-events>.



Top - Maxton and Mollie Wooten imagining a ride in the Electric Dragonfly.  
Bottom – John George talking about the future of electric VTOL Ultralights.



# Pilots on the Go.



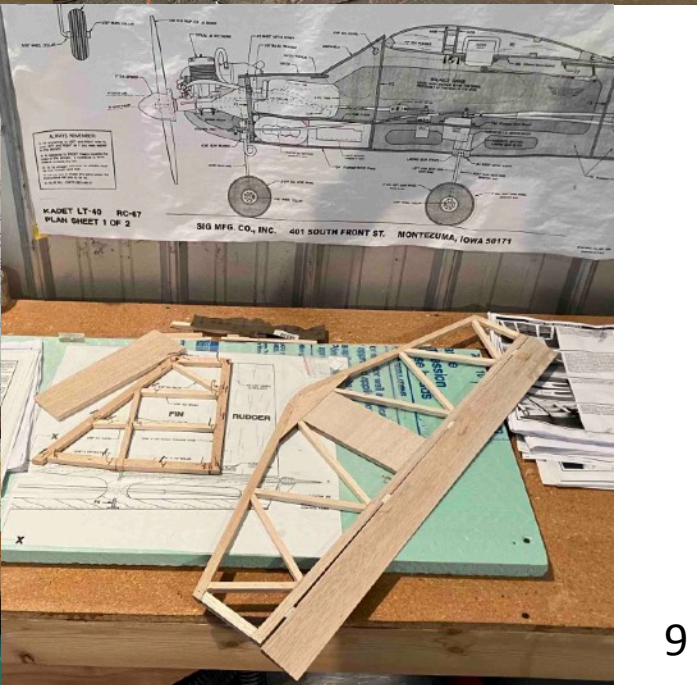


# Mentors make the Build & Fly project possible.





# The eKadet will soon be flying.





# Pierre's RV-14 Build

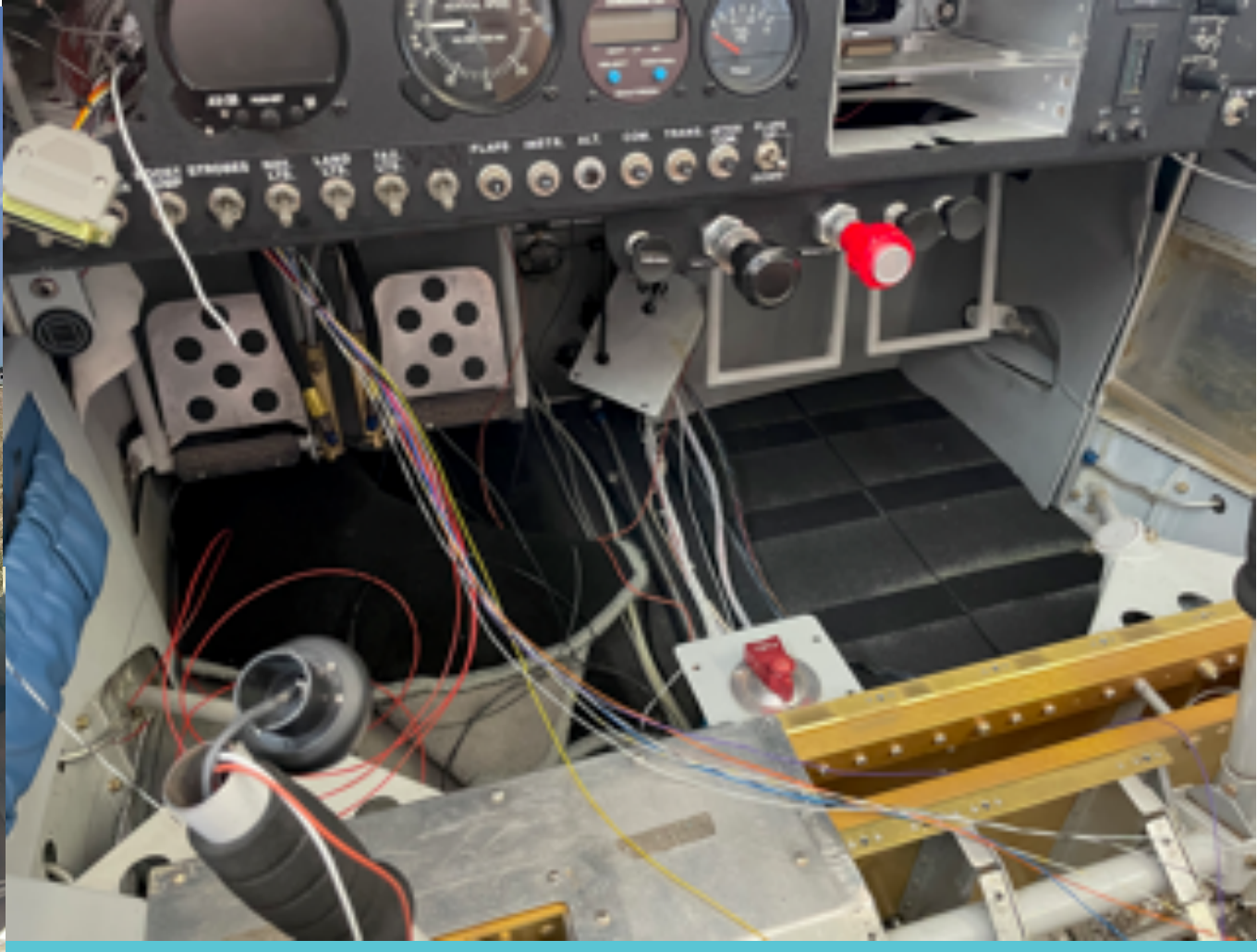




John and Will talk about advances in VTOL aircraft.







Member happenings

Paul Price installed a new Xcruise 100 Autopilot (formally TruTrak) in his RV-9A



I just completed the installation of the Xcruze 100 in my VANS RV9A and am very pleased with the results. I connected the AP to my Garmin GNC250XL (circa 2003) from it's secondary serial output and the ARINC A and B output. That connection only required three new pins in the J101 female 37 pin connector. The AP also requires connecting the pitot and static systems. After working out a few bugs, the first flight was a delight. I put several waypoints in the Garmin nav/com route function. The AP acquired the GPS signal immediately and started monitoring my heading while taxiing. Shortly after climb-out I changed the mode to GPS steering and the plane gently turned toward and intercepted the route. The AP anticipated each succeeding way point and gently turned the plane rounding each corner and fixing on the next waypoint heading. Climbs, descents, and heading adjustments are also easily made in the tracking mode.

The installation was labor intensive and included removing all seats, interior panels, seat pans and several floor pans. After that routing the wiring was quite easy thanks to the excellent wiring harness from Aircraft Spruce. VANS provided excellent support about wire routing and allowable additional pass-through holes where required.

A few things, unnecessarily, made the install more difficult than needed.

First, The Aircraft Spruce website has no description and no reviews for the \$350 wiring harness. A customer support person at Aircraft Spruce willingly sent me a picture of the packing slip for the product. It said the harness was "30 inch" and included the 9 pin back shells for the servo connections but said nothing about the 25 pin connector needed for the autopilot control head. I ordered the wiring harness anyway and was more than pleasantly surprised. The wiring harness was 30 feet long and nicely separated into snake-skins for each servo. The remaining several wires, for mostly under the panel connections, were 5 feet long. The wires were all terminated perfectly into the 25 pin connector. Two other small annoyances were 1) the harness included exactly 16 female socket pins for making up the servo connections and none for the connection to the nav/com so if you don't have a few of your own you cannot complete the wiring and 2) one of the servo connection back-shells is a 90 degree connection that proved worthless because it's virtually impossible to connect it to the mounting screw holes in the servo. I used a straight connector that came with the autopilot itself and it worked fine. Overall, the product is excellent and I am glad I made the purchase.

Second, the installation kit specific to the RV9A cost \$515 and included two small custom sheet metal mounting brackets, two push rods, a bunch of wire terminals that also came with the wiring harness and a bunch of installation diagrams but no instructions. The mounting brackets are essential and worked perfectly but if you're handy with sheet metal you could make the same things for a few dollars.

Third, the wiring diagrams were incorrect for the RV9A. The pitch servo diagram has an option A and option B which makes the servo rotate either clockwise or counter-clockwise when commanded from the control unit. The Honeywell/BendixKing support people assured me the RV9A uses option A but they were wrong and the pitch responded opposite to my inputs during the ground test. The roll servo diagram does not include any model specific options but it also responded opposite during the ground test. Fortunately, the AP set up procedure lets you reverse the servos electronically so the corrections were easily made.

Fourth, the Garmin GNC250XL had the secondary serial output turned off so the first ground test showed "No GPS". The Garmin operating manual showed how to turn it on so that correction was also a quick fix. The second ground test was flawless and first flight test was also just perfect.

The Xcruze 100 overall is an excellent choice for me and my RV9A. I didn't know all that I was missing without an autopilot and I really enjoy the reduced work load.

[Autopilot, servos, and installation kit purchased from Gulf Coast Avionics.](#)

[Wiring harness, pitot, and static connection purchased from Aircraft Spruce.](#)



## DESTINATIONS: CUMBRES-TOLTEC SCENIC RAILROAD

Yes, I know this is an airplane newsletter, but sometimes one needs ideas on where to fly to. If you are in the mood for astounding scenery, hunting or fishing, or some good old-fashioned steam technology, I recommend the Cumbres-Toltec Scenic Railroad. The trains run between Chama, NM to Antonito, CO spring through fall.

The trains are pulled by steam engines, either coal or oil fired at a comfortable pace of about 20 mph. There are three choices of passenger cars offering different levels of service. There is also a club car (the drinks are good) and an open-air observation car, which is a lot of fun. Be sure to wear a hat and plenty of sunscreen. The train winds through the mountains offering wonderful scenery. There are water towers, a trestle or two, and two tunnels that offer ample opportunities to play “gotcha”.



Member happenings

Marc Bonem's visit to the Cumbres-Toltec Railroad



It's interesting that the engines were built in 1925, around the same time as the Ford Tri-Motor. Steam power seems like a throwback to the 19th century, while the airplane seems like a step forward to the modern. Was 1925 a technology crossover point? Is 2024?

There is a stop for lunch at Osier. It's cafeteria-style, and not bad. You can change trains there and head back, or ride on to Antonito and take the bus back.

We stayed overnight at one of the "lodges" in Chama, which was pretty bare bones. Take some time on your computer and find someplace better. Also, most of the cafes in Chama cater to the breakfast and lunch crowds. There are only 2-3 places open for dinner.

For detailed trip information go to [Cumbres & Toltec Scenic Railroad | Experience the Authentic West! \(cumbrestoltec.com\)](http://cumbrestoltec.com)

There are no public airports near Chama; however, 2 miles out of town is the private Eastside Airport (NM24), Altitude: 8,030'.





# Tech Corner

by Will Fox



## The Mechanic

Once upon a time there was an airstrip high in the mountains, where the air was thin, the winds were tricky, and the pilots were salty. The strip was known for testing a pilot's skills, and more than a few planes and pilots had met their demise challenging it. There was only one way in and one way out of that old airstrip because of the mountains and canyons that surrounded it. On some days there was no way in or out, because the terrain, weather, and thin air combined to make it impossible for any airplane or pilot regardless of their capabilities, to use it. Sometimes the wind would toss an aircraft that was not ready to fly hopelessly into the air, and other times it would grab it out of the air and slam it onto the ground. The weather could change from warm and sunny to freezing cold in an instant. Thunderstorms reaching far into the stratosphere froze water into ice that fell back to earth and hammered planes with hail so fierce that they were unflyable wrecks afterward. But the airstrip also had an irresistible beauty to it. It could be seductive and entice unknowing pilots to land to enjoy the grassy plateau and piney forests that covered the mountains it sat against. The spell was broken when the pilot discovered that there was no hope of taking off again. Such was the case in the story I am about to tell you.

One day two salty old aviators were standing next to the runway on a summer day talking about airplanes and flying. One was tall, the other was husky. It was late morning and it was already getting warm and humid as they found their conversation coming to an end. Suddenly, the husky one looked up to see an airplane coming over the trees to land on the airstrip. "He's landing the wrong way", he said casually. "Yup, he came straight in over the mountain and he is high and fast"



The Mechanic. It takes a special type of person to run their own aircraft maintenance business. It's a hard row to hoe. They have to be gifted in some ways and crazy in others. I don't know what we would do without them.

said the tall one. They watched as the plane floated past, with no apparent interest in landing, and the husky one said, “that’s what happens when you land going downhill”. You see, the airstrip sloped away from the mountains in the direction the pilot was trying to land, so the pilot found himself chasing the runway downhill during the flare. Finally, the plane caught up with the runway and the pilot made a nice job of the landing, but he had used up a lot of runway in the process. The two old aviators watched as the plane rolled past the last runway exit, expecting the pilot to stop and turn around, but that didn’t happen. Instead the pilot continued to taxi to the end of the runway where he turned back around and began to takeoff toward the mountain even though he had a bit of a tailwind. “Looks like he is going to try to take off uphill with a tailwind” said tall one. “That’s not good and I sure don’t want to see a crash today” said the husky one. But the pilot of the plane did not hear this of course and continued to chase the warm mountain air uphill not realizing how improbable his chances to taking off would be.



The takeoff unfolded in a plodding distinctly ponderous way. The plane, a type not known for being overburdened with horsepower, accelerated slowly, seeming to take forever to build any speed. Impatient, the piloted attempted to lift the nose and get the plane flying, but although the nose obliged, the rest of the plane remained glued to the runway. The pilot, realizing that he didn’t have sufficient speed wisely lowered the nose and allowed the plane to struggle to gain a few more mph. Once again he pulled the nose up, higher this time, and the plane grudgingly lifted off momentarily and then settled back down on the runway. It was at this point that any wrinkled and weathered pilot would admit defeat, pull the throttle, and abort the takeoff, knowing full well that a successful takeoff wasn’t in the cards. This pilot however, was fresh out of the factory and had not yet learned the rules of the game let alone how the deck was stacked against him.

By this time the plane was two thirds of the way down the runway, drifting to the left, and approaching the two salty old aviators giving them a good view of what was predictably about to occur. With the trees at the end of the runway approaching much more rapidly than he expected, the pilot gave the yoke a mighty pull to get the plane into the air. This produced the desired result for a few seconds, but unfortunately, the aircraft simply didn’t have enough speed or horsepower to remain there very long. “He’s going to stall it” said the husky aviator. Nose too high and sliding to the left the struggling aircraft did stall. Fortunately, it wasn’t more than 20 feet off the ground when this occurred and equally fortunate was the fact that the designer of the aircraft had anticipated that this might happen and endowed it with a forgiving wing. Nevertheless, the impact with the ground proved substantial as the aircraft hit hard, first on the left wheel and then on the right one, and finally on the nose wheel as it skidded off the runway disappearing in a cloud of dirt and mountain grass. The two salty old aviators looked at each other, and one said in a tired voice, “I guess we should go over and see if he is still alive” and the other said, “He probably is, it wasn’t near as bad as it could have been”.



It turned out there were two people in the plane, a young couple, and fortunately they were unhurt. But you couldn't quite say that about the plane which was old and slightly bent. As they all stood looking at the plane, the grumpy, and only mechanic on the field, drove up to survey the situation. He had been a mechanic in the Navy and afterward he had been scraping out a living fixing airplanes. He had been running his own business for several years, and he wasn't doing so well, so he was even saltier than the two old aviators. He got out of his car and looked at the pilot and said, in an unsympathetic voice, "You landed the wrong way and then took off the wrong way with a tailwind, where did you learn to fly?" Without waiting for an answer, he began assessing the damage to the aircraft. Looking at the left gear, he said, "You bent the axle and the gear spring". Looking at the right gear, "you may have bent this one too, it's hard to tell". Looking thru the oil inspection hole on the engine cowl, he announced, "You're lucky, it doesn't look like you bent the firewall. Well, let's tow it up to my hangar and take a closer look."

Knowing the young couple were in good hands now, the two aviators decided it was time to leave because they had other commitments to meet. It didn't look like the couple's airplane was going to get flying any time soon, so one of them gave them a phone number to call if they needed a ride back to their home base.

Back at the hangar after looking things over, the Mechanic said, "That left gear is bent bad and needs to be replaced". The couple got that look that young people get when fun and adventure goes awry and reality hits. Embarrassment and money they didn't have was the special for the day. Seeing the look on their faces, the Mechanic, who had a heart of gold under the crusty exterior and had faced an unfortunate reality on more than one occasion himself said "I own a plane just like this one. I can pull the gear off of it and loan it to you until you can get a replacement. That way you can fly it back home." And that is exactly what he did, and they did.

The Mechanic's airplane ended up resting on a pile of tires until one day the young man brought back his landing gear and some money to pay him for his help. The Mechanic appreciated both because he had fallen on hard times. His plane eventually flew again, but only after he sold it to a friend after he had lost his business and moved away.

I doubt many people would pull the landing gear off their plane and loan it to a couple of strangers. Especially after the strangers had just crashed their own plane. Sometimes people will really surprise you with their trust and generosity. I wish there were more of those kind of people around.



# Update On The Electric Dragonfly Project

- Substantial progress has been made on a number of issues with the Dragonfly airframe but more work is needed.
  - The canopy was damaged during moving and was rebuilt.
  - The fuel header tank had a leak that was repaired.
  - Control pushrods were improperly constructed and new ones were built.
  - Control stops were missing or did not work properly and new ones built and installed.
  - The control rigging does not match the specifications in the plans so the controls are being rerigged.
  - There is some water damage due to leaks around the boot cowl inspection cover and the turtle deck cover that need to be repaired.
  - There is thermal damage to the bottom of canard skin due to the close proximity of the exhaust pipes that needs to be repaired.
  - The fairings on the main gear legs are damaged and need to be rebuilt.





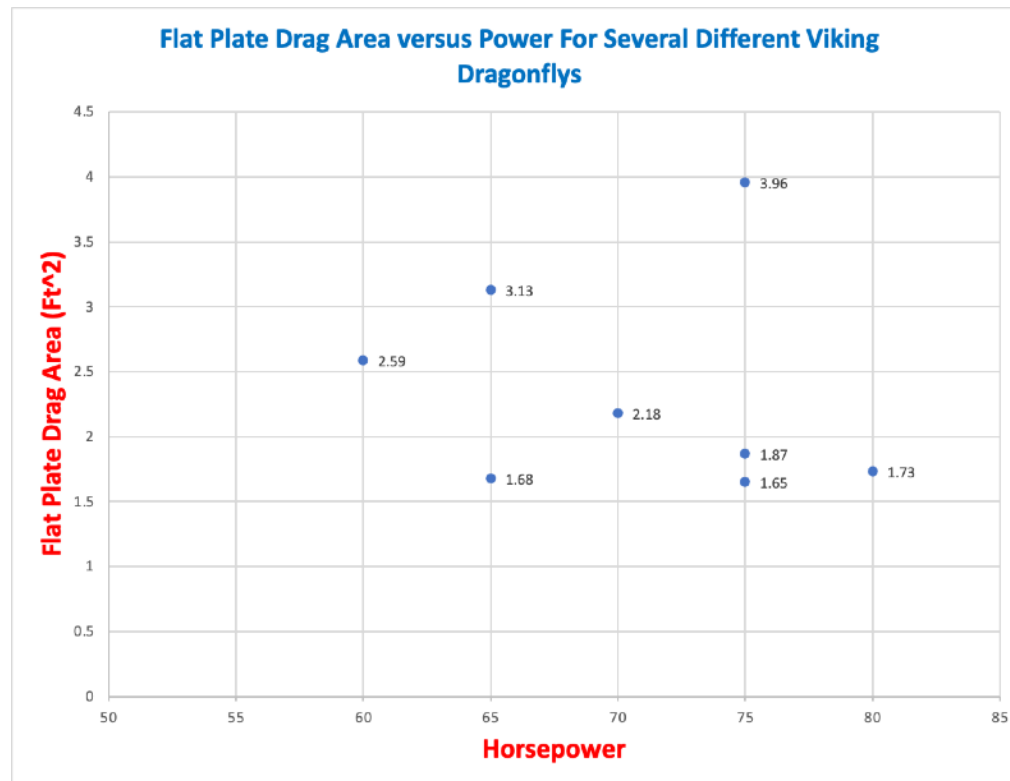
# Accurate Dragonfly Performance Data Is Needed

- There is considerable scatter in the performance data that has been published by various Dragonfly builders and pilots.
  - Analysis indicates that the flat plate drag can vary considerably from one plane to the next. This could be due to rigging and/or builder errors.
  - It could also be due to the fact that engine output power is not well known on many of these aircraft given the experimental nature of the engines used.
- These factors make it difficult to design an optimized electric propulsion system.
- As a result, we are considering installing a reliable and well characterized aircraft engine such as a Rotax 912 or Continental O-200 as an intermediate step to evaluate the Dragonfly performance and provide input to the electric propulsion design.



## Electric Dragonfly Performance Prediction

- Reported ICE Dragonfly performance data is all over the place.
- Calculated Flat Plate Drag Area varies by more than a factor of 2 between aircraft.





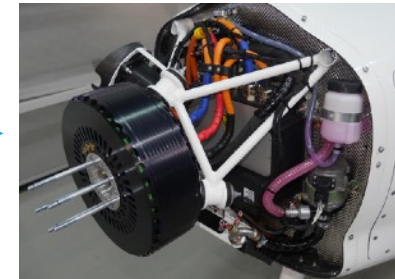
# Electric Dragonfly Development Flow Chart

- Dragonfly performance data needed
- Propulsion system development needed

- Electric Dragonfly
  - 1 hour @ 150 mph
  - Modular Battery
  - 2-place Operation
  - X-Country Race



- ICE Dragonfly
  - Rotax 912/Continental
  - Performance Eval.
  - Training
  - Demonstration

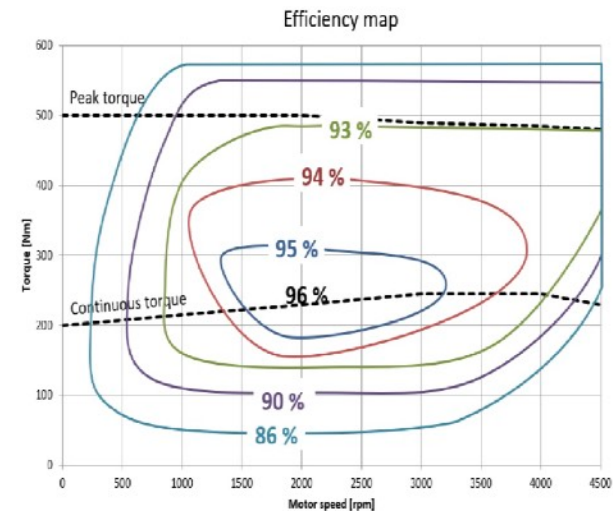
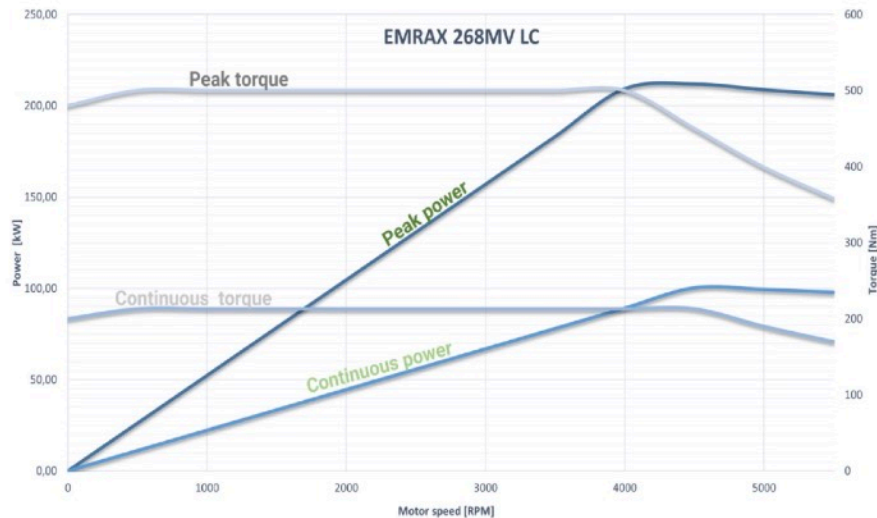


- Dragonfly Status
  - Canopy repaired
  - Controls rebuilt
  - Rigging in progress
  - Panel upgrade needed
  - Motor upgrade needed

- Electric Dragonfly
  - EMRAX/Saluqi Motor
  - 40kwh Battery
  - LFE/LNMC
  - MT Prop

# Preliminary Electric Propulsion System Requirements

- Electric constant speed propeller with a 52"-54" diameter.
- Propeller efficiency of 85% to 90% in cruise
- 50 kw (65 hp) continuous power rating for cruise.
- 85 kw (115 hp) peak power rating for maximum speed.
- Motor efficiency of 94% or better in cruise.
- Motor voltage 400 volts.
- Motor current 250 amps.







## FOR SALE

### 1977 Cessna 182Q Skylane

1/2 share of 759HR - with LAM Hangar and Maintenance fund (current balance ≈ \$11,000)

Total Package Value \$150,000. 1/2 Share \$75,000

#### Key Features:

- Engine - Less than 300 hrs SMOH
- Prop – Less than 300 hrs since overhaul
- Long Range Tanks (80 gal)
- Useful load over 1,100 lbs!
- ADS-B In and Out
- Fuel totalizer (Fuel scan FS-450)
- S-Tec 40-50 Auto pilot
- IFR Capable
- Current Annual and Instrument Checks
- 6200 hrs TTAF

Call or text Jared @ 972-567-4664

# Clickbait

Thank you contributors!

## **Why Electric Planes Are Inevitably Coming**

<https://www.youtube.com/watch?v=aH4b3sAs-l8>

## **The REAL story About the Crash that Killed Concorde! | Air France flight 4590**

<https://www.youtube.com/watch?v=C-nALYF73hU>

## **Sucked Out Of The Airplane**

<https://www.youtube.com/watch?v=PRwV9rn2794>



# EAA Chapter 691 Membership Application/Renewal Form



*Please mail this form along with \$35 (single) or \$40 (family) to our Chapter Treasurer, Checks can be made out to EAA Chapter 691.*

*You can also go to <https://www.eachapter691.org/support/join/> and join or renew online using PayPal.*

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: